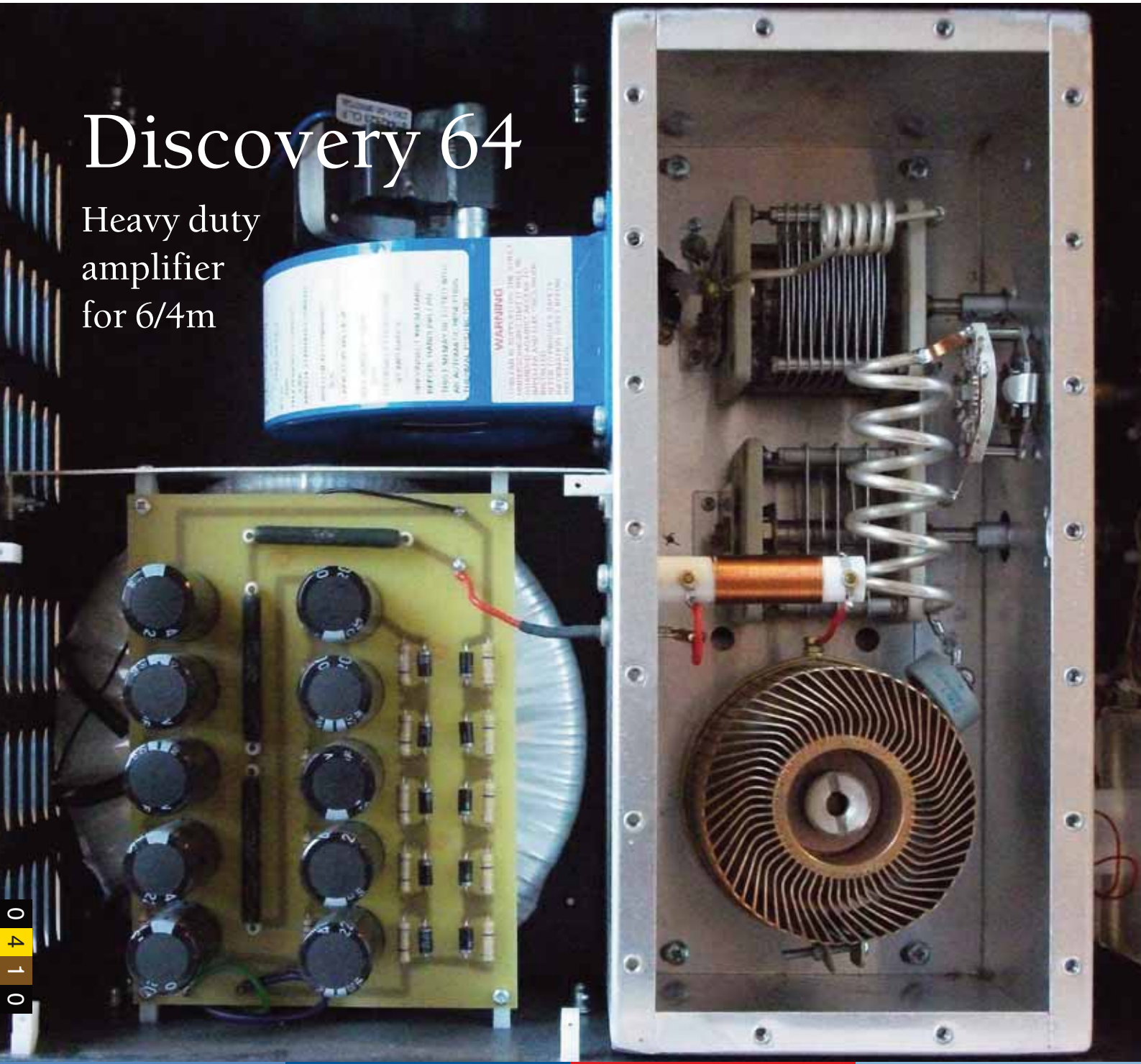
RadCom

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

APRIL 2010
VOLUME 86
NUMBER 04

£4.25



Discovery 64

Heavy duty amplifier for 6/4m

0410

AGM in Bedford

Preceded by trophy presentations

Bletchley Park

Work continues on Amateur Radio Centre

IOTA

M0BLF operating from the Monach Islands

Homebrew

Make your own switched attenuator

WATERS & STANTON

SCOTTISH STORE • W&S @ JAYCEE, 20 WOODSIDE WAY, GLENROTHES, FIFE, KY7 5DF - CLOSED MONDAYS
• ENQUIRIES: 01592 756962 / 0845 5050128 FAX: 01592 610451 EMAIL: jayceecoms@aol.com
• OPENING TIMES: Tue-Fri: 9.15am - 5pm Sat: 9am - 4pm

HEAD OFFICE & SOUTHERN STORE • SPA HOUSE, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS
• ENQUIRIES: 01702 204965 FAX: 01702 205843 EMAIL: sales@wsplc.com • OPENING TIMES: Mon-Sat: 9am - 5.30pm

Introducing "Smashing Prices"

For the best and latest prices on radios, go to www.wsplc.com and click Smashing Prices

SMASHING PRICES!

At Waters and Stanton we want to offer you the best possible prices and service. This means tracking market deals, price movements and reacting to supplier's offers. So the prices in this advert may now be even lower or there may be "Deals." Check our web front page and see just what our latest ***"Smashing Prices"*** prices are.

Check any item showing the Smashing Prices logo:

FAST SAME DAY DESPATCH SERVICE!
Orders must be received before 3pm.

Come & See Us At...
NARSA Blackpool Rally - Sunday 11/04/10
& Grab Yourself A Bargain!

Package Deals!

Grab a Rig & Heil Proset for a Bargain Price!

This package deal offers you a huge saving on cost and gives you the best audio in the business from Heil. Operate hands free choosing Pro-Set-5 for normal operation or Pro-Set-4 with treble lift for DX.

Get yourself a great deal with Smashing Prices.

1 Heil Proset Headset 4 or 5
2 Matching Interface lead
3 Three Year Rig Warranty
4 FREE Carriage UK mainland

Rig + Heil Pro-Set		Package Price
FT-2000	Inc PEP	£1999
FT-950	Great value	£1199
FT-450	Best budget deal	£695
IC-7600	DXers delight	£3479
IC-7200	Value rig	£859

YAESU HF Transceivers

FT-2000 The classic HF & 6m 100W transceiver with PEP (performance upgrade) ready installed. Dual receive and fantastic filtering make this an impressive performer. And despite what you may read, we still have the largest, most up-to-date stock of Yaesu in the UK! **£2079 D**

FT-2000D	200 Watt version of FT-2000 with built-in PSU.	£2649.95 D
FT-950	100W HF - 6m transceiver with DSP & Auto ATU	£1099.95 D
FT-450AT	100W HF - 6m with automatic ATU & latest updates	£679.95 D
FT-450	100W HF - 6m transceiver - great value.	£589.95 D
FT-DX9000contest	200W HF - 6m "formula one" contest machine	£4599 D
FT-DX9000D	Deluxe fully loaded base station	£7695 D
FT- DX9000MP	Amazing 400W "legal limit" radio	£8549 D
FT-857D	HF to 2m mobile. portable or base - up to 100W	£574.95 D
FT-817BHIDSP	Fitted with DSP module exclusive to W&S	£549.95 D

COMING SOON **FT-DX5000 Series**

The FTDX5000 series of HF /50MHz 200W transceivers are a new premium class of Yaesu radios with two fully independent receivers designed to meet the performance requirements of even the most demanding amateur radio operator.

FT-817ND

A great radio, whatever your interest is. With 2.5 watts from battery or 5 watts from ext. 12V, it slips into a brief case or rucksack with ease. Many operators have DX tales to tell with this mighty midget. Offers SSB, CW & FM.
+ FREE CSC-83 Case!

£439 D

YAESU VHF Mobiles & Handhelds

FTM-10SE	50/40W 2m/70cms stereo FM	£269 D
FT-2800	2m Mobile 65W wideband receiver	£124 D
FT-7800	Dualband 50W mobile, AM airband	£189 D
FT-8800	Dualband Mobile 50W / 30W	£289 D
FT-8900	10/6/2m & 70cm Mobile	£334 D
VX-3E	2m / 70cm Handheld Wideband receive	£139 D
VX-7R	Waterproof dualband handy (silver or black)	£259 C
VX-6E	2m/70cms handy, 5W Wideband Receive	£199 C
FT-60E	2m/70cms, 5W handy Wideband Receive	£142 C
FT-270E	2m/ 5W 16-Key Keypad	£99 C

VX-8E **Triple Band**

APRS and Bluetooth, plus waterproof housing and barometer! You also get dual simultaneous receive and a GPS option!

£329 D

ICOM HF Transceivers

IC-7600 **FREE USB keyboard!**

This HF-6m transceiver is the successor to the IC-756 series. It takes features from the flagship IC-7800 and the more recent IC-7700, putting them into a package that brings the price within reach of many more hams. **£3379 D**

IC-7800	HF / 50MHz All-Mode 200W. A masterpiece of ham radio engineering	£7999 D
IC-7700	1.8-54MHz 200W with built-in PSK-31 + keyboard	£5499 D
IC-7400	160m-70cm 100W base station with large easy to read LCD display	£1339 D
IC-7200	HF & 6m DSP 0.005-3335MHz wideband receive with USB port	£759 D
IC-718	160m-10m 100W transceiver that brings HF to those on a budget	£449 D

IC-7000 100W 1.8-440MHZ all-mode transceiver with 2.5" colour display. An incredibly small package with a quite amazing performance. Phone for deal on external 6" LCD screen. **£939 D**

Receivers & Scanners

IC-R20

IC-R5	*LAST FEW* Handheld scanner 0.15 - 1310MHz	£172.95 C
IC-R6	*NEW* Handheld scanner (see opposite page)	£172.95 C
IC-R20	Handheld scanner 0.15 - 3305MHz	£314.95 C
IC-R1500	PC scanner 1.01 - 300MHz	£449.95 C
IC-R8500	Base receiver 1.01MHz - 2GHz	£1379.95 D
IC-R9500	Base receiver 5kHz-3.3GHz	£8999.95 D

COMING SOON **IC-9100**

This expandable transceiver offers professional performance, out of the box on HF, 6m & 2m with 100W, plus options for 70cms (75W) & 23 cms.

KENWOOD HF Transceivers

TS-2000E The TS-2000E is the classix all-band, all-mode base station covering HF - 70cms at up to 100 Watts. Includes dual channel receivers and DX-cluster monitor with built-in TNC.
£1489 D **TS-2000X** +23cm **£1749 D**

TS-480HX Ideal for mobile, portable or base station. Gives a massive 200W on HF and 100W on 6m. **£849 D**

TS-480SAT This model gives 100 Watts on all bands up to 6m, but adds a built-in automatic ATU. **£749 D**

KENWOOD Handhelds

TH-F7E	2m/70cm 5W (2-pin Kenwood) SMA **+FREE Clip Mic**	£229.95 D
TH-K2E	2m 5W 4-Key Keypad (2-pin Ken) SMA **+FREE Headset**	£159.95 D
TH-K2ET	2m 5W 16-Key Keypad (2-pin Ken) SMA **+FREE Headset**	£165.95 D
TH-K4E	70cm 5W (2-pin Kenwood) SMA **+FREE Headset**	£159.95 D

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

Orderline

01702 206835

Online Catalogue

www.wsplc.com

UK's Lowest Prices

Zero Deposit Zero Interest

BUY NOW - PAY 2011!
INTEREST FREE NO DEPOSIT

BUY NOW PAY LATER AT BOTH STORES

On most items over £200 in value it is now possible to buy with a finance agreement and pay nothing for 12 months without incurring ANY interest charges. If paid in full within 12 months then a £29 settlement fee is payable. **Typical example** of Buy Now Pay Later: Cash price - £600. Pay no deposit and pay the full amount in 12 months. **Pay no interest – just £29 fee OR - 29.8% APR** - Then repay £30.85 per month for 36 months. No settlement fee. Total amount due £1110.60. Interest is calculated from date of agreement. All finance is subject to status – written quotation on request. A Direct Debit agreement must be signed at the time of purchase.

We can arrange over phone or e-mail

Get that dream radio now!

Enjoy it today - not tomorrow

NOW IN STOCK!
NEW AIRNAV RADARBOX-3D

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

Full Package **£489.95 C**

Current owners can upgrade to 3D with RADARBOX-UG for just **£89.95 C**

Kenwood
VHF/UHF Mobile/Handy

TM-V71E

**2m 70cm*
**Wideband Receive*
**Built-In Echolink*
**Removeable Control Head *CTCSS Encode/Decode*
**Supplied w/ DTMF Mic.*
£289 D

TM-271E **£165 D**

2m FM 60W Mobile Transceiver. MIL-SPEC DTMF, Mic. Built-in CTCSS & DCS encoder / decoder.

TM-D710E **£429 D**

Kenwood's new mobile FM station is great! APRS, Built-in TNC DTMF Mic & Weather Station ready.

Icom
VHF/UHF Mobile/Handy

IC-E208 Dualband Mobile

**Freq range 144-146MHz, 430-440MHz Tx*
**55/50W (3 pwr steps each band)*
**Wideband Rx: 118-173, 230-549 & 810-999MHz*
£254 D

IC-910H **£1249 D**
2m / 70cm 100W Base station all modes with option for 23cm module (UX-910 £359)

IC-910HX **£1449 D**
As above but with 23cm module ready fitted and a big saving as well.

IC-2200H **£199 D**
2m 55W FM mobile with rugged construction and with digital option.

IC-2725E **£319 D**
Dual band 2m/70cm. Easy to operate and install and a lovely detachable head.

IC-E90

6m / 2m / 70cm Handheld Transceiver. **£234 C**

IC-R6 *Scanner* **NEW**

This new model wide frequency range of 0.100-1309.995MHz in AM, FM, and WFM modes Amateur stations, AM, FM, short wave broadcasts, TV audio can be listened to. **£172 C**

COMING SOON — YAESU

FTM-350E *New Dual Bander*

• High Speed Bandscope • Optional FGPS-1 Internal GPS Unit • Optional FGPS-2 Internal GPS Unit • Optional FPR-1 Monitor Unit • 500 + 500 Alpha Memories • Bluetooth Ready • Built-in Barometric Pressure Sensor • Large Dot Matrix Display • Selectable Eight Colour Display • Extended Receive • AM & FM, FM Stereo Broadcast Bands

RT Systems
Rig Control Software

Programming software for your radios. Comes with interface lead.

Yaesu FT Handhelds	£44.95 C
Yaesu VX Handhelds	£44.95 C
Yaesu FT Mobiles	£44.95 C

State model of radio when ordering.

Vibroplex USA
Morse Keys

V-ID *Paddle* Iambic Deluxe Chrome Base. **£199.95 C**

V-CM "The Code Mite"	£63.95 C
V-CWJ iambic key	£114.95 C
V-SRD chrome base, red paddles	£154.95 C
V-SRS Black base black paddles	£135.95 C
V-ODBK "Original Deluxe Bug	£229.95 C
V-OSBK Standard Bug Key blk	£179.95 C
V-SKD Straight Key Deluxe	£199.95 C
V-SKG Straight Key Gold 24K	£299.95 C
V-VKS Vibrokeyer Standard	£164.95 C

Rigblaster USA
Data Interfaces

A range of high performance interfaces.

RB/DU/CUSB	£329.95 C
DUO Data Mode Soundcard Interface + USB	
RB/PR/CUSBDC	£279.95 C
PRO Data Mode Soundcard Interface + USB	
RB/PL/C-USBDC	£159.95 C
PLUS Data Mode Soundcard Interface + USB	
RB/NO/CUSB	£79.95 C
NOMIC Data Mode Soundcard Interface Passive USB	
RB-CD Software Collection v8.1	£8.95 C

Bonito
Rig Control Software

Famous all over the world, this software is designed by professionals in radio communications. Use today's technology to make your ham operating more fun.

RadioCom-6 Latest version	£179.95 C
SB-RCHAM Extra interface	£59.95 C
RadioCom-4.5UNI	£79.95 C
RadioCom-4.5PCR	£59.95 C
RadioCom-6-UPG5	£59.95 C

We stock a wide selection of interface leads, phone for details.

Butternut
Vertical Antennas

Extremely efficient & use no traps. Large, air-spaced coils are the secret, resonant adjustments can be made at ground level.

HF-2V 80, 40m DX vertical. 9.75m, Easy erect.	£289.95 D
HF-6V 80,40,30,20,15,10m self support 7.9m	£389.95 D
HF-9V As HF-6V but adds 17,12 & 6m. 7.9m	£449.95 D
HF-5B 5-band beam	£449.95 D

Adonis
Base Microphone

High quality microphones with a range of leads to suit most radios.

AM-308GBL	£79.95 C
AM-508GBL	£99.95 C
Leads from	£12.95 A

Check www.wsplc.com

Bencher
Morse Key Paddles

Morse Paddles Of Distinction

A range of high quality keys from the USA.

Hex-Paddle Iambic paddle	£199.95 C
BY-1 Twin paddle, black base	£119.95 C
BY-2 Twin pad. chrome base	£139.95 C
BY-3 Twin paddle, gold base	£299.95 C
BY-4 Twin pad. gold parts	£189.95 C
ST-1 Single pad, black base	£119.95 C
ST-2B Single pad, chrome b.	£144.95 C
RJ-1 Straight key, black base	£109.95 C
RJ-2 Strght key, chrome base	£129.95 C

FlexRadio Systems

FLEX-3000 160m - 6m 100W Transceiver

The Flex-3000 gives you the full 100 Watts from a package that sits neatly under your laptop. This software defined radio covers 160m - 6m & has a built-in automatic ATU. It offers incredible performance at a highly competitive price, with selectivity that will amaze you. [Laptop not included.] **£1399 D**

FLEX-5000A

The ultimate 100W SDR transceiver that has a performance that achieves amazing selectivity, Dynamic range and DSP power. ATU, dual receiver and VHF-UHF options. **£2495 D**

FLEX-1500 **NEW**
160m - 6m
5W Transceiver

The new software defined transceiver that rocks the world when it comes to price & performance. It's tiny, measuring 10x15x5cm yet produces 5W out. No soundcard needed, just plug into your USB port on your laptop.

Due May Approx. Price £TBA

Watson
VSWR/PWR Meter

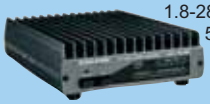
W-420 *SPECIAL OFFER!*

VSWR/PWR Meter 118-530MHz 5/20/200 Watts

Was £49.95 **Now £34.95**

Tokyo Hy-Power
HF Linear Amplifier

HL-45B



HF/6m linear amplifier 1.8-28.00 & 50MHz 5W in 45W max out

£469.95 D

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

WATERS & STANTON

General Enquiries
01702 204965

UK's Lowest Prices

Online Catalogue
www.wsplc.com

CUSHCRAFT COMMUNICATIONS ANTENNAS

HF Beams

X-7	10-20m 7 el. Yagi	£899.95 D
X-740	40m add on	£379.95 D
A3-S	10-20m 3 el. Yagi	£579.95 D
A-743	40/30m for A3S	£189.95 D
A4-S	10-20m 4 el. Yagis	£699.95 D
A-744	40/30m for A4-S	£199.95 D
A3-WS	12 & 17m 3 element	£479.95 D
A-103	30m add on for A-103	£189.95 D
ASL-2010	13.5-32MHz log 8 el.	£869.95 D
MA5B	5-band mini 3 el.	£459.95 D
D-3	3-band 10-20m dipole	£289.95 D
D-3W	30-17-12m dipole	£289.95 D
D-4	40-10m 4-band dipole	£399.95 D
D-40	40m dipole	£369.95 D
TEN-3	10m 3 element	£259.95 D
XM-240	40m 2 element	£899.95 D

HF Verticals

R-6000	6-band 6m -20m	£399.95 D
R-8	6m - 40m 1.5kW 5.8m	£549.95 D
MA5V	10-20m 5-band	£279.95 D
MA6V	6-band 6-20m compact	£329.95 D
MA-160V	160m 36ft	£299.95 D
MA8040V	80 & 40m	£319.95 D

VHF/UHF

A270-6S	2m/70cm 3 el. yagi	£125.95 D
A270-10S	2m/70cms 5 el.	£159.95 D
A6270-13S	6m-70cm 13 el.	£269.95 D
AR-270	2m/70cm vert. 1,13m	£139.95 D
AR-270B	2m/70cms vert. 2.3m	£159.95 D
13-B2	2m 26 element	£239.95 D
17-B2	2m 17 element	£369.95 D
719B	70cm 19 element	£239.95 D
AR-X2B	2m vert. 4.3m	£109.95 D
AR-X2	2m vert. 2.8m	£69.95 D
AR-2	2m vert. 1.2m	£59.95 D
AR-450	70cm Ringo Ranger	£47.95 D
AR-6	6m vert. 3.1m	£89.95 D
AR-10	10m vert. 5.36m	£99.95 D
A50-3S	6m 3 element yagi	£129.95 D
A50-5S	6m 5 element yagi	£199.95 D
A50-6S	6m 6 element yagi	£339.95 D
A148-3S	2m 3 element yagi	£64.95 D
A148-10S	2m 10 element	£139.95 D
A430-11S	70cm 11 element	£109.95 D

Pro-set-4 & 5

HEIL SOUND

The standard headset with a choice of NC-4 or 5 inserts. Requires AD-1 patch lead.

£114.95 C

For Icom transceivers, choose the **Pro-Set-IC** with "Icom" Element £129.95 C

Pro-set-Plus

With the Pro-set Plus you have the benefit of dual NC-4 / NC-5 mic capsules that can be selected. Requires AD-1 patch lead.

£189.95 C

Pro-Set-PLUS-IC Icom Element £189.95 C

AD-1 Connector Leads
There's one to suit any ham radio rig. Just let us know you radio. £16.95 A

GM-4 & 5

These "Gold Lime" mics contain the NC-4 or NC-5 capsule. Can be handheld or mounted on a stand (clip supplied). Requires CC-1 cable kit for rig.

£119.95 C

CC-1 Cable Kits - there's one to match every ham radio rig. Just tell us the radio you need it for. £29.95 A

WATSON

Multi-Ranger Mobile / Portable Whips

The Watson Multirangers offer great performance at great value. Use mobile on our 3-way magnetic mount for easy mobile or mount on ground via a suitable SO-239 base with radials. Quick low loss band changing is achieved with the wander plug system and fine tuning is taken care of with the upper telescopic whip. Choose from two models.

Multi-Ranger-9

9-band whip approx 1.9m high with PL-259 base. Handles 125 Watts & covers 80m, 40m, 20m,15m, 10m, 6m, 2m, 70cms and VHF airband.

£39.95 D

Multi-Ranger-200

10-band whip approx 1.9m high with PL-259 base. Handles 200 Watts & covers 80m, 40m, 30m 20m,17m, 15m, 12m, 10m, 6m, 2m.

£59.95 D

W-300S Mag Mount

The quick way to go mobile. No holes needed. Fitted with SO-239 socket, it comes with RG-58 coax terminated in PL-259 plug.

£39.95 C

SGC

Auto ATU

SG-237

- *Frequency 1.8 to 60MHz*
- *Power input 3-100W (PEP) 40W max CW*
- *VSWR: <1.4:1 (typical)*
- *Antenna: Min length 2.4m 3.5-60MHz, min length 7m 1.8-60MHz*
- *Input impedance range 45 - 55 Ohms*
- *Output: Ceramic terminal*
- *DC supply 13.8V DC 0.3A*
- *Fully waterproof housing*
- *Size: 178 x 229 x 38mm*
- *Weight: 0.9kg*

£319.95 C

SG-211

Was £219.95
Now **£199.95 C**

SG-211 "Stowaway" auto antenna tuner back in stock and better price, not weather-proofed. HF + 6m Up to60W. Powered by internal battery.

hy-gain

Rotators Tough designs made in the USA

AR-35X	£99.95 C
AR-40X	£299.95 D
CD-45IIX	£399.95 D
HAM-IVX	£659.95 D
HAM-VX	£1029.95 D
HDR-300AX	£1499.95 Q

We also stock a good selection of control cables.

RADIO WORKS

Carolina Windom Antennas

All windoms include WARC bands

CW-160	160-10m 252' l.	£159.95 D
CW-80	80-10m 133' l.	£129.95 D
CW-80LP	80-10m 133' l.	£119.95 D
CW-40	40-6m 66' l.	£119.95 D
CW-40LP	40-10m	£116.95 D
CW-40PLUS	40-10m 66' l.	£139.95 D
CW-620	20-6m 33' l.	£119.95 D
G5RV-PLUS	80-10m 102; l.	£79.95 C

Baluns

B1-2kPLUS	1:1 2kW	£39.95 C
B4-2K	4:1 1.5kW	£49.95 C
Y1-5KPLUS	1:1 1.8-50MHz	£52.95 C

Ferrite Clamps

RFFF-213	for RG-213	£5.95 A
RFF-58	for RG-58	£3.95 A

VECTRONICS ...World Class Quality

HFT-1500

W&S **£439.95 C**

- *1.8-30MHz 1kW*
- *Built-in 4:1 balun*
- *Roller inductor*
- *4.5kV capacitors*
- *140 x 318 x 305mm*
- *Weight 4.5kg*

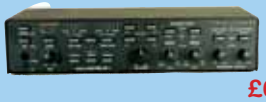
VC-300DLP

W&S **£179.95 C**

- *1.8 to 30MHz up to 300W*
- *Dummy load*
- *8-way switch*
- *260 x 89 x 238mm*
- *Weight: 1.58kg*

microHAM Interfaces

Mk2R+



W&S **£699.95 C**

The most advanced 2-way radio interface available. Contest or DX, you will love the way your station becomes so much more.

microKEYER II

W&S **£319.95 C**

A most advanced single radio interface that offers huge potential and flexibility.

For fuller details *www.microham.com*

High Sierra Mobile

Highly efficient remote tuned mobile whips. 80m - 6m.

HS-1800 System Complete assembly in several packages.

Platinum-Bk	£449.95 D
Platinum-Gy	£449.95 D
Bronze-Bk	£399.95 D
Bronze-Gy	£399.95 D
Eldorado-Bk	£449.95 D
Eldorado-Gy	£449.95 D

Sidekick - Ultra compact 80-6m OK on 3-way mag mount W-300S **£329.95 D**

MFJ

MFJ-998

W&S **£649.95 C**

• 1.5kW SSB & CW • Digital & Analogue x-needle VSWR • 1.8 - 30MHz • 20,000 memories • Radio interfaces optional • Built-in antenna selector • Field upgradeable firmware • Auto bypass protection

MFJ-925	Compact auto tuner	£169.95 D
MFJ-927	200W remote auto atu	£249.95 D
MFJ-928	Basic auto atu	£199.95 D
MFJ-931	Artificial ground	£112.95 C
MFJ-932	Mini loop tuner	£139.95 C
MFJ-934	Artificial ground + ATU	£199.95 C
MFJ-935B	Portable loop system	£199.95 C
MFJ-945E	Mobile atu 300W	£129.95 C

MFJ-929

AUTO TUNER 1.8-30MHz 200W

LCD readout, 20,000 memories, long wire & coax, radio interface.

W&S £209.95 C

MFJ-991B	Auto atu 150W	£209.95 D
MFJ-993B	Auto atu 300W	£249.95 D
MFJ-994B	Auto atu 600W	£339.95 D
MFJ-962D	1.5kW ATU	£289.95 D
MFJ-969	160m - 6m 300W	£209.95 D
MFJ-971	Portable atu	£118.95 C
MFJ-974B	Balanced ATU 3.5-30MHz	£189.95 D
MFJ-986	3kW differential tuner	£349.95 D

MFJ-112B

World map clock.
Was ~~£32.95~~ Now £22.95 A

MFJ-1260	Mic control 1 in/2 out	£99.95 C
MFJ-1263	Mic control 2in/2 out	£109.95 C
MFJ-1275	Sound card adaptor	£109.95C
MFJ-1625	Window Ant + Tuner	£199.45 D
MFJ-16B01	Dipole centre SO-239	£21.95 A
MFJ-16C06	6x dog-bone insulators	£4.95 A
MFJ-16E01	300Ω end fed SO-239	£10.95 D
MFJ-1796	40m-2m vertical	£239.95 D
MFJ-1798	80m-2m vertical	£299.95 D
MFJ-1908H	43ft fibre glass mast	£239.95 D
MFJ-1922	Digital screw driver control	£99.95 D
MFJ-1924	Prog. screw drvr control	£129.95 C
MFJ-1925	ATAS-100 controller	£72.95 C
MFJ-202B	Receiver noise bridge	£79.95 C
MFJ-250X	1kW dummy load (x-oil)	£55.95 C
MFJ-260C	300W dummy load	£44.95 C
MFJ-261	100W dummy load	£32.95 C
MFJ-265	2.5kW load fan cooled	£199.95 C
MFJ-403	Micro CW keyer	£66.95 C
MFJ-403P	Micro travel iambic	£79.95 C
MFJ-4103	PSU for FT-817	£52.95 C
MFJ-417	Pocket morse tutor	£76.95 C
MFJ-4403	Trcvr volt conditioner	£109.95 C
MFJ-442	Slim electronic keyer	£199.95 C
MFJ-461	Pocket morse reader	£99.95 C
MFJ-4714	4-way remote ant switch	£87.95 C
MFJ-4726	6-way remote ant switch	£159.95 C
MFJ-490	Memory keyer + paddle	£244.95 C
MFJ-495	Memory keyer	£189.95 C

MFJ-269 ANTENNA ANALYSER

- *1.8 -170 & 415-450MHz*
- *Frequency Counter*
- *LCD readout*
- *SWR & impedance*
- *N-socket (Ant), BNC (Counter)*
- *AAx10 or ext. 12V DC*
- *Size 103 x 173 x 60mm*
- *Weight 750g*

W&S £349.95 C

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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

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

RSGB ADVERTISING:
KIM MEYERN

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

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

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

RadCom is published by the Radio Society of Great Britain as its official journal on the first day of the relevant month and is sent free and post paid to all members of the society.

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

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

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

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

RSGB MEMBERSHIP – Annual Rates

Full membership £48.00
(individual & club)
Family membership £57.00
Paying by Direct Debit saves £4 on the rates above.
Student (21-25) . . . . . Free
Ham Club (under 21) . . . . . Free

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

P&P on RSGB orders:
£1.95 for 1 item, £3.50 for 2 or more items. Overseas rates on request.

The new Linear Amplifier UK Discovery 64 amplifier for 6m and 4m – full review on page 14.

News and Reports

Leslie Butterfields, G0CIB and Steve Nichols, G0KYA, running the Propagation Studies Committee stand at the RSGB National Hamfest. More on page 52.

Reviews

Features

Part of the large audience paying rapt attention during Four Days In May. QRP, page 70.

Technical Features

Make your own attenuators – Homebrew, page 26.

Regulars

Construction continues on the National Amateur Radio Centre at Bletchley Park.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

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

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

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

BOARD OF THE SOCIETY
PRESIDENT
Dave Wilson, M0OBW

MEMBERS
D Beattie, G3BJ
R Bellerby, GM3ZYE
P Brooks, G4NZQ
L Butterfields, G0CIB
D Field, G3XTT
J Gould, G3WKL
C Morrison, GI4FUE
I Phillips, G0RDI
B Reay, G8OSN
J Stevenson, G0EJQ

REGIONAL MANAGERS
Region 1 - position vacant
D Morrison, GM1BAN - Region 2
K A Wilson, M1CNY - Region 3
H Scrivens, G0UGE - Region 4
T Bailey, M0KMB - Region 5
M Harper, MW1MDH - Region 6
J Sneddon, MW0EQL - Region 7
P Lowrie, MI5JYK - Region 8
A Johnston, G8ROG - Region 9
G Keegan, G6DGK - Region 10
P Helliwell, G7SME - Region 11
P Brooks, G4NZQ - Region 12
J Stevenson, G0EJQ - Region 13

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

The above details were correct at the time of printing, 11 January 2010.

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

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

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

Website: www.rsgb.org
Members Area: www.rsgb.org/membersonly
Log-in using your callsign in lower case as the user name, and your membership number (see *RadCom* address label) as the password.

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

QSL Matters

A CURSE OR A BLESSING? Computers that is, or computer printed QSL cards. Let me explain. Take a callsign like SV9/G3UGF. It should be fairly obvious that this needs to be in the UK pile but your computer thinks it should be with all the other cards for Greece! This means that the sorters at the RSGB QSL Bureau simply cannot rely on a pile of 30 or more SV cards all being for Greece and must check every one. One of those times when the human operator – you – are better than the machine! So many thanks; once again, to those operators who send their cards in the correct order having weeded out these issues before they reach the bureau, your efforts are much appreciated.

SURFIN' USA! The USA cards are a challenge of their own. With such a vast country – and a wide variety of callsigns – their system is different. Cards for the USA are shipped by the call number and not strictly by the call letter. This means that all the A1, K1, N1, W1, etc cards are sent together. There are exceptions, there always are! The 4s are split into two groups, A4, K4, N4 and W4 in one group and the two letter prefixes in another group (AA4, KA4, NA4 and WA4). There are others. When dealing with US cards, check out www.iaru.org/iaruqsl.html for a better idea of which should be groups together.

SHIPPING. In February, the RSGB QSL Bureau sent approximately 150kg of cards to some 12 countries. The top weight went to the Ukraine and amongst the rest were parcels to Brazil, Eire, Malta and the Slovak Republic.

SUB MANAGERS. We are all very grateful to the volunteer sub managers for distributing the UK cards and that's to Members and non Members alike. Anyone can lodge envelopes to receive cards and let's be honest; if you are active on the bands you are likely to receive a card sooner or later even if you don't collect them. Roy Walsh, G4ZNK is the sub manager for the M0D to M0F range. He would like to remind amateurs that a C5 envelope (that's the size that holds an A4 sheet of paper folded once) is the most useful size to lodge with your sub-manager. Please put your callsign in the top left hand corner, clearly, then Roy and his fellow sub-managers find it easier to file and search for your envelope when it comes to sorting QSL cards. A4 envelopes are a problem now that the postal system is charges by size and weight. You can only get 2 or 3 cards in before it is too thick to go through as an ordinary letter.

RSGB AGM

Join us in Bedford for the RSGB 2010 AGM. It will take place on Saturday 17 April at the Bedford Swan Hotel, The Embankment, Bedford MK40 1RW. The whole day is geared to bringing the RSGB to you and is an ideal opportunity for local clubs to socialise and meet with each other and meet with senior RSGB officers.

The timings for proceedings are:

10am:	VHF Award Presentations
11am:	AGM Registration
12 noon:	Annual General Meeting - Formal Proceedings
1pm:	End of Formal Proceedings
1-2pm:	Lunch (£8 for two course hot buffet)
2pm:	Open Forum
4pm:	End of Open Forum

Further details and the Calling Notice are on page 54 and on the RSGB website. The AGM Proceedings will be streamed by the BATC at www.BATC.tv.

Welcome

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

2E0DAB	Mr D A Bambrook
2E0HOG	Mr M H M Stroud
2E0KLP	Mr K Langfield
2E0PVQ	Mr E Rhodes
2E0SLB	Mrs S Langfeld
2E0UKX	Mr A Fletcher
2E0WDX	Mr C Cairns
EA4ZQ	Mr J L Oliva
EA5NR	Mr I J M Rizo
G0FGG	Mr J J Thompson
G0IAX	Mr R A Bailey
G0PKU	Mr J Maunder
G0PRF	Mr J A Goodwin
G0RJL	Mr J Hilton
G0TEB	Mr C P Sexton
G0TIK	Mr C Pemberton
G0UWS	Mr A M Sharman
G0WVE	Mr B Richardson
G0XJB	Mr J Button
G1BVI	Mr N D Moldon
G1CPP	Mr I R Fowler
G1CVH	Mr F A Childs
G1XOW	Mr S M Wragge
G3GYC	Mr P J Ingram
G3IVM	Mr B Bush
G3PGA	Mr A M J Hammond
G3WKW	Mr R E Thornton
G4AZB	Mr S Metcalfe
G4FNQ	Mr C P Wedgbury
G4FUT	Mr J J E Dougherty
G4JVX	Mr D K Powell
G4MZL	Mr E J Ailsby
G4OJB	Mr W C Tatum
G4OXM	Mr C J W Mason
G4PPK	Mr C M Everley
G4YJS	Mr B Parsons
G6CVV	Mr M A Gumbrell
G6DFZ	Mr M A T Jones
G6XBW	Mr P Springer
G7EMN	Mr K R Fuller
G7HAH	Finningley ARS
G7LPP	Mr F Rice
G7MLL	Mr M Birtles
G7NBA	Mr E Wild
G8HXD	Mr M J Ledger
G8IMN	Mr D R W Fitch
G8PXB	Mr S J Hopkins
G8ZMH	Mr K Robinson
GB3GT	Jersey AR Repeater Group
GM4WCE	Dr P J Kirsop
KA1REO	Mr M Rippe
KC9NEX	Mr G L Seaman
KL7JN	Mr J R Cliver Jr.
M0AXH	Mr K Jasinski
M0KIT	Mr C P Wilkins
M0KRL	Mr K Fell
M1DBF	Mr G Jones
M3BTJ	Mr J A Meredith
M3IBD	Mr A McMinn
M3NBV	Mr I K Brocklehurst
M3NYQ	Mr M Hives
M3RPE	Mr R P Evenden
M3ZGU	Mr L Retford
M3ZHG	Mr C Barnes
M3ZJO	Mr J Rawlinson
M5FRA	Mr C R Shaw
M6BRC	Mr M Winward
M6CHS	Mr M Drury
M6GSK	Mr M Silver
M6JAT	Mr J Singh
M6JKD	Mr J Davis
M6LJB	Mr A Tipper
M6MID	Mr I S Shiradski
M6MWT	Mr M Tolmie
M6NAC	Mr N J Carter
M6OPO	Ms O Pochat
M6POD	Mr D Pochat
M6ROP	Mr R Pochat
M6RRJ	Mr R Jobber
M6YKP	Mr J Dryland
MI6CWC	Mr C Campbell
MI6WAG	Mrs M Barr Mr A Furlanis
MW0TDQ	Mr J Grzywaczewski
MW0USK	Mr C Burke
MW6CAN	Mr C Davies
N4WVE	Mr G C Hemmings
N5SKH	Mr S C Veal
OH2LAK	Mr E Finskas
OH6PU	Mr S Setala
OZ2TG	Mr Steen
OZ6TA	Mr J Andersen
PA3BXR	R J De Wit
PD0PRS	P C J Rademakers
RS157690	Mr L Lawry
RS162827	Mr P W Walduck
RS176615	Dr E G Duncan
RS179080	OVRC
RS187924	Mr S C Allen
RS203440	Mr K Thistlewaite
RS204133	Mr J J Thompson
RS205315	Mr P M Richards
RS205388	Mr D P Cook
RS205398	Mr R S Blackmann
RS205400	Mr G E Dobson
RS205430	Mr P H Stevenson
RS205432	Mr P H heron
RS205438	Mr P Holmes
RS205440	Mr C P Nicholls
RS205454	Mr G P Belson
RS205473	Mr Lemaire
RS205486	Mr R A Booker
RS205495	Mr J Ashley
RS205501	Mr B H Cook
RS205534	Mr D Bendelow
RS205553	Mr C Webb
RS205559	Mr F A Taylor
VE3ND	Mr J A Cull
VK6WJ	Mr W Rose
VR2WBL	Mr L Piu Chi
VU2LU	Mr K G Ramesh Kumar
W0IKT	Mr J R Miller
W0NLY	Mr A W Klein
W3HQ	Mr F C Curtis
W9QR	Mr L W Wheeler
WA4JXL	Mr E Esserman
WB4JJI	Mr M Jackson
WQLJ310	Mr R J Browne

Club of the Year

Region 1: The Region 1 winning entry for the Club of the Year competition was submitted by the Ayr Amateur Radio Group, who now go forward to the National Finals. The Region 1 Trophy, sponsored by LAM Communications, will be presented to the Club in the near future.

Region 2: The Region 2 winning entry for the Club of the Year competition was submitted by the Caithness Amateur Radio Society, who now go forward to the National Finals. The Region 2 Trophy, sponsored by Jaycee Electronics, will be presented to the Club in the near future.

Regional Manager, Denny Morrison, GM1BAN handing over the certificate to Brian Sparks, GM4JYB, Vice Chairman of Caithness Amateur Radio Society.

Region 3: The Region 3 winning entry for the Club of the Year competition was submitted by Stockport Radio Society, who now go forward to the National Finals. The Region 3 Trophy, sponsored by LAM Communications, was presented to the Club at the RadioActive Rally on Sunday 21 February.

Region 4: The Region 4 winning entry for the Club of the Year competition was submitted by the Sheffield Amateur Radio Club, who now go forward to the National Finals. The Region 4 Trophy will be presented to the Club in the near future.

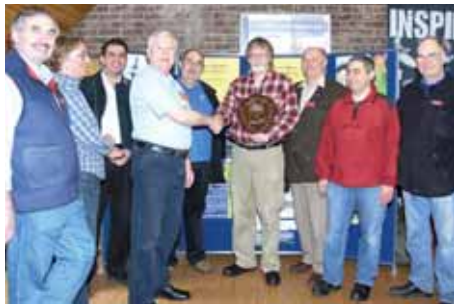
Region 5: The Region 5 winning entry for the Club of the Year competition was submitted by Wythall Radio Club, who now go forward to the National Finals. The Region 5 Certificate will be presented to the club in the near future.

Region 6: The Region 6 winning entry for the Club of the Year competition was submitted by the Merion Amateur Radio Society, who now go forward to the National Finals. The Region 6 Trophy, sponsored by Snowdonia Radio Company, will be presented to the Club in the near future.

Region 7: The Region 7 winning entry for the Club of the Year competition was submitted by Highfields ARC. Sid Hudson, GW0NQQ, President of the club received the trophy from the Regional Manager, Jimmy Sneddon, MW0EQL. The trophy was sponsored by Ken Smith, MW0YAC of AA Couriers (right in the photo).

Region 8: The Region 8 winning entry for the Club of the Year competition was submitted by the Lough Erne Amateur Radio Club, who now go forward to the National Finals. The Region 8 Trophy will be presented to the Club at the Lagan Valley ARS Radio Rally in Hillsborough.

Region 10: The Region 10 winning entry for the Club of the Year competition was submitted by the Harwell Amateur Radio Society, who now go forward to the National Finals. The Region 10 Trophy, sponsored by Adur Communications, was presented to the Club by Gavin Keegan, G6DGK, Region 10 Manager.



Gavin Keegan, G6DGK, Region 10 Manager presented the Region 10 Club of the Year trophy to Mike Stevens, G8CUL, Chairman of Harwell Amateur Radio Society at the Rally held on Sunday 14 February. Also in the picture is Michael Senior, G4EFO, Deputy Regional Manager for District 103, Sussex and Malcolm Andrew, G8NRP, Deputy Regional Manager for District 101, Oxfordshire and committee members of the Society.

Phil Godbold, G4UDU, from Adur Communications, presenting the Region 10 award to Gavin Keegan, G6DGK, Regional Manager Region 10.

Region 11: The Region 11 winning entry for the Club of the Year competition was submitted by the West Devon Radio Club, who now go forward to the National Finals. The Region 11 Trophy will be presented to the Club in the near future.

Region 12: The Region 12 winning entry for the Club of the Year competition was submitted by the Chelmsford Amateur Radio Society, who now go forward to the National Finals. The Region 12 Trophy, sponsored by Waters & Stanton plc, will be presented to the Club in the near future.

Region 13: The Region 13 winning entry for the Club of the Year competition was submitted by the Spalding Amateur Radio Society, who now go forward to the National Finals. The Region 13 Trophy, sponsored by Tetra Communications, was presented to the Club at the Horncastle Rally in January by Gary Austin, G6NYH from Tetra Communications.

Gary Austin from Tetra Communications (centre) presented the Region 13 trophy to Chairman John Hill, G4NBR, and Secretary of Spalding ARS Graham Boor, G8NWC.

Who will be Club of the Year?

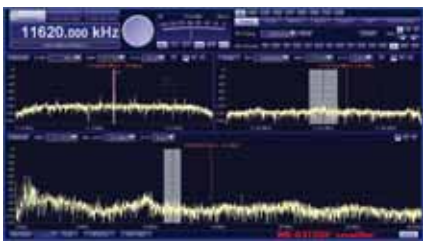
Congratulations to all the Regional winners. It will certainly be difficult for the judges to decide an overall winner! Deliberations are ongoing as we go to press.
The results of the National Finals will be announced at the RSGB AGM on Saturday 17 April in Bedford, which is sure to be a nail-biting time for all concerned.

GB0BS

Friskney & East Lincolnshire Communications Club will be helping to activate GB0BS for the Boston and Rural Boy Scouts based at Butterwick on Easter Monday, 5 April. They will be running HF, PSK and 2m from 9am to 5pm. They ask that you give them a call if you hear them.

Winradio WR-G31DDC Excalibur

Winradio have just announced the launch of a brand new high performance, low cost receiver - the Excalibur. The receiver uses the very latest in SDR technology with a direct sampling digital down-converter architecture that delivers an impressive specification. Direct sampling of the entire 9kHz to 50MHz frequency range is made possible through the use of a 16-bit 100MSPS (mega samples per second) analogue to digital converter. The entire sampled spectrum can be used to show a spectrum analysis of the frequency range with a resolution of just 1.5kHz. Alternative spectrum analysers are included covering the 2MHz down-converted segment, 62.5kHz channel spectrum and finally a 16kHz demodulated audio spectrum – each with 1Hz resolution. The digitised output of the front-end low noise amplifier and A/D converter combination is digitally down-converted in bandwidths of up to 2MHz. This bandwidth is available for demodulation or recording and the Excalibur includes three separate demodulators so you can simultaneously monitor up to three different frequencies within each 2MHz segment! The 24-bit digitised I & Q signal from Excalibur is sent via a USB 2.0 port for final processing in the computer. With a frequency coverage from 9kHz to 50MHz and a 3rd order intercept point of better than +31dBm the WR-G31DDC is sure to attract attention. The Excalibur is due to be launched in April or May and there will be a demonstration model at the Kempton Rally.



CAVMAG 2010 Conference

2010 marks the 70th anniversary of the development of the high-power cavity magnetron, a crucial technology for radar in WWII. Registration is open for CAVMAG 2010, a two-day conference sponsored by the IET, DEHS and the IEEE in the Allsebrook Lecture Theatre on the Talbot Campus at the University of Bournemouth on 19 and 20 April.

The origins of the cavity magnetron go back to the mid-1930s with key work being carried out in Czechoslovakia, France, Germany, Russia, Switzerland, The Netherlands, Japan, UK and the USA. Speakers from several of these nations will bring together knowledge of this early work and will show how the cavity magnetron has been improved and applied subsequently.

The registration fee is £65 (for members of IEEE, IET and DEHS) and £80 for others (with a £10 increase for registration after 22 March). This fee includes lunches and tea/coffee breaks. There will be a pre-event visit to the Royal Signals Museum, Blandford on Sunday 18 April and a conference dinner on 19 April.

Visit www.cavmag2010.org.uk to book and pay online through the IET, or to book and arrange payment by cheque or bank transfer. Numbers for the pre-conference visit and conference dinner are limited, so early registration is recommended to be sure of a place.

For further details contact the conference Chairman is Keith Thrower at kthrower@theiet.org. The contact at the IET is Anne Locker, alocker@theIET.org.

Intermediate Success

Following the recent Intermediate exam course run by the Mid Lanark Amateur Radio Society, all eight candidates were successful in the February exam. In the photograph are Alastair, MM6KAF, George, MM3WEV, Brian, MM6OWL, David, MM6PYX, Martin, MM3MAO, Brian, MM6BAB, David, MM6BOD and Calum, MM3YCG, together with Bob, MM0RKT (course instructor) and club members. Missing from the photo is Gordon, GM3ULP (course instructor).

G4LIK SK

On 8 April, the ashes of Lt Cdr L R Borley, G4LIK will be scattered from *HMS Belfast* in the Pool of London. The ceremony will take place at 1300hrs. Leonard Borley, who died at the age of 91, was a Sea Scout who later qualified as an engineer and was instrumental in the design of magnetic loop aerials for direction finding, many of which are in use today. Len was a member of the Royal Naval Amateur Radio Society (RNARS) and regularly appeared on the air from his home in Gosport.

Essex CW Club

Essex CW Amateur Radio Club is a new club with a difference… it is for CW only. This new club was formed late last year by a small group of enthusiastic CW operators who wish to see the continued use of Morse code together with all its advantages for world wide communications. The club call is G1FCW. Although formed in Essex, it welcomes members from anywhere in the UK or abroad who share the passion for CW. It welcomes proficient CW users as full members and those aspiring to become proficient as associate members. The group plans to undertake a range of activities that involve CW and further information can be obtained from the club's website at www.essexcw.org.uk.

Intermediate Course

Southport and District ARC held its second Intermediate course in February and all four candidates passed. In the photo you can see Walter Bevins, Ian Nicholson, Thomas Munro and Paul Davis.

NEWS IN BRIEF

• Due to a price increase by the local council for the room hire, the Chesterfield rally due to be held on 24 April has now become unviable. The organisers have started a new website at www.m0oct.com where they will post further news as it becomes available.

RSGB shop

Morse Code for Radio Amateurs

NEW

By Roger Cooke, G3LDI

Morse Code for Radio Amateurs is the latest 10th edition of the Radio Society of Great Britain's (RSGB) book designed to show how to learn Morse code and get the maximum enjoyment from using it. This hugely popular title has been updated and revised from the 9th edition by Morse enthusiast Roger Cooke, G3LDI.

Morse Code for Radio Amateurs has always set the standard for books covering Morse code and this edition is no exception. As you would expect this book covers the history of Morse, how to get started, abbreviations and prosigns, how to increase your speed and, ultimately, using the code when DXing or contesting. A chapter on keys discusses the way to use a straight 'pump' as well as modern keys and paddles. You also are provided with the latest learning techniques involving computers and there are circuits included to build a Morse practice oscillator and an electronic keyer.

FREE CD:
Included with this book is a free dual purpose computer/audio CD. This contains nearly an hour of audio recordings of Morse code at 5, 10, 15, 20 and 25 words per minute. This provides the ideal opportunity to learn Morse code in the car or at leisure by playing the disk in any CD player. The computer section also contains these audio files which can be run on a PC soundcard or downloaded to a personal MP3 player. The CD also contains a whole host of Morse software from learning Morse programmes through to Morse contesting software. In addition there is bonus material such as additional articles and pictures and an array of web links.

Morse Code for Radio Amateurs is essential reading and listening for anyone wanting to widen their horizons by adding Morse code to their skills.

Size 240x174mm, 32 pages, ISBN 9781-905086-17-7

Non Member's Price £7.99 **RSGB Member's Price £6.79**

By the same editor

RTTY/PSK31 for Radio Amateurs

By Roger Cooke, G3LDI

RTTY and PSK31 for Radio Amateurs provides you will all you need to know to get the most out of this fascinating area of amateur radio. Readers will find details of where to find data modes on the amateur bands, through getting started, to making the most from both these modes. DXpeditions and contests use these modes and there is lots of information on getting the best from these too.

Free CD
The free CD that accompanies this book provides an A-Z of amateur radio data mode programs to get you started.

This book is a practical guide to the two most popular data modes, RTTY and PSK31.

Size 240x174mm, 32 pages, ISBN 9781-9050-8652-8

Non Members' Price £7.99 **RSGB Members' Price £6.79**

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

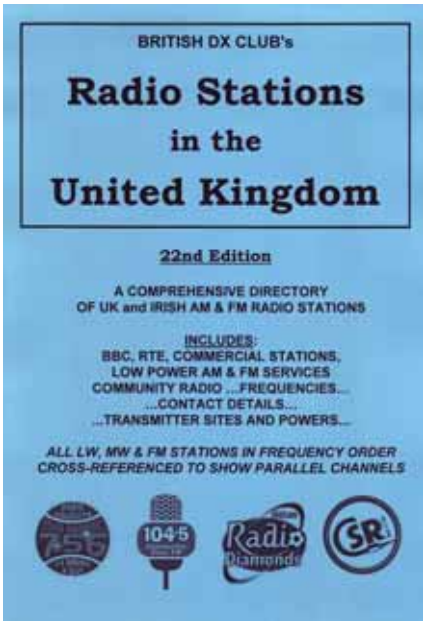
www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

UK Radio Stations

The new 2010 edition of *Radio Stations in the UK* has just been published by the British DX Club. Now in its 22nd edition, this 72 page booklet is a must for anyone interested in UK or Irish domestic radio. The booklet covers BBC, commercial stations, community radio and low power AM/FM services on MW and FM. It's been two years since the last edition was published so there are numerous changes, including many new community radio stations. Copies are £4 for UK addresses, other postal rates can be found on the website (www.bdxc.org.uk). Payment can be either by cheque or PayPal.



International Marconi Day

The 23rd International Marconi Day will take place on the 24 April. Although not a contest, awards can be obtained and full details can be found at www.gb4imd.org.uk. For a station to be counted towards an award by applicants, that station must be registered by contacting the webmaster (webmaster@gb4imd.org.uk) prior to the event with full details of the station. In order to qualify as an Award Station, operations should take place from a site that either used Marconi equipment prior to his death in 1937 or from which Marconi carried out experiments during the same period.

NEWS IN BRIEF

• GB0BMT will be on the air on 17 April between 10am and 3pm. It is part of an Open Day at Birkenhead Masonic Temple.

NEWS IN BRIEF

• From 24 to 27 April there will be an IOTA activation from the Isle of Eigg on the west coast of Scotland. IOTA EU008, IOSA NH03, WAB NM48, IARU Locator IO66WV. This is a joint activation by Kilmarnock and Loudoun ARC and South Cheshire ARS. The call will be GM6TW/P. Information at QRZ.com.

• A photo and video report about the trip to Loch Lomond National Nature Reserve by MM0DFV is available at www.srars.org/wff-reports/gmff-046.htm. The QSL card for this DXpedition has been already designed and printed and will be sent via the bureau.

• Chepstow & District Amateur Radio Society is experiencing a renewed enthusiasm among its increasing membership. Open meetings take place on the first Tuesday of each month and informal/practical meetings take place on the third Tuesday of each month. The venue for both types of gathering is at Chepstow Athletic Club, Mathern Road, Bulwark, Chepstow, starting at 7.30pm.

• Reading and District Amateur Radio Club is scheduling another Intermediate licence course commencing Monday 19 April through to 28 May. Details from Eric Curling by e-mail to m0luv@radarc.org.

GB10GKA

To mark the 10th anniversary of the closure of the world's largest maritime radio station, Portishead Radio GKA, a special callsign GB10GKA has been granted. It is being activated for a period of one month between 30 April and 27 May. Hours of operation will be dependent on individual operator's free time however, it is intended that the callsign will be active extensively throughout the period. Operation will be primarily on CW.

Operations will be on all HF bands from the following stations, each manned by an ex-GKA Radio Officer.

Rick, G3YEC:
30 April to 6 May.
QTH near Colchester, Essex.
Tony, G3ZRJ:
7 to 13 May.
QTH near Hereford, Herefordshire.
Mike, GW3UOF:
14 to 20.
QTH near Treorchy, Mid Glamorgan.
Pete, G3TJE & Larry, G4HLN:
21 to 27 May.
QTH near Burnham on Sea, Somerset.

Special Anniversary QSL cards will be produced to mark this historic event, eQSL will also be used. Certificates for contacting GB10GKA on more than four HF bands will be available; contact Tony Roskilly, G3ZRJ by e-mail to g3zrj.morsekey@btinternet.com. Information about Portishead Radio can be found at www.gka.btinternet.co.uk.

Visiting the Red Arrows

Low cloud and poor visibility meant that the day organised for the Bishop Auckland Radio Amateur Club visit was not a good flying day in Lincolnshire. The visit to the home of the internationally respected and famed aerobatic team had been arranged by Matt, the repeater keeper, whose background in aviation came in very useful. Unfortunately, work commitments meant that he was not able to join the other members of the club. The hospitality was excellent and, after a short briefing, they were conducted through the main hanger onto the ramp where the ten red Hawks were spotted. Usually nine fly displays, with a spare aircraft always being available.

The weather was not only misty but fiendishly cold. Nevertheless the ten pilots from the team, who then joined club members at their aircraft for a photocall, were the most enthusiastic and welcoming one could imagine. Club members were left with the clear impression that the pilots were not only top of their profession but they genuinely enjoyed meeting and greeting. It was humbling to realise that this relaxed exterior had been built on a minimum of 1500 hours fast jet experience, together with substantial active service in recent conflicts. They have each packed a lot of life into their thirty or so years.

A tour to the Base's museum, past Digger's grave, and a welcome brew brought the morning to a close. There was a lot of radio talked about and technical aspects of flying, but BARAC members are more likely to remember the energy and composure of these airmen than such details.

NEWS IN BRIEF

• On 17 and 24 April, Bracknell Amateur Radio Club is running a Foundation licence course. To book or for more information please contact David Ferrington, M0XDF by e-mail to M0XDF@Alphadene.co.uk.

Foundation Success

Seven candidates recently passed the first Foundation course run by the Harwell Amateur Radio Society in February. The club has more than twenty new candidates interested in taking the course and examination following an Open Day and JOTA weekend held last year.

Amateur Get-together

Jim Wheeldon, M0JHW is organising another Field Day get-together on Saturday and Sunday 3 and 4 April. The location is the Sports and Social Club at Harlaxton, near Grantham (postcode NG32 1HX for satnav users). There will be plenty of tea and coffee and a barbeque on the Saturday afternoon. This twice yearly event is very popular with amateurs from near and far. It is organised by Jim, M0JHW, M3BYY, G4MQM and 2E1AXL. All are welcome.

RNLI Funds

Porthmadog and District Amateur Radio Society chairman, Simon Lord, (right) presented a cheque for £278 to Criccieth RNLI operations manager, Peter Williams. The funds were raised by the society operating a special event radio station at Porthmadog Yacht Club.

Half Term Exams

During half term many young people struggle to find things to do. The cadets from 7 Overseas (Jersey) Squadron, Air Training Corps were hard at work in the classroom, doing practical radio exercises and playing the odd game of football. Now, 11 cadets and three staff hold a Foundation licence.

The week proved very enjoyable and all of the cadets are now looking forward to getting on the air and trying to contact as many air cadets units around the world as they can. In addition, the cadets are all now working towards their Communicators badge.

In the picture are, seated from left to right, Cl Jim Buckley (Invigilator), Cl Sarah Foot (Student), Officer Commanding Flt Lt Vicki Atherton (Student), Tom Atherton, M0GNN (Lead Instructor), Training Officer Flt Lt Leighton Jenkins (Student), Val Atherton (Invigilator).

Standing from left; Cdt Cpl Mollie Turner, Cdt Cpl Jonny Carry, Cdt Cpl Mathew Pugsley, Cdt Cpl Tom Pallot, Cadt Ethan Lynch, Cdt Baille Gaudin, Cdt Michael Hill, Cdt Gabrielle La Rose, Cdt Jamie Henderson, Cdt Cpl Lisa Williamson, Cdt Alex Silva.

Exam Passes

Hinckley Amateur Radio and Electronics Society had more exam successes recently. All five Foundation candidates passed and half of the full licence candidates passed with the others keen to do further revision and re-sit soon. The club had a visit from an Inspection team who enjoyed the visit so much they volunteered to give talks in the forthcoming programme!

The photo shows Full licence candidates with the inspection team. L-R, back row: John Callis, Gary Matts, Tracy Bown, Dayne Dewsbury, Duncan Gunn. Middle row: Mike Finn, Tony Lewis, Gary Smith, Jim Stevenson (RSGB RM 13), Steve Boden (RSGB DRM 132S) and front: John Rogers, lead instructor.

Bath Buildathon Contest

This contest is primarily intended to activate the radios built at the Bath Buildathon events but is open to all UK radio amateurs. Stations may be operated from any fixed location within the UK; operation from a vehicle or as a pedestrian is permitted, as is Maritime Mobile, so long as operators stay put during each session!

There are seven sessions over the course of a week. Stations may take part in as many sessions as they wish: 1400 to 16200UTC, Sunday 30 May, 1800 to 2000UTC, Monday 31 May to Friday 4 June inclusive and 1000 to 1200UTC, Saturday 5 June.

It is 80m telephony contacts only with a suggested frequency range of 3.60 - 3.70MHz and a maximum ten watts pep output from transmitter.

Full rules and award schemes can be found at www.southgatearc.org/news/february2010/buildathon_contest.htm and enquiries about the contest should be sent to G0FUW, QTHR.

The Brendon transceiver that has been built at Bath Buildathon events.

GB3YL

In January, GB3YL (RB14) started using new equipment consisting of a Motorola compact base station repeater and custom logic, which was built and programmed by Jake, G1YFF. GB3YL had been using 1750Hz tone burst access since it started transmitting many years ago using a Pye T414 TX and a Pye R460 Rx and G3RKL MK1 Logic. The repeater is now CTCSS only access with a sub-audible tone of 94.8Hz, a change that has been welcomed by repeater users. Details of the group can be found at www.gb3yl.co.uk.

Reading donates £1000 to Spectrum Defence Fund

The Reading & District Amateur Radio Club was founded in 1934 and has around 90 members of all ages. The club feel there are several reasons for their success; being in a high tech area, their website (www.radarc.org), running successful RCE courses, being the main sponsoring Club of the McMichael Rally and having an enthusiastic membership and a committee of experienced radio amateurs. This success has brought with it rewards. The club run very profitable junk sales, earns money from the McMichael Rally, have been donated and bequeathed large amounts of equipment and PMR radios from which they have earned a considerable income. This has enabled the club to keep the full membership fee at only £12 for at least the last 20 years.

The Committee and membership have unanimously agreed that the Club should make a substantial contribution to the RSGB Spectrum Defence Fund – the enormously generous sum of £1000.

A display cheque was presented to RSGB Board Member, Don Field and the Regional Manager Dr Alison Johnston, both Club members.

GG100ACD

Special Event Station GG100ACD was run by members of the North Wales Radio Society at Nant Y Coed School in Llandudno Junction. The station commemorated the centenary of the birthday of Lord Baden Powell. On this day each year, members of WAGGGS (World Association of Girl Guides and Girl Scouts) remember the founders of the movement and take part in various activities to think about their sisters throughout the world.

The club set up three stations, HF SSB, 2m SSB and HF digimodes. Contacts were initiated by members then passed onto the girls for them to send greetings messages. They contacted various stations across Europe into Russia and the USA. Another activity was a Morse desk where the girls learned to key their names. The day passed quickly with the girls enjoying themselves, one was overheard telling her friend how someone on the radio told her that in Michigan there is 6 inches of snow and it was –20 degrees! The digimode station was particularly popular as a lot of the girls are experts in typing, due to texting their friends and using MSN!

The amateurs too were well looked after with copious amounts of tea and some very special home made vegetable curry soup, thanks to Brown Owl! Thanks too to Rob, GW6STK, Clive, MW3XXX, Gordon, MW0GBR, Tony, MW0BXJ, Ron, GW6ZDH, Mark, MW0RKB, Merv, GW1SGG and Karl, MW6CSS for giving up their time and lending their kit. A great day was had by all and the guides all left chatting away to their parents about all the places they had 'been to'!

Gordon, MW0GBR teaching Brownies PSK!

SBS Open Day

The 3rd annual open day for the Kinetic SBS virtual radar was held at ML&S in February. The event was well attended (figures possibly up on the 2009 event) and this year focused on the add-ons available for the SBS.

Four SBS stations were displayed all day and those present were given a talk and demonstration by Rick Butterworth and Paul Brown on SBS-resources 6, the latest version of the software suite. At the end of the presentation it was announced that CDs were available on the day for SBS-r 6 and a donation to the local air ambulance would be appreciated for a disk. This produced over £130, so for those that donated – many thanks.

The afternoon session had further presentations and it was rounded off by a general questions and answers session. ML&S and Kinetic would like to thank all that came on the day with special thanks to those making the presentations.

GX0MWT

On 24 April, as part of international Marconi Day, The Chelmsford Amateur Radio Society will be operating the club callsign GX0MWT (Marconi Wireless Telegraph) from the Sandford Mill museum. The station will be using SSB and CW on HF and FM on 145MHz. The club is fortunate in being able to set up one of their stations in the famous Writtle Hut now housed inside the museum. It was used for some of the first wireless broadcasts by 2MT in the early 1920s.

As well as the stations CARS will also be running a demonstration of automatic mechanical Morse transmission and reception using historic equipment from early in the last century. This demonstration run by Geoff, G7KLV and Colin, G0TRM is always very popular with the general public especially younger visitors.

For further information contact Martyn Medcalf, G1EFL on 01245 469008.

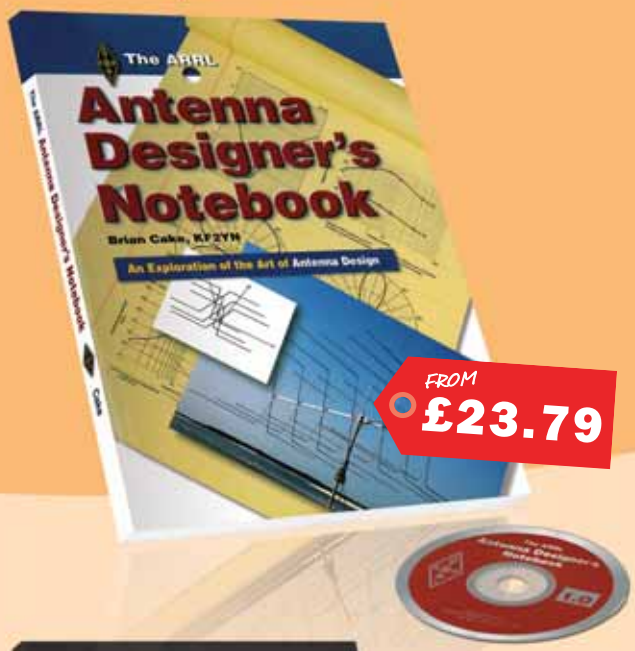
Young Passes

The Isle of Man Amateur Radio Society recently held a Foundation licence course, resulting in all 8 students gaining a pass. Those licensed so far include Dave, MD6TSW, Henry, MD3ZFQ, Izzy, MD6IZI, Michael, MD3ZGV and Peter, MD6IOM. Henry and Izzy follow their parents Andy, GD0AMD and Jane, GD1LVY into the amateur world, whilst Peter follows has dad Andy, GD1MIP. The three younger members of the club Peter aged 9, Izzy aged 16 and Henry aged 12 are pictured getting to grips with their new hobby in the shack of one of the club tutors Godfrey GD4EIP (formerly ZS5VF).

Foundation Passes

Cockenzie & Port Seton Amateur Radio Club held another successful Foundation course. The photo shows the latest passes. Rear l-r: Thomas Lincoln, Stewart Lockhart, Glyn Farrer, Alex Falconer, Kyle McLachlan, Ian McLachlan, Colin Bryson. Front L-R: Gary, MM0FZV (Asst Invigilator), Bob, GM4UYZ (Instructor), Robbie Campbell age 11, Cambell Stevenson (Lead Invigilator) and Nikolay Pulev.

RSGB shop



FROM £23.79

The ARRL Antenna Designer's Notebook

NEW

An Exploration of the Art of Antenna Design

By Brian Cake, KF2YN

Radio amateurs continue to make true advances in antenna experimentation and *ARRL Antenna Designer's Notebook* looks at that process. From the idea through to a workable design this book presents the use of computers, antenna modelling software in arriving at an antenna solution.

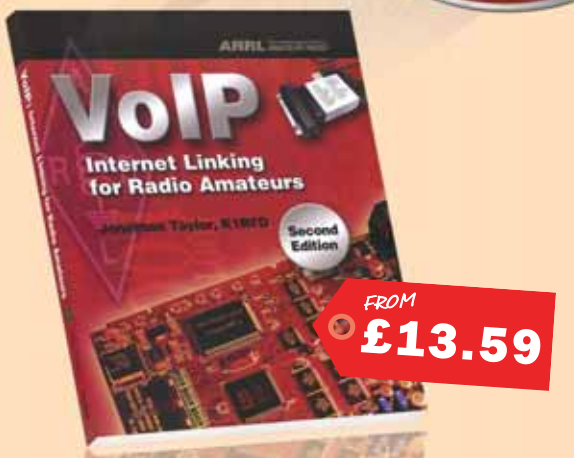
ARRL Antenna Designer's Notebook opens up the world of the antenna designer as the design is imagined, perfected, and finally constructed. This book provides a description of new components of antennas, such as the FZ element and the C-pole and provides designs of practical antennas made from them. The book also explores the details of an improved tunable HF loop, theoretical analyses of linear loading and ground losses, and practical designs for beams and omnidirectional antennas. Readers will find much more, including long Yagi antennas, box kite Yagis, Vertical Antennas, C Pole Antennas, Twin-C Antennas, Big Loops, Ground Plane Antennas and much more.

Free Bonus CD

Included in the book is a CD with EZNEC models for all the antennas in the book plus a bonus presentation on box kite Yagi antennas.

Size 210 x 270mm, 208 pages, ISBN 9780-8725-9147-9

Non Members' Price £27.99 **RSGB Members' Price £23.79**



FROM £13.59

VoIP:

Internet Linking for Radio Amateurs

NEW Second Edition

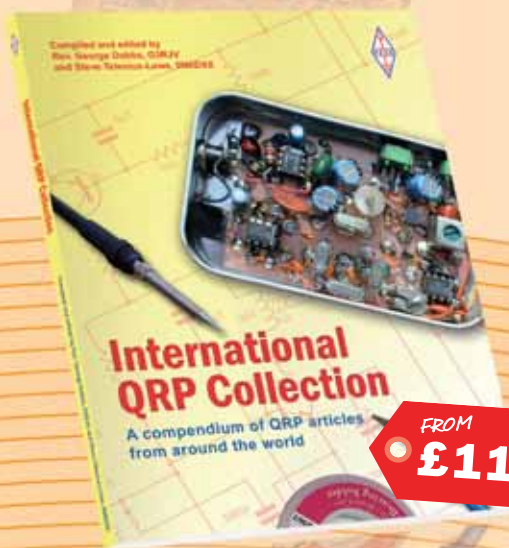
By Jonathan Taylor, K1RFD

Large numbers of radio amateurs are now regularly using VoIP, or "Voice Over Internet Protocol" and this second edition of *VoIP: Internet Linking for Radio Amateurs* is the complete guide to this fascinating topic.

VoIP: Internet Linking for Radio Amateurs covers the most widely-used VoIP systems used by radio amateurs, with particular attention to EchoLink and the Internet Radio Linking Project, or IRLP. This book is designed for beginners who need information on how to get started, set-up, and use these systems. It is also the ideal guide to the ham radio applications of VoIP, in combination with their radios for long-distance communication. The use of the Internet as the relay between their base stations, handhelds and mobile transceivers. For the more advanced, it provides plenty of technical "meat" for those who want to dig deeper into VoIP applications.

Size 227x185mm, 144 pages, ISBN 9780-87259-926-4

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



FROM £11.04

International QRP Collection

A compendium of QRP articles from around the world

Compiled and edited by Rev. George Dobbs, G3RJV & Steve Telenius-Lowe, 9M6DXX

QRP (or low power) operating is practiced by many radio amateurs across the globe. Much is published by these QRP enthusiasts detailing great designs, best practice and much more. The authors of the *International QRP Collection* have scoured the world for the best of these and compiled them for you, into this great scrapbook.

With authors from Europe, Africa, Asia, North America, South America and Oceania, the *International QRP Collection* is truly an international window on today's QRP construction and operating practices.

Size 210x274mm, 176 pages, ISBN 9781-9050-8655-9

Non Members' Price £12.99 **RSGB Members' Price £11.04**

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

Linear AMP UK Ltd, Discovery 64

A dual-band 50MHz/70MHz high power linear amplifier

PHOTO 1: The Discovery 64 is a high power linear amplifier for 50 and 70MHz.

INTRODUCTION. I was really pleased when I was asked to review the Discovery 64 high power 50MHz/70MHz amplifier as I am very active on VHF and have the facility to run high power into large antennas on both the 50MHz and 70MHz bands. The linear amplifier that I'm reviewing is manufactured by Linear Amp Limited, previously owned by Peter Rodmell, G3ZRS, but recently taken over by Elite Enterprises and now branded as Linear Amp UK.

The new company has made significant design changes to existing amplifiers and it has introduced a number of new models. Linear Amp Limited is well known for their HF amplifiers, the Ranger (800W output) and the Challenger 3 & 4 (1500W output). However, they also manufacture a range of VHF and UHF amplifiers with the Discovery 64 (1000W output) for the 50MHz and 70MHz bands, the Discovery 2 (1500W output) for the 144MHz band and the Discovery 70 (700W output) for the 430MHz band. All of these power amplifiers are fairly similar both in electrical and mechanical design and are capable of generating the full UK legal limit output with a very generous reserve.

WHY USE A HIGH POWER AMPLIFIER?

Before I get down to the review itself I should explain why high power amplifiers are sometimes necessary on the VHF bands, their advantages and the circumstances in which they should be used. Propagation on the VHF bands is quite unlike that experienced in many other areas of the RF spectrum. Apart from the normal day-to-day contacts made via tropospheric refraction there also exist numerous ionospheric and scatter modes. Many of these, such as auroral backscatter, meteor scatter, troposcatter, ionoscatter and moonbounce are conducted over non-optimum paths and, as a consequence, the received signals are often very weak. To make effective and consistent contacts via these modes does require the use of high power. It is simply a necessity, not a luxury. In principal there's nothing wrong with running high power if used sensibly. Indeed during a pile-up situation, as is so often encountered on the 50MHz band during the summer, there may be less interference caused by a high power station that is able to work a DX station immediately rather than calling endlessly over and over again.

But why use a VHF amplifier capable of generating 1000W output when the UK limit on the 50MHz band is only 400W. First and foremost an amplifier such as the Discovery64 will idle along at reduced output and the life of the valve will be considerably lengthened. Operators who use high duty-cycle modes such as FSK441 and JT6M for meteor scatter and JT65 for moonbounce communication often find that they need to considerably reduce the output power of an existing amplifier to prevent meltdown during lengthy transmit periods. In theses circumstances, a 1kW amplifier providing 400W output will run considerably cooler during the entire transmit period and will put far less stress on the power supply and other components. Distortion products may be reduced (but not necessarily always) at lower levels of output thus producing a cleaner signal. Indeed I have often maintained that a clean 400W of 'valve' power will always be infinitely better than an over-driven 30W solid-state amplifier. And there are many of those around!

Secondly, the power limit in the UK is specified at the driven element of the antenna, not at the output connector of the amplifier. It is not unusual for feeder runs to be fairly long and losses especially at VHF can be quite high even at 50MHz. Add in the odd connector or two, even more if you use an external power meter and the combined losses can easily amount to 3dB or higher. Even with a conservative 3dB feeder system loss it means that the amplifier must be capable of providing 800W output in the shack to give 400W at the antenna.

It is also possible of course to apply for a Notice of Variation (NoV) to your existing licence that authorises, on a case by case basis, the use of very high power within the 50MHz band. Typically these are granted, following site investigations, to operators running EME stations.

I do, however, have a moral issue with an amplifier that is capable of running 1000W output on the 70MHz band. The 4m band in the UK is allocated with secondary status and is available only on the basis of non-interference to other users and services. The power limit is a mere 160W and although the Discovery 64 requires around 10W drive to achieve this output level it hardly seems a cost effective method of RF generation. I would defy anyone who can claim that running an amplifier with a 1.5kW anode dissipation valve, 40W of heater supplies, a cooling fan and associated electronics to provide 160W output is a sensible idea. However Paul Cullen, G4KTZ of Linear Amp UK Ltd explained that with relatively little expense it was very easy to modify the original 50MHz amplifier to run on both bands. Basically you're getting the 70MHz amplifier for free and how you use it is up to the individual operator.

DESCRIPTION. The Discovery 64 is a self-contained, mains powered, linear RF power amplifier that is manually switched for use on

both the 50MHz and 70MHz bands. Using a rugged GS35 ceramic triode with an anode dissipation of 1.5kW it is capable of providing 1000W output on either band.

The linear amplifier has a maximum drive level of 100W (although I didn't require anything like that to achieve 1kW output) with a nominal gain of around 13dB. At this level of gain a drive power of 10W should produce around 200W output and 50W drive will produce approximately1000W output. The GS35 is used in grounded grid, cathode-driven configuration with a tuneable input circuit and a switchable Pi-L output circuit. This type of design is inherently very stable and easy to operate.

The amplifier has an integral centrifugal fan that enables it to operate at full output power for some considerable time. Self-contained power supplies provide EHT (3600V), heater voltage (12.6V AC) and a control supply (12V DC) for switching various relays. Coaxial input and output relays are built into the amplifier and these relays automatically transfer the driver transceiver to the antenna when the PA is switched to standby or off-line position.

The amplifier requires a press-to-talk (PTT) contact in the driving transceiver to key the amplifier, a simple 'earth to transmit' configuration. Incidentally when this line is grounded the current drawn from the transceiver is about 10μA and when the PTT line is un-grounded the open-circuit voltage is regulated at +12V. This is compatible with the PTT output of many well-known transceivers.

Importantly a control board continually monitors the status of amplifier and provides a number of protection circuits to safeguard both the valve and PSU components. The amplifier comes supplied with a heavy duty IEC power cable, phono-plug (for PTT control), a spare mains fuse and operating manual.

VISUAL APPEARANCE. The amplifier chassis and cabinet is constructed from heavy gauge steel finished in a pleasing grey paint coating. The wrap-round top and base panels of the cabinet are neatly held by six dome-headed bolts, making access very easy. The case measures 330 x 220 x 410mm and weighs in at a whopping 25kg.

The front panel is pleasingly laid out with two large flush mounted meters that indicate anode current and grid current. A switch, located below these meters, can be selected to either show grid current or relative power output. Located on the lower right hand side of the front panel two large rocker switches control the mains power on/off and amplifier standby/transmit modes. A row of five coloured LED status lights are located towards the top of the panel to depict the operational function of the amplifier. Three green indicators show that the mains power is connected, the amplifier is ready and the amplifier is on-air.

PHOTO 2: Taking the covers off revealed the PA circuitry.

Red and orange lights will illuminate to indicate high anode current (flashover) and grid current trip lock-out fault conditions.

Centrally located are two very large Tune and Load controls. These are coupled to slow-motion epicyclic gearing and provide for very easy and positive tuning. A 6m/4m band switch is located in the vicinity of the load and tune controls. This is very heavy-duty and throws with a satisfying clunk! A similar shaped knob, adjusts the input matching for either the 50 or 70MHz band.

At the rear of the amplifier are located two N-type sockets, one for the driving transmitter and the other for the antenna. There's also a phono-socket for press to talk (PTT) control and a ground connection with an integral wing nut.

The mains input connector is an IEC C19 type designed for high power applications and has heavy duty horizontal blades rather than the more familiar C14 PC-type connector or C15 kettle connector that have vertical blades. A heavy duty main lead that matches the C19 socket is supplied with the amplifier but it may be worthwhile remembering the difference in these types of IEC connectors. Waiting on top of a mountain for your mate to bring the correct mains lead won't win you many friends or contests!

INSIDE APPEARANCE. Now it was time to take a look inside. The main chassis is positioned such that one-quarter of the area underneath is used for the control board and switching circuitry and the remaining top three-quarters are used to mount the PSU components and cooling fan. The PA components are based around two separate screened aluminium compartments, with anode circuitry above and cathode circuitry below the main chassis. This arrangement is very good and ensures essential isolation between input and output circuits.

TRANSFORMER. Towards the rear of the upper chassis is located a very large and heavy toroidal transformer. This is custom made by Carnhill Transformers Ltd, a well known and reputable manufacturer. It provides both the low voltage for the heater supply and high voltage for the anode supply. The transformer incorporates a thermal trip that disconnects the primary circuit if the core temperature reaches 120°C. Tests showed that when using a digital mode such as RTTY

PHOTO 3: The cathode circuitry under the covers of the Discovery 64.

running at a power level of 1000W output with a 50% duty cycle (1-minute transmit, 1-minute receive) the transformer took around two hours to significantly heat up. This is rather a harsh test but does indicate that prudence should be exercised when using digi-modes for extensive periods at full power output. Under normal operational circumstances the temperature does not rise significantly.

EHT SUPPLY. Above the transformer is mounted a professionally looking PCB with associated components for the full-wave voltage doubler. This circuitry provides a nominal off-load voltage of 3600V at 1A current rating. The diode string uses four 1N5408 diodes in each half of the doubler circuit. The current rating of these diodes is 3A, a much better option than the 1N4007 originally fitted by the previous company.

It is very important to choose the correct type of smoothing capacitor and I was pleased to note that high ripple-current electrolytic capacitors are being used. The EHT board is securely screened from above with an earthed aluminium plate and appropriate warning labels. This is infinitely safer than the original design.

COOLING. Also at the rear of the upper chassis sits a large centrifugal fan made by Airflow Development Limited, an established and competent UK fan manufacturer. Air is drawn in at the back of the amplifier via 36 custom-made slots in the rear panel and blown directly into the anode compartment. A Teflon chimney fits snugly around the copper anode cooler ensuring that the air is drawn efficiently through the valve before being expelled via a series of concentric holes punched into the amplifier top cover. However, all the designs I've seen for cooling a GS35 blow the air initially through the lower cathode/grid compartment before passing through to the anode assembly. To provide some cooling of the cathode assembly a number of holes have been drilled in the lower compartment that allows an indeterminate quantity of air to get into this area and then presumably escape into the anode compartment. In continuous military service, the GS35 anode cooling requirement is approximately 88 cubic feet per minute. The Discovery 64 amplifier uses a type 33BTFL blower that has a static fan pressure of 64 cubic feet per minute. In normal intermittent amateur service, with the amplifier running at 1kW output, this will provide sufficient cooling. The fan noise by the way is reasonably unobtrusive but it must be remembered that if you can't hear any noise then it's not doing the job it is intended to do!

PA CIRCUITRY. The anode circuitry is located in a screened compartment towards the front of the upper chassis. Both coils in the Pi-L network are wound with large diameter copper tubing and the Pi coil is switched between the 50 and 70MHz bands with a substantial heavy-duty ceramic switch. Equally important is the choice of variable capacitors and it was pleasing to note that Jackson capacitors are used for both load and tune functions. Jackson Brothers capacitors (now owned by Mainline Electronics) were – and still are – synonymous with quality. Although taken very much for granted variable capacitors used in high power VHF amplifiers need to be chosen carefully to minimise rotor contact resistance, dielectric losses and leakage. These Jackson capacitors, made using ceramic end plates, aluminium vanes and nickel-plated rotor contacts ensure efficiency, stability and ease of tuning.

The external grid ring structure of the GS35 valve is securely clamped into a hole cut in the chassis, this technique of grounding the grid being mandatory for triode VHF amplifiers. The circular cathode/heater assembly of the GS35 projects into an aluminium compartment located on the underside of the amplifier. Again it was good to see a Jackson C802-type trimmer being used within a T-network (L-C-L) to provide variable input matching across both bands. A tuned input circuit by the way is necessary to reduce intermodulation distortion (IMD) products in this type of grounded-grid amplifier. Another requirement to facilitate low IMD products is for the cathode bias to be as 'stiff' as possible and preferably adjustable so as to set the GS35 to its recommended standing current. However in the Discovery 64 the cathode bias is fixed by a series of high-power Zener diodes (soon to be changed to a single large Zener diode). These are not adjustable and the voltage developed tends to increase with rising anode current. I'm not sure how much this is an issue but I would have preferred some method of setting the standing anode current.

All linear amplifiers create harmonic distortion, multiples of the fundamental frequency. The 3rd harmonic of the Discovery 64 is claimed to be -45dB and the 2nd harmonic (not measured) will be better than this level. Even so, the second harmonic of the amplifier used at 50MHz will fall inside the FM broadcast band and at 70MHz will be uncomfortably close to the aeronautical band. It really depends on how hard you are pushing the amplifier and therefore you may need an additional 2nd-harmonic notch filter to ensure that interference is not caused to other services.

SWITCHING RELAYS. The coaxial relay selected for input switching is aTohtsu CX-120. This is a good choice as it is able to handle 250W at 50MHz with only 0.05dB insertion loss. The output relay is a little unusual in that it is designed around an Omron GR2 general purpose relay. The relay is located within a substantial die-cast enclosure onto which have been mounted two type-N connectors. The third port of the switching system, from the CX-120 relay, enters the die-cast box directly with coaxial cable. Internally, the N-connectors are joined to the Omron relay switching tags by short lengths of UT-141 semi-rigid cable and copper earthing strips in an attempt to maintain a 50Ω coaxial environment. I was somewhat sceptical at this approach but apparently this design is used in the 144MHz model and that can handle 1.5kW of continuous power (cold-switched, of course). Terminating the antenna port in a 50Ω load I checked the VSWR through the receive path but could not measure any mismatch whatsoever at 50 or 70MHz. I also tried to check the through-path insertion loss at 70MHz but because the loss was so low I was actually defeated by the limitations of my test equipment. In hindsight I shouldn't have been too sceptical about using a DC switching relay at lower VHF frequencies. As long as the relay is not hot-switched and the VSWR of the antenna system is low then it can handle considerable through power. What does suffer is the isolation rather than power handling but as this amplifier doesn't have a built-in preamplifier this parameter is inconsequential.

AMPLIFIER PROTECTION. Protection of various power supply and amplifier circuitry is provided by a dedicated control board.

Designed and manufactured by Linear Amp Limited the board has recently been changed from the original controller design to meet relevant CE regulations.

The amplifier uses a soft-start system to protect the toroidal transformer from mechanical and electrical stress. When the amplifier is initially switched on this protection circuit briefly connects a low value resistor into the primary circuit of the power transformer. Associated with the mains input connector is a 10A T-type high breaking capacity (HBC) fuse and holder. T-type means transformer rated or time delay and will take a little longer to blow to allow for surges created by transformers and other inductors. Ceramic HBC fuses can also cope with higher surge currents than the more conventional glass types.

The GS35 triode requires a warm-up period to avoid damaging the indirectly-heated cathode. A delay circuit is incorporated that keeps the amplifier in standby mode for a nominal period of three minutes. This seems like an eternity when waiting for the PA to warm up during a Sporadic-E opening though!

The control grid of a GS35 is a delicate structure and to avoid destruction of the valve the specified maximum grid dissipation must not be exceeded. Excessive grid current can be caused by a combination of high RF drive or incorrect loading. The control board continually monitors for excessive grid current and if the condition is detected the PTT is disabled and the GRID alarm illuminates. Similarly the control board also monitors for anode over-current and internal valve flashover and if either of these parameters is detected the PTT control is disengaged and the ANODE alarm illuminates. When a fault trip does occur the amplifier can be reset by use of the standby/transmit control switch, once the source of the problem has been eliminated.

Although not protection in the strict sense of the word, metering has been provided to monitor both the anode current and grid current to ensure that the amplifier is functioning correctly. I was pleased with the overall level of protection provided for the amplifier.

SWITCH ON! It was almost time to switch on the amplifier but first I decided to thoroughly read through the operating manual. It adequately covers what the connections are, how to set up and tune the amplifier and its correct operation. Wisely it cautions about the dangerously high voltages contained within and emphasises this on a number of occasions throughout the manual. Although the manual does not presently contain circuit diagrams, Linear Amp Limited have agreed to provide them later this year.

Connecting up the amplifier is extremely easy. Two leads with N-type plugs are required.

PHOTO 4: The mains input connector is an IEC C19 type designed for high power applications. Worthwhile remembering as you won't win many contests - or friends - if you have to wait on top of a mountain for your mate to bring the correct mains lead!

One connects to the driving transceiver and the other to the antenna system.

I connected Bird-43 power meters to both the input and output of the amplifier. This is particularly useful if you are unsure about your drive levels and of course it will confirm that you remain within the appropriate power limit for either band. Apart from plugging in the mains lead the only other connection required is the PTT line from the driving transceiver.

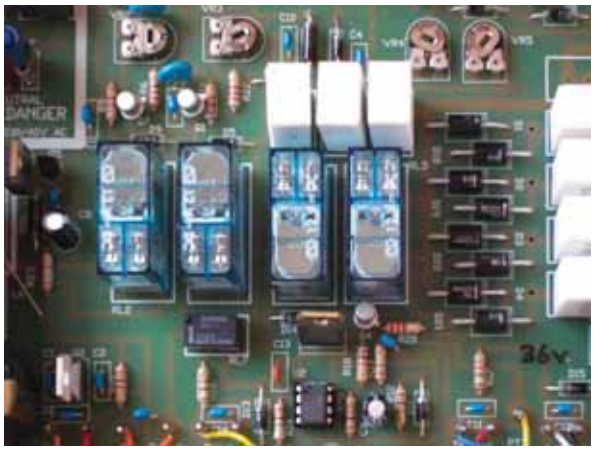


PHOTO 5: Protection of various power supply and amplifier circuitry is provided by a dedicated control board.

For the initial tests I connected the amplifier to a large oil-cooled VHF dummy load rated to handle up to 1000W of RF power. Before switching on I set the band switch to the 50MHz position and pre-set the input tune capacitor to the appropriate position.

Having switched on and waited the obligatory three minutes for the valve to warm up I was now ready to check the operation of the amplifier. With no RF drive applied I keyed the amplifier to check the standing anode current. This should lie in the range 80-100mA but I measured 120mA on the review model. Although this is not particularly critical it does highlight the need, in my opinion, of having the facility to set the standing current.

Applying a few watts of 50MHz drive from an FT-2000 transceiver I adjusted the Tune and Load controls for maximum output on the power meter. The controls were very smooth in operation and there were no signs of instability from the amplifier. Increasing the drive level to 25W I measured nearly 400W output thus indicating that the amplifier gain was close to 12dB. With 60W of drive I measured approximately 1000W output but at that point I had reached the limit of my Bird-43 element. I also carried out a test on the 70MHz band and recorded fairly similar results. Around 10.5W drive produced 160W output (the UK power limit) indicating that the amplifier gain was marginally less at this higher frequency.

Then it was time to disconnect the dummy load and connect the amplifier to a 50MHz Yagi. At this point I should mention some words of advice. Check that your antenna VSWR is sufficiently low and ensure that the coaxial feeder and antenna connections can handle the stress of very high power. Running hundreds of watts is a completely different ball-game from using a low power transceiver!

Operating with the Discovery 64 amplifier I made a number of SSB and CW contacts and at no time did I receive any adverse report of poor signal quality. I also used it during the hurly-burly of a Six Metre contest and it operated flawlessly during the six hour event.

CONCLUSIONS. I was pleased with the overall look and performance of the Discovery 64 amplifier. It produced 1000W of output power effortlessly. Tuning was very easy and it was very stable in operation. Particular emphasis has been placed on making the amplifier rugged to ensure long lasting and reliable operation. The level of protection is very good and sufficient air cooling is provided to ensure long valve life. The price of the Discovery 64 is £1895 (inclusive of VAT) plus carriage. This compares very favourably indeed with similar amplifiers of this type and, of course, it's made in Great Britain.

My thanks are extended to Paul Cullen, G4KTZ of Linear Amp UK Limited for the loan of the amplifier.

Science Week

Newlands Community Primary School starts the school year with amateur radio

SCIENCE EXPERIMENTS. For the new school year in September 2009, it was decided by the head teacher and staff to hold a science week. This was to introduce the pupils of the school to the meaning of science and what the application is to real world situations, by covering physics, chemistry and biology. Simple and innovative experiments were used and performed by the children. These experiments caught the children's imagination and opened their eyes to what science was all about, and what it could do.

As a school governor, with science as my subject, and because I was a radio amateur – my callsign is M1EYA – I was asked for any suggestions. I looked at what the school had to offer and where I could help fill any gaps in experiments for them. Looking at amateur radio, I realised how well the subject fitted into the national curriculum and would reinforce the lessons material well.

Amateur radio covers science, geography, English, maths and foreign languages, for all the right reasons. I then offered to put an amateur radio station into the school for the final two days of the science week. With a school roll of some 290 pupils, I realised I would not be able to manage on my own, so I enlisted the help of two other radio amateurs; John Mills, M0BWR (a white stick operator) and a Foundation licence holder Jayne Burrows, M6JAB, who works in a school for disadvantaged children. Jayne was able to give us some invaluable input and some good ideas to work with. John, M0BWR is retired and blind, he gave us some very valuable help on the Thursday, other commitments preventing a second day with me.

SETTING UP. On Monday 14 September, the school premises officer and I installed the G5RV aerial between the school hall and the sides of the two double-mobile classrooms. This gave us a 'V' formation for the aerial and approximately 8m of height above the playground. Some 450Ω ladder line was used to give the bottom half of the aerial, followed by RG213 50Ω coax via a six turn, 8in diameter RF inductor, to prevent any back RF radiation entering the school hall. Equipment used was an FT-840 transceiver with desk mic and a Kent straight Morse key, along with an FC-707 aerial tuning unit. John, M0BWR used a TS-570 with a voice adaptation unit for use by the blind.

IN OPERATION. A map was placed on the hall wall and the position of the school was denoted by a coloured pin, from which hung several coloured lines. During the demonstrations, as a callsign prefix was found, the children used the charts provided to find the country of the signals origin on the map. They stuck a pin into place with one of the coloured lines attached, thus showing both the distance and bearing from the school to the radio station. The children couldn't believe the distances involved.

Richard Neale-Gardner, M1EYA and a Year 5 pupil sending Morse.

Contacts began with with Italy, Macedonia, Spain and other European countries and we did work into the USA too. Conditions, whilst not good, were nevertheless reasonable enough for the purpose of the week's subject material.

MIC SHY. A large number of the children did not feel comfortable enough to talk live on air, so a Morse signal generator and the Morse key were used so the children could send their first names in Morse code. The week before I had given the school a handout on the Morse code and asked that the children be taught the code for their first names only. They made sure that I did not see their names, so when receiving the code I could tell the child their first name – which they thought was amazing. Initially they were taught that it was 'Dot' or 'Dash', and not 'Dit' or 'Dah', until I explained that that was what was heard when sending Morse code.

All the children got to send Morse code and a good many of them were very good. They got certificates for sending their name in Morse. During all this, my compatriot M0BWR was busy working other stations. The children could not believe that he was totally blind, and then they realised that a disability was not a reason for not taking up the hobby. A good many of the children are capable of obtaining Foundation licence before they leave the primary system and go in to secondary education.

LEARNING THROUGH PLAY. The children thoroughly enjoyed their science week and learned a considerable amount whilst they thought it was all play. They are keen to have more of the same! They have requested that an amateur radio club be formed at the school so they could get their Foundation licence and I am now discussing this with the Head teacher and governors. Some equipment has already been provided by the Amateur Radio In Schools charity, whose Chair is Dave Jones, G0HHP. The charity provides equipment and help to schools where they don't have anyone with the necessary know -how to set up a radio station. All the equipment they supply comes from donations and bequests. The charity does ask the schools that if they no longer want the equipment, to remember the charity, and give them first refusal, so that it can be recycled for further use or sold to help with funds.

During the course of the week a local group requested an evening demonstration of amateur radio, which I provided on the Thursday evening at the school. This group also are interested in starting a club locally within the village. I will be looking into this for ways to provide this in tandem with the schools radio club.

LIFETIME QUALIFICATION. At the end of the week I asked one of the teachers, "Where could an eleven year old child leave the primary system with a qualification, that would last a lifetime, be obtained?" They had no answer. I replied, "as a radio amateur with a Foundation licence".

Can I encourage all amateur to consider encouraging local schools and colleges to use this resource to raise pupil's attainments in education – and also to further the hobby.

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

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

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

FT-817ND

YAESU

After almost 9 years you would think there would be competition for the FT-817. Still the ONLY truly hand-portable 160m-70cm all mode transceiver available today.

£449.95 with Free CSC-83 Carry Case worth over £20.

NEW! Yaesu FT-dx5000MP

HF/6M Transceiver with 112dB Dynamic Range & IP3 of +40dBm

Coming soon! See web for further details.

Yaesu FT-857D & ATAS-120A Package

Still our best selling HF Mobile Radio.

By adding the remarkable ATAS-120A Auto Antenna you have 40-10M at the press of a button without getting out of your car! No other manufacturer has been able to offer this unique feature together with their mobile radio. Having used the ATAS on 40m I was amazed how a mobile antenna so small performs so effectively. My single band whips have been consigned to the garage ever since!

FT-857D only £589.95 or with ATAS-120A £819.95

ICOM

GB7ML
D-Star repeater is back on air!
439.4625MHz
Default reflector 13.B

ML&S are Officially Icom's Largest UK Amateur Dealer

Icom HF products

IC-718	Basic HF Radio, 12V, 100W output	£459.74
IC-706mk11G	100W HF/6m + 2/70 Multimode Mobile	£735.95
IC-7200	Mr T's choice for tough HF/6M Operation	£775.95
IC-7000	Full DSP, TFT Screen, 100W HF/6m + 2/70	£939.95

IC-7400
100W HF/6M/2M Base, full DSP, Auto ATU £1199.95

IC-7600	100W, Twin RX, Huge Display. No psu	£3149.95
IC-7700	Superb 200W HF/6M Base, PSU/ATU	New RRP £5499.95 1 only at £4995.95
IC-7800	Icom's Flagship radio has gone up again	New RRP £7995.95 2 only at £6995.95
IC-PW1Euro	1kW Fully automatic HF/6m Linear Amp	£Call!!

Icom V/U Products

IC-E92ED	As above c/w D-Star fitted & splash–proof	£379.95
IC-E880	NEW! Latest D-Star Dual-Bander. Now in stock	£Call!!
IC-E2820	Proper dual band, dual display, remote etc	£395.95
IC-E2820+D	Supplied with UT-123 D-Star board	£549.95
IC-910H	Multimode 2/70 Base Station	£1269.95
IC-910X	As above but with optional 23cm UX-910	£1469.95

Icom Receivers

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

ICOM PC Controlled Receivers

Icom IC-R1500 & IC-PCR2500
All Windows XP, Vista or Windows 7 Controlled via USB

IC-R1500	10kHz-3300MHz All Mode with remote head	£449.95
IC-PCR2500	Twin Receiver version of PCR-1500	£499.95

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

Click on our website to see a video from Tokyo Hamfair August 2009!

Price: TBA

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

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

Icom IC-7600

£3149.95

See our website for first full detailed review by Adam Farson VA70J

The successor to the IC-7565Pro111, the eagerly awaited new mid-range HF/6M Transceiver will try and set another bench mark like that of its predecessor.

KENWOOD

Kenwood HF Products

TS-480SAT	Remote head HF/6m 100W inc ATU Transceiver	£749.95
TS-480HX	200Watt version of above, no auto-ATU	£849.95
TS-2000E	100Watt all mode HF/2/6M with auto-ATU etc	£1499.95
TS-2000X	As above but fitted with 10Watts on 23cm (all mode)	£1799.95

Kenwood V/U Products

TH-F7E	The only 2/70 FM Handie with SSB/CW WB Receiver	£229.95
TM-V71E	First Class 2/70 FM Mobile with remote head	£289.95
TM-D710E	The only 2/70 FM Mobile/Base with APRS/TNC etc	£429.95
TM-D710E+AvMap	Bundle. Personal Navigator for GPS located APRS	£Call!!

New! Alinco DJ-G7E

"As used by Howard, G6LVB". Unique 2/70/23cm Handie. Ideal for hand-held Satellite operation.

Special Price! ML&S: £299.95

NEW!

MicroBit Remote Rig Interface

A complete remote control system for Amateur radio

Using Microbit's advanced technology, full remote control of your rig is available today.

Imagine going on holiday but missing your HF system back home. Well no more! Using the RRC-1258 system all that is required is for you to take the head unit of say your IC-706 or TS-480 together with one half of the RRC-1258, plug into a LAN connection connected to the web and within seconds you are "ON AIR" as if you were sitting in your shack at home. (Minus the cat, TV and any other external interference!)

The previous model is still available.

Microbit-1258 mkI £349.95. Including Lead Set

Microbit-1258 mkII £399.95. Leads included

For more info see **www.hamradio.co.uk/rrc-1258.shtml**

ML&S are the sole UK & Ireland distributor for Microbit.

Latest version of the Remote Rig. One version for ALL radio models.
Like the original RRC-1258, the MkII is sold in pairs, assembled and tested but not configured. Included in the package is one USB cable, Power cables (2 pc), Cat 5 cable for making IC-706 cable and a 2xRJ-45 extender.

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

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

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

Outline House, 73 Guildford Street,
Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

THE WORLD'S BEST ANTENNA TUNERS FROM ML&S

LDG

FACT not FICTION: Did you know that ML&S sell MORE of the excellent LDG Auto Tuners than any other dealer outside the U.S.A.?

LDG Auto Tuner Range

AT-100pro	Desktop tuner covering all frequencies from 1.8-54 MHz	£194.95
AT-200pro	Designed for new generation of rigs	£214.95
AT-1000Pro	1kw 160m-6m (1.8-54MHz) High speed Auto ATU, tuning range 6-1000Ohms	£510.95
AT-897Plus	Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too!	£183.95
IT-100	New version of the AT-7000	£159.95
YT-100	NEW AUTO ATU for FT-897/857 or FT-100 with additional Cat Port Control	£173.95
Z-817	Ultimate autotuner for QRP radios, including the Yaesu FT-817D	£122.95
Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£143.95
Z-11Pro	Portable compact & tunes 100mW to 125W	£158.95
RCA-14	4-way DC Breakout Box	£49.95
KT-100	Dedicated tuner for Kenwood radios	£173.95
RBA-1:1	Probably the best 1:1balun out there	£35.71
RBA 4:1	Probably the best 4:1 balun out there	£35.71
DTS-6 + 6R	Remote Antenna Switchers. 1.5kW 1-54MHz.	£43.95
FT-Meter	Neat Analogue back-lit Meter for FT-897/857. S-meter, TX Pwr, ALC Etc	£45.95
NEW FTL-	Meter Jumbo version of the famous FT-Meter	£79.95

MyDEL CG-3000

ML&S: £289.95

With 200W and 200 memory channels.

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

NEW! Remote control for the CG-3000 and CG-5000. £39.95

CG-3000 shown with optional remote switch.

As reviewed by Steve White in Radcom
"A real bargain when compared to its obvious USA competitor" "Well built & performs impressively"
Steve White, Radcom November.

CG-5000MkII

At last! 600W PEP High Speed Remote Tuner from MyDEL

Specifications:

- Tuneable frequency:
  1.8 - 30Mhz with long wire antenna from 8 meters
- Input impendence: 45-55 ohms
- Input power: 10 - 600W PEP
- SWR: <2:1
- Power supply voltage: DC 13.8V
- Current consumption: <1.5A
- Memory channels: 800
- Auto tuning time: 0.5-6 seconds (first time tuning), less than 0.2 second (return to memory frequency)
- Weight: 3 Kg.
- Size: 385mm x 280mm x 110mm (L - W - H)

ML&S: £559.95

Palstar

Full range of Palstar now in stock

New! Palstar AT-2KD.
Replaces the AT-1KP & AT-1500DT.
160-6M 2kW. ML&S: £419.95

New!
Palstar Commander HF-2500 1.5kW Amplifier

Palstar are pleased to announce a new range of HF Linear Amplifiers built to the highest standard. We have started with the "Commander HF-2500" which is available from stock. The 2m & 6m versions will be available during early 2010. ML&S: £3499.95

AT-500 600W PEP Antenna Tuner	**Special Price £349.95**
AT-Auto Automatic 1500 Watt ATU	**£1099.95**
AT-1500DT 1500W Differential Antenna Tuner	**£449.95**
AT-2KP (2000W) Antenna Tuner	**£429.95**
NEW AT-2KD The AT-1500DT and the AT-1KP have been combined into a new 2Kw Tuner	**£419.95**
AT-4K (2.5kW) Antenna Tuner	**£729.95**
AT-5K (3.5kW) Antenna Tuner	**£999.95**
BT-1500A Balanced Antenna Tuner	**£599.95**
PM-2000AM Power/SWR Meter	**£159.95**

Palstar Dummy Loads

DL-1500 (1.5KW)	**£119.95**
DL-2K (2kW)	**£229.95**
DL-5K (5kW)	**£349.95**

Palstar R30A Receiver
Palstar R30A, fitted Collins filters for SSB & AM **£569.95**

MW550P Active preselector & ATU for AM & 160M reception	**£259.95**
SP30 Matching Desk Speaker	**£69.95**
AA30 Active Antenna Matcher 300kHz-30MHz	**£99.95**

PALSTAR AT-500 600 Watt PEP Antenna Tuner

Covering 160 to 6 Meters, the AT-500 features a differential tuning capacitor with 2 stators and 1 rotor, a precision ceramic body roller inductor, and a 4:1 ferrite current balun for balanced line feeds.

The AT-500 utilises only 2 controls to operate for tuning, providing maximum ease of use in a manual tuner. A small-sized roller inductor operates all the way up to 6 Meters, while a relay-switched add-on inductor allows 160 Meter operation. The AT-500 also features Pastar's active Peak and Peak Hold dual cross-needle metering, chem-film treated aluminum metalwork and durable powder coated finish on the front panel and top cover. You'll have a tuner that will grace your shack for years to come.

ML&S PRICE: £349.95

PALSTAR AT-2KP 2000 Watt PEP Antenna Tuner

A newly-designed, smaller roller inductor allows the AT2K to tune 6 Meters, while a relay-switched toroid adds the extra inductance needed for 160 Meter coverage. Newly designed capacitors feature lower minimum capacitance for improved high band performance, while maximum capacitance has been increased to 400pF for better low band performance. In addition, the Peak/Peak Hold metering from the PM2000 has been incorporated into the AT2K.

ML&S PRICE: £429.95

PALSTAR BT-1500A Balanced Antenna Tuner

The BT1500A is a dual-roller balanced L antenna tuner that fills the void for a matching network up to 1500 watts pep for balanced line antennas. For ease of use the BT1500 utilises only 2 controls to operate for tuning with two direct-coupled precision ceramic roller inductors.

ML&S PRICE: £579.95

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

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

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

RFspace

DV-Dongle

Want to dabble in D-Star without the expense of a radio? The new DV-Dongle is ideal.

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

NEW

In stock, works with MAC or PC. £199.95

MyDEL HB-1A Ultra Compact 3 Band CW Transceiver

Offering up to 4 Watts output on 40/30/20M Bands, this tiny HF portable is powered by 8 x AA cells and is aimed at the serious QRP enthusiast and has performance similar to that of the Elecraft KX-1.

- 20 meters, 30 meters and 40 meter amateur bands.
- CW Transceive, SSB receive.
- Receiving from 5 MHz to 16MHz.
- Maximum transmission power of about 4 watts on external 12V.
- Weight 350Grams (approximate).
- Battery compartment to hold 8 rechargeable AA cells.
- Built-in auto function keys.
- DDS VFO with 20 frequency storage memory.
- Digital dial with LCD technology.
- Automatic keyer with the CQ programmable with your call.
- RIT 10 Hz, 100 Hz.
- Frequency conversion super- heterodyne receiver.
- Unit will operate with voltage supply from 8-14 VDC.
- Built in AGC function.

NOW IN STOCK - very limited quantity.

ML&S Price: £249.95.

Call or see website for further details.

The SR2000A Frequency Monitor

ML&S: £1999.95

Combines a spectrum display unit and receiver in a single cabinet. Up to 40MHz display bandwidth may be selected and minimum 1kHz RBW. The embedded receiver provides continuous coverage from 25MHz to 3GHz in AM, FM & WFM modes. The FFT SEARCH function enables you to locate elusive transmissions FAST, a free PC package (from the AOR web site) further enriches operation. Video images can be displayed on the LCD (PAL + NTSC). The interconnections are incorporated "in the box" along with an internal speaker.

VENTUS WX-928-ULTIMATE

The NEW WX-928 really is the ULTIMATE in professional weather stations, offering the usual feature set of the WX-831 but uses a Anemometer with solar cells , Satellite Meteotime forecast over the next 4 days and a massive split screen.

Description
This weather station is as called the ultimate weather station. It provides you with local weather data from anemometer, rain gauge and thermohygrometer sensor. All these local measurements from your garden can you save on your pc by using the pc-software included. Furthermore it receives a 4 days forecast by satellite from cities all around in Europe. Just find your city and the weather station updates automatically.

Intro offer only £199.95 - in stock now!

VENTUS WX-831

This new much improved wireless Weather Station is built to a very high standard and even includes O-Ring seals on battery compartments that are mounted externally. The quality of external hardware is built to last for years and really moves the game on when it comes to "Professional Weather Stations"

ML&S Price: £119.95.
Options: Additional wireless temperature monitors: £24.95. PSU to run the WX-831 from 240V: £19.95

ONLY £49.95

VENTUS G730 GPS-LOGGER

This USB memory stick sized unit is a fascinating pocket device with multiple commercial and personal uses for individual movement tracking. It's very light, extremely easy to use and logs your route automatically. It also adds your GPS location to digital pictures. It presents the route you have taken in 3D via Google Earth™ on your PC and it can export in different formats.

Begali

For the entire range with choice of bases and contacts and prices please see our website or BEGALI on www.i2rtf.com

The finest range of keys available today.


Begali Sculpture


Begali Camel Back

Begali chose ML&S because they wanted a quality company to see the very best Morse Keys in the World.
ML&S are sole distributors for these beautifully crafted keys in the UK. For full details see our website or send 40p in stamps for full colour catalogue.

Begali Spark	Straight Key gold base	**£122.56**
Begali Camel Bac	Straight Key black base	**£126.87**
Begali Blade	Straight Key black base	**£218.34**
Begali Simplex-Mono	Mono Paddle gold base, silver contacts	**£149.97**
Begali Simplex-Mono	Mono Paddle gold base, palladium contacts	**£180.44**
Begali Simplex-Mono	Mono Paddle palladium base, gold contacts	**£180.44**
Begali Simplex-Mono	Mono Paddle palladium base, silver contacts	**£149.97**
Begali HST	Single Lever Paddle black iron base, gold contacts	**£218.34**
Begali Simplex-Dual	Dual Paddle gold base, silver contacts	**£133.32**
Begali Simplex-Dual	Dual Paddle gold base & contacts	**£163.92**
Begali Simplex-Dual	Dual Paddle palladium base, gold contacts	**£163.92**
Begali Classic	Iambic Magnetic return, gold base, silver contacts	**£196.29**
Begali Classic	Iambic Magnetic return, palladium base, silver contacts	**£196.29**
Begali Classic	Iambic Magnetic return, gold base & contacts	**£226.75**
Begali Classic	Iambic Magnetic return, palladium base, gold contacts	**£226.75**
Begali Signature	Iambic Magnetic return, gold base silver contacts	**£265.62**
Begali Signature	Iambic Magnetic return, palladium base, silver contacts	**£265.62**
Begali Signature	Iambic Magnetic return, palladium base, gold contacts	**£296.09**
Begali Signature	Iambic Magnetic return, gold base & contacts	**£296.09**
Begali Traveller Light	Iambic Travel Key with gold contacts	**£235.11**
Begali Pearl	Iambic Magnetic return, palladium base, gold contacts	**£297.74**
Begali Contour	Iambic Magnetic return, gold base & contacts	**£286.71**
Begali Graciella Jnr	Iambic Magnetic return, palladium base, gold contacts	**£341.85**
Begali Sculpture	Iambic Mag return Carbon Fibre, stainless base, gold C	**£410.72**
Begali Intrepid	Semi-Auto Bug, magnetic return, black base, gold C	**£457.64**

Kent Morse Keys

The best British range of keys money can buy!

The Kent twin paddle Morse key. £84.95. Kent Single Paddle Key. £72.85. Kent KT-1 Professional. £79.90.

Perseus VLF-LF-HF Receiver

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

£699.95

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

PERSEUS = Pretty Excellent Receiver for Software-Eager Unperceivable Signals

It features a 14 bit 80 MS/s analog-to-digital converter, a high-performance FPGA-based digital down-converter and a high-speed 480 Mbit/s USB2.0 PC interface.

A COMPLETE SDR RECEIVER FOR SHORTWAVES The PERSEUS analog front-end has been carefully designed for the most demanding users and includes a 0-30 dB, 10 dB steps, attenuator, a ten bands preselection filters bank, and a high dynamic preamplifier with a top-class input third-order Intercept Point of more than 30 dBm. The resulting third-order dynamic range is more than 100 dB in SSB and more than 105 dB in CW. Believe us, there's no other so performant and complete shortwave SDR receiver in the market today. The PERSEUS receiver can be operated also in a wide band mode as a 10 KHz - 40 MHz spectrum analyzer with more than 100 dB dynamic range in a 10 KHz resolution bandwidth.

SOFTWARE FOR DEMANDING USERS Being a software defined radio, the PERSEUS receiver relies on software applications to carry out the demodulation process. Besides providing all the required software signal processing for the PC platforms, the PERSEUS software has a comfortable graphical interface, is simple to use and runs under Microsoft Windows 2000, XP and Vista. All the controls a listener is used to see on a radio are there, in the application main window. The interface to third party software is provided in several ways, by means of the Microtelecom Software Defined Radio Developer Kit, virtual audio ports and virtual communication ports.

DX Engineering Products stocked at ML&S!

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

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

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

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

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

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

New! GAP Antennas Available from stock

GAP ANTENNA PRODUCTS

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

Alpha Delta Antennas

ALPHA DELTA COMMUNICATIONS, INC.

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	£54.15
Delta-4B	4-way position SO-239 switch (2kW) for use up to 500MHz	£75.60
Delta-4BN	4-way position N-type switch (1.5kW) for use up to 1.2GHz	£86.80
AD-ATT3G50	0MHz to 3GHz (200W) surge protector. N-Female Connector	£49.95
AD-ATT3G50/HP	0MHz to 3GHz (2kW) surge protector. N-Female Connector.	£48.89
AD-ATT3G50U	0MHz to 500MHz (200W) surge protector. SO-239 Connector	£39.95
AD-ATT3G50U/HP	0MHz to 500MHz (2kW) surge protector. SO-239 Connector	£44.95
End Insulators	Dog Bones. They are extremely rugged, UV and RF resistant	£1.53
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	£79.95
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	£84.96
Delta-DX-CC	80m, 40m, 20m, 15m and 10m dipole. This antenna is parallel length dipole with no traps; overall length is 82ft	£136.90
Delta-DX-DD	80m and 40m dipole. This antenna is parallel length dipole with no traps; overall length is 82ft	£89.95
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	£119.95
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.	£162.45
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	£44.95
DX-Ultra	Medium wave to 30MHz 80ft AM Broadcast Dipole. Efficient, low-noise dipole for military, government, etc., use.	£119.95
Hardware Kit	contains the following: 1x Dipole Centre 2x Dog Bones 1x Surge Protection Block	£27.95
Delta-SEP	Replacement/spare Arc-Plug™ Static Electricity Protector. This unit is usually attached to the back of the Alpha Delta Centre T Balun	£12.95

Super Antennas USA

Super Antenna ChapStick
MP-1 80m-10M Portable Antenna supplied complete with tripod & 80m coil.Only £159.955

Super Antenna MP-1 Rotary Dipole
10-80M with (Incl. 80m Coils) Collapses into a small carry bag. .....Only £299.95
Or Deluxe version with Tripod. £389.95

Super Antenna YP-3 "Beam in a Bag" 80-10M (inc WARC) 3 ele portable beam supplied with carry bag £399.95

The complete range of Super Antenna products and accessories can be found on our web site

HUSTLER

Hustler Antennas

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

4-BTV	40/20/15/10m	£178.95
5-BTV	80/40/20/15/10m	£218.95
6-BTV	80/40/30/20/15/10m	£245.95
17-BTV-S	17m add on for 5-BTV or 6-BTV	£53.95

Mobile Range
200W or 1kW, both stocked. RM10 to RM-80
10M to 80m single-band whips.. **£24.95** to **£56.95**

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

Yaesu Rotators
The best available at very special prices.

Only £299.95

G-450C The most popular medium duty rotator available today. ML&S always guarantee to have the largest stocks in the UK and of course the best prices. With 25m of cable.

G-250 Ideal simple to use remote control Antenna rotator for light weight antenna installations. Ideal use for turning 4/6/9 element Tonna 2m antennas, 9/19/21 element 70 cm antennas. Also V/U Log periodic (i.e. Maldol LP-1300) and small single and HF dipoles.....Only £109.95

G-550 Elevation rotator for satellite operation .....Only £259.95

G-5500 Heavy-Duty PC Controlled Vertical rotator for satellite and EME applications. .....Only £469.95

G-650 Medium duty with higher brake torque than the G-450. Supplied with 25m control cable.....£339.95

G-1000DXC This new, high-performance rotator is ideal for heavy-duty applications. Its slim-line constructions is ideal for many crank-up tower installations. Rotation range: 450°, with presets. £399.95

G-2800DXC Yaesu's top-of-the-line rotator is for extra-heavy-duty antenna installations. It includes Auto Slow Start and Auto Slow Stop features to avoid sharp jolts to the antenna array and tower. The G-2800A includes a mast clamp and 40 metres of control cable, to simplify installation. Total rotation range: 450°, with presets.....£769.95

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

COMET

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

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

Comet Wide-Band Vertical
CHA 250B 80m to 6m with no ATU and no gaps £306.48

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

Comet HF/VHF/UHF Base Antennas

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

Comet Handy Antennas

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

Comet Duplexers

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

Comet Triplexers

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

DIAMOND

Base Antennas

X-30	2/70, 3/5.5dB, 1.3m Long	£51.04
X-50N	2/70, 4.5/7.2dB, 1.7m Long	£66.37
X-300	2/70, 6.5/9dB, 3.1m Long	£102.12
X-7000	2/70/23, 8.3/11.7/13.7dB 5m Long	£204.30
V-2000	6/2/70, 2.15/6.2/8.4dB, 2.5m Long	£127.67

Mobile Antennas

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

Duplexers/Triplexers

MX-72N	1.6-150/400-460MHz Duplexer	£45.94
MX-62M	1.6-56/140-470MHz Duplexer	£69.44
MX-610	HF/6+2+70 (for FT-8900)	£73.52
MX-2000	6/2/70 Triplexer	£85.78
MX-3000N	2/70/23 Triplexer	£82.71

Switches

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

SWR/PWR Meters

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

Power Supply
GSV-3000 25Amp 5-15V Variable Metered.....£224.74

Huge selection of Diamond products always available ex-stock.

bhi
Great British designed and built products

DSPKR Price £149.95
New Desk Top "Noise Away" Price £149.95
NES10-2MKII DSP Noise cancelling speaker Price £97.95
NEIM1031MKII Price £136.95
ANEM "Noise Away" MKII Price £122.95
NEDSP1061-KBD Price £97.95
NEDSP1062-KBD Price £102.95
Radio Mate Compact Keypad Price £87.95
CAT-MATE Electronic "Y" splitter for Yaesu FT-817 FT-857 & FT-897 Price £48.95

BRITISH DESIGNED & BRITISH BUILT

Two new Books from Nifty!

Nifty E-Z Guide to D-Star Operation
Using easy to understand explanations and illustrations, this book describes how the D-STAR system operates and provides guidance for setting up transceivers to be able to access D-STAR's many features and modes of operation. **Only £13.00**

Nifty E-Z Guide to PSK-31 Operation.
Using the very popular DigiPan software as a basis, a detailed step-by-step approach is used for configuring your interface hardware, software and computer system for PSK31 operation. Detailed step-by-step instructions and computer screen shots are provided for several Windows operating systems, including Vista. **Only £13.00**

Plus the full range of Nifty Equipment Manuals available from stock.

Equipment Manuals and Quick Reference Cards for Yaesu, Icom, Kenwood, Elecraft & Ten-Tec radios.

Mini VNA PC Controlled Antenna Analyser

ML&S: £259.95

The mRS miniVNA is a compact 100kHz to 180MHz antenna analyser interface that is operated via a PC powered by a single USB connection. You can see at a glance where the antenna is resonant, what the SWR and the return loss is. The best (minimal) SWR frequency is automatically found and displayed. An optional internal RS232 connection is also available.

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

WE WANT YOUR USED EQUIPMENT!

Used equipment sitting at home gathering dust?
MAXIMUM PRICES PAID
For genuine good condition equipment

Call us now and get an instant quote to buy & collect from your home. Or send your list to: sales@MLandS.co.uk

ISOTRON!

The most compact 1kW HF Antenna ever!

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

Unlike other compact designs (that aren't actually that compact) Isotron even offer multi-band versions for 80/40 and 20/15/10m.

- Solve Virtually Any Restricted Space Problem - 40 Metre Isotron only 22 inches x 16 inches x 15 inches!
- Easy, Quick, and Simple Installation
- Tunes & Performs Without Radials or Antenna Tuners
- Handles Up to 1000 Watts PEP
- Durable Construction, Can be Used in Extreme Weather Conditions
- Excellent For Portable Operation - Emergencies, RV's, Field Day, Motels
- Multi-Band Operation on One Feedline with Back-to-Back Mounting & NO Loss of Performance
- Can be mounted in ANY Position Without Loss of Performance
- Maritime Operation - Uncluttered Setup, with Stainless-Steel Fasteners & Not Dependent Upon Grounding for Performance
- SO-239 Connector on All Models

W8USR showing off the Isotron 40-80 Meter Combo Antennas

The full range can be viewed on our web-site and prices start from only £100 through to £200 for the "Combo's".

G3TXQ HEX BEAM 5-BAND DXE-HEXX-5ATP

The G3TXQ 5-band HEXXAGONAL BEAM built by DX Engineering is a directional antenna kit made with fibreglass spreaders and wire elements for the 20, 17, 15, 12 and 10 meter bands. It looks like a very large inverted umbrella frame. Even at 22 feet wide and approximately 5 feet tall, it has a smaller turning radius than a two element 20 meter Yagi, and offers several enhanced operating characteristics.

The DX Engineering HEXX antenna can offer gain and front-to-back performance that exceeds your expectations for a 2 element beam, as its unique shape is much smaller, better balanced and has been reported to receive less noise than typical beams. This lighter, easier to handle antenna can be rotated with a light duty rotator, and it performs well, even when it is not mounted very high above the ground.

DX ENGINEERING

In stock, £599.95
more details see our website.

MyDEL CG SB-2000 USB Radio Interface

A one stop solution to your data and radio control. It employs a CAT/CIV interface as standard and supports CAT with RS232 protocol.

The MyDEL CG SB-2000 Interface connects to your PC via USB and Sound Card and connects to your radio via Custom leads. Once connected and configured you have Computer Control via USB and decoding via your soundcard using HamRadio Deluxe or other packages.

High quality ready-made leads for most rigs available at only £18.95.

Only £99.95

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

Tigertronics SL-USB

IN STOCK!

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.

MyDEL POWER SUPPLIES

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

New Nissei PS-30SW11

Latest high performance switch mode PSU. Die-cast Alloy chassis, full over-voltage protection and short circuit design.

RRP £119.95.
ML&S only £84.95

2 Year Warranty!

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

SPS-8250. £79.95
25A continuous, fully metered power supply, switch mode.

2 Year Warranty!

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

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

2 Year Warranty!

2 Year Warranty!

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

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

2 Year Warranty!

Only £99.95

Only £169.95

Alinco DM-330MW PSU

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

Yaesu FP-1030A Linear PSU

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

MFJ Innovative Ham Radio Accessories at LOW Prices

MFJ-269B MFJ's latest Antenna Analyser with UHF frequency coverage. Based on the successful MFJ-259B it combines all of the features plus more.
£369.96

MFJ-949E 300 Watt Antenna Tuner. £189.95
If you want a good reliable All-in-One ATU this is the one for you. Worldwide reputation for being able to match just about anything.

MFJ-993B . Only £259.95
This very popular Autotuner from MFJ lets you tune any antenna automatically balanced or unbalanced - ultra fast. It's a comprehensive automatic antenna tuning center complete with SWR/Watt-meter, antenna switch for two antennas and 4:1 current balun for balanced lines. What will it tune? Just about anything! End feds, open wire feeders, beams, dipoles, G5RV's you name it.

MFJ-974HB 160 Thru 6 Meters Balanced Line Antenna Tuner. £194.95
The MFJ-974HB is a fully balanced true balanced line antenna tuner. It gives you superb current balance throughout its very wide matching and frequency range.

MFJ-971. Only £119.95
Portable ATU, 1.8-30 MHz 200W cross needle SWR/PWR. An ideal QRP ATU. Easy to use and very compact. QRP Portable ATU

MFJ-834 RF Current Meter 160-10M 3 Amps. **Only £84.95**

MFJ-16010 Mini Random Wire 100W ATU. Just plug your HF transceiver on one end, throw out some wire out of the window and tune. Nice and compact (only 2 x 3 x 2 inches) **Only £69.95**

MFJ-259B/L
Range: 1.8-170MHz. HF frequency coverage. Keeps your antennas in check. Complete pictures of your antenna's performance. You can read antenna SWR and Complex Impedance 1.8 to 170MHz. **£279.95**

Don't forget ML&S stock one of the largest displays of MFJ in the country!

The World's Biggest Selling Virtual Radar System
Now includes built-in Airband & FM!

SBS-1eR Pocket Radar

£479.99

See web site for full specifications

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

EMC

Digital satellite TV immunity

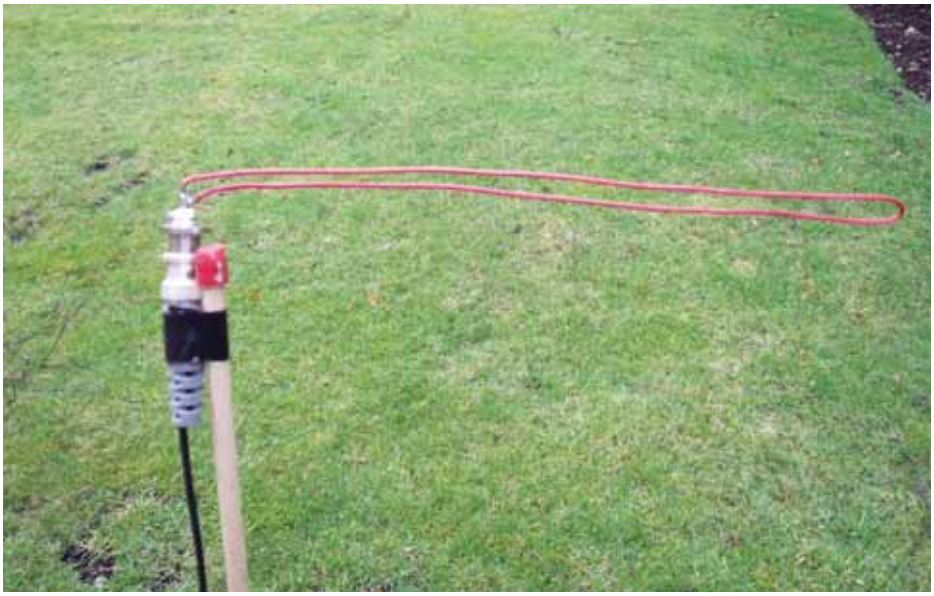


PHOTO 1: The G8MM loop antenna used to trace RF noise on telephone drop-wires.

EMC HELP. John, G8CAU sent an e-mail to pass on his thanks for the services of the RSGB EMC Help Service. John has been back on the air since autumn 2008, after having let his licence lapse in the 1980s. In early October 2009, John's neighbour approached him asking what he was 'messing' with as his neighbour's TV picture was breaking up. John suggested doing some tests but the neighbour was not free for a few days so in the meantime John kept a low profile and sent a request for help to RSGB Tech on Yahoo Groups (see WebSearch). Of the many replies, one was from Ken, G3SDW, one of the Region 11 EMC Advisers – who can also be contacted directly via the RSGB EMC Help web page (see Websearch).

Over the next week or so Ken and John exchanged many e-mails, where John explained what was happening and his dealing with his neighbours. John did various tests but found that when the SCART connection was removed between the set-top box and the TV, there was no picture break-up at all. Then John's neighbour mentioned that the man of the house had not been at all happy with John 'fiddling' with the TV so at that point, John decided to leave well alone and suggested to his neighbour that she should contact Ofcom. She asked John what was the point of that as they knew what the cause was!

John's neighbour took John's advice and contacted Ofcom. An Ofcom field engineer then phoned John to arrange a suitable time and date to visit. Two Ofcom field engineers visited one afternoon and John conducted a lot of tests, transmitting various modes such as CW, SSB, PSK, etc. The Ofcom field engineers proved that the breakthrough on the TV picture was caused by RF pickup in the SCART cable feeding the TV. John had already bought a fully screened SCART cable from Maplin (Stock No. L21AJ) with the intention of lending it to his neighbours. One of the Ofcom field engineers used this to see if the breakthrough could be cured and it was completely successful with no more picture break up. The Ofcom field engineers then came back to John's house and explained what they had done, also explaining to the neighbour what the cause was and how it was cured.

John, G8CAU e-mailed the EMC Committee Chairman John, G8MM to thank the RSGB EMC Committee and in particular Ken, G3SDW and also Tony, GI1GME whom Ken got involved. It was Ken who suggested a fully screened SCART cable in the first place. John tried to get the original poorly screened SCART cable so that it could be tested by the EMC Committee but without success. John reports that his neighbours still cannot understand why their installation can be any problem.

We think we know the problem. Satellite and cable TV companies often supply a cheap type of SCART cable with a flat ribbon cable. These are available for as little as 25p each from trade sources. Although the cables in the flat ribbon are individually screened, it is a 'lapped' screen like audio cables, not a woven braid screen like RF coaxial cable. They also have no overall screen, unlike SCART leads with round cables, which generally have an overall screen in the cable, usually foil. So if you have any breakthrough problems into TV equipment, particularly on HF amateur bands such as 3.5MHz or 7MHz, look out for any SCART cables with a flat ribbon cable. Replacing these with a round cable type should improve RF immunity to breakthrough into audio or video signals via the SCART cable. An expensive SCART cable shouldn't be necessary as long as it has a round cable with an overall screen inside.

USB HARD DISCS. EMC Committee Chairman John, G8MM has provided a report with photos about of an EMC case in Watford. The radio amateur concerned suffered high levels of interference in amateur bands that appeared to be coming from a neighbour's house. The source was not particularly near and the interference was being radiated from the telephone drop wire over a distance of several hundred metres. The source could have been in a number of houses and the problem was to identify which one.

The interference was very evident on 3.5MHz and the member was able to walk around the district with a portable receiver. He quickly found that the cables running up the telephone poles were carrying large amounts of noise. One particular telephone pole was very noisy. He spoke with all neighbours connected to the drop-wires on this pole, but that drew a blank.

Then John, G8MM became involved and he came up with an idea for identifying which overhead telephone wire was carrying the most interference, as this would probably lead to the house that contained the source of the noise. John made a narrow search loop out of a stout piece of enamelled copper wire. The wire was about 1mm diameter although any wire could be used provided it is thick enough to be self-supporting. It was about 24cm long and 1cm wide, as shown in **Photo 1**. One end of the 'loop' was soldered to the centre pin of a BNC socket and the other end was soldered to the ground side of the BNC socket. The connection from the loop to a portable receiver was made with about 8m of miniature 50Ω coaxial cable such as RG174. The reason for using miniature coaxial cable was to minimise weight as the standard RG58 type of cable was found to be too heavy when held aloft on a long thin pole.

Then John and the radio amateur attached

PHOTO 2: The G8MM loop mounted on a partially extended 10m fishing pole to get close to the telephone drop-wires. WARNING - Members should exercise caution when near to any overhead wires, first checking that they are insulated telephone drop wires and not overhead electric power wires.

the 'loop' to a long fibreglass fishing pole (see **Photo 2**), connected the cable to a portable HF receiver and went 'fishing' for QRM. By holding the narrow loop up close and parallel to each overhead phone wire in turn, they were able to trace the noise to one particular drop wire at the top of the pole. This in turn led to an intermediate telephone pole, before going to a house.

Fortunately when tracked down, the neighbour was co-operative albeit a little apprehensive when first approached. It was found that he had many external USB hard disc drives for backing up data from his several networked computers. Each USB hard disc drive had its own plug-in 'power block' type of switch-mode power supply and two of these were identified as being particularly noisy.

The member had prepared a detailed report of his findings, which helped Ofcom considerably when they became involved and they found noisy switch-mode power supplies. Ofcom advised the neighbour to switch off the USB external hard disc drives except when acutually using them for data backup.

The neighbour had been complaining that the ADSL line speed on his broadband Internet connection was poor and he discovered that when he switched off the two particular switch-mode power supplies for the USB external hard discs, his ADSL line speed increased greatly so he was very pleased. Now he only switches them on when he does a backup and this is normally late at night when it does not bother the nearby radio amateur. He is also saving a significant amount of energy by switching off at least 50W of continuous load.

As is often the case in situations like this, the EMC Committee has been unable to get full details of the products involved or to obtain samples for testing so we cannot refer the matter to Trading Standards if any of the power-supplies fail to comply with the EN55022 standard. They were of USA origin, and were CE marked.

This case illustrates the problem of locating a source of interference in the lower HF bands, where signals can travel along overhead phone lines or mains wiring for hundreds of metres. If a house contains a source of interference such as a switch-mode power supply without RF interference filtering, then this is likely to get out and radiate from any overhead telephone wiring. The actual source of interference may be something that is not directly connected to the telephone line but interference can be coupled from mains wiring to phone wiring via stray capacitance in any mains-powered telephone equipment such as a cordless phone or an ADSL router.

Clearly this type of search loop on a pole should only be used for tracing sources of radio interference on insulated telephone wires and NEVER for overhead power cables of any type. Any searching for interference being conducted on any type of overhead power lines should only be done from ground level.

PLAs IN US. Whit from Alaska, USA reports that he has been following the Power Line Ethernet Adaptor (PLA) controversy in the UK for some time now. Whit is an amateur radio astronomer who operates a radio observatory in Anchorage, Alaska. He considers that having a noise-free environment is important above (just about) all else.

Whit used the US equivalent PLAs in his local computer network. He found that the PLAs transmitted 'polling' pulses every five seconds or so. The pulses were quite evident over a wide frequency range in the HF band and the noise levels produced by the PLAs were quite different between sending data and not. Whit notes that the RSGB tests reported in this EMC Column were with no live data being sent but his PLAs were the quietest when there was no live data (except for the 'polling' pulses). When live data was being sent the noise levels increased considerably in certain HF bands.

The reason for this is that there are two fundamentally different types of PLA. Some types such as the Comtrend models that have been tested in this column transmit continuously regardless of whether or not they have any data to send. With this type, the difference in interference levels between sending data or not is relatively small. The other type is the 'Homeplug' type that only transmits when it has some data to send, apart from regular short 'polling' pulses when idle. The 'Homeplug' type has a substantial difference in interference emissions between the idle state and transmitting data at maximum rate.

ELECTRICITY METERS. John, G3ZSE wonders whether there are any known instances of amateur radio transmissions causing problems with electronic electricity meters. John runs 100W into a doublet on HF, mainly 3.5MHz. He wonders what might happen if he has an electronic meter installed in the future as he doesn't want the meter to notch up another kilowatt-hour on every speech peak!

The EMC Committee is not aware of any immunity problems with electronic electricity (or gas) meters in practice. This is classed as 'legal metrology' equipment and is has to be immune to RF field strengths of at least 10 volts per metre. This is substantially higher than the 3V/m generic EMC immunity standard and this requirement has been in force since before the days of the EMC Directive.

Nevertheless, one EMC effect of replacing a conventional electromechanical electricity meter with a new electronic type is that the electromechanical meter has a series inductor to sense the current and this also provides a certain amount of RF interference filtering against mains-borne interference from sources outside the house. The new electronic type typically has a very low series resistor to sense the current and this does not provide any RF interference filtering.

WEBSEARCH

RSGB Tech Technical Help (general):
www.rsgb.org/rsgbtech/about.php and
http://groups.yahoo.com/group/rsgbtech/

RSGB EMC Help:
www.rsgb.org/emc/emchelp.php

Homebrew

RF attenuators.

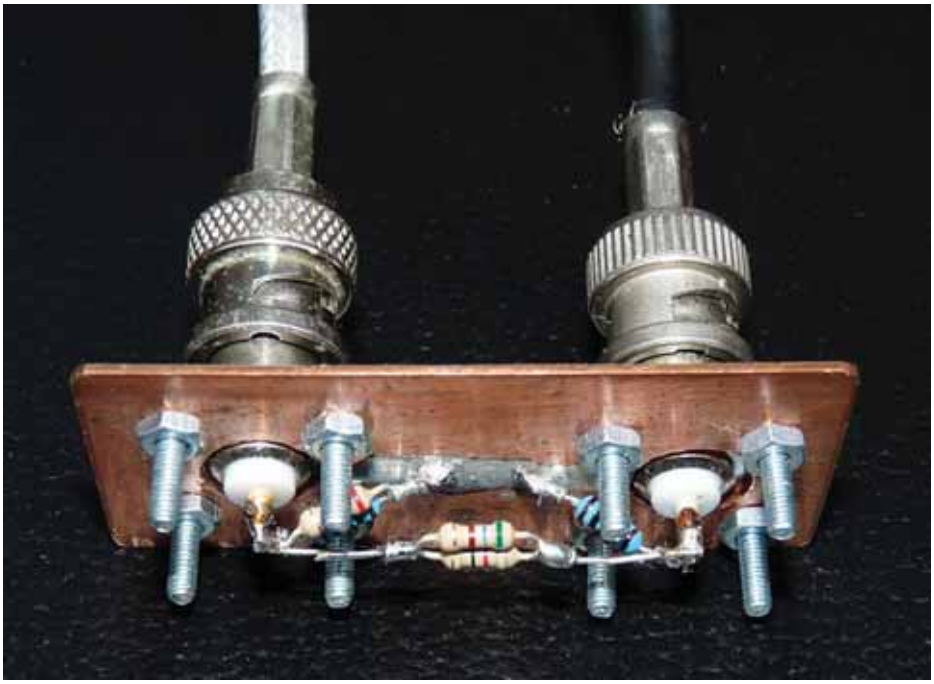


PHOTO 1: A home made 10dB attenuator.

LOOSE ENDS. I have put the source code and some additional circuit details for the Pinguino based DDS on the web at http://tinyurl.com/3v4gul. Several versions are available including the local oscillator for the LF/MF receiver and a version for a 33MHz signal generator. I have also built a VHF PLL/DDS synthesiser running at 133.xxxMHz (144 - 10.7). This will be featured as our annual spring VHF/UHF project in the near future.

RF ATTENUATORS. Before we get on to the subject of attenuators, I feel the need to bring up a particular bugbear of mine: The generic name for these very useful devices is 'ATTENUATOR' and not antenuator or any other corruption of the name.

The name perfectly describes the function of the device, which is to attenuate signals by a specific amount. The ideal attenuator will attenuate signals without introducing any distortion so that the output signal is a reduced but otherwise perfect replica of the input signal. Attenuators built from passive resistors usually come very close to achieving this ideal, but some types of attenuator containing active electronics or non-linear components like diodes can produce unwanted distortion of the output signal.

Figure 1a is a voltage divider that consists of just two resistors, **b** is a PI attenuator, **c** is a T-attenuator (also known as Tee-attenuator). The PI and T types are shown in both unbalanced and balanced forms.

The simple voltage divider (also known as a potential divider) is very widely used in high impedance audio circuits. The input/output voltage ratio is R2/(R1+R2) although this is only true if the output load impedance is very high compared to R2. One problem with this circuit is that the input impedance is not the same as the output impedance. This lack of symmetry makes it unsuitable for use as a general purpose RF attenuator. Adding a third resistor to make a PI or T attenuator makes the circuit symmetrical so that it can be designed to have equal input and output impedances. Most commercially made attenuators are designed for an I/O impedance of 50 or 75Ω. The home constructor can design and build attenuators with any desired value of I/O impedance.

The PI attenuator (B) is probably the best choice for use in home made 50Ω attenuators because it usually requires reasonable values of resistor for R1/R2 for all values of attenuation ranging from a few dB up to high values of 30dB or more. The T-attenuator (C) is also a popular choice, but it does call for quite low values of resistor at high and low extremes of attenuation. For medium values of attenuation, both types of attenuator are equally suitable. The choice of configuration is often determined by the availability of suitable resistors. For example, for a 10dB attenuator, you might design a PI and a T type, and then choose the design that requires resistor values that fall closest to standard E24 values. For a multi-section attenuator, you can use a combination of the two types.

At frequencies below the low VHF range, the attenuator resistors can be regarded as lumped components that have perfect characteristics and are infinitely small in terms of wavelength. This is not necessarily the case at UHF and above. The most common types of resistor are made by cutting spiral grooves in a carbon or metal film that is deposited on a ceramic insulator. This subject was discussed at length in Homebrew for September 2008 and several times by Ian White in the In Practice column, most recently in August 2009. Because of the small size of modern low power resistors, the inductance of this spiral structure is quite small, usually only a few nH. This inductance combined with the resistor lead inductance and other stray reactances can have a significant effect on the performance of the resistor at very high frequencies. When frequencies are increased into the high UHF and microwave region, the physical size of the resistors may be a significant fraction of a wavelength. If you consider the typical case of a resistor mounted on a ground-plane PCB, the resistor will behave as one conductor of a transmission line and the PCB ground will act as the other

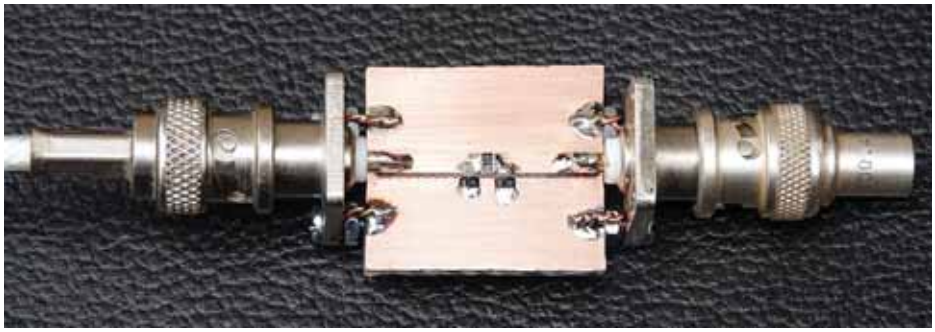


PHOTO 2: A home made 20dB 50Ω attenuator.

Something new is coming.

Something exciting.

Something that will change HF radio forever.

The EXCALIBUR™

Get a better picture:

www.winradio.co.uk/excalibur

Live demo at Kemton Park show on Sunday 18th April.

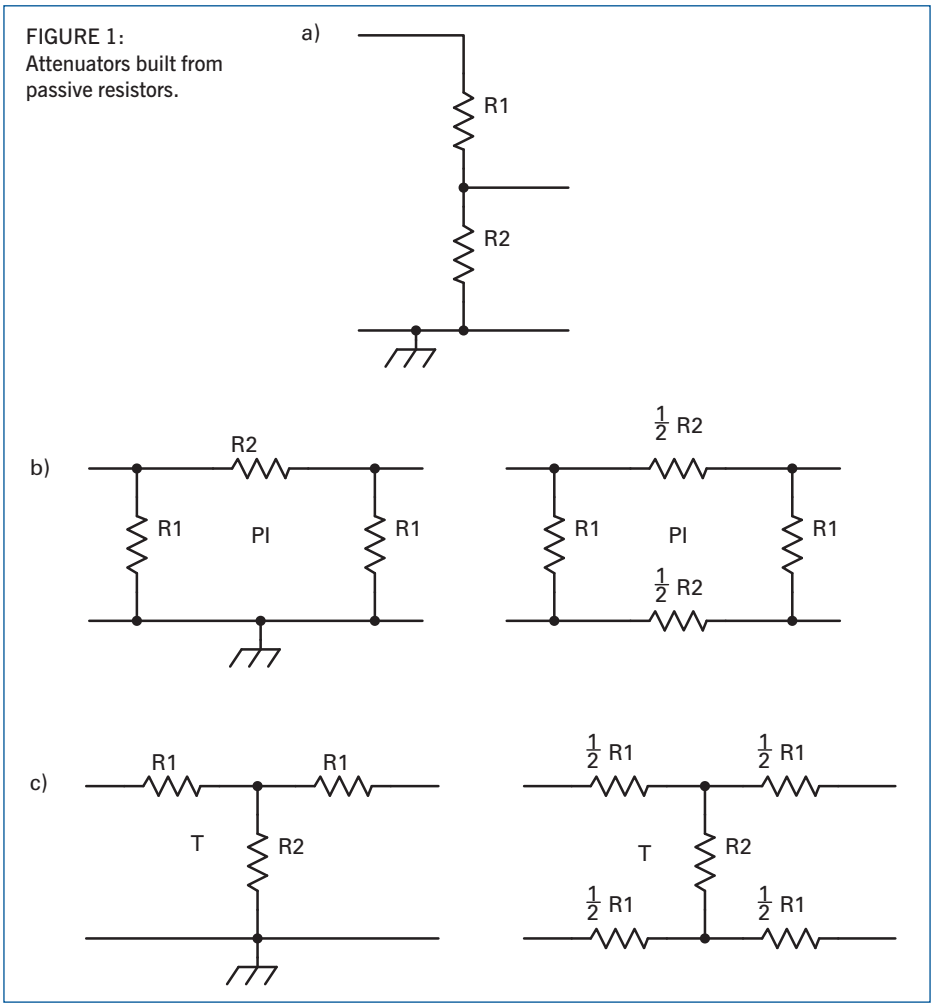


FIGURE 1: Attenuators built from passive resistors.

PHOTO 3: A home made 40dB high power attenuator.

conductor. The resistor insulation and the PCB material will act as the transmission line dielectric. The electrical length of this line will depend on the physical size of the components involved and any stray reactances in the circuit. To minimise these effects, attenuator components should be no bigger than the size required to handle the maximum power dissipation in the circuit. Stray reactances should be kept to a minimum by keeping component leads as short as possible and choosing your component layout carefully. Leadless chip resistors surface mounted on a PCB will provide good performance up to UHF and beyond. More about this later...

Figure 2 shows the formula for calculating the component values for a PI attenuator, **Figure 3** shows a similar formula for designing T-attenuators. For a 50Ω, 20dB PI attenuator, Z=50, dB=20.

50*(10^(20/20)+1)/(10^(20/20)−1) gives us a value of 61.111Ω for R1.

(50/2)*(10^(20/10)-1)/10^(20/20) = 247.5Ω for R2.

Always unsure of the accuracy of my calculations, I checked these values against published tables **[1]** and found that the values are correct. I have written a simple C program to generate the PI attenuator tables in **Figure 4**. The tables show a few useful values for multiples of 5dB and 3dB.

There is no universal standard or convention for the numbering of the resistors in attenuators. Some references use R1, R2, R3 from left to right in the schematic, others use R1, R2 for the input and output resistors and R3 for the centre resistor. As all of our attenuators will be symmetrical, the input resistor will always be the same as the output resistor, so I will use the simplest option of just having two values: R1 and R2. R1 is always the input resistor. If you prefer to consider the output resistor as R3, then R3 = R1.

247.5 and 61.111Ω are not close to any of the standard E12 or E24 series of resistor values **[2]**. If we are only to use three resistors, the best we can do is to use the nearest E24 values of 240Ω for R1 and 56Ω for R2. This will lead to some error in the actual attenuation value and input/output SWR. Simulating the above attenuator on QUCS shows attenuation of 20.4dB and return loss of just over 28dB (SWR=1.07:1). If this level of error is acceptable for your application, then no further improvements are required. Many of our previous projects are full of such compromises. For example: in the recent receiver project, I wanted to put a 50Ω 3dB or 6dB attenuator between the post mixer amplifier and the IF filter transformer but I actually used 4dB instead so that I could use resistors from the readily available E12 series (22 and 220Ω). E12 series resistors are widely available and cost almost nothing, even for high quality 1% tolerance units. The values are 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82 and their decimal multiples ie 150,1500,15000...

Some E24 values are harder to find. A variant of Murphy's Law dictates that you will be able to find any value from the E24 series except for the value that you happen to need at the time. I have several thousand resistors in stock at the moment, but I haven't seen a 240Ω resistor for years. A commercial manufacturer might decide to order components from the E48 or E96 series so that more suitable values would be available. The availability of 249 and 62Ω resistors would improve the accuracy of our 20dB attenuator to 19.94dB and SWR to less than 1.02:1. Unfortunately, this option is rarely available to the home constructor, we usually have to make do with components that are readily available at low cost.

The other way of achieving the required values is to use combinations of series or parallel resistors. Series combinations seem to offer the simplest solution because it is easy to achieve the required value and the calculations are very simple. 247 is easily made from 220+27. However, I try to avoid using series connected resistors in RF attenuators because this approach leads to greater values of unwanted series inductance. Parallel connected resistors should be considered as the lesser of two evils because the inductance is reduced to less than the inductance value of any individual resistor in the paralleled group. Using paralleled pairs of E12 or E24 resistors will usually get you close enough to the required valued value, even for calibrated attenuators for use in test equipment.

The resistance of parallel resistors is the product of the values divided by the sum of the values. In this case: (R1*R2)/(R1+R2). Using this approach for our 20dB attenuator allows us to make a 249.58Ω resistor from

RSGB shop

Haynes Owners' Workshop Manual for Supermarine Spitfire

By Alfred Price & Paul Blackah

The iconic Supermarine Spitfire is the high point of many air shows and this famous aircraft now receives the Haynes Owners Workshop Manual treatment. This fascinating book provides a unique perspective on what it takes to own, restore and operate a Spitfire. A highly detailed and attractively designed hardback book is based around the restoration of the Spitfire Mk XVI at RAF Coningsby. Providing an insight into owning, restoring, servicing and flying Britain's legendary WWII fighter – recommended reading.

Size 270x210mm, 160 pages, ISBN 9781-8442-5462-0
Non Members' Price £19.99 **RSGB Members' Price £16.99**

Haynes Owners' Workshop Manual for Messerschmitt Bf109

By Paul Blackah & Malcolm Lowe

Messerschmitt Bf109 gets the same Haynes treatment as the iconic Supermarine Spitfire. This single-seat fighter was the main combat adversary of the RAF's Hurricanes and Spitfires in the Battle of Britain. This book covers Bf109 history, restoration to flight, the views of owners, pilots and engineers, and more. Illustrated with a mix of colour and archive photographs, the Bf109 Manual also includes illustrations from Luftwaffe official wartime servicing manuals, and coverage of restoration projects in the UK and overseas.

Size 270 x 210mm, 160 pages, ISBN 9781-8442-5642-6
Non Members' Price £17.99 **RSGB Members' Price £15.29**

Bouncing-Bomb Man

20% off RRP

The Science of Sir Barnes Wallis

By Iain Murray

Barnes Wallis is best known as the 'boffin' behind the famous bouncing bomb used by 617 Squadron to breach the Ruhr dams in 1943, but his work covers a far wider canvas. Lavishly illustrated this great hardback book makes extensive use of line artwork and photographs to demonstrate the concepts involved. For those seeking an authoritative work or those simply wanting a good read *Bouncing-Bomb Man* is ideal reading.

Size 270x210mm, 288 pages, ISBN 978-1-84425-588-7
Non Members' Price £25.00 **RSGB Members' Price £19.99**

Schneider Trophy to Spitfire

20% off RRP

By John Shelton

R J Mitchell is best known as the designer of the legendary Supermarine Spitfire fighter. *Schneider Trophy to Spitfire* is a comprehensive account of the design career of this great aircraft designer. Produced in hardback *Schneider Trophy to Spitfire* is heavily illustrated with line drawings of the aircraft and contemporary pictures, and provides a great insight into the man and career of R J Mitchell.

Size 270 x 210mm, 256 pages, ISBN 978-1-84425-530-6
Non Members' Price £25.00 **RSGB Members' Price £19.99**

What Really Sank the Titanic?

By Jennifer Hooper McCarty and Tim Foecke

We are now all aware of the infamous night when the "unsinkable" RMS Titanic, with over 2,200 passengers onboard, plunged to a watery grave. But what really caused the Titanic to sink? Was it simply an unlucky accident with an iceberg in the North Atlantic or was it more? Grippingly written, *What Really Sank the Titanic* is illustrated with fascinating period photographs and modern scientific evidence. This book is not to be missed.

25% off RRP

Size 231x157mm, 256 pages, ISBN 9780-8065-2896-0
Non Members Price £10.99 **RSGB Members' Price £8.24**

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

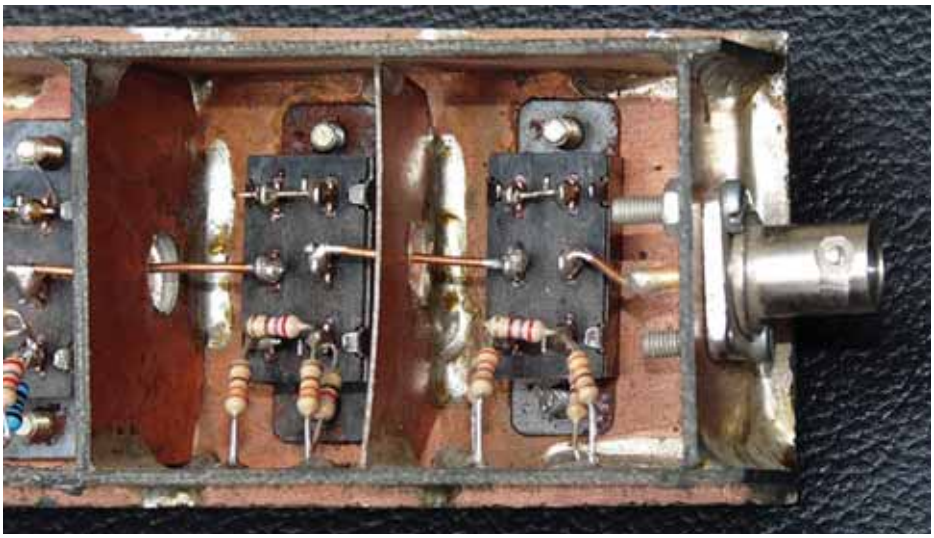


PHOTO 4: A rather tatty attenuator made from PCB laminate.

PI Attenuator Z = 50.0		
5dB	R1, R3 = 178.49Ω	R2 = 30.40Ω
10dB	R1, R3 = 96.25Ω	R2 = 71.15Ω
15dB	R1, R3 = 71.63Ω	R2 = 136.14Ω
20dB	R1, R3 = 61.11Ω	R2 = 247.50Ω
25dB	R1, R3 = 55.96Ω	R2 = 443.16Ω
30dB	R1, R3 = 53.27Ω	R2 = 789.78Ω
35dB	R1, R3 = 51.81Ω	R2 = 1405.41Ω
40dB	R1, R3 = 51.01Ω	R2 = 2499.75Ω
PI Attenuator Z = 50.0		
3dB	R1, R3 = 292.40Ω	R2 = 17.61Ω
6dB	R1, R3 = 150.48Ω	R2 = 37.35Ω
9dB	R1, R3 = 104.99Ω	R2 = 61.59Ω
12dB	R1, R3 = 83.54Ω	R2 = 93.25Ω
15dB	R1, R3 = 71.63Ω	R2 = 136.14Ω
18dB	R1, R3 = 64.40Ω	R2 = 195.43Ω
21dB	R1, R3 = 59.78Ω	R2 = 278.28Ω
24dB	R1, R3 = 56.73Ω	R2 = 394.65Ω

FIGURE 4: A table of PI attenuator resistor values.

$$R1 = Z \times \left(\frac{10^{\left(\frac{dB}{20}\right)} + 1}{10^{\left(\frac{dB}{20}\right)} - 1} \right)$$

$$R2 = \frac{Z}{2} \times \left(\frac{10^{\left(\frac{dB}{10}\right)} - 1}{10^{\left(\frac{dB}{20}\right)}} \right)$$

FIGURE 2: The formula for calculating the component values for a PI attenuator.

$$R1 = Z \times \left(\frac{10^{\left(\frac{dB}{20}\right)} - 1}{10^{\left(\frac{dB}{20}\right)} + 1} \right)$$

$$R2 = (2 \times Z) \times \left(\frac{10^{\left(\frac{dB}{20}\right)}}{10^{\left(\frac{dB}{10}\right)} - 1} \right)$$

FIGURE 3: The formula for calculating the component values for a T attenuator.

270Ω in parallel with 3300Ω (270×3300)/(270+3300)=249.58. This is within 1% of the required value of 247.5. The 61.11Ω ohm is made from 68Ω paralleled with 560Ω giving an actual value of 60.64Ω. This is also within 1% of the required value. This results in an attenuation of 20.1dB and return loss of 52dB (SWR less than 1.01:1). This is good enough for all but the most critical applications.

Where greater accuracy is required, the home constructor has options that are not generally available to the commercial manufacturer. If you have time to spare and a very accurate digital multimeter, you can hand pick resistors that are at the correct end of the tolerance range so that they are closer to the required value. This works well with 5% tolerance metal-film types because they tend to have excellent stability over time and temperature range. In other words, if you find one that is exactly the right value, it will probably stay at that value for a long time provided that it is not overheated by exceeding the maximum power dissipation limits.

Photo 1 shows a home made 10dB attenuator built on a strip of 1mm copper sheet. Input/output connections are via 50Ω BNC connectors that are bolted directly to the copper. Three pairs of paralleled resistors are used. The required values are 96.25Ω for R1 (R3) and 71.15Ω for R2. I used 100 in parallel with 2700Ω and 82 in parallel with 560Ω giving actual values of: 96.43 and 71.53. Attenuation is 10.015dB and SWR is far below 0.01:1. The resistors are a mixture of 1% and 5% metal film types. Measurements with a spectrum analyser/tracking generator and a return-loss bridge confirm that the attenuation accuracy is at least as good as the analyser's built-in switchable 10dB input attenuators and some high quality commercial attenuators. Input SWR is better than 1.05:1 up to 40MHz, 1.1:1 to 180MHz rising to 1.2:1 at 400MHz. Performance could probably be improved further by placing the BNC sockets closer together so that the lead lengths of R2 can be reduced.

UHF AND MICROWAVE ATTENUATORS.

Surface mount chip resistors are ideal for use in RF attenuators at UHF and above. Special low inductance types are available for use at microwave frequencies. Due to their very small size, even standard SMT resistors can perform well at such high frequencies. For best results, the resistors should be mounted on a double-sided ground plane PCB. Copper tracks to and from the I/O ports of the attenuator should be designed to have a characteristic impedance that is equal to the I/O impedance of the attenuator. This is not difficult to do in practice. An even easier approach is to use a strip of copper clad laminate as a continuous ground plane and narrow strips of single-sided PCB as transmission lines for the I/O connections. The correct width for a 50Ω line made from standard 1.6mm fibreglass board is 2.77mm.

Photo 2 shows a home made 20dB 50Ω attenuator made from 805 type SMT resistors and 50Ω line that is fixed to a ground plane using Super Glue.

The ~2.8mm line (You can get closer if you have a micrometer and a lot of patience) is broken in the centre by cutting a small notch in the centre using a hacksaw blade. This notch is bridged by R2 of the attenuator. R1 (R3) are both soldered directly between the ends of R2 and ground. This attenuator shows a flat -20dB from DC to more than 550MHz (limited by my spectrum analyser, not the attenuator). SWR is better than 1.1:1 across the entire range. R1 (R3) is a parallel pair of 68 + 680, R2 is 330 + 1000. Input/output connections are a pair of chassis mounting BNC sockets that are connected directly to the 50Ω lines and to the ground plane using the shortest possible connections. A pair of PCB edge mounting SMA connectors would give even better UHF performance.

POWER.

The safest way of ensuring that the resistors are run well within their maximum power rating is to use identical resistor types for all three resistors (or resistor pairs). Provided that the input power is less than the maximum dissipation value for any single resistor, you can be sure that all resistors are operating within safe limits for all values of attenuation. This approach is viable for low power attenuators like the example previously. For high power attenuators with large values of attenuation, this approach would be very wasteful. If we consider the case of a 20dB, 100W 50Ω PI attenuator, the input voltage is 70.71V (RMS). This voltage is directly across R1 so that the dissipation in R1 is:

V^2 / R
$= 70.71^2/61.1111$
$= 81.818W$

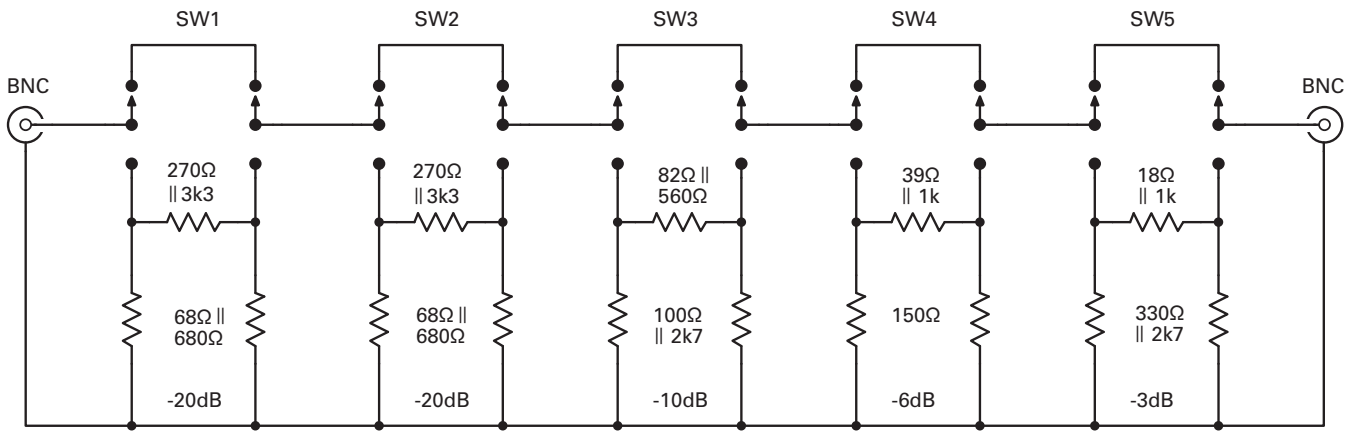


FIGURE 5: A schematic of the step attenuator. || = parallel connected resistors

The output resistor has the same value of resistance but the voltage across it is much less – in this case: $10^{(-20\div20)} = 0.1$ times the input voltage so that the dissipation in the output resistor is only 0.818W. Clearly we will need to use a resistor with a maximum dissipation of 82W or more for the input resistor, but a 1W resistor will suffice for the output resistor. The dissipation in R2 is $(V^{in}\text{-}V^{out})^2/R = 63.6396^2/247.5 = 16.3636$W. Adding all three dissipation figures gives a total dissipation of 81.818 + 16.3636 + 0.818 = 99W. The remaining 1W is dissipated in the 50Ω load connected to the attenuator output port.

Photo 3 shows a home made 40dB high power attenuator. R1 is a 250W 50Ω resistor. This dissipates most of the power delivered to the input. The input voltage is $V = \sqrt{(P*R)} = 111.803$V RMS for P=250W. This allows us to calculate R1 dissipation as almost exactly 250W. Increasing R1 to the theoretically correct value of 51.01Ω gives a more exact value of 245.05W. Dissipation in the output resistor is just 25mW, which means that R2 must be able to dissipate just under 5W safely.

Because this type of attenuator is often used to protect the input of expensive test equipment, we must ensure that R2 can safely survive more than 111V across it without any risk of breakdown. Because of this danger, I will break my rule about using series connected resistors in attenuators. As the value of R2 is 2500Ω, any series inductance of the resistors will have a very small reactance compared to the high resistance of R2. For power levels up to 100W, a pair of 2W carbon film resistors will be adequate for the job. Suggested values are 1k in series with 1k5. For use at higher power levels you will need to use a longer string of resistors or a combination of series and parallel connected resistors. Don't use high wattage axial resistors unless you are sure that they are low inductance types. Wire-wound resistors are obviously not suitable for this application. The prototype shows a remarkably flat -40dB from DC to 550MHz. Input return loss is very high indicating a SWR of better than 1.1:1 across the entire range. This is not surprising as the resistor is rated for use up to 2GHz.

PHOTO 5: The finished project.

A SWITCHABLE STEP ATTENUATOR.

This month's project is a step attenuator. The number of stages and attenuation value for each stage is left up to the individual constructor. I used five PI stages with attenuation values of 20, 20, 10, 6 and 3dB giving a total attenuation of 59dB. It would be quite easy to add more stages, but don't get too carried away. Avoid using very high values of attenuation for any single stage because stray capacitance between the switch contacts will tend to partially bypass the attenuator pad at UHF and above. I have found that cheap and simple DPDT slider type switches work very well at VHF and even into the low UHF region provided that you are careful with your physical layout. It is a good idea to use inter-stage screening between stages, especially for adjacent pads with attenuation of 20dB or more. **Photo 4** shows a rather tatty attenuator made from PCB laminate with screening plates between each stage.

I used a mix of 1% 0.6W and hand selected 5% 0.25W metal film resistors. The 20dB pad values are 68 + 680 and 270 + 3k3. The 10dB pad is 100 + 2k7 and 82 + 560. The 6dB pad is 150 (no parallel value required) and 39 + 1k. The 3dB pad is 330 + 2k7 and 18 + 1k. **Photo 5** shows the finished project. Input/output connectors are 50Ω BNC (Maplin HH18U or similar). The enclosure is a Maplin Box AB7 (LF08J).

TESTING. The step attenuator is very well behaved from DC up to the mid VHF region around 200MHz. Behaviour at UHF is less predictable, especially when all of the pad switches are set to 0dB (straight through). In this condition, the attenuator looks like a short length of transmission line with a characteristic impedance of much more than 50Ω. Because of the short line length, this is of no consequence at lower frequencies but it does have a significant impact on the behaviour at UHF. Switching in the 20dB pad nearest to the input socket improves the behaviour radically. With all five pads in circuit, the attenuator is well behaved even at UHF. Power handling is at least 250mW regardless of attenuation level and it should be able to handle brief surges of up to 1W for a few seconds without damage.

I had intended to include a section on electronically controlled attenuators, but due to the lack of suitable PIN diodes, I have abandoned this effort for now. I did build a test circuit using 1N4007 rectifier diodes in place of the PIN devices. This was successful to some degree, but I found that the diodes acted more like rectifiers than resistors at lower frequencies and more like capacitors at VHF and above. Perhaps I will re-visit this subject when suitable components are available.

Next month: Microphones.

REFERENCES

[1] *Radio Communication Handbook*, 10th edition. Table 5.13.
[2] http://en.wikipedia.org/wiki/Preferred_number.

MOONRAKER

CALL MAIL ORDER 01908 281705

sales@moonrakerukltd.com

ALINCO

Hand-helds

Alinco DJ-G7 Triband 2/70/23cm ~~£359.00~~ ..... **Special Offer £295.00**

Alinco DJ-V5 Dual band 2/70cm **£199.00**

Alinco DJ-596 Dual band 2/70cm **£189.00**

Alinco DJ-C7 Dual band 2/70cm **£149.00**

Alinco DJ-175E Single band 2m **£149.00**

Alinco DJ-V17E Single band 2m **£149.00**

Alinco DJ-195E Single band 2m ~~£139.00~~ ..... **Special Offer £99.95**

Mobiles

Alinco DR-635E Dual band 2/70cm with wideband RX 50 Watts **£299.00**

Alinco DR-135E Single band 2m with optional RX 118-173.995MHz 50 Watts **£199.00**

Base/Portable

Alinco DX-70TH 100W 1.8-50MHz All modes ~~£599.00~~ ..... **Special Offer £549.00**

NEW Alinco DX-SR8
All mode 100W HF Transceiver with QRP **£499.95**

KENWOOD

Hand-helds

Kenwood TH-F7E Dual band 2/70cm RX 0.1-1300MHz **£229.95**

Kenwood TH-K2ET Single band 2m with 16 button keypad **£165.95**

Kenwood TH-K2E Single band 2m **£159.95**

Kenwood TH-K4E Single band 70cm **£159.95**

Mobiles

Kenwood TM-D710E Dual band 2/70cm with APRS RX 118-524MHz & 800-1300MHz, 50 Watts **£429.95**

Kenwood TM-V71E Dual band 2/70cm with EchoLink RX 118-524MHz & 800-1300MHz, 50 Watts **£289.95**

Kenwood TM-271E Single band 2m, 60 Watts **£165.95**

Base

Kenwood TS-2000X All mode transceiver HF/50/144/430/1200MHz 100 Watts All mode transceiver **£1,749.95**

Kenwood TS-2000E All mode transceiver HF/50/144/430MHz 100 Watts All mode transceiver **£1,489.95**

Kenwood TS-480HX HF/6m 200 Watts Transceiver **£849.95**

Kenwood TS-480SAT HF/6m 100 Watts Transceiver **£749.95**

ICOM

Hand-helds

ICOM IC-E92D Dual band 2/70cm RX 0.495-999.9MHz with built in DSTAR **£369.95**

ICOM IC-E90 Tri band 6/2/70cm RX 0.495-999.9MHz **£234.95**

ICOM IC-V82 Single band 2m digital with 7 Watts output **£172.95**

ICOM IC-U82 Single band 70cm digital with 5 Watts output. **£172.95**

ICOM IC-T3H Single band 2m, 5.5 Watts output **£144.95**

Mobiles

ICOM IC-7000 All mode HF/VHF/UHF 1.8-50MHz, 100 Watts output **£939.95**

ICOM 706MKIIGDSP HF/VHF/UHF 1.8-70cm, 100 Watts output **£739.95**

ICOM ID-1 Single band 23cm 1240-1300MHz digital and analogue DSTAR transceiver **£689.95**

ICOM IC-E2820 + UT123 Dual band 2/70cm with DSTAR fitted, 50 Watts output **£539.95**

ICOM IC-E2820 Dual band 2/70cm DSTAR compatable, 50 Watts output **£384.95**

ICOM IC-2725E Dual band 2/70cm with detachable head, 50 Watts output **£319.95**

ICOM IC-E208 Dual band 2/70cm RX 118-173, 230-549, 810-999MHz 55 Watts output **£254.95**

ICOM IC-2200H Single band 2m digital compatable, 65 Watts output **£199.95**

Base

"NEW" ICOM IC-9100 HF/VHF/UHF/23cm All mode 100 Watts ..... **£TBA**

ICOM IC-7800 HF/6m All mode 200 Watts Icom flagship radio **£7,999.95**

ICOM IC-7700 HF/6m 200 Watts with auto ATU transceiver **£5,499.95**

ICOM IC-7600 HF/6m 100 Watts successor to the IC-756 ..... **£3,379.95**

ICOM IC-7400 HF/6/2m 100 Watts with auto ATU transceiver **£1,339.95**

ICOM IC-7200 HF/VHF 1.8-50MHz RX 0.030-60MHz, 100 Watts output (40w AM) **£759.95**

ICOM IC-718 HF 1.8-30MHz RX 300kHz - 29.999MHz, 100 Watt output (40w AM) **£449.95**

YAESU

Hand-helds

Yaesu VX-8E Tri band 50/144/430MHz Bluetooth ready, 5 Watts output **£329.95**

Yaesu VX-7R Tri band 50/144/430MHz RX 0.5- 900MHz, 5 Watts outut **£259.95**

Yaesu VX-6E Dual band 2/70cm RX 1.8-222/420-998MHz, 5 Watts output **£199.95**

Yaesu FT-60E Dual band 2/70cm RX 108-520/700-999.99MHz, 5 Watts output **£142.95**

Yaesu VX-3E Dual band 2/70cm RX 0.5-999MHz, 3 Watts output **£139.95**

Yaesu VX-170E Single band 2m, 16 digit keypad, 5 Watts output **£95.95**

Mobiles

Yaesu FT-857D All mode HF/VHF/UHF 1.8-430MHz, 100 Watts output **£549.95**

Yaesu FT-8900R Quad band 10/6/2/70cm 28-430MHz, 50 Watts output **£334.95**

Yaesu FT-8800E Dual band 2/70cm RX 10-999MHz, 50 Watts output **£289.95**

Yaesu FTM-10E Dual band 2/70cm, 50 Watts output **£269.95**

Yaesu FT-7800E Dual band 2/70cm RX 108-520/700-999MHz, 50 Watts output ~~£199.95~~. **Special Offer £189.95**

Yaesu FT-2800M Single band 2m, 65 Watts output **£124.95**

Yaesu FT-1802E Single band 2m, 50 Watts output **£119.95**

Portable

Yaesu FT-897D HF/VHF/UHF Base/Portable transceiver 1.8-430MHz 100 Watts HF+6, 50 Watts 2M, 20 Watts 70cm **£659.95**

Yaesu FT-817ND HF/VHF/UHF Backpack Transceiver RX 100kHz – 56MHz 76-154MHz 420-470MHz 5 Watts .. **£439.95**

Base

Yaesu FT-2000D HF/6m All mode 200 Watts transceiver RX: 30kHz – 60MHz **£2,649.95**

Yaesu FT-2000 HF/6m All mode 100 Watts transceiver RX: 30kHz – 60MHz **£2,079.95**

Yaesu FT-950 HF/6m 100 watt transceiver with DSP & ATU RX 30kHz – 56MHz **£1,099.95**

Yaesu FT-450AT Compact transceiver with IF DSP and built in ATU, HF+6m 1.8-54MHz, 100 Watts output **£679.95**

Yaesu FT-450 Compact transceiver with IF DSP, HF+6m 1.8-54MHz, 100 Watts output **£589.95**

eton

Eton Globe Traveller G3 AM/FM/Shortwave Digital Radio with SSB, RDS and Synchronous detector RX:150-30000kHz 118-137 MHz **£99.95**

Satellit 750 AM/FM-Stereo/SW/Aircraft band Radio with SSB RX: 100-30000kHz 88-108MHz 118-137MHz **£299.00**

AirNav Systems

The Most Trusted Name In Flight Tracking

"New" AirNav RadarBox 3D

£479.95 + £7.99 P&P

● Watch all the action from home ● Real-Time radar Mode-S and ADS-B decoder ● Zoom worldwide to runway level ● Network your station with others ● Self powered from your computer or laptop USB port ● Centre map on your home – Direct reception

This new 3D version of the ever popular AirNav Radar Box adds Google Earth as a map overlay. In addition, the new 3D picture library displays the selected aircraft, enables you to zoom down and see the airport runway, or zoom out and see the aircraft fly over towns, sea and mountains. Never before has such detail and excitement been available.

AirNav RadarBox-Pro. £389.95 The original box with everything you need including RadarBox, antenna and easy to install software.

"NEW" AirNav RadarBox 3D Upgrade.£89.95 Upgrade your existing RadarBox 2009 to 3D version with this plug and play software.

Radar Box Accessories Available: Base Antennas, Amplifiers & Cable leads

SPECIAL DEAL
Free Radar Rama Antenna when purchasing either Radarbox worth £49.95

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

MOONRAKER Opening times: 9-5.30pm Mon-Fri

CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR

www.moonraker.eu

★ Postage is a maximum of £7.99 on all orders ★
(UK mainland only)

Manufacturers of radio communication antennas and associated products

HUSTLER HF Verticals

Brilliant ground mounted antennas that work!

4-BTV	4 Bands 40-10m, Power 1000 Watts, Length 6.5m	£179.95
5-BTV	5 Bands 80-10m, Power 1000 Watts. Length 7.6m	£219.95
6-BTV	6 Bands 80-10m, Power 1000 Watts, Length 7.3m	£249.95

MOONRAKER VHF/UHF Mobiles

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

DIAMOND ANTENNA Yagi Antennas

Diamond performance from the superb Diamond factory

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

MOONRAKER Mono Band Collinear Verticals

Totally encapsulated GRP fibreglass antennas which require no tuning!

BM33	70cm 2 X 5/8, Gain 7.0dBd, Length 100cm, N-Type	£44.95
BM45	70cm 3 X 5/8, Gain 8.5dBd, Length 155cm, N-Type	£54.95
BM55	70cm 4 X 5/8, Gain 10dBd, Length 250cm, N-Type	£74.95
BM60	2m 5/8, Gain 5.5dBd, Length 155cm, N-Type	£54.95
BM65	2m 2 X 5/8, Gain 8.0dBd, Length 250cm, N-Type	£79.95
BM75	2m 3 X 5/8, Gain 9.0dBd, Length 430cm, N-Type	£99.95
BM140	4m 1/2, Gain 2.75dBd, Length 230cm, N-Type	£69.95
BM260	6m 1/2, Gain 2.75dBd, Length 285cm, N-Type	£89.95

MOONRAKER HF Mobiles

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

AMPRO-10	28MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-12	24MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-15	21MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-17	18MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-20	14MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-30	10MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-40	7.0MHz, Length 220cm, 38th fitting (slimline design)	£17.95
AMPRO-80	3.5MHz, Length 220cm, 38th fitting (slimline design)	£19.95
AMPRO-160	28MHz, Length 220cm, 38th fitting (heavy duty design)	£49.95
ATOM-20S	14MHz, Length 130cm, PL259 fitting (compact design)	£24.95
ATOM-40S	7.0MHz, Length 165cm, PL259 fitting (compact design)	£26.95
ATOM-80S	14MHz, Length 165cm, PL259 fitting (compact design)	£29.95

TA Tarheel Motorised Mobile

The best USA motorised antennas available here from Moonraker the European distributor – All models in stock now!

Little Tarheel II 3.5-54MHz 200W max length 48" **£349.95**

MOONRAKER GP2500

All Band HF Vertical

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

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

All at an amazing

£199.95!

MOONRAKER Dual and Triband Collinear Verticals

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

SQBM105P	2/70cm, Gain 2/4.5dBd, RX 25-2000MHz, Length 70cm, SO239 (Radial Free)	£39.95
SQBM105N	2/70cm, Gain 2/4.5dBd, RX 25-2000MHz, Length 70cm, N-type (Radial Free)	£44.95
SQBM110P	2/70cm, Gain 3/6dBd, RX 25-2000MHz, Length 100cm, SO239 (Radial Free)	£54.95
SQBM110N	2/70cm, Gain 3/6dBd, RX 25-2000MHz, Length 100cm, N-Type (Radial Free)	£59.95
SQBM200P	2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, SO239	£54.95
SQBM200N	2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, N-Type	£59.95
SQBM500P	2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, SO239	£64.95
SQBM500N	2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, N-Type	£69.95
SQBM800N	2/70cm, Gain 8.5/12.5dBd, RX 25-2000MHz, Length 520cm, N-Type	£129.95
SQBM1000P	6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, SO239	£79.95
SQBM1000N	6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, N-Type	£84.95
SQBM223N	2/70/23cm, Gain 4.5/7.5/12.5dBd, RX 25-2000MHz, Length 155cm, N-Type	£69.95

MOONRAKER Multiband Mobile

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

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

MOONRAKER Yagi Antennas

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

YG27-4	Dual band 2/70 4 Element (Boom 42") (Gain 6.0dBd)	£49.95
YG4-2C	2 metre 4 Element (Boom 48") (Gain 7dBd)	£29.95
YG5-2	2 metre 5 Element (Boom 63") (Gain 10dBd)	£49.95
YG8-2	2 metre 8 Element (Boom 125") (Gain 12dBd)	£69.95
YG11-2	2 metre 11 Element (Boom 185") (Gain 13dBd)	£99.95
YG3-4	4 metre 3 Element (Boom 45") (Gain 8dBd)	£59.95
YG5-4	4 metre 5 Element (Boom 104") (Gain 10dBd)	£69.95
YG3-6	6 metre 3 Element (Boom 72") (Gain 7.5dBd)	£64.95
YG5-6	6 metre 5 Element (Boom 142") (Gain 9.5dBd)	£84.95
YG13-70	70 cm 13 Element (Boom 76") (Gain 12.5dBd)	£49.95

MOONRAKER ZL Special Yagi Antennas

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

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

MOONRAKER HB9CV

Brilliant 2 element beams ... ideal for portable use

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

MOONRAKER Halo Loops

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

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

MOONRAKER G5RV Wire Antennas

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

G5RV-HSS	Standard Half Size Enamelled Version, 51ft Long, 10-40 Metres	£19.95
G5RV-FSS	Standard Full Size Enamelled Version, 102ft Long, 10-80 Metres	£24.95
G5RV-DSS	Standard Double Size Enamelled Version, 204ft Long, 10-160 Metres	£49.95
G5RV-HSH	Half Size Hard Drawn Version, pre-stretched, 51ft Long, 10-40 Metres	£24.95
G5RV-FSH	Full Size Hard Drawn Version, pre-stretched, 102ft Long, 10-80 Metres	£29.95
G5RV-HSF	Half Size Original High Quality Flexweave Version, 51ft Long, 10-40 Metres	£29.95
G5RV-FSF	Full Size Original High Quality Flexweave Version, 102ft Long, 10-80 Metres	£34.95
G5RV-HSP	Half Size Original PVC Coated Flexweave Version, 51ft Long, 10-40 Metres	£34.95
G5RV-FSP	Full Size Original PVC Coated Flexweave Version, 102ft Long, 10-80 Metres	£39.95
G5RV-HSX	Half Size Deluxe Version with 450 Ohm ladder, 51ft Long, 10-40 Metres	£44.95
G5RV-FSX	Full Size Deluxe Version with 450 Ohm ladder, 102ft Long, 10-80 Metres	£49.95

Accessories

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

MOONRAKER Trapped Wire Dipole Antennas

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

MDT-6 FREQ:40 & 160m LENGTH: 28m POWER: 1000 Watts **£79.95**

MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts **£69.95**

MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts **£79.95**

MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts **£129.95**

MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts **£69.95**

MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts **£119.95**

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

Moonraker @ M5 Communications
Moto Services Area, Junction 30 M5 South, Exeter, EX2 7HF.
Tel: 01392 427269

NEW Moonraker Satellite shop now open in the West Country



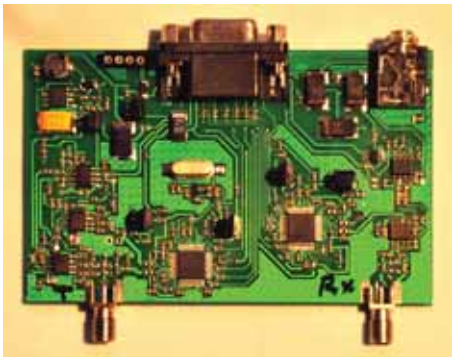


If we advertise it – we stock it!

Come and see us at our next rally 7th March Cambridge & District Radio Rally www.cdarc.co.uk

Antennas

More on the Vector Impedance Analyser



The DG8SAQ VNWA board.

THE AIM 4170. As many of you are aware the subject of antenna parameter measurements and test equipment is my main interest and this is reflected in the subjects discussed in Antennas. One of the most useful items of test kit that I have had is the AIM 4170, which has been used for the analysis of antennas and baluns in Antennas columns since late 2008. It is very intuitive to use with only occasional recourse to the instruction book being necessary.

It measures the impedance at the RF connector and normally presents these measurements in terms Z_{mag}/Theta (θ). It can simultaneously display SWR as shown in **Figure 1**. The more familiar R ±j and reflection coefficient are displayed on the right hand side. This instrument is called vector impedance analyser or in some cases a vector network analyser (VNA).

These instruments have been around for some time now (the first I heard of them was in G3VA's Technical Topics in September 2004). The construction and use of N2PK VNA was described by G(M)3SEK **[1]** and is a home brew project. The lack of availability of some of the required components outside the USA meant that only a small group of dedicated constructors originally built them.

Additionally there is the miniVNA from Mini Radio Solutions. This instrument is based on a design by IW3HEV, details of which can be found at **[2]**.

THE DG8SAQ VNA. More recently I was loaned a similar instrument designed by DG8SAQ by Graham Rumsey, M0GCR, who asked if I would like to experiment with this item and perhaps describe it in the Antennas column. The DG8SAQ instrument is rather a different instrument from the AIM 4170. It appears more technical and has a frequency range of 1kHz to 1.3GHz. In common with the N2PK VNA it uses two RF connectors instead of the one as used on the AIM 4170.

While I had no difficulty setting up and calibrating this unit, the terminology in the help file was, to me, unfamiliar. Which RF connector should be used was unclear; and just what did S11, S12, S21 and S22, shown in **Figure 2**, mean?

VNA TERMINOLOGY. To answer this question we have to look at some basic terminology. The measurement of incident, reflected, and transmitted waves on a transmission lines is a subject which you are probably already familiar. It is the measurement of these parameters that allow us to measure SWR, see **[3]**.

An analogy using optical wavelengths is given in Agilent AN 1287-1 application note **[4]**. When a light beam (incident waves) meets a clear lens, some of the light is reflected (reflected waves) from the lens surface, but most of it continues through the lens (transmitted waves) as shown in **Figure 3a**. This analogy applies to RF fed into a transmission line, some of which is reflected back down the transmission line toward the source due to impedance mismatch. Most of this RF is successfully transmitted to the terminating device, usually the antenna.

Network analyser terminology generally compares measurements of the incident waves with reflected waves. With the amplitude and phase information in these waves, it is possible to quantify the reflection and transmission characteristics of a transmission line or electronic device, normally referred to as the device under test (DUT). The reflection and transmission characteristics can be expressed as vector (magnitude and phase) or scalar (magnitude only) quantities. For example, impedance is a vector reflection measurement while return loss is a scalar measurement of reflection (**Figure 3b**).

Ratioed measurements allow us to make reflection and transmission measurements that are independent of both absolute power and variations in source power versus frequency. Ratioed reflection is often shown as reflected over incident and ratioed transmission as transmitted over incident, relating to the measurement channels in the instrument.

The transmission coefficient is defined as the transmitted voltage divided by the incident voltage (**Figure 3c**). If the absolute value of the transmitted voltage is less than the absolute value of the incident voltage, the DUT is said to have attenuation or insertion loss. This would apply if the DUT was a long length of transmission line. If the absolute value of the transmitted voltage is greater than the absolute value of the incident voltage, a DUT is said to have gain. This would apply if the DUT was an amplifier.

S-PARAMETERS. In answer to the question posed earlier, S11, S12, S21 and S22 are known as S- (for 'scattering') parameters. S-parameters are widely used for UHF and microwaves because they can be applied to a device embedded in a circuit or a test fixture. The advantage of using S-parameters is that the DUT can be as simple or as complicated as you like – it is treated as a 'black box' with input and output connections or 'ports'. A two-port device can be resistor network (attenuator), amplifier or a length of transmission line, which has both an input at Port 1 and an output at Port 2 (sharing a common ground) as shown in **Figure 4**.

With the input port is labelled '1' and its

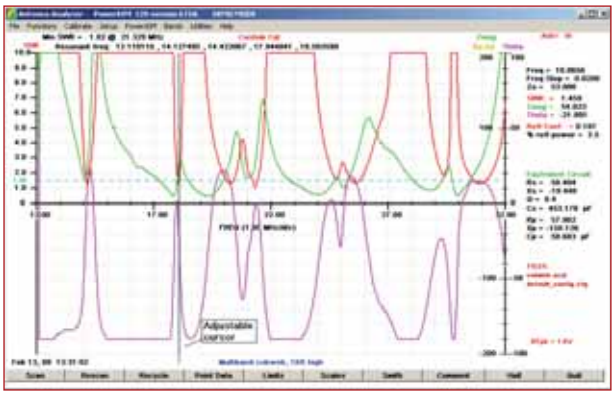


FIGURE 1: AIM 4170 analysis of a multiband cobweb antenna built by M0UOO.

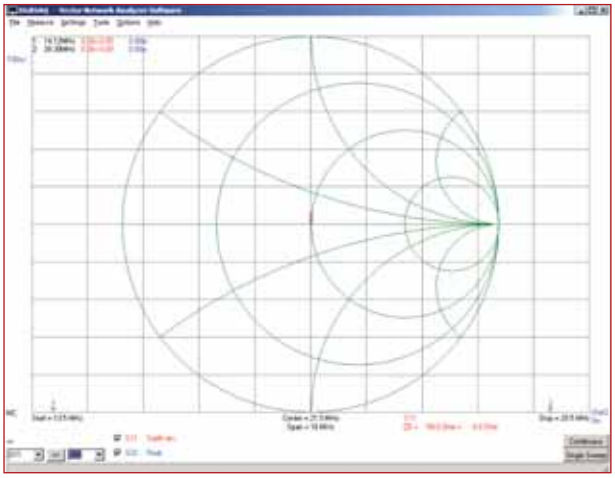


FIGURE 2: The DG8SAQ VNA main page. Most of the displays in the instruction manual show the Cartesian scale and SWR and superimposed.

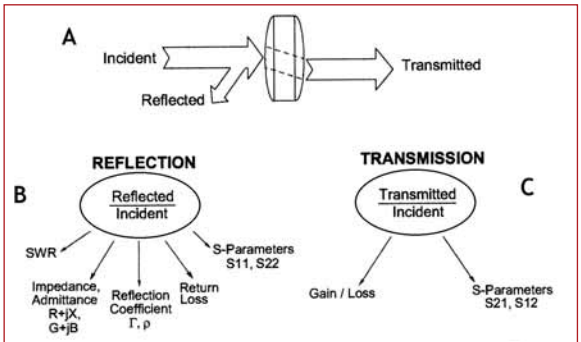


FIGURE 3: (a) Optical analogy of incident, reflected and transmitted waves. (b) Characteristics of reflected waves. (c) Characteristics of transmitted waves.

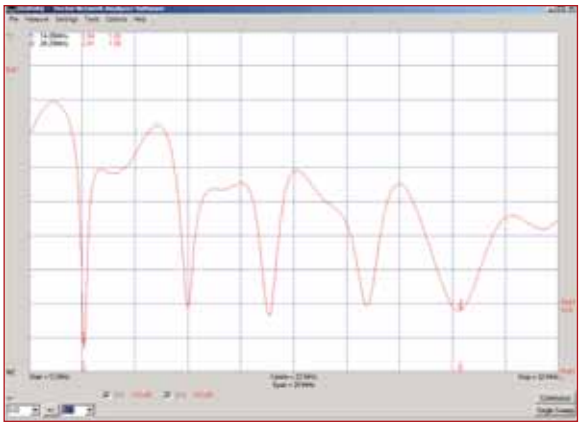


FIGURE 6: SWR plot of a HF multiband dipole.

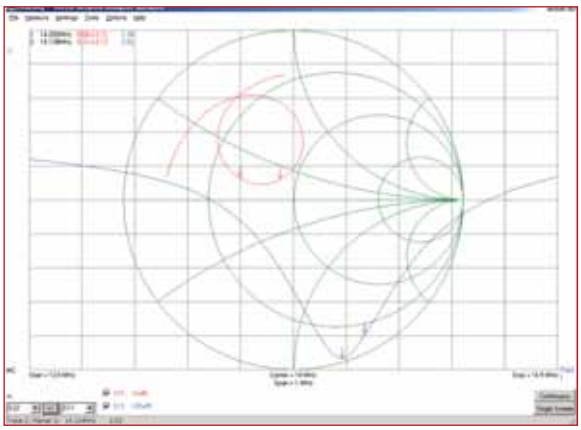


FIGURE 7: The Impedance characteristics (Smith chart) display superimposed on a SWR characteristics display of the 14MHz section of the multiband dipole.

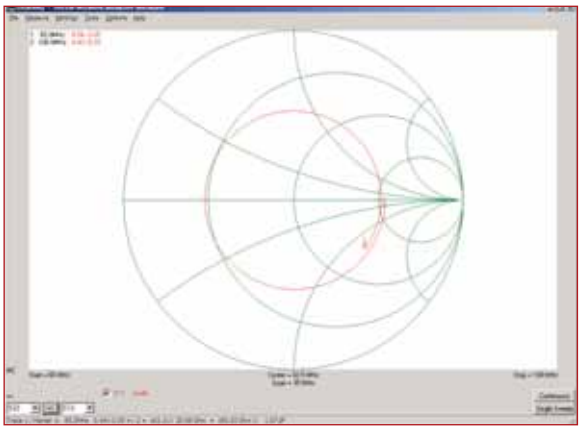


FIGURE 8: The results of a test obtained by measuring a 200Ω resistor over a two-metre length of 50Ω cable.

FIGURE 4: Circuit for analysis represented as a two port 'black box' with the incident, reflected and transmitted parameters.

$$\begin{pmatrix} b_1 \\ b_2 \end{pmatrix} = \begin{pmatrix} S_{11} & S_{12} \\ S_{21} & S_{22} \end{pmatrix} \times \begin{pmatrix} a_1 \\ a_2 \end{pmatrix}$$

FIGURE 5: Matrix algebraic representation of 2-port S-Parameters.

output port '2', as shown in Figure 4, the gain of this device is found by dividing the output voltage from port 2, by the signal applied in to port 1, The corresponding S-parameter is S21. Since two distinct subscripts are involved, this is pronounced 'S sub two, one' and not 'S sub twenty-one'.

If the impedance of any port of our DUT is imperfectly matched to the previously specified system characteristic impedance, reflections will result when a signal is applied to that port. The amplitudes of these reflections, which can be determined independently with a directional coupler, defines the remaining two S-parameters, S11 (for the voltage reflected out of port 1, divided by that applied to port 1), and S22 (similarly defined for port 2).

A simple impedance meter is said to be a 'one-port device'; it only has one pair of terminals (one of which is ground) called Port 1. S11 is simply the reflection coefficient or return loss looking into Port 1. In other words, S11 is 'the signal coming out of Port 1, relative to the signal going into Port 1'.

S-Parameter scattering actually refers to scattering matrices, a tool of matrix algebra from which S-parameters were derived, see **Figure 5**. You don't really have to utilise scattering matrices, or even understand matrix algebra at all, to apply S-parameters successfully. Once you know how to use S-parameters, devices can be chained together and the effects calculated of their interacting port impedances. There are many modelling programs that allow this to be done.

This brief and simplistic description of S-parameters has been included to illustrate the range and versatility of the VNA. For most of our antenna measurements there are simpler ways of using such a device as I will now describe.

REFLECTION MEASUREMENTS.

Most of the measurements we perform on antenna systems and components are Reflection measurements. An example of such measurement, or should I say a series of measurements to plot an antenna characteristic, were done using the AIM-4170, see Figure 1. Provision is made to calibrate any length of feeder so that the AIM-4170 measures the impedance at the point where it is connected to the antenna. This instrument is a one-port device as described above.

The DG8SAQ instrument uses two RF connectors instead of the one as used on the AIM 4170. The connector on the right, see **Photo 1**, is the transmitter and the one on the left the receiver. If I wanted to plot the characteristics of a filter then I would connect the input of the filter to the transmitter and the output to the receiver. The instrument can then compare the incident wave and the transmit wave as described above.

If we are only interested in reflected parameters then the DUT is connected to the transmitter connector and the instrument the compares incident waves with reflected waves. I used the DG8SAQ to measure the SWR characteristics of a multiband dipole as shown in **Figure 6**. The DG8SAQ does not appear to allocate scales to the graphs but instead allows one to analyse the curves with the use of markers controlled by the computer mouse.

The characteristics of the 14MHz section of the same multiband dipole shown in are shown in **Figure 7**. In this case the SWR plot is shown on the Cartesian scale and the impedance signature is shown on the superimposed Smith Chart.

The DG8SAQ VNA Smith chart plot shown in **Figure 8** is the result of a frequency sweep test (65 to 100MHz) of a 200Ω resistor at the end of a two metre length of 50Ω coax cable. The near circular plot around the prime centre of the chart is a good indication of the accuracy of the instrument, a method proposed by W N Carron **[5]**.

The tendency of the plot to spiral towards the centre as the frequency is increased is caused by coax cable loss not by any inaccuracy of the instrument. Impedance at any point on the graph can be read out by moving a cursor to the appropriate point and reading the measured impedance in the top left-hand corner.

REFERENCES

[1] In Practice, *RadCom* October 2004
[2] www.miniradiosolutions.com/
[3] In Practice, *RadCom* January 2010
[4] Enter Agilent AN 1287-1 into Google
[5] The Hybrid Junction Admittance Bridge', W N Carron, *Antenna Compendium Vol 3* ARRL 1992.

Radioworld Ltd

34-42 Brook Lane, Great Wyrley, Walsall, WS6 6BQ
Tel:01922 414796 Fax: 01922 417829 skype:radioworld_uk

KENWOOD

"NEW" TM-D710E
Dual-Band Mobile
VHF/UHF - £439.90

TS-480SAT - HF&6m 100W... £748.00.
TS-480HX - HF & 6m 200W.. £848.00.
TS-2000 - HF/6/2/70cms..... £1448.00.
TS-2000X-HF/6/2/70/23cm... £1633.00.
TM-V7E - 2m/70cm's..... £367.95.
TH-F7E - 2mtrs/70cm's..... £229.00.
TM-271E-2m/FM Mobile TX/RX £169.55.
TM-V71E - VHF/UHF Trx ..... £289.00.

ICOM
2 YEAR WARRANTY

ICOM IC-E92
Built-in
DSTAR
£366.80

IC-7600 HF 6m transceiver....**CALL**.
IC-7700 HF & 6m Base £5499.00
IC-7800-2 HF/50MHz 200W.....£7795.00.
IC-7400 - HF 6m/2m 100W.....£1361.00.
IC-7000 - HF/6m/2m/70cm's.....£939.00.
IC-718 - HF 100W.....£444.00.
IC-910H - 2M 100W/70cm 75W £1265.00.
IC-E91 - Top Flight Handheld....£254.00.
IC-706M2G - All-Mode TX/RX ....£695.00.
IC-E90 - 2m/6m/70cm Handheld £235.00.
IC-E2820 Dualband VHF/UHF £393.00.
IC-RX7 wideband receiver ...£213.00.
IC-R6 wideband receiver ..... £239.95.

YAESU
Choice of the World's top DX'ers

VX-8 triband handheld... £335.00.
FT-950 HF Transceiver..... £1095.00.
FTM-10E - VHF/UHF tx/rx ... £265.00.
FT-897D - HF/6m/2m/70cm.. £649.00.
FT-817ND - 1.8-430MHz 5W. £439.00.
FT-857D - HF/6m/2m/70cms £554.00.
FT-7800E mobile ..... £209.00.
FT-8800E - 2m/70cm mobile. £286.00.
FT-8900 - 10m/6m/2m/70cm. £329.00.
FT-1802E - 2m 50W mobile.. £124.95.
FT-2800M - 2m 65W mobile.. £127.50.
VX-7R - 6m/2m/70cm handy. £256.00.
VX-6E - 2m/70cm handheld.. £199.00.
VX-3E - 2m/70cm handheld.. £135.00.
FT-60E - 2m/70cm FM 5W .. £135.00.
FT-450 - HF/6m transceiver. £549.00.
FT-450AT transceiver..... £639.00.
VR-500 scanner .....£198.00.

YAESU FT-2000 - £PHONE
FT-2000D 200W - £PHONE

MFJ

MFJ-989D 1500W Auto ATU..£389.95.
MFJ-986C 3Kw HF.....£349.95.
MFJ-991B Auto Intellituner....£209.95.
MFJ-976 1500w ATU .....£469.95.
MFJ-969 300w Rollercoaster £209.95.
MFJ-962D 1.5Kw Inductor.....£289.95.
MFJ-949E 300w W/D-Load....£179.95.
MFJ-948 300w HF.....£162.95.
MFJ-945E Mobile .....£128.95.
MFJ-941E 300w .....£139.95.
MFJ-934 ATU+AG .....£298.95.
MFJ-921 2m ATU.....£96.95.
MFJ-924 70cms .....£96.95.
MFJ-914 Extender .....£89.95.
MFJ-901B 200w Versa tuner..£109.95.

Analysers

MFJ-249B 1.8-170 Dig.....£264.95.
MFJ-259B 1.8-170 .....£279.95.
MFJ-269 HF/VHF/UHF .....£349.95.
MFJ-201 grid dip meter.....£156.95.
MFJ-269PRO 1.8-170&430-520 £399.95.

Dummy Loads

MFJ-250 1kw Oil filled .....£77.95.
MFJ-250X 1KW without oil .....£55.95.
MFJ-260C 300w PL259 .....£44.95.
MFJ-260CN 300w N-Type .....£53.95.
MFJ-264 1.5kw PL259 .....£76.95.
MFJ-264N 1.5kw N-Type .....£85.95.
MFJ-267 Load/VSWR .....£159.95.

RigExpert

RigExpert Standard.....£182.00
RigExpert Plus £279.95
AA-200 Antenna Analyzer.....£464.00
AA-500 Antenna Analyzer £574.00

New lower prices on..

HEIL SOUND

PR-781-PTT deluxe base mic...£136.95.
Pro-Set-Plus Headset .....£189.95.
Pro-Set-Plus-IC Headset .....£199.95.
Pro-Set-HC-4/5 Headset .....£115.49.
Pro-Set-HC-IC Headset .....£132.95.
Goldline GM-4 Stick mic .....£119.95.
Goldline GM-5 Stick mic .....£119.95.
HM-4 Handy mic w/HC-4 insert £79.95.
HM-5 Handy mic w/HC-5 insert £79.95.
HM-IC Handy mic + Icom insert £79.95.
HM-10-4 Hand mic + HC-4 .....£79.95.
HM-10-5 Hand mic + HC-5 .....£79.95.

Tigertronics

SL-USB-13PDI 13pin DIN for Icom..£94.95
SL-USB-13PDK 13pin Kenwood....£94.95
SL-USB-4R 4pin round mic cable..£89.95
SL-USB-5PD 5 pin round mic cable £89.95
SL-USB-6PMD 6pin miniDIN(Yaesu)£94.95
SL-USB-8PD 8pin mini DIN.....£89.95

COMET

Comet H422 - High power 1Kw, 4 Band Rotary V Dipole. Frequencies : 7,14,21,28 Mhz
£269.95

CHA250B broadband vertical, covers 80-6m, no gaps £299.95.

Comet V-250 3.5-54MHz Max 200w. Ideal for limited space £299.95.

GP-6 High Gain Dualband CoLinear 2/70cm Max 200w £99.95

GP-15 Tri-Band 2/6/70 Fibreglass Antenna. Max 150w £99.95

WATSON

POWER-MITE NF Watson 22A, £69.95

W-25AM 25A Supply.....£89.95.
W-10AM 10A Supply .....£59.95.
W-5A 5A Supply .....£29.95.
W-3A 3A Supply .....£24.95.
W-10SM 10A Supply .....£61.95.

WATSON

W-30 2/70 Base .....£49.95.
W-50 2/70 Base .....£54.95.
W-300 2/70 Base .....£74.95.
W-2000 6/2/70 Base .....£89.95.

Butternut

BENCHER, INC.

Butternut HF-2V 40/80m .....£289.95.
Butternut HF-6V 80-10m .....£389.95.
Butternut HF-9V 80-6m .....£449.95.
Butternut HF-5B 20-10m .....£449.95.
STR-II radial kit .....£156.49.
A-17-12 17&12 ad for HF6V .....£71.99.
A-6 6m ad for HF6V-X .....£24.95.
TBR-160S 160m HF2/6/9V .....£169.99.

HUSTLER

Hustler 5-BTV .....£219.95.
Hustler 4-BTV .....£179.95.
Hustler 6-BTV .....£259.95.
Hustler RM-10 10m resonator ....£22.49.

PALSTAR

AT-1KP Digital Display .....£419.95.
AT-1500DT 1500w ATU .....£449.00.
AT-2K 2000W ATU .....£499.95.
AT4K 2500 Watt ATU ..... £809.95.
AT5K 3500 Watt ATU ..... £1079.95.

Miracle Antenna

Miracle Whip .....£112.49.
Miracle Ducker IL .....£112.49.
Miracle Ducker PL .....£112.49.
Miracle Whip TL .....£132.79.

AUTO TUNERS

AT-1000 Pro

1KW Auto ATU - 1.8-54MHz - 1-8 secs Tune - Approx SWR Rating of 10:1
£495.95

Z-100 Plus

125w Auto ATU - 1.8-54MHz - 0.1 - 6 secs
£137.93

DM-7800

Dual meter system made exclusively for the IC-7800. This will give you a true analogue meter
£132.95

Z-817 ATU

ATU specific for FT-817 Uses CAT / ACC port Powered by batteries 0.1 - 20w - 1.8 - 54MHz
£117.50

LDG IT-100

Icom ATU 125w Auto ATU - 1.8-54MHz 0.1-6 seconds Tune
£148.16

LDG baluns

1:1 or 4:1 Balun - Covers 1.8 - 30Mhz Power rating 200w
£32.95

LDG ELECTRONICS

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

LDG ELECTRONICS

TONNA

Tonna 20505 6m 5el	£109.95
Tonna 20809 2m 9el	£74.95
Tonna 20811 2m 11el	£105.95
Tonna 20817 2m 17el	£135.95
Tonna 20909 70cm 9el	£69.95
Tonna 20919 70cm 19el	£89.95
Tonna 20921 70cm 21el	£109.95
Tonna 20635 23cm 35el	£89.95
Tonna 20655 23cm 55el	£109.05
Tonna 20745 13cm 25el	£94.95

West Mountain Radio

RIGblaster Pro	£295.49
RIGblaster Plus USB	£159.49
Nomic 8P	£69.99
Nomic RJ	£69.99
M4-CBL RG45/4Pin lead	£18.99
RIGRunner 10way 12v distribution board	£149.95

DIAMOND ANTENNA

HF10FX 10m Mobile	£49.95
HF15FX 15m Mobile	£49.95
HF20FX 20m Mobile	£49.95
HF40FX 40m Mobile	£49.95
HF80FX 80m Mobile	£52.95
CR8900 10/6/2/70	£97.95
CP6 Base 6m-80m	£339.95
X50 Base 2/70	£72.99
X200N Base 2/70	£114.95
X300 Base 2/70	£139.95
X7000 Base 2/70/23	£225.95

AMERITRON

AL-811XCE 10-160m 600w	£899.95
AL-811HXCE 10-160m 800w	£999.95
ALS600X Solid State 10-160m 600w	£1549.95
AL-1500XCE 10-160m 1.5KW	£3499.95
AL-1200XCE 10-160m 1.5KW	£3449.95
AL-82XCE 10-160m 1.5KW	£2699.95

RADIO WORLD

CW-160 160-10m (252ft)	£159.95
CWS-160 160-10m (133ft)	£149.95
CW-80 80-10m (133ft)	£129.95
CWS-80 80-10m (66ft)	£149.95
CW-40 40-10m (66ft)	£116.95
CW-40+ 40-10m (66ft)	£139.95
CW-20 20-10m (34ft)	£99.95
G5RV+ 80-10m	£79.95
G5RV-XF Fullsize	£69.95
G5RV-XH Halfsize	£54.95

SGC

SGC-230 200Watts

£490.00

SGC-230 HF	£479.95
SGC-500 HF	£1499.95
SGC-235 HF-500w	£1249.95
SGC-237 HF+6m	£319.95
SGC-237 Porta	£399.95
SGC-237 PCB	£289.95
SGC-239 HF	£209.95
MAC-200	£289.95

Rotators

YAESU

G-2800SDX Rotator	£1021.95
G-450C Rotator	£305.49
G-550C Rotator	£268.95
G-650C Rotator	£346.49
G-1000DXC Rotator	£408.00
G-5500C Rotator	£481.95
AR-35X Hy-Gain rotator	£99.95
G-250 - Rotator	£111.29

Feeders & Wire

RG-213 Military Spec High grade 50 Ohm coaxial Cable

£91.95 per 100m Drum

RG58U	£0.61 per Metre
RG8 Super	£0.71 per Metre
RG213	£1.02 per Metre
W103 Westflex	£2.00 per Metre
RG-8 75 Metre Drum	£62.49
Flexweave 50m Flex	£30.49
Flexweave-PVC-50 50m	£40.49
Enamelled Copper Wire 50m	£18.49
Hard Drawn Copper Wire 50m	£25.49

Rotator Cable: - Color coded Cable

3 core	£0.82 per Metre
7 core	£1.23 per Metre
8 core	£2.04 per Metre

DC Connecting Cable

5A DC Cable	£0.51 per Metre
10A DC Cable	£0.75 per Metre
20A DC Cable	£1.00 per Metre
25A DC Cable	£1.10 per Metre

Telecom linear amplifiers

Self-contained, solid state

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

CUSHCRAFT

X-7 - 20/15/10 7EL Yagi	£979.95
A3S - 20/15/10 3EL Yagi	£579.95
A4S - 20/15/10 Yagi	£699.95
A3WS - 12/17 3EL Yagi	£479.95
ASL-2010 13-32MHz Log	£869.95
MA5B - Mini Beam	£459.95
D-3 - 20/15/10 Dipole	£289.95
R-6000 - 6Band Vertical	£399.95
R-8 - 40-6m Verical	£559.95
MA5V - 10/20m Vertical	£279.95

Second Hand List.

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

Amplifiers
Yaesu FL-2025 25W Linear Amplifier £99.00
Kenwood VB-2200GX 2M Amplifier £79.00
Yaesu FL-2050 amp £99.00
Nietzsche NB-30W - RF Amplifier £59.00
TOKYO HY- POWER AMPLIFIER HL-37V £69.00
Phi Hong 13.8 volt 3 amp Psu £15.00
Kenwood TL-120 HF Amplifier £129.00
Analyzers + SWR meters
Daiwa CN-103L Meter £59.00
Diamond SX-400 VHF-UHF SWR Meter £70.00
YW-3 SWR meter £30.00
Hanson FS-20D SWR Meter £45.00
Antenna Tuners
Yaesu FC-20 Antenna Tuning Unit £175.00
Yaesu FC-30 Antenna Tuner Unit £169.00
MFJ-902H Manual Travel Tuner 3.5-30MHz 150W £89.00
MFJ-989C MFJ 3kW ATU, ANTENNA TUNER. £299.00
Vectronics VC-300D Tuner with LED PEP Meter £199.00
Antennae
Hi-Sierra Spurs Unit £35.00
ATAS-120A Active Tuning Antenna System for FT-897, F £249.00
Sidekick-black Compact Motorised Mobile HF Antenna £299.00
Set top TV antenna £3.00
EZ-TUNE-7000IBOX High Sierra Control box for £85.00
Baluns
Receive Long Wire Balun £15.00
Books
Icom IC-R20 manual in Italian £5.00
CB
Midland 38 UK £45.00
Zetagi BV-131 Amplifier £65.00
Ranger RCI 2950DX 10 - 12m Transceiver £179.00
Harrier CB-HQ Home Base FM CB £99.00
DAB Radio
Roberts RD-21 'Gemini 21' DAB & FM radio, black £49.00
Gemini 49 Digital Radio £40.00
Gemini 46 Digital Radio £39.00
Pure Evoke-1s DAB radio - Maple £65.00
Data Comms
Kamtronics KAM Multimode TNC £129.00
DC/Cig adapter/chargers
BC-135 Desktop Rapid Charger for IC-R3 £40.00
NC-386 Ni-Cd Battery Charger £20.00
Duplexer / Triplexer
Revex D24 duplexer 1.6-150 MHz £22.00
TSA-6001 Duplexer £25.00
Comet CF-416B 144/430Mhz PL/NP Duplexer £25.00
Filters (various)
Bremi BRL-10 - TVI Low Pass filter 27MHz £10.00
ABF-125 - Airband Filter £29.00
Comet CF-50MR - Low Pass Filter (HF + 50MHz) £35.00
AEC LP-30 - Low Pass Filter £15.00
Frequency Counter/finder
CUB Optoelectronics MINI Counter £119.95
Handheld Transceivers
Yaesu VX-7R Silver Tri-band Handy £189.00
Yaesu FT-41R £79.00
Icom IC-T7E Dual Band Handy £139.00
IC-E91 Icom 2m/70cm Handheld Transceiver £209.00
Alinco DJ-V17E £105.00
DJ-193 Alinco 2m FM Hand Held £99.00
HF Transceivers
Yaesu FT-920AF HF / 6M Base £899.00
Alinco DX-70TH HF/6m transceiver £399.00
Yaesu FT-920 £799.00
Yaesu FT-767GX £599.00
Kenwood TS-570DG/E HF transceiver £599.00
Kenwood TS-850S /AT £699.00
Kenwood TS-690SAT HF -6m Transceiver £549.00
Icom IC-7400 HF, 6m & 2m Transceiver £999.00
Kenwood TS-570DG/E £549.00
Yaesu FT-900/AT HF Transceiver £475.00
Icom IC-718 HF AllBand Transceiver £389.00
IC-7400 HF, 6m & 2m transceiver £950.00
Midland Alan 98 Plus CB Tranceiver £49.00
Yaesu FT-690R II £275.00
Mics and Speakers
Kenwood SP-430 Speaker £59.00
NES-10-2MKII bhi DSP Noise eliminating Speaker £79.00
Yaesu MD-100 Desktop Microphone £99.00
Kenwood MC-60A £89.00
Icom SP-21 loudspeaker £54.00
Yaesu MH-29 Speaker Microphone £49.00
Adonis AM-303 Microphone £39.00
HM-133 Remote Control Microphone for IC-E208 £44.21
Alinco EMS-8 - Speaker Microphone £10.00 extension speaker £9.99
Alinco EMS-14 £49.00
EMS-47 Remote Control Hand Speaker/mic direct VFO in £15.00
Yaesu SP-102 Speaker £75.00
ICOM SP-10 Mobile Speaker 5W 4 Ohms for IC-2725, IC- £30.00
Yaesu FSP-2 Speaker £25.00
Yaesu MH-32 Speaker-Mic £15.00
Morse keys / tutors
Kent Straight Key £59.00
Morse Key £89.00
Bencher Twin Paddle Key £79.00
NATO Morse Key £199.00
Enclosed Kent Twin Paddle Key £55.00
Ex-Army Operators Unit £39.00
Bunnel Morse Key £59.00
Other
IF-232C RS-232 Interface for TS-50 £69.00
YF-112A 2nd IF AM 6kHz Crystal Filter for FT840 £38.26
AKD 6001 6m FM Trx £115.00
M/Mods 144/100 £149.00
Yaesu SP-767 £69.00
Alinco DJ-X3 £89.00
Comet CF-BPF 6
EDC-16B adapter £9.99
Icom BC-156 Desktop Charger for ICR20 £45.00
CSC-83 Soft Carry Case for FT-817ND £15.00
Yaesu YO-100 Monitor Scope £199.00
SGC MAC-200 Antenna Controller Auto-Tuner £220.00
MFJ-461 Pocket Morse Reader £69.00
Bhi NEIM-1031 Noise Eliminating In-line Module £89.00
Microset SR-200 2m 200w £319.00
AOR ARD9000 Digital Voice Interface. £129.00
Yaesu SC-1 Station Console £89.00
MB-17A Quick Release Mount £25.00
Dee Comm Dummy Load £69.00
MFJ-1817 2m/70cm Telescopic Rubber Duck 36.8cm long £22.00
N-Type 50 Watt Dummy Load £35.00
EM-8200 External Memory Card for AR-8200-8200-S2 £40.00
FT-290 MK2 Carry Case £10.00
Kenwood YG-455CN-1 - CW Crystal filter £100.00
Kenwood / Trio BPF-2A HF filter £25.00
YF-114CN 2nd IF Filter 8.2/250Hz for FT1000MP/FIELD £45.00
Kenwood YK-88CN CW Filter £50.00
SC-45 Soft Case for TH-G71E £10.00
CASE FOR KENWOOD TH-47 £10.00
ALINCO ESC-28 £10.00
010-10117-02 Garmin GPS New Carry Case £5.00
HS-800/PRO High Sierra Standard Control Box for 180 £75.00
BP-206 Lithium Ion Battery Pack for IC-R-20 & IC-R3 £30.00
HPS-900 934-935mhz POWER-SWR Meter £40.00
universal scanner/handheld desk stand £10.00
Icom IC-E7 cover/carry case £10.00
IC-MB5 mounting bracket £25.00
KT-790 Carry case £15.00
HMC-3 Vox Headset £20.00
Host Master II £20.00
IC-R5 cloning cable £15.00
Eton S-350 Field Radio £65.00
CX-401 £35.00
Yaesu FT-817 tilt stand £12.00
CSC-88 Soft Case for VX-7R £10.00
Bremi BRL-5 - 3-way switch with 5Watt dummy load (52 £20.00
JD Model 151 - TVI Low Pass Filter £10.00
Archer Antenna Discharge Unit £15.00
Mizuho KX-2 antenna coupler £59.00
CP-163X-II MOBILE LINEAR AMPLIFIER £99.00
BRV-1 Mirror Mount £10.00
8-BAND W2IHY Audio Processor with Noise Gate £199.00
Universal Scanner Desk Stand
Kenwood RM-1 Remote Function Keyboard £44.95
IC-7200 19 Inch Rack Mount With Speaker £99.00
PMR446
Uniden PMR-825 Hand-Helds (pair) £25.00
Power supplies
Bnos 20AMP PSU £89.00
Microset PT 135 PSU £149.00
Icom PS-55 Power Supply £99.00
Adonis AM-708E £89.00
Icom PS-15 20A power Supply £119.00
PT-1012 Microset 12A 13.5 PSU £110.60
GSV-3000 Diamond 25A Supply £129.00
Maplin XM-21 - power supply 7-9A £20.00
Seif PS-134,DC power supply £20.00
Farnell G-12 £59.00
W-5A Watson 5A 13.8V fixed power supply unit £24.00
Sharman PS-5 - 5 Amp psu £20.00
Icom IC-PS15 Power Supply £89.00
Receivers
Icom IC-R72 Receiver £399.00
Yaesu FRV-8800 RX inc Converter £299.00
Magellan GPS 315 Receiver £129.00
Icom IC-R5 Receiver £129.00
AOR AR-3000A Wideband Receiver £450.00
Kenwood R-5000 Communications Receiver HF £549.00
Alinco DJ-X30 Scanning Receiver 100KHz - 1.3GHz £140.00
Roberts R-809 £45.00
AOR AR-5000 Wide band all mode Receiver £899.00
Scanners
Bearcat UBC-278 CLT Scanner £99.00
Bearcat UBC-9000 Scanner £179.00
Yupiteru MVT-7100 £140.00
GRE PSR-214 FM Base Scanner £99.00
Realistic Pro-43 Scanner £89.00
PSR-282 GRE Handheld Scanner £50.00
UBC-785XLT Uniden-Bearcat Base Scanner 25-1300MHz £189.00
Uniden UBC-180XLT scanning receiver £99.00
VHF/UHF Transceivers
Icom IC-490E 70cms Mobile £250.00
Kenwood TS-271E £165.00
FT-290RMKI 2m Multi mode £150.00
Yaesu FT-8100R 2m / 70cms Mobile Transceiver £220.00
IC-7400 HF, 6m & 2m transceiver £999.00
Kenwood TM-G707E Dual Band Mobile £189.00
Yaesu FT-290MkII 2m Multi-mode transceiver £250.00
Yaesu FT-690R II 6m transceiver £275.00
Yaesu FT-480R 2m Transceiver £220.00
Yaesu FTV-901R 2m / 6m Transverter £275.00
Kenwood TS-790E Dual-Band Base / Mobile Transceiver £999.00
Yaesu FT-817ND HF 6m VHF UHF 5W Transceiver £359.00
Kenwood TH-22E compact FM transceivers £69.00
Yaesu FT-897D Multiband Portable Transceiver £529.00
ICOM IC-2200H 144–146 £175.00
The TINY-2 MK-II - With Open Squelch Board £109.00
Kenwood TM-741E - VHF/UHF transceiver 144-146 / 430- £229.00
DR-635E Alinco 2m/70cm FM Dual Band Mobile T £230.00
Radioshack HTX-252 2-meter FM transceiver £89.00
Alinco DR-620 remote cables

bhi

ANEM amplified module	£124.99
1042 6-way switch box	£20.49
NEDSP-1061-KBD DSP module	£101.95
NEDSP-1062KBD Noise Module	£106.95
NEIM1031 Noise Module	£132.95
NES10-2 MK II speaker	£101.95
1090 Radiomate Keypad	£91.95

bhi

We also accept PayPal

skype at radioworld_UK.

Stock and prices accurate as of 01/03/2010. E&OE. For accurate, up-to-date prices please check our website before visiting our shop

In Practice

Stuck again

FIGURE 1: Gaps between threads are essential for assembly, but allow movement afterwards. © Henkel Corporation (Loctite).

ADHESIVES UPDATE. The article on Adhesives in December 2004 created a lot of interest, so here is an update on more sticky subjects. It's a short column this month due to pressure on page space, but we can promise a three-page special for May.

LOCTITE 243

Q: How can I prevent my rotator fixing screws from falling out of the base plate? How can I prevent stainless steel nuts and bolts from jamming solid when they're being tightened?
A: The answer to both questions is the same: Loctite 243 thread locking fluid.

Rotator fixing screws will only work loose if they are allowed to start moving in the first place. We try to tighten them correctly, using the spring washers provided, but we're always wary of over-tightening the steel screws into the softer aluminium alloy of the rotator housing. So in spite of the spring washer, there's always a possibility that the threads can start to move against each other under the insistent leverage of the wind (**Figure 1**). If even the slightest movement is allowed to begin, the threads lose some of their clamping force and allow more movement, so the process gathers speed. Since these screws are inserted from underneath the rotator mounting plate, gravity will also have its way, so it's not at all uncommon for screws to drop out and disappear. This is always accompanied by damage to the threads in the base of the rotator, which means the problem will be even worse the next time.

The solution is to lock the threads together to prevent any movement from getting started. Loctite are world pioneers of thread locking compounds and basically what they manufacture is glue – an adhesive that fills the microscopic gaps between mated screw threads and then sets solid to lock the threads together. There's more to it than that, of course. In particular, you're sure to need to remove those rotator screws one day...

Loctite manufacture a bewildering variety of specialised adhesives for manufacturing and assembly processes, but they also produce a helpful brochure to guide you towards a much smaller range of general purpose products (**Figure 2**). For general antenna work, Loctite 243 offers the best combination of properties. It is a liquid, so it's very easy to apply from a dropper bottle and it flows easily to fill the whole length of the screw threads; it doesn't demand absolutely clean metal surfaces; and it sets quite quickly, locking the threads and sealing them against corrosion. This last point is particularly important with the dissimilar metals used in rotators. With the help of the spring washers, the rotator will then stay put on the base plate until you're ready to remove it.

The blue-coloured grades of Loctite are specifically designed to allow manual disassembly with normal spanners and socket wrenches. Don't use any of the red-coloured grades because these are intended for permanent fixings, such as steel studs into cylinder blocks; removal requires far more force than you'd normally want to use on rotators or antenna parts. In contrast, the pink-coloured Loctite 222 is weaker than the blue grades and is intended for use on tiny instrument screws that might snap if the adhesive was too strong. Loctite 243 sits nicely in the middle; one of the strongest of the blue grades and suitable for most kinds of light engineering work. Its versatility has made it an industry-standard product that is readily available from most engineering suppliers [1].

The second problem is about stainless steel nuts jamming solidly onto stainless steel U-bolts. The name for this is 'galling'. As the two metal surfaces slide over each other, some microscopic surface imperfection digs up a tiny 'gall' or 'divot' on the opposite side. If you feel this happening – stop! If you don't, this gall will gather up even more metal like a snowball, until there's a loud squeal and the nut is friction welded onto the U-bolt. If you have forced the nut this far, you'll be very lucky to move it ever again; more likely you'll twist the whole U-bolt in two.

The answer once again is Loctite, for while it's still liquid it acts as a lubricant to help the metal surfaces slide over each other. The nuts tighten up smoothly without galling and then the Loctite sets solid. (Other lubricants like oil and grease will also prevent galling… but they don't stop being lubricants, so they can also help the nut to work loose again.) The nuts won't come off until you want them to; and when you do, there won't be any drama about it.

A further word about reassembly: when Loctited threads are unscrewed, most of the material crumbles out as a fine powder. Clean any loose material from external threads using a small wire brush and do your best to clean the internal threads as well, eg with a pipe cleaner and by running the clean screw in and out a few times. Then it should be fine to apply fresh Loctite 243 and reassemble the parts.

FIGURE 2: Selection chart identifies Loctite 243 for rotators and antennas. © Henkel Corporation (Loctite)

As you'll gather, Loctite 243 is very strongly recommended – it isn't cheap but it does exactly what the name implies! A small bottle lasts a very long time. For suppliers, follow this month's links from the 'In Practice' website [1].

ADHESIVE HEATSINKS. The following question and answers came from the RSGBTech forum **[2]**.

Q: I want to attach a small heatsink to the top of an 80-pin square SMD package. It definitely needs some form of heatsink, as the chip is dissipating about 1.5W and has to be enclosed in a shielding box. Heatsink grease on its own wouldn't hold, and there is no room for screws.

A: Heatsink adhesives are available, but expensive. Ordinary cyanoacrylate adhesive ('superglue') is worth considering; Marconi Communications used it in the 1970s/80s to attach small heatsinks to DIL packages. Isopon car body filler was mentioned, as it contains a heat conducting aluminium filler, but this was too 'experimental' for use with an IC costing £30!

The purpose of heat conducting compound is to fill the tiny gaps between the IC package and the heat sink. Almost anything conducts heat better than an air gap, but anything more than the thinnest possible film will make the heat conduction worse than it need be (if you remove the heat sink from a factory-assembled PC, notice how little heat conducting compound they actually used). Another alternative is to use special heat conducting pads made of soft silicone rubber, which compress to fill the air gaps and need no grease. This material is also available as a double-sided adhesive tape. However, if something needs to be ordered in specially, the best option would probably be a ready-made heatsink with an adhesive pad (**Photo 1**) [1].

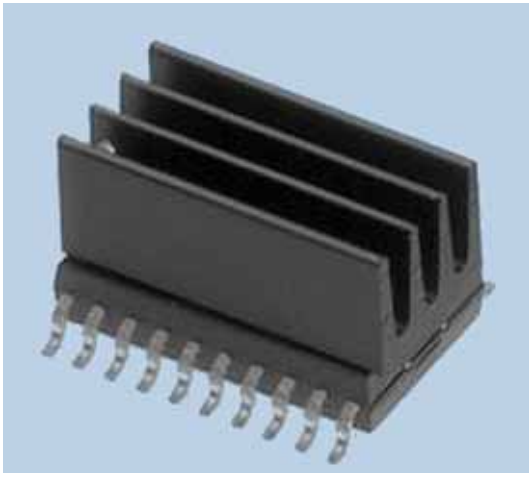


PHOTO 1: IC heatsink with heat-conductive adhesive pad. © Fischer Elektronik GmbH.

We also have to remember that the heat from the IC will still need to go somewhere. Although the heatsink helps to reduce the operating temperature of the silicon chip itself, it is only transferring the heat into a small volume of air that remains trapped inside the shielding box. What's really needed is some way to get the heat out of the box and away into the room air.

The last word goes to Paul, 9H1FQ, who had asked the question. He decided to use thermally conductive tape and instead of adhesive he would make a mechanical hold-down from the lid of the box.

And finally: if you're reading this column, isn't it time you joined RSGBTech? **[3]**

NOTES AND REFERENCES

[1] Please follow this month's links from the 'In Practice' website: http://tinyurl.com/inpractice

[2] With minor editing and a few afterthoughts, and grateful thanks to Paul, Leslie, Mario, Brian and David.

[3] Join the RSGBTech forum at http://groups.yahoo.com/group/rsgbtech/

RSGB HEADQUARTERS
AND REGISTERED OFFICE:
3 ABBEY COURT, FRASER ROAD,
PRIORY BUSINESS PARK,
BEDFORD MK44 3WH

YOUR RSGB
WORKING FOR YOU

Radio Society of Great Britain
Annual Report

1 JANUARY TO 31 DECEMBER 2009

WORK IS WELL UNDER WAY AT THE NATIONAL AMATEUR RADIO CENTRE AT BLETCHLEY PARK.

RSGB Annual Report

Review of the year by the RSGB President

Can I thank all members for supporting the Society in its role – as it says in the Memorandum of Association – to "promote the general advancement of the science and practice of Radio Communication or other subjects allied thereto… to obtain the maximum liberty of action consistent with safeguarding the interests of all concerned". The last 12 months have been challenging and undoubtedly the next year will be too.

The Society survives purely by its membership and I hope that all members feel you receive a service second to none. In this respect I personally thank the hundreds of volunteers who help provide you with that service, likewise the staff at RSGB HQ in Bedford.

Our biggest challenge was/is the continuing saga of Power Line Adapters, their threat to the HF spectrum and the possibility of new devices that will extend up to VHF. In September, Ofcom published their statement on these devices, which resulted in the Society taking legal advice on how best to combat this huge threat. The one thing we quickly realised was that any legal action would be costly so, with that in mind, the Society launched the Spectrum Defence Fund at the end of 2009. The response of members and other radio users has been extremely encouraging. We still have a long way to go and it still remains probably the most important issue we have at the moment. If we get it wrong the implications to the hobby, to the Spectrum and to the Society could be disastrous. Radio amateurs are renowned for complacency – *we can't afford to be complacent about this*. Whilst we have an issue with the regulator on this issue we continue to work together with Ofcom in many other areas and I and many others appreciate their support.

Back to 2009 and two events stick in my mind, the National Hamfest and the RSGB Convention. Working together as a team, the Lincoln Short Wave Club and the RSGB put on the National Hamfest at the Newark Showground, a hugely successful event, as was the RSGB Convention. Everyone seemed to enjoy the experience – delegate and day visitor numbers were up, the raffle (with some prizes donated by the two major sponsors, Icom UK and ML&S) raised a record amount for the DXpedition Fund. The 2010 RSGB Convention is moving to Horwood House, just outside Milton Keynes, with the added benefit that the Convention is taking over the whole place.

The Society relies hugely on its volunteers and HQ staff to provide first class services to its members and once again everyone made a huge impact. There were issues surrounding tutor status that could have had serious repercussions but the HQ staff quickly had matters under control. Thanks and well done. The numbers taking the exams still amazes us but we still need to encourage people to take that final step from Intermediate to Advanced.

The various committees continue to do sterling work, coming up with groundbreaking ideas all the time and trying to "get the most out of the least". The Commercial arm of the society continues to publish new and varied titles but it is getting harder and harder to come up with ideas – if you have any ideas then please drop us a line and we'll certainly follow it up.

Finally, I look forward to meeting as many of you as I can during my term as President – please feel free to drop me a line saying how good or bad you think the Society is doing. We can't rest on our laurels; we can't expect to know it all so we welcome constructive comments and criticism.

RSGB President, Dave Wilson, M0OBW

Operational review by the RSGB General Manager

2009 was an extremely challenging year. The country was in the depth of recession and having positioned the Society over the previous two years into a position of financial stability we were hit badly by a decline in our traditional revenue streams.

The poor return on our investments also added to the problem and it is disappointing to report that the Society for the first time in a number of years is posting a loss in this report. The upside was that we continued to keep costs and expenditure under control without affecting the services that we provide to our members.

Further disappointment was the delay in the start of the construction of the new National Amateur Radio Centre at Bletchley Park. These delays were totally outside of the control of the Society inasmuch as they were caused by planning issues regarding demolition and construction on a listed building and site. Work commenced in early January 2010 and we expect to be handed the building from the constructors in late May, early June. The building should be operational by mid summer and it is planned to have the official opening in the autumn when it is hoped that the Patron will be able to attend.

Having pulled out of organising rallies and shows some years ago, following pressure from the amateur radio trade and the amateur radio community at large, the RSGB once again put its toe in the water by joining the Lincoln Short Wave Club in organising a new event – the National Hamfest – which took place in Newark in early October. This was the largest amateur radio show to take place in the UK in over six years and was an outstanding success. Leading on from this success and the continued growth of the RSGB Convention, the Society is launching in 2010, National Ham Radio week. This will start with the National Hamfest and finish with the RSGB Convention. It is hoped that during the week, which will again take place in early October, to officially open the NARC at Bletchley Park and involve as many clubs as possible in the promotion of amateur radio during this special week.

Another success story this year was the national launch of RSGB Club of the Year.

Each RSGB Region ran local competitions and the successful regional winners have gone forward into the national competition. The winning club will be announced at this year's AGM in Bedford. You will read in this report of the launch of the Spectrum Defence Fund and the hard work that 'Team RSGB' has been doing looking after your interests. I always look upon the efforts of our hundreds of volunteer's from the Board down along with the Abbey Court staff as being a team effort and as always in this report you will be able to see first hand the excellent work that the team undertake throughout the year.

What of the future? Certainly 2010 is going to be another difficult year financially but we are all committed to doing our best to keep the Society on an even keel and continue to provide the best possible service to the membership. This is in direct services and our representative role. There are some high spots to look forward to and despite the recession, interest in amateur radio is still strong and the hobby remains vibrant.

RSGB General Manager, Peter Kirby, G0TWW

1 January to 31 December 2009

Company no. 216431
Radio Society of Great Britain
Report and Financial Statements
31 December 2009

Legal and administrative details
For the year ended 31 December 2009

Status	The organisation is a company limited by guarantee, incorporated on 21 July 1926
Company number	216431
Registered office and operational address	3 Abbey Court, Fraser Road, Priory Business Park, Bedford MK44 3WH
President	C Thomas, G3PSM (retired 31 December 2009) D Wilson, M0OBW (installed 1 January 2010)
Honorary officers	**Treasurer** R Dingle, G0OCB **Company Secretary** R Thorogood, G3KKT
Principal Staff	**General Manager** P Kirby, G0TWW
Bankers	Natwest Plc, 181 Darkes Lane, Potters Bar, Hertfordshire EN6 1XT
Solicitors	Eversheds LLP, Kett House, Station Road, Cambridge CB1 2JY
Auditors	Sayer Vincent Chartered accountants and registered auditors, 8 Angel Gate, City Road, London EC1V 2SJ

The directors present their report and the audited financial statements for the year ended 31 December 2009.

PRINCIPAL ACTIVITIES. The principal activities of the Society are to provide services to members who are radio amateurs, short wave listeners or others with interests in radio communications. The Society represents the interests of UK licensed radio amateurs to the regulatory authority in the UK, Ofcom and via the International Amateur Radio Union (IARU) to other international bodies.

The Society has continued to monitor the threat to the amateur spectrum allocations particularly from low power, short range 'homeplug' devices that do not conform to the European Electromagnetic Compatibility Directive (EMC Directive) which became law in July 2007. The Society has canvassed Ofcom on this matter and following grave concerns and an exchange of letters including a formal complaint to the administration over the legality of placing these items on the market the Board took the decision to seek legal advice on Ofcom's interpretation of the EMC Directive. Despite this issue the Society's relationship with Ofcom remains good and both organisations have worked closely together on other issues threatening the bands particularly the Microwave bands.

The Society has also continued to work closely with Ofcom to improve the reporting and investigation of abuse on the amateur bands and it is hoped that from these discussions a Memorandum of Understanding will be put in place to allow much closer co-operation between the UK Regulator and the Amateur Radio Observation Service. There has also been close liaison between the two bodies on the impact the 2012 London Olympics will have on the radio spectrum, in particular those parts of the spectrum allocated to Amateur Radio.

In December 2009 the Board took the decision to launch a Spectrum Defence Fund. This fund will be used in the protection of the radio spectrum against current threats and also future threats. The fund is ring-fenced accordingly.

The Society continues to prepare for World Radio Conference (WRC) 2012. A number of items of interest to the Amateur Radio community will be discussed at the conference including a proposal for an amateur MF allocation.

It is pleasing to report that the numbers of candidates sitting the Radio Communications Examination (RCE) at all three levels has shown no signs of decline and it is encouraging to note that numbers of candidates taking the Advanced examination continues to rise.

The Society continues to maintain strong links with Government departments to ensure that amateur radio continues to be recognised as a scientific hobby that has a role to play in education and in shaping the future of the radio communications workforce in the UK. In October 2006 the Society commissioned a consultation into aligning the Radio Communications Examination with the Government's National Vocational Qualification scheme. It is expected that the Office of the Qualifications and Examinations Regulator (Ofqual) will report the results of this consultation in early 2010.

The GB4FUN demonstration vehicle has again been a very popular asset and many schools have benefited from visits. However, following a visit to Northern Ireland in September 2009, due to lack of staff and funding, the vehicle was withdrawn from service until the start of 2010.

Throughout the year work on the planning and provision of the new National Amateur Radio Centre at Bletchley Park, Milton Keynes has continued. Final planning approval was granted in November 2009 and building commenced in January 2010 with a completion date of May 2010.

The Society's membership on the 31 December was 22,265 compared with 22,532 at the start of the reporting period.

FINANCIAL REPORT. The financial result for the year, after interest income, was a deficit of £40,137 compared with a surplus of £8,185, excluding the sale of Lambda House, in the prior year.

Some of the deficit can be attributed to the current economic climate which is evidenced by the extremely poor return on bank interest. We are also aware that advertisers are constantly monitoring the amount of advertising they undertake, which has seen a downturn in advertising this year. Early indications are that this year will have a similar outturn.

Although book income is down this is only due to the reduced number of Members' offers. Overall, after the cost of sales is taken into account the sales margin is only £3,000 lower than the prior year.

The decision to increase subscription rates is always difficult and never taken without proper consideration. Income from subscriptions has decreased this year and in view of the fact that there has not been an increase since 2006 it was agreed that they would be increased on 1 January 2010. Existing members who pay by direct debit will not be affected by the increase.

The move to Abbey Court has resulted in cost savings in all areas.

£10,000 was received as a donation from the Radio Communications Foundation towards the running costs of GB4FUN. No further donations have been received since the project was temporarily suspended. Discussions have taken place with a fund raiser to help identify funding from other sources. The fees for this are being funded from the legacy left to the Society in 2008.

RESPONSIBILITIES OF THE DIRECTORS. Company law requires the directors to prepare financial statements for each financial year which give a true and fair view of the state of the affairs of the company as at the balance sheet date and the profit and loss for the year then ended.

In preparing those financial statements that give a true and fair view, the directors should follow best practice and:

- select suitable accounting policies and then apply them consistently
- make judgements and estimates that are reasonable and prudent
- state whether applicable accounting standards have been followed, subject to any material departures disclosed and explained in the financial statements
- prepare the financial statements on the going concern basis unless it is inappropriate to assume that the company will continue on that basis

The directors are responsible for keeping adequate accounting records that disclose with reasonable accuracy at any time the financial position of the company and to enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

The directors are responsible for the maintenance and integrity of the corporate and financial information included on the company's website. Legislation in the United Kingdom governing the preparation and dissemination of the financial statements may differ from legislation in other jurisdictions.

Each of the directors confirm that to the best of his / her knowledge there is no information relevant to the audit of which the auditors are unaware. The directors also confirm that they have taken all necessary steps to ensure that they themselves are aware of all relevant audit information and that this information has been communicated to the auditors.

The directors who served on the board during the year and up to the date of this report were as follows:
R Barden, MD0CCE Resigned January 2010
R Bellerby, GM3ZYE to May 2009 / from January 2010
P Brooks, G4NZQ
L Butterfield, G0CIB
D Field, G3XTT
B Reay, G8OSN
J Stevenson, G0EJQ
C Thomas, G3PSM to December 2009
A Vinters, G0WFG co-opted January 2009 to December 2009
D Wilson, M0OBW
C Morrison, GI4FUE from January 2010
I Philipps, G0RDI from January 2010
DF Beattie, G3BJ from January 2010
Dr JW Gould, G3WKL from January 2010

Every member of the Society undertakes to contribute to the assets if it should be wound up while he/she is a member or within one year after he/she ceases to be a member for payment of the liabilities of the Society contracted before he/she ceases to be a member. Every member also undertakes to contribute to the costs; charges and expenses of winding up the same, and for the adjustment of the rights of the contributories amongst themselves, such amount as may be required not exceeding one pound. The number of guarantees held at the balance sheet date was nil (2008: nil).

AUDITORS. Sayer Vincent was re-appointed as the company's auditors during the period and have expressed their willingness to continue in that capacity.

The directors' report has been prepared in accordance with the provisions applicable to companies subject to the small companies' regime.

Approved by the directors on 8th March 2010 and signed on their behalf by
Dave Wilson, M0OBW, President
Rupert Thorogood, G3KKT, Company Secretary

Independent auditors' report
To the members of Radio Society of Great Britain

We have audited the financial statements of Radio Society of Great Britain for the year ended 31 December 2009 which comprise the income and expenditure account, balance sheet and related notes. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards (United Kingdom Generally Accepted Accounting Practice).

This report is made solely to the company's members as a body, in accordance with chapter 3 of part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the company's members those matters we are required to state to them in an auditors' report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the company and the company's members as a body, for our audit work, for this report, or for the opinions we have formed.

Respective responsibilities of directors and auditors. As explained more fully in the Directors' Responsibilities Statement, set out on page 43, the directors are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view. Our responsibility is to audit the financial statements in accordance with applicable law and International Standards on Auditing (UK and Ireland). Those standards require us to comply with the Auditing Practices Board's (APB's) Ethical Standards for Auditors.

Scope of the audit of the financial statements. An audit involves obtaining evidence about the amounts and disclosures in the financial statements sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of: whether the accounting policies are appropriate to the company's circumstances and have been consistently applied and adequately disclosed; the reasonableness of significant accounting estimates made by the directors; and the overall presentation of the financial statements.

Opinion on the financial statements. In our opinion the financial statements:
- give a true and fair view of the company's state of affairs as at 31 December 2009 and of its results for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Opinion on other matters prescribed by the Companies Act 2006. In our opinion the information given in the Directors' report for the financial year for which the financial statements are prepared is consistent with the financial statements.

Matters on which we are required to report by exception. We have nothing to report in respect of the following matters where the Companies Act 2006 requires us to report to you if, in our opinion:
- adequate accounting records have not been kept, or returns adequate for our audit have not been received from branches visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of directors' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit; or
- the directors were not entitled to prepare the financial statements and the directors' report in accordance with the small companies regime.

Judith Miller, Senior Statutory Auditor for and on behalf of Sayer Vincent, Statutory Auditors 9th March 2010

SAYER VINCENT
8 Angel Gate, City Road, London EC1V 2SJ

Income and expenditure account for the year ended 31 December 2009

	Note	2009 Total £'000	2008 Total £'000
Turnover	2	1,470	1,524
Cost of sales		(183)	(201)
Gross surplus		1,287	1,323
Sales and distribution expenses		(252)	(258)
Other operating expenses		(1,096)	(1,258)
Operating deficit		(61)	(193)
Profit on disposal of fixed assets		5	737
Interest receivable		16	34
(Deficit)/surplus on ordinary activities before taxation	4	(40)	578
Taxation	6	-	-
Retained (loss) / surplus for the financial year		(40)	578
Accumulated surplus at the start of the year		976	398
Accumulated surplus at the end of the year		936	976

All of the above results are derived from continuing activities.
The movement in the income and expenditure account is shown in note 13.

Balance sheet as at 31 December 2009

	Note	£'000	2009 £'000	2008 £'000
Tangible fixed assets	7		440	434
Current assets				
Stock	8	71		74
Debtors	9	154		159
Cash at bank and in hand		550		571
Short term deposits		310		355
		1,085		1,159
Creditors: amounts due within one year	10	578		603
Net current assets			507	556
Total assets less current liabilities			947	990
Creditors: amounts falling due after more than one year	11		11	14
Net assets			936	976
Capital and reserves				
Income and expenditure account			936	976
Total funds	13		936	976

The financial statements have been prepared in accordance with the provisions applicable to companies subject to the small companies' regime.
Approved by the directors on 8th March 2010 and signed on their behalf by
Dave Wilson, M0OBW, President
Rupert Thorogood, G3KKT, Company Secretary

Statement of total recognised gains and losses for the year ended 31 December 2009

	2009 £'000	2008 £'000
Deficit for the financial year	(40)	578
Total recognised gains and losses relating to the financial year	(40)	578

Notes to the financial statements for the year ended 31 December 2009

1. Accounting policies

(a) The financial statements have been prepared under the historical cost convention and in accordance with applicable accounting standards and the Companies Act 2006, modified to include the revaluation of land and buildings.

(b) Turnover represents the invoiced amounts of goods sold and services provided, net of Value Added Tax and trade discounts. Turnover comprises subscription income, book income, advertising income and exam income. Subscriptions income is recognised on a monthly basis over the duration of the subscription; book income is recognised on despatch of books; advertising income is recognised on publication date; and exam income is recognised on the date of the exam. Donations and voluntary income are recognised when received or receivable – whichever is earlier. All income arises in the UK.

(c) Depreciation is provided on all tangible assets at rates calculated to write each asset down to its estimated residual value evenly over its expected useful life (except freehold land which is not depreciated), as follows:

Leasehold buildings	2%
Computer equipment	20%-33%
Fixtures and fittings	10%
Furniture and equipment	20%-25%
GB4FUN	12%-20%
Motor Vehicles (not leased)	33%
Leased assets (motor vehicles)	over the period of the lease

Assets are capitalised where the purchase price exceeds £1,000.

(d) Where the carrying value of an asset will be recovered principally through a sale transaction rather than through continuing use, the asset is classified as held for sale and stated at the fair value less costs to sell, following the adoption of a policy of revaluation for this class of asset. No depreciation is charged in respect of current assets classified as held for sale.

(e) Stocks are stated at the lower of cost and net realisable value. In general, cost is determined on a first in first out basis and includes transport and handling costs. Net realisable value is the price at which stocks can be sold in the normal course of business after allowing for the costs of realisation. Provision is made where necessary for obsolete, slow moving and defective stocks.

(f) Any charge for taxation is based on the surplus for the year and takes into account taxation deferred because of timing differences between the treatment of certain items for taxation and accounting purposes. When this arises it appears in the income and expenditure account. Deferred tax is recognised, without discounting, in respect of all timing differences between the treatment of certain items for taxation and accounting purposes which have arisen but not reversed by the balance sheet date, except as otherwise required by FRS19.

(g) Leases acquired under finance leases are capitalised and the outstanding future lease obligations are shown in creditors.

(h) The Society contributes to group personal pension policies to provide benefits for employees on a defined contribution basis. The assets of the policies are held separately from those of the Society in independently administered funds. The amount charged to the income and expenditure account represents the contributions payable to the policies in respect of the accounting period.

(i) Under FRS 1 the company is exempt from the requirement to prepare a cashflow statement on the grounds of its size.

2. Turnover

	2009 £'000	2008 £'000
Subscription income	839	850
Radcom advertising income	162	170
Book sales	346	366
Other income (note 3)	123	138
	1,470	1,524

3. Other income

	2009 £'000	2008 £'000
Foundation licence	43	41
Intermediate licence	19	18
Full licence	14	12
Legacy	-	22
GB4FUN donation	10	15
Commercial Sponsorship	10	10
Sundry income	13	12
Rallies and exhibition fees	9	8
Spectrum Defence Fund	5	-
	123	138

4. (Deficit) / surplus on ordinary activities before taxation

This is stated after charging / (crediting):	2009 £'000	2008 £'000
Depreciation on owned assets	31	50
Depreciation on leased assets	15	14
Interest receivable	(16)	(34)
Profit on disposal of property	-	(733)
Profit on disposal of other fixed assets	(5)	(4)
Directors' remuneration	-	-
Board reimbursed expenses	17	25
Regional & Committee reimbursed expenses	36	33
Auditors' remuneration: Audit	10	10
• Non-audit services	-	2

Expenses totalling £17,000 (2008: £25,000) were reimbursed to 10 Board members (2008: 10) for travel and subsistence costs of attending meetings, and other sundry costs.

5. Staff costs and numbers

	2009 £'000	2008 £'000
Salaries and wages	465	468
Social security costs	47	47
Pension contributions	12	10
	524	525

One employee earned more than £50,000 during the year. (2008:1)
The average weekly number of employees (full-time equivalent) during the year was as follows:

	2009 No.	2008 No.
Headquarters staff	17	18

6. Taxation

	2009 £	2008 £
UK corporation tax	-	-

RSGB has an agreement with HMRC over the calculation of schedule D Case I profits for corporation tax purposes. In recent years this has generated a loss, contributing to a deferred tax asset (see note 12). RSGB has generated an accounting loss in the year. There is also a tax loss, and consequently no corporation tax liability has arisen in the year.

7. Tangible fixed assets

	Leasehold land and buildings £'000	Computer equipment £'000	Fixtures and fittings £'000	Furniture and equipment £'000	Motor vehicles £'000	Bletchley Park £'000	GB4FUN	Toyota GB4FUN tow vehicle	Totals £'000
Cost									
At the start of the year	339	299	53	154	46	-	37	8	**936**
Additions in year	-	5	-	9	16	22	-	-	**52**
Disposals in the year	-	-	-	-	(16)	-	-	-	**(16)**
At the end of the year	339	304	53	163	46	22	37	8	**972**
Depreciation									
At the start of the year	5	284	48	141	21	-	2	1	**502**
Charge for the year	7	9	1	6	15	-	7	1	**46**
Disposals in year	-	-	-	-	(16)	-	-	-	**(16)**
At the end of the year	12	293	49	147	20	-	9	2	**532**
Net book value									
At the end of the year	**327**	**11**	**4**	**16**	**26**	**22**	**28**	**6**	**440**
At the start of the year	334	15	5	13	25	-	35	7	**434**

Included in the total net book value of motor vehicles is £26,000 (2008: £25,000) in respect of assets held under finance leases.
Depreciation for the year was £15,000 (2008: £14,000).
The Society purchased 3 Abbey Court, Fraser Road, Priory Business Park, Bedford MK44 3WH on 17 March 2008 for £339,000.
The building has been acquired on a leasehold of 125 years. The land is on a peppercorn lease from Bedford Council for 125 years, and is not depreciated.
Work on the new National Amateur Radio Centre has commenced at Bletchley Park and is due for completion in mid-2010. Costs incurred to date, £22,235, are included in the balance sheet at 31 December 2009. Depreciation will be charged on the asset when it is fully completed and brought into use.

8. Stock

	2009 £'000	2008 £'000
Goods held for resale	73	74
	73	74

9. Debtors

	2009 £'000	2008 £'000
Trade debtors	41	38
Prepayments and accrued income	113	121
	154	159

10. Creditors : amounts due within one year

	2009 £'000	2008 £'000
Trade creditors	84	87
Obligations under finance leases (note 11)	15	11
Taxation and social security	11	16
Other creditors	12	12
Subscriptions in advance	344	355
Accruals	112	122
	578	603

11. Obligations under finance leases

	2009 £'000	2008 £'000
Gross obligations under finance leases	28	28
Less: finance charges allocated to future periods	(2)	(3)
	26	25
Due within one year	15	11
Due within two to five years	11	14
	26	25

12. Unprovided deferred tax asset

	2009 £'000	2008 £'000
Difference between accumulated depreciation and capital allowances	46	(8)
Tax losses	(2,201)	(2,168)
Undiscounted, unprovided deferred tax asset	(2,155)	(2,176)

Deferred tax asset is not recognised because of the unlikelihood of utilising trading losses brought forward in the light of current trading conditions.

13. Reconciliation of movements in members' funds

	2009 £'000	2008 £'000
Members' funds at the start of the year	976	1,110
(Deficit) / surplus for the period	(40)	(134)
Members' funds at the end of the year	936	976

14. Pension scheme

The company operates a defined contribution pension scheme. The pension cost charged for the period represents contributions payable by the company to the scheme and amounted to £12,159 (2008: £9,882). Outstanding contributions at the year end amounted to £767 (2008: £873). These are included in other creditors at the year end.

15. Related party disclosure

The Radio Communications Foundation is a registered charity, number 1100694. Peter Kirby and Marilyn Slade, two officers of the Society, are trustees of the charity. Since its inception, the Society has provided the Foundation with management services at no cost. During the year the Society was awarded a donation of £10,000 towards the running costs of GB4FUN.

16. Designated funds

During 2008 Mrs Olive Taylor bequeathed to the Society the sum of £22,488. Her late husband was a radio amateur. The Board has decided to use these funds in acquiring the services of an experienced fund raiser. During 2009 costs of £1,038 were incurred.

17. Post Balance Sheet Event

During December 2009 a fund was established, (the Spectrum Defence Fund), to contribute towards the legal costs that would be incurred in the defence of the Radio Spectrum. In the first instance it was agreed that the money raised would be used to meet the costs of the current legal challenge to Ofcom in relation to the Power Line Adaptor issues. Following advice from the Society's solicitors the Board conducted a teleconference on 7 February 2010 during which it was decided not to proceed at this time with any legal action. Donations received at the 31 December 2009 totalled £4,780 against costs of £13,400. These have been included in the financial statements for the year ending 31 December 2009.

18. Funds held on behalf of trusts

RSGB acts as custodian for the funds below and holds the amounts below within accounts for each fund. These funds are repayable to the individual trusts upon demand, and as such are not recognised as assets held by RSGB. The movements on these funds are shown below.

	At 31 December 2008 £	Incoming resources £	Outgoing resources £	At 31 December 2009 £
The J Fraser Shepherd Prize Fund	1,242	23	-	**1,265**
DXpedition Fund	7,511	1,588	(2,458)	**6,641**
K M Bennett Legacy Fund	1,027	4	(98)	**933**
The Pilot Officer Norman Keith Adams Prize Fund	1,219	31	-	**1,250**
Dewit L Jones W4BAA IOTA Legacy Fund	-	7,208	-	**7,208**
The Legacy Fund	19,175	86	-	**19,261**
Total trust funds	30,174	8,940	(2,556)	**36,558**

These amounts are not included in the balance sheet of RSGB at the year end.

Committee reports for 2009

AMATEUR RADIO DEVELOPMENT COMMITTEE. 2009 was a busy and successful year, during which the main focus of activity continued to be supporting training for the UK's Radio Communication Examinations and those offering training to new, and developing, radio amateurs.

The Morse Competency Programme, led by Phillip Brooks, G4NZQ and Roger Cooke, G3LDI, continues to grow. Those who are proficient in Morse code, and are keen to assist in its promotion, are needed in the Regions to act as instructors and examiners. Those interested in being part of this programme should contact their Regional Manager.

The Buildathon initiative, being led by Steve Hartley, G0FUW, continues to grow in popularity, stimulated by an excellent DVD produced by Steve and his Bath based team.

Train the Trainers sessions continue to be popular with two teams running sessions, one covering the South and another in the North. The Train the Trainer sessions offer instructors the opportunity to learn the details of the progressive examination scheme from the members of the team who developed it, plus advice on teaching best practice from experienced instructors and professional educators. In addition, the Tutors Reflector continues to flourish and provides a valuable link for active instructors to share ideas and resources. Instructors wishing to join the reflector, or enquire about a Train the Trainers session, should contact me direct at g8osn@rsgb.org.uk.

Following the success of the RSGB Train the Trainers sessions, the ARRL have introduced a similar scheme. In addition, the IRTS have asked the RSGB organise a Train the Trainers session tailored to match the Irish exam scheme.

As in previous years, the ARDC organised a 'one stop' Radio Communication Examination session at the RSGB Convention, allowing candidates to complete the assessments and examination(s) for one or more levels. The International Amateur Radio Examination (IARE) continues to be offered twice per year and remains the only examination endorsed by the International Amateur Radio Union for countries that lack the resources to support their own examination system.

I would like to thank all the members of the ARDC and the various members of HQ staff who support the ARDC for their hard work in 2009.

Brian Reay, G8OSN

AMATEUR RADIO DIRECTION FINDING COMMITTEE. ARDF continued to develop during the year and a programme of 17 separate days of ARDF competitions plus a seminar in Scotland were promoted by the Committee. This is a new 'high' for ARDF and the year was also marked by having two events on the same day at opposite ends of the country – at Milngavie near Glasgow and at Coombe Hill near Wendover in the Chilterns.

Events are the lifeblood of our sport and the Committee wishes to record its thanks and appreciation to all those who organised events in 2009. Outside of the Committee we are grateful to David Heale, G6HGE, Steve Stone, RS193217, Phil Ellis, M0GIE and the Oldham Club and Michael Dunbar, M6MDD for their contributions.

A three day ARDF Festival was staged in Shropshire over the Spring Bank Holiday weekend. This incorporated the British ARDF Championships and competitions were held on 144 and 3.5MHz. These used different parts of Brown Clee Hill whilst the third day of the Festival moved into Wales for a FoxOring event at Corndon Hill.

The Festival enjoyed superb spring weather to the delight of our visitors from the Continent. RSGB President, Colin Thomas, G3PSM, came to see something of ARDF and to present the trophies and certificates. He took the opportunity to go out onto the course and try some 'hands on' ARDF.

The 144MHz Champion was David Williams, M3WDD running in the M40 class and the 3.5MHz Champion was Bob Titterington, G3ORY running M60.

Contest University

During the year the Committee took a number of steps to improve participation. The first of these was to run an ARDF Seminar at Mugdock Park, Milngavie near Glasgow. The aim of the Seminar was to introduce ARDF to Scotland and it was well attended with 25 people enjoying an introduction to the radio sport. It was followed later in the year by the first actual event to be held in Scotland. The Committee has benefited greatly from the enthusiastic support of committee member Tom Mitchell, GM0JHF and also Dave Cossar, GM3WIL in the efforts to promote ARDF in Scotland.

The Committee also assembled a kit of equipment to allow a FoxOring event to be run for up to 24 participants. This was used at the Mugdock Seminar, at two events held in conjunction with Orienteering Clubs and also at two of the normal programme events. Publicity about the kit in *RadCom* resulted in some enquiries about the use and availability of the kit.

The autumn is the time of year that the Committee is active in promoting ARDF at Shows and Conventions. We had a stand at the Leicester Show in September and another at the National Hamfest in October. We were also represented at the RSGB Convention at Wyboston in the same month. These stands do attract a group of radio amateurs who have an interest in the more energetic pursuits of life and who are tempted to try out ARDF. Attendance at these events has proved to be very worthwhile in promoting ARDF to the wider amateur community.

On the International scene, 2009 was the year of the bi-annual IARU Region 1 ARDF Championships in September. The event was staged by the BFRA (Bulgarian national society) at Obzor. Bob Titterington competed in the M60 class and Steve Chalk in the M40 class. The UK competitors were entirely self-funded.

Looking ahead to 2010, the Committee sees the continuing need to focus on increasing participation. It is hoped to extend the programme of events involving orienteers by running more 'demonstration' FoxOring events in conjunction with summer orienteering events.

We will also be looking at ways in which 'Come and try it' events might be run and promoted to the amateur community in different parts of the UK.

Finally, the events programme, which continues to grow each year, might be focused in different areas of the country. Participation is likely to be better if an event is taking place within 60 miles of one's home instead of 120 miles.

There will be the World Championships in Croatia in September and the early indications are that the RSGB could be set to send its largest team ever to an international event.

Finally, I wish to acknowledge the enthusiasm and contributions of the Committee members in running events and promoting the sport. During the year, Dave Burleigh left the Committee and his contribution since 2002 is much appreciated. He has been replaced by Robert Vickers, G3ORI.

The Committee is also grateful for the unfailing support from the RSGB Board member responsible for Sport Radio, Don Field, G3XTT.

R G Titterington, G3ORY

AMATEUR RADIO OBSERVATION SECTION. We still have the age old problems of abuse, interference, piracy and the sexist, racist comments that are regularly being reported to AROS. Ofcom has been more approachable over the past year and has taken action on behalf of radio amateurs regarding their various problems. As I stated last year we the amateurs have to provide a lot of evidence, for instance, recordings of the abuse etc actually carried out on the air. Back up in the form of tip offs direct to the Ofcom Field Officer involved with their case and steerage by local amateurs who are assisting to solve the problem. These factors have contributed to a few successful conclusions of the problems. Many a time I have found myself short of AROS volunteers in the areas affected, but luckily some of the persons involved in making the original complaint have offered their services.

I heard recently from one of my volunteers, who had been told factually by a Field Officer (Ofcom), that it was illegal to record a person making abusive (etc) calls on air, without asking the offenders permission first! I do not think there would be a great danger of the offendee taking anyone to court as that would blow his/her anonymity. Secondly how could you ask an anonymous persons permission? Certainly not over the air as you could infringe your licence conditions.

AROS welcomes newcomers into the hobby. The latest amateur licensees, might benefit if they become involved as volunteers for AROS it would highlight that self regulation as taught in the RAE is so obviously needed. Available as a service from RSGB are talks on AROS activities that can be arranged for clubs. 2010 will be a year of liaison with Ofcom to tighten up procedures and provide a better service for radio amateurs when reporting abuse etc over the air.

Tony Selmes, G4KLF

CONTEST COMMITTEE. This has been another busy year for the Contest Committee, with participation up in most events, both HF and VHF. Part of the reason is undoubtedly the ease of log submission via the web upload facility (by uploading a complete electronic log or by the alternative method of manually entering QSO data) and the fast turnaround of results for most events.

One significant innovation has been the move from paper to PDF certificates. This eases the adjudicators' workload while, at the same time, saving the Society money in printing and mailing costs. So far the response has been very positive. Some entrants still prefer a traditional certificate and all such requests have been honoured.

The VHF trophy presentations were once again held at Kempton but in 2010 will precede the Society's AGM.

Publication of the RSGB's contest results continues to be something of a challenge. The Contest Committee website is, for most contesters, the first port of call but does not constitute a permanent record. Pressure of space within *RadCom* itself resulted in the alternative approach of twice-yearly supplements which, it was hoped, would be self-financing through additional advertising. However, in the present economic climate that has not been the case. Instead, an annual *Sport Radio Yearbook* will be produced and mailed free of charge.

The Committee remains keen to introduce new events to the calendar that are more of a challenge than the simple 'report and serial number' type of exchange. The 80m Sprint contests were one such attempt and have been well received by some, but the format is not universally popular. The Committee will continue to look for ways to innovate and is always open to suggestions from potential contest entrants. The whole contest programme is under continual review as some events effectively reach their sell-by date while new opportunities come along, whether to exploit new modes or new formats.

The Committee has also been involved during the year in drafting criteria for the extension of the Special Contest Calls programme to individuals, in looking at possible contest events in connection with the 2012 Olympics, in contributing to contest aspects of papers to be considered at the Vienna interim IARU Conference, and in a host of other contest-related matters and correspondence.

Recent recruits to the Committee include G3ZVW (as incoming *RadCom* Sport Radio columnist), G4MEM and G4LMW, while G0ADH, G4PIQ, G4VXE (outgoing *RadCom* Sport Radio columnist) and MM0CCC stepped aside and our thanks are extended to them for all their hard work over the years. There was also a handover of the Committee Chairmanship at the end of 2009, when Ed Taylor, GW3SQX took over the reins. I wish Ed all the best for his period in the hot seat, but remain on the Committee myself as I continue to manage the ever-popular IOTA Contest.

Contesters are, by their very nature, competitive and, frequently, highly opinionated and chairing the Committee is both a challenge and a privilege as a result! I want to thank all those who have served on the Committee during my three years as Chairman for their support, enthusiasm and hard work, and wish them well for the years to come.

D Field, G3XTT

EMC COMMITTEE. Recalling the breadth of our involvement over the last year, I am forced to wonder how any of the volunteer EMC Committee members have found time to do any operating. However, I can assure you that we do listen on the HF bands quite frequently, and sometimes get to have a few QSOs. It is an important aspect of our work, keeping aware of band conditions and listening to the many comments (complaints) about band noise. To supplement this, the committee attend various gatherings where we are able to meet members and discuss their problems. This may be at the National Hamfest, RSGB Convention or at an evening club meeting.

Electromagnetic Compatibility (EMC) is, of course, a two way subject, but interference with our reception is perhaps uppermost in many mind with the ever increasing proliferation of electrical and electronics into every aspect of our life. Some of these are quite benign, offering no threat to our hobby, and no obvious interference. Others pose a serious threat, both now and for the future.

The ever expanding application of switching technology in power supplies is perhaps the biggest concern. Switched mode power supplies appear in so many disguises, and creep into our home almost unnoticed, cell phone chargers, low voltage lighting in bathrooms and kitchens, chargers for children's toys, and even battery chargers for motor vehicles or lawn mowers add to the list. It is almost impossible to avoid them in computers, external disk drives, routers and modems, etc. Over the last few years we have attempted to identify all of the applications, and David Lauder has revealed them in his regular EMC column in *RadCom*. We have implored every HF users, active radio amateur, or short wave listener, to be ever vigilant, and keep their local pollution to a minimum.

Much has been made of the pollution caused by PLT devices, and the EMC committee has concentrated a great deal of effort investigating, and counselling members on the issues. Where interference from these sources has been identified, a complaint to Ofcom has in many cases resulted in a remedy. Best results have come about thorough scientific investigation by members. It has been recognised that we share the responsibility for indentifying the source, and/or the user of PLT. This has been a positive aspect of our work over the year. I believe that Ofcom welcome this initiative.

Keeping the HF spectrum clear of pollution has been another consuming passion for committee members, who contribute to the work of International Standards, both home and abroad. I would like to highlight the continuing work of Richard Marshall, G3SBA, who has gained respect by the EMC community for his outstanding work.

Richard identified mechanisms by which PLA's pollute by inter-modulation, that spreads the effects very widely throughout the HF spectrum and up into the VHF spectrum. The first result of his work is reported in David Lauder's column in February 2010 *RadCom*. Some of his other contributions are set out in the *EMC Journal* supplement, 'Greedy PLT'. See www.theemcjournal.com.

Richard's work on interference from TV receivers will in due course result in an amendment to the product standards, from which we will all benefit in due course.

There are always causes of frustrations in our work, and for members afflicted by interference. I recall that at long last a member in the West of England is again able to listen on the HF bands, after more than two years of interference from a nearby pumping station. The EMC committee persuaded the member to put pressure on the area Water Authority, and he was able to demonstrate the problem, which was caused by poor earthing of the thyristor controllers for the pumps. This was a most interesting case, in that the member had done an excellent job of investigation and was able to pin-point the source, but he did not complain to Ofcom. The reason for this was the ever present threat of a £50 charge. In this and many other cases where good ground work has been done, there is no prospect of the fee being applied.

Other cases have been dealt with within weeks, especially where the members has been able to point Ofcom at the exact cause in the first place, and at no cost, other than a commitment of time to conduct an investigation.

Whilst the number of cases of interference being caused by amateur radio has significantly reduced, there have been a number of cases throughout the year. In many instances defects were found in the interconnection of apparatus. Poor quality SCART cables, and or ground loops between TV and recorders figure highly. Usually the EMC Advisor in a region is able to help, and they are always backed up by the EMC committee itself.

The EMC committee conduct a constant vigil for technology or changes that threaten our hobby, and this year there have been two notable causes of concern. First the Government has stated that by the year 2020, every home in the UK should have an energy monitor. There are actually two facets to this, one is Energy Monitoring and the other is Smart Metering. Our concern is that the implementation of Energy Monitoring will use PLT, and that Smart Metering may require the more aggressive form of Access PLT. The committee is tuned into the exchanges taking place, but fearful that the EU is dealing with the subject behind closed doors to forestall any objectors. Our objective will be to open those doors!

The Committee welcomes the creation of the Spectrum Defence Fund, which should help defray some of the costs of combating the introduction of spectrum-invasive technologies.

Secondly, the so called Digital Dividend, which results from the imminent closing down of analogue TV services throughout the UK, may have an unwarranted and unexpected impact. It has been proposed that the released bandwidth should be used by cellular telephony services, a seemingly inconsequential change. Industry experts were however quick to recognise that a new interference potential will be created. Our TV services presently enjoy a large and relatively well protected UHF spectrum, but the intrusion of cell phones would result in a huge potential for localised interference. Broadband amplifiers and set top boxes have poor immunity, and even a watt or two will cause overload. This is the sort of thing that 70cm operators encounter. Our concern is that more complaints will be unwittingly attributed to us.

The RSGB has a commitment to support the work of Society volunteers who attend Standards meetings, and I would commend this as a very wise investment. We are able to contribute a lot to the meetings, which in turn benefits our hobby. I was very please to hear amateur radio being described by Don Hierman the President of CISPR (Special International committee on Radio Interference) at its plenary session in France, as being the 'eyes and ears of the industry'. His comment shows very real recognition of the contribution we make.

A message communicated so many times throughout the year is, "don't give up on EMC, work with it, work on it, but be prepared to compromise".

John Pink, G8MM

EMERGING TECHNOLOGY CO-ORDINATION COMMITTEE. The aims and objectives for the ETCC are to develop and enhance the UK Amateur Radio Repeater and Data Communications systems and promote the introduction and rollout of appropriate new technologies.

Main Activities

1: To receive, scrutinise and advise on all proposals in respect of analogue and digital repeaters and data communications systems.
2: To process finalised and agreed proposals onwards to Ofcom.
3: To liaise with Ofcom and other bodies.
4: To represent the ETCC at clubs, radio rallies and similar events.

A full list of Office Bearers and committee members and how to contact them can be found on our website at www.etcc.rsgb.org.

Digital nodes and repeaters continued to be a hot topic this year. The UKIT Team who had come together on an ad-hoc basis to provide help to groups on digital implementation and network infrastructure were doing first class work but it had become apparent that they themselves needed support. As a consequence our Board Member Dave, M0OBW convened discussions between the ETCC and the UK Interconnect Team, resulting in Darren Storer, G7LWT joining the ETCC in October. Darren now represents D-Star implementation and support issues to the ETCC and provides a conduit for information on this rapidly developing area.

In the best traditions of amateur radio it was gratifying to see a number of people taking up the challenge of developing software and adapting analogue hardware to provide a home grown solution to D-Star. Full interworking with the existing network infrastructure is now possible and those involved must be congratulated on this important achievement. We also received a number of enquiries about the possibility of establishing simplex digital gateways and after representations to Ofcom licensing parameters were agreed. Some of these digital gateways are now on the air and providing digital access to areas which can not justify the expense of a 'full blown' duplex node.

It is of interest to note that the ATV side of life is also developing and keeping in mind both spectrum conservation and emerging technologies, a number of ATV repeaters are going over to DVB-S modes both for inputs and outputs.

It is still a sad fact that some amateurs find it amusing to make life difficult for others by jamming and deliberately interfering with repeaters and the packet radio system. It was also somewhat depressing to hear a short time ago about the first case of interference to a digital node. Discussions continue with Ofcom on how the perpetrators can best be dealt with and advice on combating abuse is available on the ETCC website www.etcc.rsgb.org. The imposition of curfews on certain repeaters has been quite successful in calming things down and is a very useful tool in the armoury against abusers.

The ETCC website, which is provided and maintained by our Proposals Manager Colin, GM8LBC, provides a comprehensive source of

National Hamfest

information on all aspects of repeaters in the UK. We are indebted to Colin who does a first class job in providing this service.

One new development on the website has been the addition of a 'status' area that shows the current known condition of all licensed repeaters. Feedback is invited to bring this record up to date and this has revealed some interesting facts about the poor operating condition of quite a significant number of repeaters. Arising from this feedback our webmaster posted the following statement:

"Putting up and maintaining a repeater may soon become more complex as the criteria for processing repeater applications will be tightened. Against the backdrop of low activity levels and poorly performing repeaters, the need to justify new applications is likely to be enforced to a far greater extent. Long term non-operational repeaters, repeaters licensed but failing to commence service and repeaters nominally operational but widely reported as being either deaf or inaccessible for other reasons have become all too prevalent. The recent interest in digital modes, in particular GMSK, has been a welcome boost to the repeater sector of the hobby, but challenges to amateur use of bands above 2m is likely to require even greater proof that we 'need' and value these bands and to support our Society in seeing off commercial interest in 70cm and above. The focus on radio spectrum is going to intensify in the coming decade; we radio amateurs have to be seen to have our house in order and make good use of the valuable bands at our disposal in the so called 'sweet-spot' of the radio bands."

The ETCC would therefore encourage all repeater keepers and groups to ensure that their installations are maintained to a high standard. Our very experienced Regional and Specialist Managers are always available to help via the contact forms on the website. One of our main targets this coming year will be to look at the network and follow up on any installations that are reported to be off air or under performing and to offering advice and assistance to restore normal operation. We will also be following up on those repeaters that have been licensed but have never become operational for one reason or another. If groups would like to have a visit from a committee member they only have to ask, see: www.etcc.rsgb.org.

A total of 249 new applications were received for Simplex Internet Gateways and 18 packet NoVs were issued compared with 10 last year. Gateways continue to be popular with digital modes starting to appear as previously noted.

In conclusion I would once again wish to thank all members of committee for their hard work and dedication in providing a professional standard service to the amateur community. Thanks are also due to our colleagues in the Ofcom Licensing Centre who we deal with on a daily basis and who always give very good service in licensing matters.

John McCullagh, GI4BWM

GB2RS NEWS. It has been stated many times that GB2RS News may be likened to a weekly newspaper, with the bulk of the editorial work being carried out each Tuesday and Wednesday. Thus Sunday has been the logical day of 'publication' ever since the outset in September 1955.

The last year has seen little change in the format of the GB2RS News Service. We still have just over 100 newsreaders, who share out between them the 80-plus individual readings that are put out every Sunday. Surveys conducted at radio rallies still show that the vast majority of our listeners like to hear the news on a Sunday morning. Whilst a significant number make use of the news on the internet, it is interesting to learn that some like to hear it on the air and to follow the same bulletin on the RSGB website as well. This finding is a little hard to explain, but many people tell us that they appreciate hearing the RSGB's presence on the bands each Sunday, and furthermore they enjoy the opportunity of taking part in the news nets conducted by most of our newsreaders. What is clear is that the GB2RS News Service continues to be an RSGB facility that both members and non-members value greatly.

The most significant change in the service area coverage of GB2RS took place during the last 18 months on 40m. Two radio amateurs in Germany, who are members of the RSGB and have the callsigns Guenter, M0DXM/DJ2XB and Colin, G3ISB/DJ0OK, have been reading the news in English on behalf of the RSGB. They do this using their own German callsigns, which is permitted by the German radio regulations. This reading goes out at 10am on 7150kHz (LSB) and covers the northern half of the UK as well as parts of Northern and Central Europe. This has resulted in the RSGB's highly detailed Propagation Report being drawn to the attention of many new listeners. To fill in the skip distance gap and cover the southern portion of the UK, John, GM3JIJ reads the news again from Stornoway on 7150kHz at 10.30am. This arrangement has shown how effectively the skip conditions on 40m during daylight hours can be utilised.

Coverage of the National news readings on 60m (5403.5kHz USB at 12.30hours) and after-dark on 160m (1990kHz LSB at 21.30hours), has also been improved by the addition of several new readers located across the UK.

Plans for later in 2010 include some news readings from the RSGB's new pavilion at Bletchley Park, which is still under construction at the time of writing.

This report is devoted to changes in the HF readings, but it is important to note that many news readings continue, as always, on VHF and UHF – where some fifty percent of our listeners are monitoring. Members may also like to note that during the past year the information about GB2RS on the RSGB's website has been extended considerably. Starting at the Home Page, first click on 'Members' Area'. Enter your callsign under 'User Name' and your Membership Number under 'Password'. Then click on 'News' and select whatever interests you from Broadcast Schedule, Podcast, E-mail alerts, Download Script, Archive, How to Submit News, Volunteer as a Newsreader and GB2RS History. If you can think of any other useful features that might be included, kindly e-mail gb2rs@ntlworld.com.

It is appropriate to conclude this report by thanking all our news readers and the RSGB's Editorial staff for their dedication to GB2RS.

Gordon L Adams, G3LEQ

HF AWARDS MANAGER. The HF Awards Manager is responsible for all Society involvement in the issue and adjudication of both HF & VHF Award Programmes with the specific exclusion of the IOTA Programme, which is run under quite separate rules and management structures. In addition to RSGB Awards the HF Manager is responsible for IARU Worked all Continents Award adjudication and further acts as a check point for ARRL Worked all States and *CQ* Magazine Worked all Zones Awards. Checking other National Society Awards and generally assisting RSGB members in day to day queries and adjudication. The benefits are obvious when local certification can be done on behalf of members thus avoiding costly airmail of QSL cards to overseas destinations.

A major part of activity is directly involved in day to day e-mail enquiries on award programmes in addition to RSGB, IARU, CQ and ARRL enquiries. A typical week varies from 10-40 exchanges. Individual claims can run from a basic 6-card claim for WAC to several hundred cards for the RSGB 5-Band Commonwealth Award with endorsements. Most enquiries arrive now through e-mail and tailored responses have been 'boiler-plated' to save time and effort.

This year card checking for applications was carried out at the RSGB Convention at Wyboston, the National Hamfest at Newark and at the GMDX Convention in Stirling.

Award Programme. The RSGB sponsors awards covering lifetime achievement awards and these take considerable skill & effort over a long period of time to accumulate the required confirmations. These awards are represented by the Commonwealth Series, which cover the basic 100 Commonwealth Call Areas through to the difficult 5-Band 500 Call Areas using 10-80m with special endorsements for WARC bands and 160m operation. The second award based around ITU Zone Areas and requirements to the Commonwealth Award but confirmations from the 75-ITU Zones.

The most popular Society sponsored award is the IARU Region 1 Award for confirmation of contacts with Region-1 member countries. It has 3 levels of achievement thus enables both new and more modest stations to complete the award. Region 1 covers Europe, Africa, Middle East and Russia. Considerable work has been carried out during recent weeks with the new Region 1 Secretary Dennis Green, ZS4BS to ensure the award rules are in line with current membership and official society names and abbreviations. A copy of the Region 1 award rules and certificate will shortly be added to the updated website. To date almost 7000 Region 1 Awards have been issued to all parts of the world.

A special Listener Award based around DXCC (DX-Century Club) is available to all Short Wave Listeners starting at 100 confirmed DXCC Entities. This award like so many others attracts a minority but extremely focussed group of listeners. Several with 325+ DXCC entities confirmed.

With the recent activity on low frequencies the award covering the 136kHz band has proved popular with our European friends.

A number of WAS claims from RSGB Members have been processed and during the year the new software was introduced to allow local printing of both WAC and the 5-Band award. This is proving popular as claims can be turned around without the two trips across the Atlantic to ARRL HQ.

The past year saw the integration of HF and VHF award processing and generally the VHF claims 6m Squares and Country Certificates form 75% of the workload. The remaining being 2m which is once again are small dedicated groups of individuals chasing awards.

The Microwave Awards programme was handed over to be administered by the specialist group of enthusiasts.

All new certificate awards on VHF and HF are listed in the *RSGB Yearbook*.

John Dunnington, G3LZQ

HF MANAGER. The HF Manager's remit covers all frequencies below 30MHz, and in common with the other spectrum managers' roles it deals with both domestic and international issues.

In terms of spectrum management the year has been relatively uneventful, partly on account of it being immediately after the IARU Region 1 General Conference and still some years off from the next ITU World Radiocommunication Conference (WRC), which has been put back to 2012.

EMCUK Exhibition

The main area of work has been to develop our position on the agenda item for WRC-12 that concerns gaining a band near to 500kHz. Working with our fellow amateurs within IARU, the IARU Region 1 500kHz Working Group and through active participation in Ofcom's International Frequency Planning Group and their UK WP5A group, proposals for the band were drafted for the UK to submit to CEPT's Conference Preparatory Group PT-C and to ITU-R WP5A. The September meeting of the PT-C was attended, which gave the opportunity to meet both the supporters and those opposed to the proposed band. There is still some time to go before the preparation process in completed and, as usual, it will be a mix of technical argument and the seeking out and the gaining of 'political' support.

Looking more closely at home, a submission was successfully made to Ofcom to extend the period of NoV access to both 501 – 504kHz, and a request made for an extension of NoV access to the various channels near to 5MHz, beyond 30th June 2010. One of the duties of the HF Manager is to participate in the approval process for the issuing of 500kHz NoVs; I am pleased to say there has been a steady stream of applications for 500kHz NoVs, all of which have been successful.

Although, at the end of March the anticipated removal of the broadcasters from 7100 – 7200kHz went better than perhaps had been expected, there has been some lack of response to some aspects of the new band plan for 40m. In particular the transition between the 200 and 500Hz bandwidth segments, which moved from 7035 to 7040kHz, has been slow to be adopted. With coverage in *RadCom*, the *RSGB Yearbook* and the web it seems that one cannot overdo the communication! Of course a part of the problem is that not all countries have yet to implement the WRC-07 agreement to allocate the additional 100kHz above 7100kHz to the amateur service, so one can understand the reluctance by some amateurs in those countries affected to adopt the 'new' band plan.

With 2010 being roughly midway between the triennial IARU Region 1 Conferences there has been an opportunity to look at the issues that members feel should be discussed at what is termed the Interim Meeting and also look at those issues that other countries wish to raise. One of our affiliated clubs, the CDXC, is keen for us to again press the problem of deliberate QRM as the educational approach has not so far reduced the scale of the problem. The other issue that we want to discuss is the usage of HF Internet Gateways and to look at the longer-term consequences of remote transceiver operation. In preparation for the meeting, in February 2010, our position on various papers by other countries, such as the IARU HF Championship Contest rules, 500kHz and 5MHz band plans have been determined.

A number of volunteers continue to support our experimental access to 5MHz channels, either through the 5MHz Working Group, through the provision of the beacon chain, the collection and processing of its data for the 5MHz Experiment. The 5MHz Working Group, which has not needed to be particularly active, has discussed and agreed a proposal to be put to Ofcom for easing some aspects of 5MHz operation now that several countries have access to channels that we are allowed to utilise.

Late in the year we received a formal response to our long-term concern over interference on the 136kHz band from the LORAN-C station at Anthorn. Whilst a technical solution to what is called the 'spectrum mask' could possible reduce the problem somewhat, the operators of the station deem that the expense could not be justified. Maybe this is a precursor to the demise of the system, as has been the case in the US.

John Gould, G3WKL

INTRUDER WATCH. Russian military data signals dominate the list of intruders on the HF amateur bands. The majority are transient and are gone within a couple of days but they do take up room on our supposedly exclusive amateur bands.

Broadcast station faults were once again the main subject of reports to the Ofcom monitoring station at Baldock. Interference on the 160m amateur band was traced to a fault at the Radio Gloucester transmitter on 1413kHz. A faulty oscillator section was replaced and the problem was solved. A wideband noise rendered 7150-7200kHz unusable until Baldock identified the cause as a faulty DRM transmitter on 7265kHz at Wertachtel in Germany. The authorities were informed and the problem disappeared when the transmitter was replaced.

An AM broadcast signal with low modulation was reported on 7030kHz. Baldock determined that it was from a site near Minsk in Belarus. The signal appears to be the result of interaction between transmissions on 7390 and 7210kHz from the same site. Despite a number of complaints from Baldock, nothing appears to have been done. Frequency changes for the autumn schedule appears to have solved the problem for the moment. The spring schedule may mean a return of the problem, observations will continue.

A NATO data signal appeared on 14002kHz, Baldock determined that it was coming from Diego Garcia and saw it disappear as soon as enquiries were made! A persistent rough tone has been appearing around 7045kHz on a daily basis, its origin has been determined as Novosibirsk in Russia. Baldock have made a number of complaints but no remedial action by the Russian authorities as yet.

A distorted data signal on approximately 3727kHz was discovered to be related to an established VLF signal on 81.01kHz, transmitted from within the UK. Although the level of the spur was below the permitted maximum, the signal on 3727kHz was covering the UK. Tests between Baldock and the site reduced the level further.

A carrier appeared on 1830kHz and remained in place for several days. It was audible over much of Europe and was eventually traced to a village in Suffolk. An Ofcom representative found the house where the signal originated, it belonged to a licensed amateur who was away. He was eventually tracked down and another amateur gained access to the house and turned off the transmitter. No callsign has been made public, but we know who you are!

Chris Cummings, G4BOH

IOTA COMMITTEE. The main job during the year has been to service the IOTA community through its primary tool, the IOTA website. This provides not only detailed up to date information, open to everyone, on activity and on the IOTA Programme generally, but also, following registration, an on-line password-controlled application facility for securing score credits and awards.

As the year changed, IOTA passed its latest milestone as the 7000th person registered for access to the on-line facility, a 16% increase on the position at end 2008. Compared with the previous year, 2009 enjoyed a 20.4% increase in credits confirmed by checkpoints and an overall 10.8% rise in applications processed. Although it falls outside the period under review, rolling the 12 month comparison period forward just one month (February to January) to cover the annual Honour Roll update exercise, we saw even more impressive figures, increases of 32.4% for credits given and 20.4% for applications processed.

Calendar year 2009 saw 125 new applications for the basic IOTA award, and, overall, 576 certificates, 23 Plaques (750 Islands) and 4 Trophies (1000 Islands) issued. Comparable 2008 figures were 104 new applications and 502, 16 and 6 awards respectively.

What are the reasons for this very satisfactory growth? While it is spread fairly evenly across all checkpoints, the largest contribution has come from Brazil following the reappointment in September of a local checkpoint after a decade of the country's IOTA chasers being serviced by a checkpoint outside the country. Amazingly, we have had some 5400 cards checked in Brazil since September, from 30 applications, 15 of them all-time new. We now have 21 checkpoints in 18 countries. As ever, the contribution they make in processing applications, in handling enquiries and in representing IOTA locally at conventions and rallies is a major factor in the programme's success.

Acknowledgement must also be made of the close cooperation given the Committee by staff at RSGB Admin Centre, particularly in the expeditious handling of the issue of certificates and prestige awards. At a more strategic level we were pleased to see in October a three year extension to our sponsorship agreement with Icom UK under which the company provides valued support to IOTA. Mention should also be made of the financial and promotional help that a number of organisations, notably the Island Radio Expedition Foundation (IREF), companies and individuals give to IOTA DXpeditions to enable them to take place.

As regards future plans, the Committee sees as its top priority the continuation of the high level of service to the IOTA community. This extends not just to running the award-issuing programme but also to the establishment and maintenance of close contact with island DXpeditions, encouraging activity, validating operations when necessary from the 'rarer' island groups and dealing with island qualification issues relating to rule compliance. The IOTA team expects to continue its programme of software enhancements to the website and on-line application facility. We will continue to appoint checkpoints where we see a need.

With the welcome reappearance of sunspots, the IOTA community can look forward to a marked improvement in band conditions, and with it greater opportunities to make those difficult island contacts with modest equipment on the higher frequencies. This will undoubtedly lead to enhanced interest in the programme. A recent well-based statistical analysis concluded that there are some 20,000 amateurs at any one time following the programme seriously, ie will make IOTA contacts on "some kind of consistent basis because they are IOTA". This will not be the same 20,000, year on year, because of regular movement in and out of active operating or, for one reason or another, island-chasing. Taking a three year spread, the IOTA community could number potentially 30,000. This continuing upsurge of interest is reflected daily on the bands with no shortage of contacts for those who choose to make the boat trip.

Roger Balister, G3KMA

MANAGEMENT COMMITTEE. The Management Committee assists the General Manager in the running of the affairs of the Society and advises the RSGB Board on business strategy, focusing particularly on the issues of finance and commercial performance, membership numbers and business development.

The membership of the committee is a mix of people with business experience and knowledge of amateur radio affairs and it includes Board and Regional Council representation. During 2009 it met bi-monthly at Bedford but for 2010 alternate meetings will be held by teleconference, in order to reduce costs.

At each meeting the MC closely reviews the financial and commercial performance of the Society. It is particularly concerned to ensure that the Society continues to develop services to members whilst maintaining a viable year to year financial position and the investments and other assets are managed carefully.

With the construction of the new National Centre for amateur radio now under way at Bletchley Park, the MC is aware that there is now a great opportunity to showcase amateur radio to a wider public and to stimulate membership numbers. The MC is aware that it will be important to ensure that the investment in the creation of this centre does deliver benefits for the RSGB and for the amateur radio generally in the UK.

The committee recognises the value of the sponsorship of the IOTA programme by Icom UK as an RSGB flagship enterprise. The business aspects of the RSGB Convention, formerly the HFC, are monitored by the committee and all concerned were pleased with the continued success and development of the event. Similarly, it was satisfying to see that the new National Hamfest at Newark, in conjunction with the Lincoln Short Wave Club, was a business and social success.

The Committee is closely involved in the setting of the annual budget and whilst the Year End position for 2009 was difficult, the Society remains in a strong financial position with substantial reserves.

For 2010 the Committee will aim to ensure that in year operational costs and income are in balance whilst sustaining the present level of services.

The number of members at the end of the year 2009 was 22,265.

Angus Annan, MM1CCR

PLANNING ADVISORY COMMITTEE. The year started quietly with the number of planning applications and appeals noticeably down on previous years but recovered quickly in the second half of the year. It would seem that the amateur radio community is doing its best to lead the country out of recession.

Success wise it's been a mixed bag with most radio amateurs contacting the Planning Advisory Committee not coming back to ask about how to make a planning appeal. Although we can't be certain, it does suggest they've been successful in their planning application first time around. We love success stories but only tend to hear bad news whenever a planning application is refused or enforcement notice is issued so please remember to tell us of your successes too as it maybe useful to others in your area.

For some time now the Society has been concerned by the number of Local Planning Authorities requesting ICNIRP certification to ensure they are no safety concerns arising from RF emissions from the proposed antenna and mast. Planning Guidance PPG8 Telecommunications and its national variants makes this a planning requirement for mobile phone masts but does not mention it as a requirement for other telecommunications development such as amateur radio. The Society's position is that it is not a planning requirement and has successfully argued this in a number of planning appeals. Recently a member lost a planning appeal and amongst other reasons for refusal the Planning Inspector indicated that in his opinion the Local Planning Authority was within its rights to consider RF emissions and their possible health and safety impact.

This is a single case and an individual Planning Inspector's decision does not set precedents for other appeals, however it is persuasive. A Planning Inspector can choose to accept or ignore the comments from another Planning Inspector on a similar

installation when considering an appeal brought before him/her.

It is possible to appeal to the High Court on the basis that Inspector was mistaken in their decision, which could be successful. This is a risky strategy as in these litigious times the Court may decide on a cautious approach similar to that recommended by the Stewart Report for Mobile Phone Masts and decide that ICNIRP certification is desirable. This would be in line with RF safety requirements in some other EU countries and would effectively make it a legal requirement for all amateur radio stations to provide an ICNIRP safety statement should the Local Planning Authority require it.

As there is no certainty of success the Society been decided to take a more cautious approach at this time and will lobby the Department of the Communities and Local Government to make it clear that the recommendations of the Stewart Report for ICNIRP Certification contained in PPG8 Telecommunications was never intended to include amateur radio.

This is a far from simple process and it is possible that the Department of the Communities and Local Government will require independent assurances that there is no health risk associated with amateur radio masts and antennas before making such a recommendation.

Further information on ICNIRP Certification can be found at:
http://tinyurl.com/IARU-ICNIRP
http://www.icnirp.de/
http://tinyurl.com/HPA-ICNIRP
http://tinyurl.com/Stewart-Report
http://tinyurl.com/PPG8-Telecommunications
Len Paget, GM0ONX

PROPAGATION STUDIES COMMITTEE. One of the highlights of PSC's year was the National Hamfest at Newark. Steve, G0KYA, and Leslie, G0CIB, put together a striking and interesting stand and manned it through the entire event. This was an opportunity for many members to quiz them – and many did – and for them to discover directly the range of topics about which members wanted to know more. Not the least among these was what was happening to cycle 24, and were we facing a new Maunder minimum? (No). We expect to return to face the music again in 2010. Cycle 24 was also tackled by Gwyn, G4FKH, at the RSGB convention. G0KYA spoke at the convention too, on HF propagation and on WSPR.

Cycle 24 proved a bit of a conundrum throughout the year. This was partly because there was an absence of consensus among professional space physicists, and partly because we were passing through one of the deepest and protracted solar minimums on record. Neil, G0CAS, and Martin, G3USF, who continued producing a solar report and forecast in two versions each week for GB2RS, did their best to put the continuing dearth of sunspots in perspective and to find new angles on a barely changing landscape while avoiding undue excitement about what few developments did occur. Thanks to the additional 40m newsreaders in Germany and the Hebrides, organised by Gordon, G3LEQ, the GB2RS reports were now more widely received both within the UK and across large areas of continental Europe. G0KYA also contended with the challenges of covering a prolonged solar minimum in his monthly HF propagation report for This Week in Amateur Radio; which was also carried by an iTunes podcast and at www.g0kya.blogspot.com. Gwyn, G0FKH, continued his longstanding monthly HF forecasts to *RadCom* with a much expanded version at www.rsgb.org.uk/propagation/index.php and a version for white stick operators at www.rsgb.org.uk/propagation/WSops.xls.

With a new cycle on its way G0CAS created a web page, http://spotsandflares.lefora.com, devoted to the speedy reporting and discussion of developments on the Sun with implications for radio propagation. This rapidly attracted a healthy level of support. Meanwhile, Tomas, NW7US, one of our overseas associates also circulated information about changes in the radio weather at http://prop.hfradio.org and via Twitter. He continued his activity as contributing editor at *CQ* magazine, *CQ VHF* and *Popular Communications*.

G3USF compiled the Six and Ten Report, covering activity on 28 and 50MHz, and maintained his comprehensive lists of HF beacons (www.keele.ac.uk/depts/por/28.htm) and 50MHz beacons (www.keele.ac.uk/depts/por/50.htm). These were again carried by the publications of several national societies. The *RSGB Yearbook* propagation section was also refreshed by G0KYA.

Among members publishing papers, G0KYA rounded off his Band of the Month series in *RadCom* and Alan, G3NYK, contributed three articles to *RadCom* on LF/VLF; Sam, G4DDK, contributed his regular microwave column, also to *RadCom*. Marcus, G0IJZ, presented a paper on the Extraordinary Wave Mode to the 11th IET International Conference on Ionospheric Radio Systems and Techniques, 2009. Barry, G8AGN, spoke on amateur experience with passive bistatic radar at the Yorkshire Microwave Round Table, G0CIB gave several talks to local clubs on the International Beacon Project, Ron, G3SVW, had a particularly full programme of propagation talks at his local club in Manchester in addition to ensuring that the Intermediate and Advanced candidates he tutored in Scotland achieved a sound grasp of propagation. Work in progress included Graham, G3TCT, preparing a presentation on aurora, Marcus, G0IJZ, comparing 5MHz beacon measurements with VOACAP simulation, G8AGN and Dave, G0DJA looking at aircraft scatter and G3SVW with a small group looking at the applications of time measurement to ionospheric height sourcing and signal transit time variability at HF. Finally, I must recall the valuable contribution of our corresponding members and overseas associates via the PSC reflector. We are fortunate in being able to draw on the wide range of knowledge and experience they represent.

Our plans for 2010 inevitably include 'more of the same' because so much of what we do is a continuing service to members. With cycle 24 at last getting under way at the start of the year we will be monitoring it closely and reporting back, looking forward to be able to draw on the information that will be coming on stream from the new generation of spacecraft, which will be providing faster and more detailed information about solar dynamics. And we will be reviewing the scope, presentation and management of the committee's web page, www.keele.ac.uk/depts./por/psc.htm, now well into its second decade with its comprehensive listing of propagation-related websites.
Martin Harrison, G3USF

QSL BUREAU. The bureau has experienced a mixture of success and frustration during 2009, largely due to factors outside its direct control.

It was discovered in March that QRZ.com was still publishing the old bureau address and as late as July some 20kgs of delayed cards were still being retrieved by Headquarters and sent by carrier, as it is not possible to redirect a PO Box out of area.

The bureau managed a number of volunteer sub manager changes, throughout the year, the most significant being the largest, the GB special event series and it also opened 3 new sub groups for M6's.

For the first time, an in-house, detailed sorters manual was developed and introduced to further improve the accuracy of cards being sent to sub managers. From an initial target of a 2% error rate, set in 2008, current feedback indicates it to now be around 1% – an amazing result – reducing time and cost in routing incoming cards to correct destinations.

All sub groups now receive deliveries to a common timescale, regardless of quantity, together with a newsletter advising the next despatch period, aimed at better meeting user expectations. In September, the system was augmented by a new, free, pre-paid returns scheme for all managers. Its aim; to ensure the prompt return of mis-sorted cards.

Due to the exceptional weather conditions some of the final despatch for the year slipped into January but a total of some 650,000 cards were sorted and sent to UK managers during 2009.

With regard to outgoing cards, shipping costs, at the start of the year had already begun to rise sharply. Costs outside the EU, began to rise more than could have been reasonably predicted due to the worsening economic situation. This could not have occurred at a more inopportune time when the bureau was turning its attention to building up the overseas distribution. By the first quarter costs had risen 25% with no sign of slowing and the Board was made aware of concerns. The bureau's main provider pulled out of several destinations, including America, Russia and other ex Soviet destinations, also increasing costs to Europe and the Pacific Rim. In the second and third quarters the bureau had to use several different companies and routes, including costly personal air mail, shopping around for each despatch in order to maintain service whilst trying to find another long term partner prepared to offer trade distribution rates.

This proved to be an extremely frustrating period as all carriers appeared reluctant to take on new business and prices changed per shipment, against the value of the pound. Increasing the average weight to popular destinations, from 10kg to 25kg, brought some short term cost savings, but did not resolve the issue.

However, even with additional sorters, it became apparent that whilst the bureau's remit is not to be the quickest way to send a QSL card, only the most cost effective, that increasing the package size to gain a cost saving, would not ultimately meet some user expectations and that delays would continue.

It also brought the bureau into conflict with customs in certain countries as they refused to accept large shipments as non commercial, printed paper, imposing customs charges. Fortunately, by the last quarter, it was possible to find another provider, capable of distributing to all IARU destinations. Costs were significantly reduced and volumes began to increase in the final quarter and have continued into the New Year.

The bureau is now more positive that it can continue to stay within its budget, having shipped approximately 400,000 cards by weight, over the last year. This being 25% down on its own internal projection. The position has been recovered and provided that there are no more shocks to come in the wider economy, there is now a stable platform on which to build in 2010.

During the year the bureau looked more closely at what was being sent. Whilst the majority of cards were satisfactory, a number of abuses of the bureau were recognised, including significant numbers of users, providing out of date or no membership details.

Some clubs, societies, QSL managers and individuals were including cards from both members and non members, with no verification, together with cards from overseas amateurs, not intended for UK delivery. The increasing use of large, non standard cards, multipage QSL cards and envelopes containing additional paper, letters, money orders and other items, was found to be a significant problem, compromising the bureaus ability to avoid customs charges and secure printed paper shipping rates. With up to a third of all cards now larger than standard postcard size, it is increasingly becoming a cost issue.

In some instances clubs and contest groups have ignored the instruction to send their top ten destinations direct to the country of destination, some sending up to one or two thousand cards for a single country and a single activity. In the coming year the bureau will, by necessity, have to take a stronger line on

these issues, but hopes to overcome many of the anomalies by a programme of user education.

The 2010 *RSGB Yearbook* information was re-written in a simplified bullet point form and for the first time included an in depth look at posting and secure packing of cards to the bureau.

A *RadCom* article on holiday QSLing and the problems associated with the incorrect use of prefixes and "via" destinations, in July, appears to have had some effect on incoming cards.

The bureau presence at both the National Hamfest and the RSGB Convention was well received. Lincoln was exceptionally busy with enquiries and the PowerPoint QSL display received much interest and praise.

Regular e-mails and calls to the bureau asking for advice and information has highlighted the need for greater awareness of how the bureau operates and what the requirements are for its use.

To this end, *RadCom* will be providing information, throughout 2010, covering specific aspects of QSLing with input from sub managers.

The bureau is looking forward to further improvements in its operation, in 2010. It has already identified that there needs to be rationalisation, within the UK distribution network. Some sub groups are, for various reasons, now quite small. It recognises that there is an overdue need to re distribute and harmonise a number of sub groups, to better reflect activity in order to speed up sorting times and make the system easier for all to follow.

Richard J Constantine, G3UGF

National Hamfest

SPECTRUM FORUM. The annual meeting of the Spectrum Forum took place in September with a good representation from RSGB committees and special interest groups. Matters discussed ranged from beacon planning through to WRC-12 preparations. Despite being an original member of the Forum the UK Six Metre Group remains conspicuous by its absence. Any RSGB affiliated special interest group that has an interest in spectrum usage is welcome to join the work of the Forum.

During the year AMSAT-UK announced a new amateur satellite project - FUNcube. It has the primary goal of enthusing and educating young people about radio, space, physics and electronics. It will also carry a low power, 30kHz bandwidth, 435 to 144MHz linear transponder for weak signal CW and SSB working. BATC reported that 3 digital ATV repeaters were now in use but progress in licensing new repeaters in the microwave bands was slow due to lack of available frequencies being agreed by the primary user. The new Society policy regarding the support of beacon projects had been agreed by the Board and was brought to the attention of the Forum.

The ETCC reported on the rapid growth of D-Star repeaters and the resultant lack of available channels on 2m. New applicants are recommended to apply for 70cm and 23cm GMSK nodes. A survey is also to be carried out to identify currently licensed but inactive repeaters. Members of the ETCC have also been involved in designing and producing non-industry specific equipment for use with the D-Star networks.

The problem of undisciplined operation and spectrum abuse on the HF bands continues to generate discussion. Although many of the signals have been identified as originating in Eastern Europe there appears to be little enthusiasm by the national societies or the administrations concerned to identify and take any action against the offenders. CDXC reported that it now sends out a copy of the IARU's 'Ethics and Operating Procedures for the Radio Amateur' booklet to all new members. The Society remains committed to trying to influence the thinking of the national societies involved through the IARU structure.

With the failure of Ofcom management to take the problem of PLT spectrum pollution seriously, resulting in a major increase in the workload of the Ofcom field force, the RSGB Board agreed to seek legal advice. As a result of this and considering the likely costs involved, a Spectrum Defence Fund has been established to help support this and any similar legal challenge that might occur in the future.

Spectrum Forum members continue to provide responses to the various public consultations generated by Ofcom, CEPT and the European Commission. Of particular interest are the consultations regarding spectrum usage planning for London 2012. Planning is still at an early stage but it is anticipated that any usage of primary amateur service bands will be minimal.

Preparation for the World Radio Conference 2012 (WRC-12) continues and contributions to support a possible secondary allocation around 500kHz are being presented to the various organisations studying this agenda item.

Finally, as retiring Spectrum Director and Chairman I would like to thank the Forum members for all the support provided since the inception of the group. The Spectrum Forum remains an important tool in the work of the Society.

Up to date information regarding the Spectrum Forum can be found at www.rsgb.org/spectrumforum.

Colin Thomas, G3PSM

TECHNICAL FORUM. The Technical Forum held its first meeting in June 2009 in London. The progress of peer review of technical articles was discussed in a very positive light. The result of this important activity by the Forum has been a significant increase in the technical level of *RadCom*, which I hope that members will have noticed and appreciated. The Forum will be looking not only be looking at projects such as technical building blocks but also trying to broaden the appeal of the magazine from the experienced radio amateur to the newcomer too. The activities of the forum are reflector based, which not only facilitates ideas but enables every participant of the forum to know what is going on so expertise can be added accordingly. In addition, the important issues of the hobby are being addressed on an ongoing basis. If have ideas on what you would like to see in your magazine the Technical Forum would be delighted to hear from you. I would also like to thank those members of the Technical Forum who have given so freely of their time.

RSGBTech (http://www.rsgb.org/rsgbtech/about.php). The RSGBTech site on Yahoo is open to all radio amateurs to discuss amateur radio related matters be it technical query or area of interest. It has been operating successfully for about a year and to date (February 2010) has just under four hundred radio amateurs from around the world taking part, sharing their expertise, knowledge and experience for the benefit of fellow radio amateurs. The breadth of subjects covered so far is beyond the scope of this short report but there is always some area which sparks the imagination to the next project with the soldering iron. You never know it could even be the subject of the next technical article in *RadCom*!

Leslie Butterfields, G0CIB

VHF MANAGER.

Bandplans. Work has been carried out to update the national VHF and UHF bandplans following the recent IARU Region 1 conference in Cavtat, Croatia. The FM calling frequency 51.510MHz has been reintroduced into the 50MHz band plan having been inadvertently omitted in the previous year. You would not believe how many times I read through the bandplan to make sure these mistakes didn't occur!

Spectrum Forum Website. The RSGB Spectrum Forum website is a grouping of the RSGB HF, VHF and Microwave Managers, all RSGB spectrum related bodies and other special interest groups.

During the year the VHF and UHF pages www.rsgb.org/spectrumforum/vhfuhf have been completely updated with new material. Covering the 50, 70, 144 and 432MHz bands, each individual page has details of licence conditions, a detailed look at the band plan with explanatory notes, how to get started and what equipment you will need, propagation modes and how to keep up with the latest developments, activity period and contests.

Special Research Permits. The SRP/NoV process continues to work well, with the exception of the 432MHz band. The number of enquiries however has reduced somewhat in recent years.

UK VHF Beacons. To assist the RSGB Board I wrote a positioning paper on the number of UK propagation beacons needed to provide an effective service within the VHF and UHF bands. The paper particularly identified the strengths and weaknesses of UK beacons stations in the 50, 70, 144 and 432MHz bands. It is still of considerable concern that a number of VHF and UHF propagation beacon are being forced to closed down permanently. Primarily this is due to funding issues associated with commercial broadcast sites. The situation is particularly poor on the 432MHz band where it is expected that only two UK beacons units will remain active. So if there are any members out there, with a suitable QTH, willing to host a beacon (or two) then please contact me!

Power Line Telecommunications (PLT). It is of concern that ITU-T (Telecommunications Standardisation Sector) recently announced a PLT standard going up to 200MHz. Therefore in addition to providing protection for the HF bands a proposal for the protection of the 50, 70 and 144MHz bands is being formulated.

As a member of the IARU Region 1 VHF/UHF/Microwaves Committee I have represented the RSGB in International VHF/UHF liaison work. This has been mainly been regarding band planning issues but particular emphasis has been made with the possible expansion of the 70MHz band throughout IARU Region 1. To this end I have assisted a number of fellow VHF Managers in developing proposals being presented to their national administrations.

IARU Region 1 Meeting, Vienna, February 20-21 2010. In preparation for the IARU Region 1 interim meeting held on 20-21 February 2010 a number of proposals were written and forwarded to the Region 1 VHF/UHF & Microwave Committee.

The papers discussed Moonbounce and Meteor Scatter allocations within the 50MHz band and the use of alternative frequencies (69.950MHz) near to the 70MHz band. More significant was a proposal to move the current 50MHz beacon band (within IARU Region 1) to 50.400-50.500MHz. Unfortunately, for health reasons, I was unable to attend the Vienna meeting but I was there in a virtual sense, making use of the Skype service to present my papers.

David Butler, G4ASR

Formal Minutes of the 82nd Annual General Meeting of the Radio Society of Great Britain

HELD ON 18 APRIL 2009 AT THE NOVOTEL NEWCASTLE, PONTELAND ROAD, KENTON, NEWCASTLE UPON TYNE

RESOLUTION 1

To receive and, if approved, confirm the minutes of the 81st Annual General Meeting
Proposed: Mr J Stevenson, G0EJQ
Seconded: Mr Jim Nichols, G0EUN
The motion was carried unanimously.

RESOLUTION 2

To appoint the auditors Sayer Vincent and to authorise the Board to fix their remuneration.
Proposed: Mr C Thomas, G3PSM
Seconded: Mr Don Beattie, G3BJ
The motion was carried unanimously.

Radio Society of Great Britain

(A COMPANY LIMITED BY GUARANTEE, REGISTERED IN ENGLAND NO 216431)

Notice for AGM 2010

ANNUAL GENERAL MEETING

NOTICE IS HEREBY GIVEN that the 83rd Annual General Meeting of the Radio Society of Great Britain will be held in the Bedford Swan Hotel, The Embankment, Bedford, MK40 1RW on Saturday 17 April 2010, commencing at 12 noon for the transaction of the undermentioned business. RSGB VHF Contest trophies will be presented from 10am.

AGENDA

To receive and, if approved, confirm the minutes of the 82nd Annual General Meeting circulated to members with the April 2010 edition of *RadCom* (Resolution 1).
To receive and consider the accounts for the period 1 January to 31 December 2009, and the reports of the Board and the Auditors therein.
To appoint the Auditors Sayer Vincent and to authorise the Board to fix their remuneration (Resolution 2).

NOTES

Doors will open from 11.00am until 11.45am for registration. Refreshments will be available. A Society bookstall will be open from 11.00am to 12.00 noon and again during lunch. The Society will make available for sale an audio tape recording of the proceedings. The use of video recording equipment will not be permitted at the meeting.

RSGB VHF contest trophies will be presented before the formal AGM and the awards will be presented after the AGM.

Members invited to attend and vote at the meeting may appoint a proxy to attend and, on a poll vote on his or her behalf. The proxy need not be a member of the Society, but is not allowed to speak at the meeting other than join in the demand for a poll.
By order of the Board

R R Thorogood, G3KKT
Honorary Company Secretary
15 March 2010

ON COMPLETION OF THE AGM

Presentation of Awards
President's Address
A buffet lunch will be available at 1pm. Lunch tickets priced £8 will be available on the day.

OPEN FORUM

The Open Forum will commence at 2pm and conclude at 4pm or shortly after.
The meeting will open with a short presentation by the General Manager, Peter Kirby, G0TWW, followed by questions and answers.

TRAVEL AND TRANSPORT

The Bedford Swan Hotel is located in the centre of this vibrant town, close to attractions, shops and amenities. Built in 1794 for the 5th Duke of Bedford, the Bedford Swan is one of the most distinctive hotels in Bedford, occupying a prominent position, overlooking the River Ouse. The hotel's postcode is MK40 1RW.

The Open Forum is always an interesting part of the AGM. This shows the 2009 AGM in Newscastle upon Tyne.

From A1
Follow A428 to Bedford. On reaching the town turn left at the traffic lights signposted for M1 south go over the roundabout then exit at the 1st right down the Embankment. The hotel car park is 1 mile on the right.

From M25
Exit at the M1 (Junction 21 of the M25) North to junction 13: follow the A421 to Bedford, then A6 and signs to town centre. Once you have crossed the River Ouse, the hotel is immediately on your right. Follow the one-way system round the square and turn left down the Embankment - the hotel car park is 100 yards on the left.

At the 2009 AGM, Life Vice Presidency was award to Don Beattie, G3BJ for services to the RSGB and the amateur radio community at large.

1 January to 31 December 2009
Radio Society of Great Britain

(A COMPANY LIMITED BY GUARANTEE, REGISTERED IN ENGLAND NO 216431)

PROXY FOR USE AT RSGB ANNUAL GENERAL MEETING.

I,* ..... CALL/RS.....

OF .....

A MEMBER OF THE ABOVE NAMED SOCIETY HEREBY APPOINT

.....CALL/RS .....

OF.....

OR FAILING HIM / HER .....CALL/RS .....

OF.....

as my proxy to vote for me on my behalf at the Annual General Meeting of the Society to be held on Saturday 17 April 2010 and at any adjournment thereof as indicated below.

IN THE EVENT OF NO PROXY BEING NAMED OR OF YOUR NOMINATED PROXIES FAILING TO ATTEND THE ANNUAL GENERAL MEETING, THE PROXY WILL AUTOMATICALLY REVERT TO THE CHAIR OF THE MEETING.
PLEASE INDICATE WITH AN 'X' HOW YOU WISH YOUR VOTE TO BE CAST; OTHERWISE THE PROXY WILL ABSTAIN OR VOTE AT HIS OR HER DISCRETION.

ANNUAL GENERAL MEETING	FOR	AGAINST
RESOLUTION 1 To receive and, if approved, confirm the minutes of the 82nd Annual General Meeting as circulated to all members with the April 2010 edition of *RadCom*.		
RESOLUTION 2 To appoint the auditors Sayer Vincent and to authorise the Board to fix their remuneration.		

SIGNATURE.....DATED.....2010

NOTES
Members may appoint any member OR non member as their proxy holder. However, the following are willing to act as proxies:
The President D V Wilson, M0OBW, 12 New Street, Elworth, Sandbach, Cheshire CW11 3JF.
The Honorary Company Secretary R Thorogood, G3KKT, Station House, Station Road, Castle Cary, Somerset BA77PB.
The General Manager P A Kirby, G0TWW, RSGB, 3 Abbey Court, Priory Business Park, Fraser Road, Bedford MK44 3WH.

The proxy form must be signed by either the fully paid up corporate member or by his or her attorney duly authorised in writing.
Articles 24 to 27 inclusive refer to proxy votes and the calling of a poll.
In order to be valid this form MUST reach the Society's registered office in the envelope provided not later than 11.00am on Wednesday 14 April 2010.

Cut along the dotted line

Back of AGM proxy form

LF

Canada on 136kHz at last!

CANADIAN PERMITS. A few Canadian amateurs have been experimenting on 136kHz for years under various special permits with restrictive conditions, but now Industry Canada has put forward a revised table of frequency allocations, which includes the changes from WRC-2007. This shows the amateur service as a secondary service in the band 135.7 – 137.8kHz, subject to a footnote that specifies that operation shall be on a non-interference basis and be limited to 1 watt EIRP.

With immediate effect, any Canadian amateur can operate on the 136kHz band and have QSOs with other amateur stations around the world.

Joe, VO1NA, one of the early experimenters, has already started operating on the band and was very soon copied by OK2BVG, G3XDV, PA3CPM, PA3FNY, RN3AGC and KL1X who was portable in Oklahoma at the time.

ICELAND ON 600m. Iceland is the latest country to grant access to frequencies around 500kHz. On 19 February the Icelandic Post and Telecommunications Administration announced that all G and N class amateurs could apply for a special permit to use 493 – 510kHz. The licences will run until 31 December 2010 and allow for CW operation with 100W.

OPTICAL TRANSMISSION OF LF SIGNALS. Stefan, DK7FC lives in a noisy urban location and had been getting poor results from his receiving loop aerial. Nulls weren't sharp and the noise was spoiling reception. Experiments showed that much of the noise was being picked up on the coaxial feeder, which ran some 20 metres back to the shack. After having limited success with chokes and transformers, he hit on the idea of using a fibre-optic link from the loop to the receiver. The loop was thus completely isolated from any other electrical circuits and the noise level was greatly reduced. The only down side was the need for a battery at the loop, to power the optical transmitter.

Stefan's loop preamp and optical transmitter and receiver circuits are very simple as you can see, and form a good basis for experimentation. If you want to have a go, Rapid Electronics stock optical fibre, the SFH756 fibre-optic emitter diode that should be suitable and the SFH350 receiver device. He points out that the simple preamp shown is only suitable for a tuned loop aerial that has quite a high output, if an e-probe or un-tuned loop were to be used then more gain would be required.

The results certainly speak for themselves and Stefan has since copied many 136kHz stations including EW6GB, IK1HSS and OE5ODL.

NEW ON THE BANDS. Since January the Dutch stations have appeared on 600m in force! First to be heard on the band was Albert, PA0A with an excellent signal. His best contact to date is with WE2XGR/6 at a distance of 5975km. This QSO took place at 0400UTC on 9 February with Albert on 502.4kHz and Bob on 507.3kHz. The time was chosen after watching Bob's WSPR beacon for a couple of nights.

G3KEV in Scarborough is often the first to log new stations across the North Sea and has reported hearing and/or working PA0LCE, PA0AM, PA0A, PE5T, PA3CW, PA3FYX, PA0HTT, and LA1TN.

WSPR ACTIVITY. Graham, G0NDB is not one of the big signals on 500kHz, having only a small top-loaded vertical aerial, so he was quite amazed to find that W4DEX near Charlotte, North Carolina got a good decode of his signal one night in January. Dex does have a pretty good receiving setup and is a keen LF operator, holding the call WD2XKO for 136kHz and WD2XSH/10 for 600m.

PA0A has been trying all sorts of modes since his arrival on 600m and when he gave WSPR a try he was copied by Steve, KD2OM near Rochester, New York state.

WSPR was never designed for QSOs and it isn't the easiest mode to use in that way. Despite this, Jim, M0BMU and Jay, WE2XGR/2 (W1VD) had a WSPR contact on 600m on Valentine's day. This must be the first trans-Atlantic 600m WSPR QSO.

LORAN CLOSES IN USA. The familiar clatter of Loran has disappeared from the 136kHz band in much of the USA. On 8 February, the US authorities closed the Loran C system on 100kHz except where it is interlinked with other chains such as the Russian and Canadian ones. These stations will continue to operate 'temporarily'. There is no new information on the future of the European Loran C stations.

WEB SDR. The Web SDR at the University of Twente has recently been extended to cover LF and MF including the 136 and 500kHz bands. It seems quite sensitive and is a good way of checking to see if your signals are reaching the Netherlands. On a quick test the other evening I tuned in to SM6BHZ's SSB beacon on 508kHz LSB with a good copy. The receiver also covers the bottom half of Top Band and some HF bands - find it at http://websdr.ewi.utwente.nl:8901/.

VLF. I'm often asked 'how are things going on VLF' and, being slightly pedantic, I usually explain that we use LF and MF not VLF which refers to frequencies below 30kHz. Recently however, there has been a great deal of discussion about the possibility of using true VLF at under 9kHz, which is deregulated in some countries (NOV required in the UK). Many theories have been put forward concerning the likely efficiency of any practical aerial systems that an amateur might have access to, and the field-strength attainable from it. Large verticals, wire loops and ground-loops have all been suggested. Detecting the tiny signals that would be radiated is going to be difficult due to the high levels of atmospheric and man-made noise at this frequency. The theorists maintain that it will be impossible to overcome the noise at a distance of more than a few kilometres, which would still be in the near-field at a wavelength of 34km, but the experimenters are keen to try. I'll let you know how they get on.

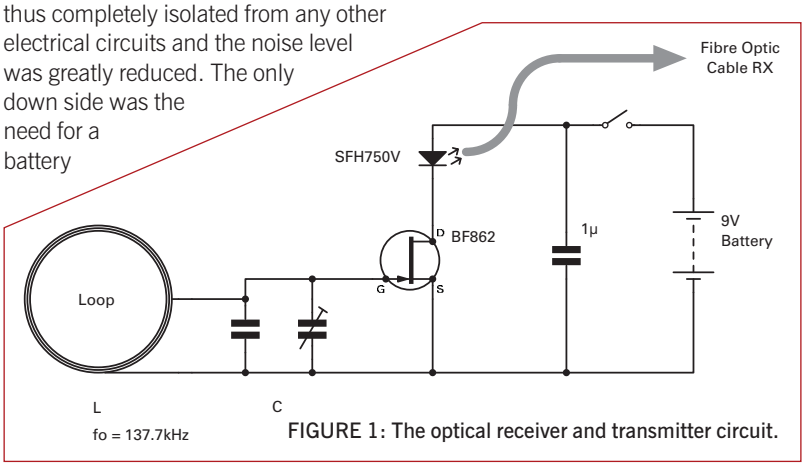


FIGURE 1: The optical receiver and transmitter circuit.

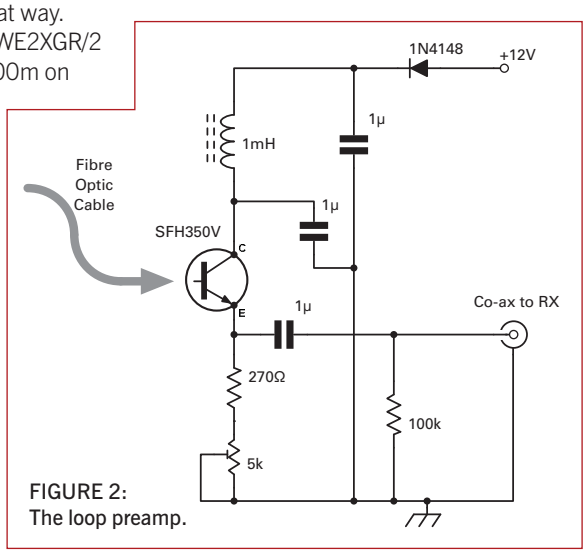


FIGURE 2: The loop preamp.

COMET

Japanese antennas - when only the best will do!

Kenny Mackintosh's CHA-250B is installed on a North Sea oil platform, it has to withstand winds up to gale and hurricane force - all without guys.

Here's what Kenny said about this tough antenna:
'I am the Platform's Radio and Telecomms engineer and work MM0GKB/P when on rota 2 on and 3 off, the locator being IO98UK. The performance is excellent with max VSWR on a few bands approx 1.5 : 1, radio is KW 570DGE @ 100W o/p and I use CW only. You will notice near base of antenna a slight bend this due to a whack from a container on crane some time ago, must say the antenna is one hell of a strong 'beast' taking into consideration the batterings it takes from the weather'.

CHA 250B Wide-Band Vertical

Covers 80m to 6m with no ATU and no gaps

The Comet CHA 250B vertical covers all the way from 80m through to 6m with a VSWR of less than 1.5:1. It's probably the easiest vertical to install, simply mounting on any pole and requiring no radials. If you are restricted for antenna installation space, the CHA-250B could be the perfect answer.

- Mounts at any height - needs no radials
- Transmit 80m through to 6m
- Receive 2 MHz - 90 MHz
- Transmit VSWR better than 1.5:1 throughout
- Rated at 250W PEP
- Only 7.2m high, weighs a mere 3.2kg
- Great performance on all bands
- Very low visual impact & low wind resistance

£299.95

H422 Rotary Dipole Covers 40/20/15/10M

Put out a bigger signal with this 4 Band trapped dipole. Use it as a fixed or rotary antenna. Rotate it to put the maximum signal where you need it and to reject interference from the sides. Use it as a Vee or straight dipole from as low as 10ft high! With high quality Japanese construction the H422 handles 1kW PEP with ease. It's ideal for home or portable operation.

- Freq bands: 7, 14, 21, 28 MHz
- Impedance: 50 Ohms nominal
- Input connector: SO239
- Power rating: 1kW PEP
- Max wind speed: 35m/sec
- Length: 10.4m (straight), 7.4m (V)
- Weight: 5.4kg
- Suitable mast dia: 38-62mm

£269.95

HB9CV
Wideband 6 Metre Beams

These antennas are perfect for Portable, Travel and Dxpedition use, being lightweight with butterfly nuts, for quick assembly. Dual driven elements, give 50 - 53.5 MHz coverage with low SWR.

CA-52HB2
2 el Yagi ...6.3 dBi 910g £79.95
CA-52HB4
4 el Yagi ...10.4 dBi 2.1kg ...£119.00

CWA 1000
Trapped Dipole

- Operating bands: 80, 40, 20, 15, 10m
- Maximum power: 500W PEP
- Total length: 19.9m

£99.95

Handheld Antennas

CH-501
SMA For 144/430 MHz £19.95
CH-701
SMA FMA 144/430/1200.....£19.95
BNC-750 HF Telescopic Whip
7-50 MHz with base loading ..£79.95

SWR/Power Meters

CMX 2300
2 separate SWR/Power meters in one box!
- Meter 1 range - 1.8-200 MHz Power 30/300/3kW
- Meter 2 range - 140-525MHz Power 20/50/200 Watts

£149.95

CD 300HV
- Meter 1 range - 1.8-200 MHz
- 30/300/3kW
- Measures PEP

£129.00

Baluns

CBL-1000
1.7 - 30MHz
1kW (PEP) 1:1 .....£35.95
CBL-2000
0.5 - 60MHz 2kW (PEP) 1:1....£39.95
CBL-2500
1.8 - 56MHz 2.5kW (PEP) 1:1.£44.95

Lightning Arrestor
CS-400P

- DC-500MHz 500W

£22.95 *P&P £5*

Antenna Tuners

CAT-300
- Freq: 1.8 - 60 MHz
- Power: 300W (SSB)
- Impedance: 10 – 60 Ohms

~~*£189.00*~~ ***£159.95***

CAT-10
- Freq: 3.5 to 50 MHz (in 7 bands)
- Power: 10W
- Impedance: 50 – 600 Ohms

~~*£99.00*~~ ***£79.95***

Tri-Band Antennas
Covering 144/430/1200MHz

Base
GP93 Gain: 4.5/7.2/10.00 dBi
1.78 mtrs long.....£89.95
GP95 Gain: 6.00/8.6/12.80dBi
2.42 mtrs long.....£109.95

Mobile
SB92 Gain: 0/2.15/5.5dBi
0.39 mtrs long.....£37.95
SB94 Gain: 2.15dBi/5.1dBi/7.2dBi
0.6 mtrs long.....£39.95
SB97M Gain: 3.0dBi/6.8dBi/9.6dBi
1.32 mtrs long.....£44.95

nevada® radio

www.nevadaradio.co.uk

UK Importers & Distributors of COMET Antennas & Accessories

UNIT 1 FITZHERBERT SPUR FARLINGTON PORTSMOUTH PO6 1TT PHONE 023 9231 3090 EMAIL SALES@NEVADA.CO.UK FAX 023 9231 3091

YAESU

We carry ALL the popular models at the BEST PRICES!

HF Transceivers

FT-950.....100W HF + 6 m (with DSP and ATU) .....£Online
FT-450AT....100W HF with ATU.....£Online
FT-897D .....100W HF with 6m +2m + 70cm .....£Online
FT-857D .....100W HF with 2m + 70cm.....£Online
FT-817ND...HF Portable with 6m +2m +70cm.....£Online

VHF/UHF Transceivers

FT-1802M ..VHF 2m Mobile.....£119.95
FT-7800E....2m/70cm 50/40W FM Mobile.....£Online
FT-8800.....2m/70cm 50/35W Mobile.....£Online
FT-8900R ...10m/6m/2m/70cms Mobile .....£Online

Handhelds Transceivers

FT60E.....2m/70cms Wideband RX .....£Online
VX-8E.....6m/2m/70cm NEW.....£Online
VX-7R .....6m/2m/70cms 5 W .....£Online

Yaesu Microphones

MD-100A8X.....Base microphone .....£Online
MD-200A8X.....Base microphone .....£Online

Yaesu Rotators & Bearings

G250C .....Light duty *SPECIAL PRICE* £99.95
G1000DXC.Heavy Duty Special *SPECIAL PRICE* £399.00

back in stock!

Yaesu YH-77STA

Stereo Communications Headphones

Light weight, dual samarium-cobalt transducers with stereo separation for the dual receive on Yaesu HF radios. Supplied with 3.5mm mini stereo socket and 1/4 inch stereo adaptor

SAVE £5! RRP ~~£54.95~~ **£49.95**

ICOM HF Transceivers

IC-7200.....100W HF+6m NEW! .....£Online
IC-7000.....100W HF+6m Mobile.....£Online
IC-7600.....100W HF+6m NEW base .....£Online

Ventus WX-831

Weather Station

NEW!

- PC-Software
- Anemometer
- Wind Speed
- Wind Direction
- Wind Chill
- Rain Gauge
- Barometric forecast
- Pressure Read out
- Bar charts
- Trend indicators
- Dew Point
- Heat Index
- Sunset and sunrise display
- Moon phase
- Critical weather alert
- In/Out temperature
- In/Out humidity
- Memory for temp, humidity & atmosphere pressure
- Calendar
- Alarm
- Radio-controlled clock
- Blue backlight

PRICE **£119.95**

Ventus W928

NEW professional unit fully featured £199.95

LOWEST PRICES for 100m Drums of:

Guy Rope

Military style, pre-stretched Olive Green

SYC-11 .....5mm 295kg £49.00
8 plait .....4mm 330kg £59.00
8 plait .....6mm 700kg £79.00
KT-3 Kevlar .....4.5mm 570kg Green....£89.00

Antenna Feeders and Wire

Westflex 103.....Lo-loss coax cable £108.00
WF-165 75 Ohm.....(Double Screened) £129.00
H100 .....Lo-loss semi air spaced.....£99.95
RG-213.....coax cable £89.00
Mini RG8 LAP.....(Double Screened) £69.00
RG-58.....coax cable £39.95
450 Ohm .....Twin Feeder £85.00
300 Ohm .....Twin feeder.....£75.00
Flexweave .....Antenna wire.....£50.00
Flexweave (coated) .....Antenna wire.....£75.00
Ribbed Insulators .....(pack 2) £3.40

LDG Tuners

Popular Models

- NOW IN STOCK!

AT-100 Pro .....160 - 6m) 125W.....£189.95
AT-200 Pro .....(160 - 6m) 250W.....£209.95
AT-879 Plus .....for Yaesu FT897.....£179.95
AT-1000 Pro .....(160 - 6m) 1kW.....£499.95
IT-100.....for Icom IC-7000 .....£209.95
YT100.....for Yaesu radios 125W £199.95
Z-11Pro .....(160 - 6m) 125W.....£154.95
Z-817 .....QRP for FT817 & others £119.95
FTL .....Meter for FT857, FT897.....£79.95

Palstar Quality Power Supplies

Palstar SPS-9600 60 Amp
PRICE **£179.95**

Palstar PS-50 40 Amp
PRICE **£159.95**

PS-04 .....4 Amp 13.8V supply.....£24.95
PS-06 .....6 Amp 13.8V DC supply £29.95
PS-15 .....15 Amp 13.8V supply.....£59.95
PS-30M.....30 Amp Variable voltage £99.95
PS-50 .....40 Amp Linear Bench power supply.....£159.95
SPA-8230....23 Amp 13.8V Switch Model lightweight .£59.95
SPS-9600 ....60 Amp Switch Mode Power supply £179.95

Daiwa Meters

Daiwa 801HP SWR Power Meter

Japanese high quality, with huge twin needle display reading Average power, Peak power and SWR

- Frequency: 1.8 - 200MHz
- Power: 20/200/2KW
- Connectors: SO239

SPECIAL PRICE ~~£129.00~~ **£99.00**

CN801HP.....1.8 - 200MHz 20/200/2kW ....~~£129.00~~ £99.00
CN801VN .....140 - 520MHz (N type Sockets) £119.95
CN101L .....1.8 - 150 MHz.....~~£99.00~~ £89.00
CN103LN.....140 - 525MHz.....£99.00
CN801S .....900 - 2.5GHz N types.....£119.95
CN801V.....140 - 520MHz (SO239) £99.95

Perseus SDR Radio

FREE DELIVERY

VLF-LF-HF Receiver

Covering 10KHz - 40MHz

Has received rave reviews!
In stock for immediate despatch!

PRICE **£699.95**

SBS-1er

Real-time Virtual Radar

- Built-in Airband and FM receiver
- Powerful SBS-1 BaseStation software included

PRICE **£469.95**

eton G3

AM/FM/SW Digital Radio

NEW!

Stereo, SSB, VHF Aircraft band, RDS and Synchronous Detector with selectable sideband

- 700 memories
- Clock, sleep timer, alarm
- Power source: 4AA batteries (not included)
- AC adapter/charger

PRICE **£99.95**

NEW!

ALINCO DX-SR8

Affordable HF Transceiver - with a QPR Setting!

Narrow filters, IF Shift, RF pre-amp, noise blanker and CW keyer with full break in. For the QRP enthusiast a special super low output power setting.

- Covers all SW and HF Amateur bands (including 5MHz)
- TX: SSB, CW, AM, FM
- Power: 100 Watts SSB/CW, 40 Watts FM
- QRP Mode: (0.1 to 2.0) Watt
- RX: 30kHz - 35MHz
- 600 channel memories in 3 banks

PRICE **£499.95**

includes: Drop-in charger, Battery pack, Swing belt clip & antenna

ALINCO DJ-G7E

Full Duplex Tri-Bander with 1200 MHz!

It's wide band receiver allows full duplex receive in combination with the three Amateur Bands. For AM broadcast reception it has a built in Ferrite rod antenna. Housed in a rugged water resistant case, this radio is tough, easy to use, feature packed and ready for action!

IPX7 WATER RESISTANT

PRICE **£299.95**

SAVE £59!

ALINCO DJ-175

VHF 2 Metre Handheld

- Transmit frequency range: 144 - 148 MHz
- Receive range: 136.00 - 173.995 MHz
- Freq steps - 5, 10, 12.5, 20, 25 & 30KHz
- New 2-touch repeater function
- High visibility backlit display
- 200 memory channels plus CALL channel
- 3 levels of output power 5, 2 and 0.5 W
- Supplied c/w battery and charger.

SPECIAL PRICE ~~£149.00~~ **£89.95**

ALINCO DM-330MW

The very best quality Low noise 30 Amp Switching Power Supply

- Input voltage 230VAC
- Output voltage (5 - 15) VDC variable
- Output voltage variation less than 2%
- Triple Protection: Short-circuit, Automatic current, Over-temp
- Output current 30A(max), 25A (continuous)
- Ripple less than 15mVp-p at rated load

SPECIAL PRICE ~~£129.00~~ **£99.00**

ALINCO DR-635

Full Featured Dual Band Mobile

- Removable Control Head
- VHF/UHF full duplex
- 144/430Mhz + wideband RX
- 200 Memory Channels
- VHF: 50/20/5W, UHF 35/20/5W
- Int. Duplexer for single ant use
- Cable Clone feature

Monitor 2 repeaters together in the same or different bands, listen to broadcast FM stations, or listen to the Civil Airband

PRICE **£299.00**

Alinco Handhelds

DJ-V17 .....Dual band handheld £149
DJ-596 .....Dual bander, 2m 70cm 100 memories SPECIAL....£189
DJ-195 .....2mtr, 40 memories, up to 5W output SPECIAL .£99.95
DJ-C7E .....Dual Band.....£149

Alinco Mobiles

DR-435 ....UHF 35W 70cm FM Transceiver £179
DR-135 ....VHF 50/10/5W, TX 144-146MHz, 100 memories....£199
DX70TH ...HF + 6 metre transceiver 100W.....£599

For unbeatable deals online 24hr shopping 7 days a week

www.nevadaradio.co.uk

showroom hours Monday to Friday 9.00 - 17.30

or call 023 9231 3090

Unit 1 Fitzherbert Spur Farlington Portsmouth Hampshire PO6 1TT email sales@nevada.co.uk fax 023 9231 3091

ALL GOODS SHIPPED FOR 24 HOUR DELIVERY

P&P: £8 (UK MAINLAND) unless otherwise stated

E&OE

HF

Finally we have something to celebrate by way of a marked improvement in propagation on the high bands

The YASME QSL card collection at the DokuFunk archives in Vienna (photo G3PSM).

PROPGATION IMPROVEMENT. 15m was wide open in the ARRL CW contest, for example, while 12m has been buzzing with DX. 10m has yet to show much improvement (I have not seen any reports of US contacts on 10 in the contest, despite the best efforts of the more serious entrants) but it's early days yet. My timing in changing the format of the Annual Table seems propitious, as we should be able to watch the effects of the improved propagation on 10 and 12 while, as you will see, some participants have already come close to DXCC in 2010 on 160 and 80, at the other end of the short wave spectrum.

DX NEWS. Geoff, M5GAC and his wife will again operate as MM5GAC/P, this time from Skye from 8 to 22 May, active early mornings and late evenings on 80 and 40, and on 20 at times during the day. Geoff says, "In the past newcomers have always made good use of contacting me, gaining experience, and I hope they will do it again once we are on the air".

Pierre, ZS1HF, will be with the new team on Marion Island, ZS8. He expects to be on the island from around 6 May and aims to make a big effort to hand out this much sought-after DXCC entity. He will be there for 13 months and will operate mostly SSB, but with the possibility of RTTY. QSL direct to ZS1X. South Africa restricts access to Marion Island, so it is generally only those (South African nationals) who are part of the annual team who are able to visit and stay on the island. Unfortunately, although much was promised by one of the team members a couple of years ago, in the event his duties prevented him from making more than a handful of contacts in his year on the island. Let's hope Pierre fares somewhat better. The last big effort was when ZS8 was active in 1996/97 – I see I worked him on six bands including Top Band.

A Spanish team will activate Annobon in April, all bands and modes, with three HF rigs and amplifiers. They will focus especially on the low bands. The call will be 3C0C. QSLs go via EA7FTR. There is a website but there will be no upload of logs when they are on the island as there will be no internet facility available to them. The last DXpedition there was 3C0M in October/November 2006 and the island now ranks 35 on the *DX Magazine* Most Wanted survey.

Apropos of which, *Les Nouvelles DX* editor Jean-Michel, F6AJA, has posted the top ten lists for the past 8 years (2002-2009) along with more than 300 QSLs from these rare DXCC Entities on the *Les Nouvelles DX* website – there is a button to click for English.

Dave, EI3IO is now A92IO from Bahrain and there until August, 2011. He will focus on the low bands during the two winter seasons that he is there.

An international team will be operating from Con Co Island (AS-185), Vietnam, as 3W6C from 10 to 18 April. Plans are to run four stations 24/7 for two weeks with a goal of 60,000 QSOs. Their website carries further details.

The YI9PSE DXpedition will operate from the Kurdistan area in Northern Iraq from 3 to 11 April. This looks like being a big effort. Further details from their website.

KERMADEC. DL1MGB says final approval has been granted by New Zealand's Department of Conservation for a landing on Raoul Island in the Kermadecs, ZL8, and a stay of 18 days. This will take place in November, so I will hold on to full details until nearer the time, or you can check the website. Suffice to say that this will be a big effort from one of the rarest DXCC entities. It's actually a spot that, like New Zealand, has particularly good propagation to the UK, being almost at our antipode. The problem is simply a lack of activity due to the difficulty in getting the necessary permits.

DOKUFUNK. The Amateur Radio Section of ORF (Austrian Broadcasting Corporation) and the Documentary Archives Radio Communications/QSL Collection (DokuFunk) will operate special event station OE10M for 72 hours during the 23/25 April weekend.

OE10M is an official International Marconi Day station. Contacts made on Saturday 24 April are valid for the IMD Award. QSL OE10M via the OE QSL Bureau or direct to OE1WHC. I had the opportunity to visit the archives during the weekend of the IARU Region 1 conference in Vienna recently. It is quite remarkable, with a huge collection of material related to short wave broadcasting and an amateur radio QSL card collection of around 12 million cards, including the historical YASME collection (itself consisting of about 750,000 cards), which was moved there from California several years ago. The archives are open to visitors and particularly welcome those doing historical research. More information on the DokuFunk website.

2010 ANNUAL TABLE

(starting 1/1/10, sorted by 160m totals)

Call	10m	12m	80m	160m
G3TBK	6	20	68	98
G3SED	8	40	36	64
GW4BLE	18	14	35	51
G6CSY	0	0	31	20
M0VKY	0	0	13	4
G4XEX	0	0	20	1
G1UGH	0	9	0	0
GW0RYT	9	6	6	0
MW0DNF(qrp)	4	3	9	0
G4FVK	0	0	12	0
G3HQT	2	10	74	0

ZS8IR was the last significant operation from Marion Island (see text).

QSL from the club station of the DocuFunk archive (see text) featuring some of the many boxes of archived QSL cards.

60m REPORT (FROM G4TRA). The 60m band saw its 100th country activated in the form of CE1/K7CA when Al came on for a short period working a lucky few in the US and Europe. Also new is 9K2YM who has been worked by some on PSK31 and RTTY. KP2/K3TEJ has been quite active from St Croix and as J7N from Dominica, whilst Bud, the designer of the Buddipole, put J6/W3FF on air from St Lucia using his bicycle portable and a Buddipole, of course.

Tom N4XP was due to be on Kwajalein, Marshall Islands V7, until 22 March for another all time new country on the band. That should be a grey line contact from the UK, either early morning or early evening. For all the other Caribbean holiday operations coming up try 5.4035 or 5.3715MHz after midnight and keep an eye on the DX Watch for DX spotting.

Don't forget the end of June is the cut-off date for the UK 60m NoVs, and what happens after that has yet to be announced, though a further extension appears likely. But do please try and activate the seven channels as much as possible during the coming three months.

AWARDS. Effective 1 January 2010 K1BV's DX Awards Website has made access to the on-line DX Awards Directory available free to all. All 3,300 awards are available. This will be a great boon to awards chasers as the K1BV site is generally regarded as the number one place to find accurate awards information.

SETTING UP FOR DX. As the sunspots finally start to put in a renewed appearance, it may be worth starting to plan how you will take advantage of the upswing in propagation. The nice thing about the high bands is that there is usually scope for a gain antenna of some sort, something that is so much harder to achieve on the lower bands. My first gain antenna was a single-band quad I constructed for 10m, and the improvement over a half-wave dipole was quite remarkable. Some years later I constructed a very similar quad for 12 and 10m combined. Made of garden canes and some wire from a club junk sale, it cost me no more than a few pounds and yet worked a treat.

Obviously a linear amplifier helps in the pile-ups, but is less of an essential than on the low bands, especially if you can crack the antenna situation which, obviously, brings direct benefits on receive as well as on transmit (and, if it's made of garden canes and surplus wire, is significantly cheaper!).

The other trick to cultivate is to recognise the beginnings of band openings, so you can be in the right place at the right time. The various international beacons (see the RSGB Yearbook, for example) are a useful indicator but, increasingly, amateurs are playing with modern tools such as WSPR, transmitting a WSPR signal at low power and checking the WSPR receiver sites to see where they are being copied (see the WSPRnet website). This is a facility that it is new for this sunspot cycle and it will be interesting to see what possibilities it opens up for discovering those fleeting band openings.

CORRESPONDENCE AND TABLES. Peter, G3HQT focused on 80m where he worked V31YN, VP8DMN (Falkland), HS0ZEE, 5N50K, TX3D (Australs), 6W/HA0NAR, HI3TEJ, J79CBS, TX4T (French Polynesia), J37BO and 6Y5WJ, all CW. Terry, G1UGH was busy on 12m, where he worked, among others, EC8ADW, SV5AZP, SV9GPV, UA9FAR, TL0A, WP2B and A65BM. On 15 he caught up with ZS2DK, 6V7V, 7Z1TT, A61KM/M and HZ1IRH, all presumably on SSB. Dave, G3TBK managed 9X0CW and KP4MS on 10m, 3B8CF, CE1/K7CA, P43JB, 9X0LX and A71BU on 12m, and VP8DMN, J38XX, VQ9LA, FM5CD, V31YN, HC2SL, CE1/K7CA, C6AKQ, PY2XB/PY0F and TX3D were amongst his best on 160m. He also put TX4T into the log on 80 through 15 but failed to hear them on Top Band, due to not being very good at getting up at 6am! All the foregoing were on CW. By the time this appears Dave will once again be in the Caribbean on another work assignment. John, G3BDQ has been having a last fling on 160 before the winter season comes to an end. His recent contacts on the band include V31YN, 9M2AX, JA7ND, JT1CO, 6W/PA3EWP, and some rare US states, all CW of course. Peter, G4XEX was surprised to catch T6AF on 20 PSK31 and not sure at first whether he had a full callsign. After the contact the whole world seemed to be there calling the T6 (which is one of the prefixes being used from Afghanistan). Peter also worked VK3CVF on 20m, his first Australian contact and quite late in the day at 1149.

Graeme, G6CSY filled some new band slots by way of ZM2A on 20 and GU0SUP on 80, both RTTY, plus OY8A on 160 CW. Simon M0VKY ended 2009 with TX5SPA (Australs) on 80 SSB and P29VSR on 20 SSB, the latter while Simon's amplifier was in pieces on the bench, so worked with just 100 watts. Best so far in the new year have been J79XBI, JT1CO and YV4EH on 80, while 40 produced KH7XS, V26VP and 3V8ST. On 20 9G1YK, EX8AB, 6W1AAD, 6W1AAD, ET3AA, EP4MRG, XW3DT, XU7FMZ, 7P8BA, YA3MKT, SU1HZ, A41OR, YC6NE, VR2PW plus several Caribbean stations, on 17 EL8RI, 4S7AB, VP5/WB4SLM, A61BK and TL0A, while 15 produced 7Z1TT, 5N7M, VP8LP, 9M6BOB and HS0ZIN. All contacts were on SSB.

THANKS. Special thanks go to the authors of the following for information extracted: OPDX Bulletin (KB8NW), The Daily DX (W3UR) and 425 DX News (I1JQJ). Please send items for the **June** issue by **Friday 23 April**.

WEBSEARCH

3C0C: www.3c0c-annobon.com
3W6C: www.3w6c.qrv.ch
A92IO: A92.ath.cx
Dokufunk: http://dokufunk.org/
DX Watch: www.dxwatch.com/dxsd1.php?f=5
Les Nouvelles DX: http://lesnouvellesdx.fr
WSPRnet: http://wsprnet.org/drupal/
YI9PSE: www.yi9pse.com
ZL8X: www.kermadec.de

VHF/UHF

This month, G4DEZ acts as guest columnist on VHF and UHF matters

Newbury & DARS locate the sheerlegs during the 2009 VHF NFD.

IN MEMORY. More tributes have been received for Norman, who is sadly missed by everyone who came in touch with him. We understand that Norman's funeral is at 1.30pm on Monday 22 March at Croydon Crematorium.

Very few updates to Reports and Tables have been included this month; please continue to send information and updates to *RadCom* (radcom@rsgb.org.uk) who will pass on details to the next guest columnist.

SOLAR ACTIVITY. A large sunspot was noted over the weekend 6 and 7 February (number 1045) this gave rise to a number of class C and M flares. Auroral activity (AU) was noted in the higher latitudes and included LA SM and OH, no reports of any activity in UK (although I did copy OY6BEC on 6m briefly going AU but only for a few minutes). There were also a few reports of GB3LER going AU for brief periods over about a week (after 7 February). John, G4MBN reports also that during Sporadic-E on 6m contacts with OH stations, there was some AU distortion evident.

METEOR SCATTER. The period of this report is one of the quietest of the whole year, there are no major showers and random meteor activity is also very low, but that does not mean that there is no DX to be worked. Brian, G8VYK reports 7 MS QSOs on 2m with LZ2FO (KN13) OH6KTL (KP02) and SM5HUA (JP80) being just three of them.

I continued to work the DX on MS on 6m 4m and 2m. On 6m LA4YGA (JO48), OZ3ZW (JO54), S51YZ (JN76), S59F (JN65), ES3RF (KO29), OH6MIK (KP13), IZ0GYP (JN61), and a few others. On 4m OZ2LD (JO54), LA4YGA (JO48), OZ3ZW (JO54), OZ1DJJ (JO65), OZ1JXY (JO46), LA4LN (JP50) and LA4ANA (JO59), the last two during 4m NAC contest. On 2m HA6NY (JN98), I3YXQ (JN55), OH6KTL (KP02), SM5HUA (JP80), IK0BZY (JN61), HB9CAT (JN46), SM4SJY (JP70) and TK5JJ (JN41). Some of the reflections were quite large and many of the QSOs were completed in less than 10 minutes. Many of the stations worked were only running low power, maybe 50 to 100W with small antennas, so if you need a 'fix' in your DXing give MS a try. There is always something out there!

MOONBOUNCE. Moonbounce has taken off in recent years with the advent of the digital modes JT65 a b and c, it is now possible to work the 'big guns' fairly easily, even if you only have low power. So no excuse for not working intercontinental DX on 2m.

There's not much in the way of reports this month, please keep the column briefed on what you have worked or heard (radcom@rsgb.org.uk).

Brian, G8VYK (G4AEZ) reports 21 QSOs on 2m EME with JM1WBB (QM05), W5UWB (EL17), OH7HXH (KP53), UA3PTW (KO93) and JR3REX (PM74) being his choice ones, now that is quite impressive and so well done. Three continents for Brian, I think I had better get my elevation system working again.

Colin, G4ZFJ has been busy and on 144MHz worked UA0LW, PY2GN, FY/DL2NUD, NG9Y and 3A/DL8YHR. G to FY is a first, well done. Colin was also active on 432MHz and with only 180W he worked NC1I. Congratulations for that one as well.

Justin, G0KSC reports an EME QSO on 2m with RA6AX on 3 March with only 100W and 11e KSC antenna with no elevation, well done.

SPORADIC-E. Mark, M0DXR sent in this report, "...caught an Es opening on Sunday 31 January on 6m, worked S51DI (JN76), YU1EU (KN04), HA8FK (KN06), OE1TKW (JN88), HA3LP (JN86) and YU1PE (KN04) all on CW. On SSB worked OE3EMC (JN78)".

I was lucky enough also to work quite a lot of stations on Es. On 1st, 3rd, 5th, 11th, 19th, 20th, 21st and 22nd. A very good start to 2010. Areas covered were Italy, France, Spain, Scandinavia, Nordic countries (I am told that most of Finland is classed as Nordic) and the Baltic.

John, G4MBN reports Sporadic-E on 6m on 1 January, to IK4JQO (JN64) and again on the 18th with IZ5EME (JN52), much better on 19th when he worked ES2QN (KO29), OH6KTL (KP02), SM6LJP (JO68), OH3SR (KP21) and OH1LWZ (KP11). Later the same day after 1650UTC he worked ES6DO (KO27), SF4J (JO79), OH2AUK (KO19), SA5K (JO78), ES4EQ (KO39) and OH2TP (KP20). Another opening on 21st brought IK5RLP (JN52) and I5IAR (JN53). Finally, the opening on the 23rd realised IW7EBE (JN71), IK5RLP (JN52), IK4OLQ (JN54), IKSNSV (JN64), IZ5EKV (JN53), IK5YJY (JN53) and IZ5HSK (JN53). John seems to think the Es opening may be related to the recent Solar flares.

OTHER PROPAGATION. I had my regular ionoscatter CW QSOs with 9A5CW on 6m on 31 January and 3 February. We had QSOs also on 8th, 14th and 21st. On 3 February apart from the CW QSO, we also had QSOs using JT6m then FSK441 and, finally, SSB phone, all were successful. Some signals were enhanced by MS, but there was no tropospheric propagation in evidence or any signs of Sporadic-E. On 28 February at 1530UTC, Pat was only using 80W and was 319 here in JO03, I think it must have been ionoscatter again, no MS at all.

BAND REPORTS. Winter Es has tailed off over the last month, but DX can still be worked on MS and ionoscatter. No tropospheric openings were reported. A good time to find DX is during contests, the UK Activity Contest series can give DX to in excess of 12 countries on 2, 4 and 6m, as well as 70 and even 23cm.

I have had tropo QSOs to JN48, JN59 on 2m and IO63 on 6m and, of course, to most of near Europe.

SNIPPETS. It is nice to see that TF now has 4m band on temporary basis, let's hope that they retain the allocation, TF is well within range of MS and certainly Es later in the summer.

M1IOS is getting himself organised down on the Scilly Isles (IN69) becoming active on 2m MS using FSK441, let's hope he has plenty of success from that rare grid.

Since 2003 DF2ZC has published the 144MHz EME NewsLetter. This is a free service for the EME community and the latest edition is now available at www.df2zc.de/newsletter.

Bernd, DF2ZC will activate the DXCC Jersey MJ on 2m EME. They will arrive at the DXpedition QTH in IN89XF on 20 April 0800Z and will immediately start to set up the equipment so that they can make at least partial use of that day's moon.

Andy, GD0TEP is currently building a GI7b amplifier for 50MHz that will give around 300 to 400W out. This should make GD easier to work on 6m (as if he wasn't loud enough already). Andy also hopes to elevate the 2 x 8ele system on 6m for EME. In some late news from Andy, he had some EME QSOs on 2m last November, the first time that GD has been active off the moon for many years. Twenty stations were worked in ZL, SM, PA, RZ, JR and OH. Thanks for the info Andy.

Justin, G0KSC says that he has been playing a little with FSK and was quite pleased with the results using his FT-847 and 100 watts. 27 February saw him working S58M, completing in just a few minutes. This week he has worked SM7GVF and I3YXQ. Many stations have been heard in the same mode including G4PBP, IS0AWZ and F4EGA. He is still setting things up but it is clear even with very low power and small antennas good distances can be achieved with MS.

After the 4m contest on Sunday 28 February, I received an e-mail from G3VVT who sent me this information. "Have moved to a better location North of Kendal (IO84) but RF pollution is severe." Bob was using a dipole on 4m and an almost completely homebrew station of an Elecraft 2 into a Spectrum transverter wound down to 10W and a Pye A200 amplifier to take the signal back up to 50W. I am surprised that I could actually hear him but he tells me that for a brief moment I hit 59 (later on during the contest). It really goes to show what stations with low power can do on 4m.

A lot more information can be gathered from MMMonVHF regarding up and coming events on the bands.

ESP RECEIVER. I received an e-mail from GU6EFB. "That new ESP receiver of yours is working well tonight in the contest, (2nd March 2m UKACC). I was tuning across the band when I heard your dulcet tones finishing a QSO, the next thing you asked was for the GU to make the call. I had not even tried to call you once so how you knew I was there is beyond me! Anyway thanks for the points on 2 and on 4 last weekend. 73 Keith, GU6EFB".

I do hope the contest committee allows ESP propagation, but I honestly thought I had heard a GU. Maybe I heard part of a suffix, who knows!

Well that's it for this month thanks to everyone who sent in information. Please send your reports and information to *RadCom* (radcom@rsgb.org.uk), it will then be passed over to the next guest columnist.

LOCATOR SQUARES TABLE

Starting date: 01-01-1979

Callsign	50MHz	70MHz	144MHz	430MHz	1296MHz	Total
G4DEZ	833	151	423	146	59	1612
GD0TEP	818	112	70	13	21	1034
G4VPD	522	34	244	18	-	818
G4OBK	519	64	96	17	-	696
G4ZFJ	476	85	543	94	51	1249
GM4VVX	449	62	316	2	-	829
G8TOK	446	84	146	58	37	771
G6TTL	428	-	-	-	-	428
G8HGN	423	26	242	102	-	796
GM8IEM	375	-	45	5	-	425
M0XLT	358	-	39	2	-	399
G4APJ	275	-	93	44	-	412
G0ISW	267	7	108	22	-	404
GM4JR	264	56	51	16	-	387
G8VYK	265	43	397	50	-	755
G0LGS	238	10	97	41	11	417
G4YTL	12	93	668	160	20	953

Updated to 3rd March 2010

No satellite, repeater of packet radio QSOs. Band of the month 50MHz.
If no updates received for a year entries will be deleted.

ANNUAL VHF/UHF TABLE JAN TO DEC 2010

	50MHz		70MHz		144MHz		432MHz		1296MHz		Total
Callsign	Grid	Ctry	Grid	Ctry	Grid	Ctry	Grid	Crty	Grid	Ctry	
G4DEZ	70	25	33	13	61	26	14	7	4	2	255
G4ZFJ	14	5	0	0	135	49	13	8	0	0	224
GD0TEP	0	0	4	2	0	0	0	0	0	0	6

The shack at G4DEZ.

GHz Bands

Measuring Sun noise - Three methods are described and the results compared

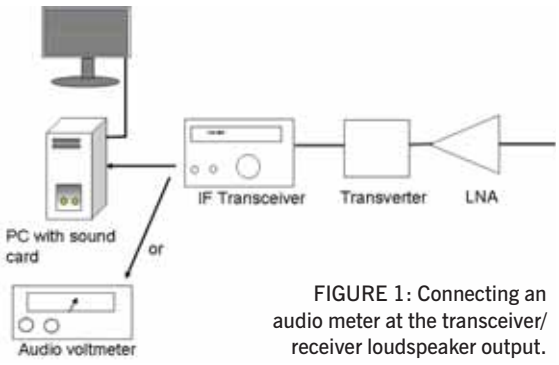


FIGURE 1: Connecting an audio meter at the transceiver/ receiver loudspeaker output.

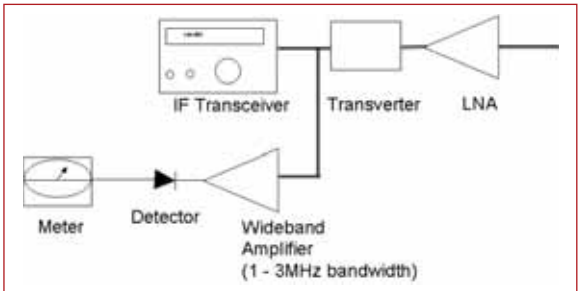


FIGURE 2: How to connect a wideband amplifier and power detector to a transverter, for noise measurement.

BAND ACTIVITY. Here, in East Anglia, temperatures have scarcely risen much above about 6°C for several months. Much of the UK has seen similar daytime temperatures and this seems to have had a dramatic effect on microwave activity, particularly on the higher bands. However, the lower microwave bands have continued to provide activity for the keen operators amongst us. It seems like the monthly RSGB Low Bands Contest (UKAC) is now providing a strong focus for much of this activity and several operators I have spoken to recently have mentioned that they now do focus their interests around participation in this event.

The January UKAC was typical of what is currently to be expected, with average to poor propagation, but lots of activity. It is now getting difficult to fit in a QSO with everyone who is active on the evening. For anyone more familiar with contests on the HF and VHF bands this may seem strange. However, with the narrow beamwidths of antennas on the GHz bands, congestion on the ON4KST chat (due to the coincident NAC contest) and generally weaker signals that require longer to complete a QSO, it is not too surprising. Add to this the unpredictability of aircraft scatter opportunities and this is a very different and challenging contest scene.

The first report is from Ian, G8IFT, who operates with the South Birmingham Radio Society, G8OHM. He mentions that the group received good signals from G4EAT, G4DDK and G3XDY (all in East Anglia) on 2.3GHz, whilst on 1.3GHz they had 33 contacts that kept them very busy throughout the contest.

Neil, G3RIR (IO92), sent in a long report on his January UKAC activity. He has been working towards improving his 1.3GHz system and now has a PE1RKI solid state amplifier producing over 100W output when driven by the TS2000X. This feeds a single 35-element Tonna Yagi through about 25 metres of Ecoflex 15 coaxial cable. He worked GM4CXM (IO75) at 436km, exchanging 569 reports and completing the QSO in less than 30 seconds. Neil likened the exchange to operating in CQ WW on 20m! He made 20 QSOs including GM, GI, GW, G and PE1EWR.

UKAC stalwart, Ray, GM4CXM sent in his usual and very welcome report on the January contest. He comments that it was a very busy evening, although Troposcatter was in short supply. Using the Virtuelradar [1] link it was possible to swiftly spot aircraft on likely paths that would give useable scatter signals to various parts of the UK and into continental Europe. During the contest there were not too many aircraft over the North Sea, which limited contacts in that direction including the usual contact with Kjeld, OZ1FF (JO45).

Ray says that Neil, G3RIR, was an outstanding signal with his new amplifier and John, G8AKE (IO92), in Melton Mowbray was worked for the first time with a very good signal. G4KIY, G8OHM, G8DKK, G4BRK, G3VKV and M0GHZ were all good signals as usual. A quiet last half hour was made up by getting a call from Bill, G3JYP for an IO84 multiplier. There were four GM stations active plus Gordon, GI6ATZ. GI4SNA was also reported active by Gordon, although he wasn't worked by any other stations. Ray's total for the evening was 16 contacts in 10 locator squares.

GETTING STARTED IN MOON-BOUNCE

Part 8. More on noise measurements. Last month I discussed sun noise measurements and how you could determine how well your system was working by the amount of sun noise measured compared with noise from the cold sky. But, how do you make noise measurements?

There are several ways to make these measurements, each with its own advantages and disadvantages. The methods can be summed up as follows:

- Audio noise output power
- RF or IF wideband amplifier and detector.
- SDR receiver with software able to make Continuum measurements.

THE AUDIO METHOD. The audio method of measurement is applicable to most receiver systems and requires no additional RF hardware. In essence a simple audio voltmeter is used to measure the noise output from the receiver. This can be a simple diode detector and meter, audio voltmeter, oscilloscope or PC sound card. **Figure 1** is a block diagram showing how the audio meter is connected.

There are major disadvantages with this technique. Since the measurement is usually made with the receiver switched to the SSB or CW mode, the bandwidth is limited to about 2500Hz. This leads to very large 'noise spikes' unless a large amount of filter damping is applied to the meter. The consequent meter lag can make it hard to find the noise peak. It is extremely important that the receiver is operating within its linear range. This means turning off the receiver AGC (if this facility is provided on the receiver) or adjusting the receiver RF gain so that the AGC is inoperative. It cannot be stressed enough how important it is to do this.

It is increasingly common to use a PC sound card and suitable software to replace the audio voltmeter. A sound card can avoid

FORTHCOMING MICROWAVE EVENTS - 2010

Rutherford Appleton Laboratories Microwave Round Table.
April 17 and 18.
Details: Brian, G4NNS, brian-coleman@tiscali.co.uk.

Finningley Microwave Round Table.
July 10 and 11.
Details: www.g0ghk.co.uk/table.php.

Crawley Microwave Round Table.
No date available yet. Possibly September.

Martlesham Microwave Round Table.
13 and 14 November.
Details: John Quarmby, G3XDY. G3XDY@BTinternet.com and http://mmrt.homedns.org/.

EME Conference, Dallas, Texas.
12 – 14 August 2010.
Details: www.ntms.org.

RSGB shop

NEW

Microwave Know How

for the Radio Amateur

By Andy Barter, G8ATD

Microwave Know How is a new compilation of articles aimed at those who are interested in building equipment for the amateur radio microwave bands. The designs in this book are from authors all around the world who are keen microwave constructors themselves. This ensures that all of the projects use modern techniques and up to date components.

The book includes chapters covering:

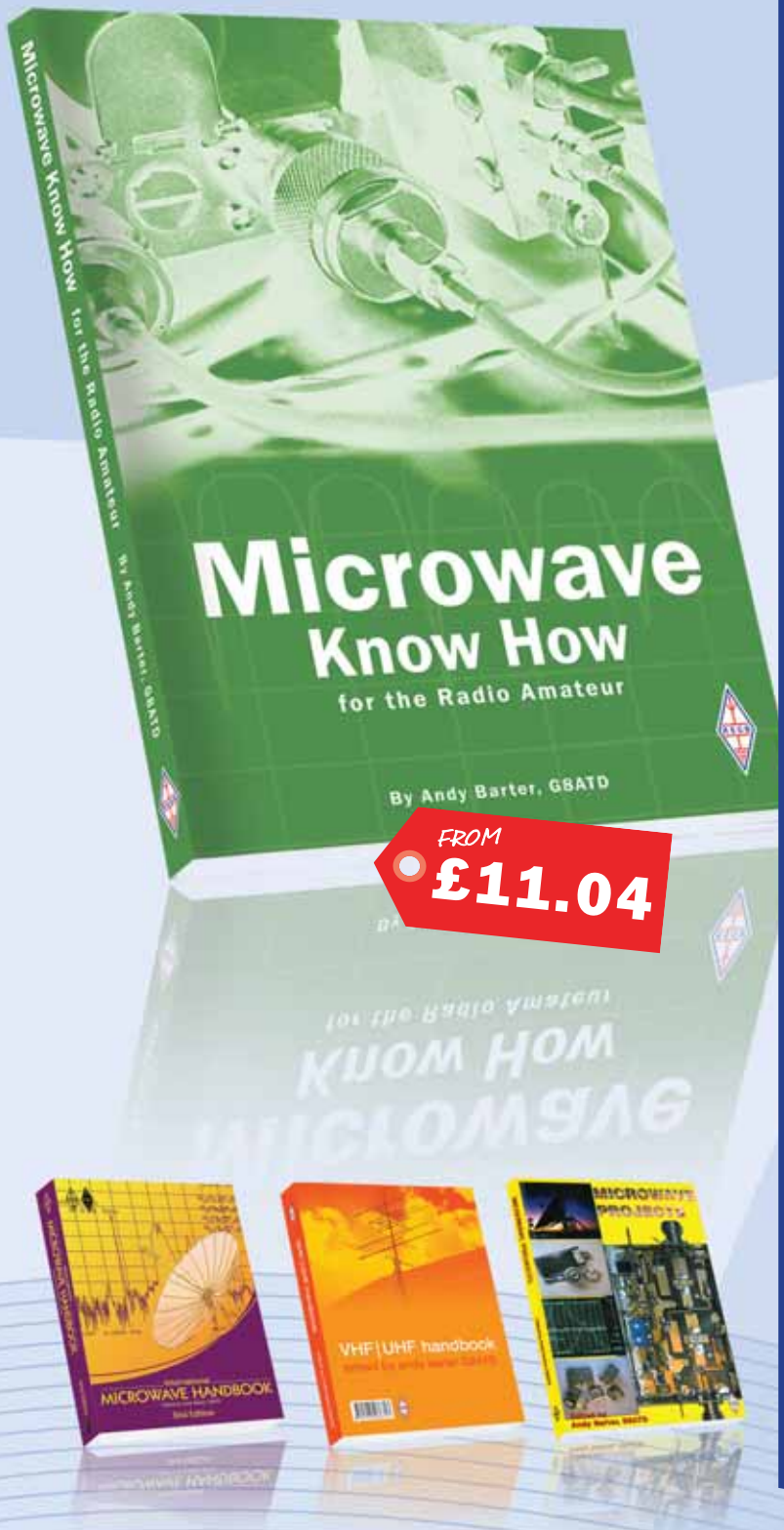
- Antennas with designs for 23cm, 13cm, 6cm.
- Power amplifiers for 23cm and 10GHz.
- Measuring equipment, with different ways to use a spectrum analyser and a very useful noise source.
- Filters and design of filters, useful for the accomplished constructor and a Hybrid coupler for 13cm.
- Modifying commercial equipment with details for using surplus equipment to get on 5.7GHz, 10GHz and 24GHz.
- Converter for S band using a YIG LO and a 2m down converter for use with SDRs.
- Oscillators showing how to use a DDS and MMICs.

If you are already active on the microwave bands or simply looking for interesting projects *Microwave Know How* will show you how easy it is to become more active using modern devices and equipment.

Size 174x240mm, 184 pages, ISBN 9781-9050-8656-6

Non Members' Price £12.99

RSGB Members' Price £11.04



By the same editor

International Microwave Handbook

Non Member's Price £16.99 **RSGB Members' Price £14.44**

VHF/UHF Handbook

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

Microwave Projects

Non Member's Price £16.99 **RSGB Members' Price £14.44**

Radio Society of Great Britain
3 Abbey Court, Fraser Road, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

TABLE 1: A comparison of results measuring Sun, cold sky and ground noise with the three methods described above. The audio method can be seen to produce results that are not in agreement with the other two methods.

Method	Cold Sky/Sun (dB change)	Ground to Cold sky (dB change)
Audio (Sound card with G4JNT Signalmeasure)	6.9	3.7
Wideband (HP435, HP8484, Miteq amplifier, Texscan tunable filter)	7.8	4.1
SDR (SDR-IQ, Spectravue)	7.8	4.2

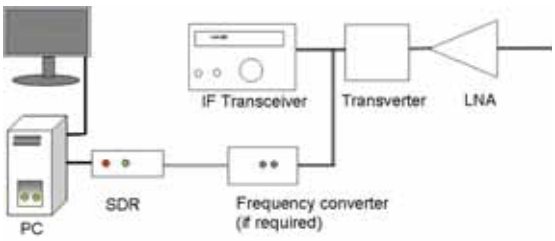


FIGURE 3: How to connect an SDR and receiver converter (if required) to a transverter output in order to make noise measurements.

problems of linearity and many applications provide a useful plotting or graphing facility to aid the measurement. The programme Signalmeasure **[2]**, written by G4JNT, is recommended for this purpose.

WIDEBAND METHOD. If the measurement is made early in the receive chain – and certainly before the roofing filter – then a wideband power meter will allow more accurate measurements to be made. Measurements here will suffer much less from 'noise spikes' and therefore the need for heavy damping of the meter, or other display device, is not usually required. Since most microwave EME involves the use of a transverter, the wideband power meter is probably best connected at the IF output of the transverter, as shown in **Figure 2**.

If you use a transceiver such as the TS-2000X or an IC-910 then you will probably need a parallel transverter or receive converter connected to the LNA output and feeding that into the wideband amplifier chain. This is because you will not normally be able to access a suitable tapping point in the first IF of the transceiver without some difficulty.

The usual method is to use a 144MHz (or other IF) high gain, wide bandwidth (1 – 3MHz) amplifier [3, 4] feeding either a conventional power meter, such as an HP432 or 435, or a simple diode power meter. If using a diode-based power meter it is essential that the diode is operated within its square law characteristic. If this cannot be guaranteed, then it is worth using a step attenuator (preferably with 0.1dB steps) to ensure that the detector always reads the same level by adjusting the attenuator and then reading the change in dB from the attenuator. It is also essential to ensure that there is adequate 'head room' so that random high level noise peaks do not cause the meter to clip or saturate. If there is insufficient dynamic range in the wideband amplifier to ensure this doesn't happen then the results can be significantly in error.

There is one other major drawback to this method. Strong in-band signals, such as from local beacons, local operators or from further a field, during a lift, can be sufficiently strong as to rival or exceed the level of the noise being measured. If this happens then the total noise power measured, especially when looking at cold sky, can be too high. It is essential that a spectrum analyser is used to examine the IF frequency range from the transverter, preferably at the input to the detector from the high gain wideband amplifier and if any significant signals are seen, do not use this method. Do not think that just because the dish antenna is looking towards the cold sky it will not pick up any terrestrial signals. Any in-band signal should be at least 20dB below the noise power level and preferably at least 30dB down.

SDR METHOD. This method is rapidly gaining in popularity, but does rely on you already owning or having access to an SDR receiver that can run software with the Continuum measurement facility. The SDR is again connected to the IF output of the transverter. Normally a 144 to 28MHz receive converter will be required between the transverter IF output and the SDR input, as shown in **Figure 3**. A suitable converter was described in the March 2010 issue of *RadCom*.

The SDR is set up with a frequency span of either 100 or 150kHz. Some trace averaging may be required for a smooth display. Using the continuum mode in the SDR software, a horizontal trace of the noise output from the receiver is displayed on screen with a resolution down to at least 0.005dB. Normally, a resolution of 1dB/division is all that is required.

With this method it is easy to see small changes in noise level as the dish is moved from looking at 'warm' ground, through cold sky to the Sun. A plot from my own 2.3GHz EME system is shown in **Figure 4**. On the left hand side of the plot the horizontal trace shows the level of sun noise, at a Solar Flux Index of 78, followed by a move to cold sky where the noise level is seen to drop about 7.8dB. Finally, on the right hand side, the dish is lowered to pick up ground noise. The irregular peaks between cold sky and ground noise are due to 'warm' tree branches, with a cold sky background, as the dish sweeps past them.

COMPARISON OF MEASUREMENTS.

I was able to compare the results of these three types of measurement. The results are presented in **Table 1**. The results are the average of several measurements.

As can be seen, the Wideband and SDR results are nearly identical. I tried a number of combinations of AGC and RF gain, together with attenuation, and even an RF amplifier between the transverter and TS-2000X. It was found impossible to achieve the same results with the audio method. A 1dB difference is very significant. It cannot be attributed to the Signalmeasure software but is more likely to be due to extra noise within the TS2000X audio stages, post demodulator, or within the DSP circuitry. Other radios could well exhibit the same problem.

INPUT TO THE MICROWAVE COLUMN.

Thank you to everyone who sent in a report this month. Input for the column is welcome at all times. However, band activity reports should be sent as soon after the event as possible. I generally start to compile the column around the end of each month. My contact details are at the top of the page.

WEBSEARCH
[1] Virtuelradar www.radarvirtuel.com/.
[2] G4JNT Signalmeasure www.g4jnt.com/dspsw.htm.
[3] G3WDG noise amplifier
www.qsl.net/n1bwt/chap10.pdf.
Dubus 2/1995 Pages 5-8
[4] G4NNS noise amplifier.
www.g3pho.free-online.co.uk/
microwaves/noiseamp.pdf.

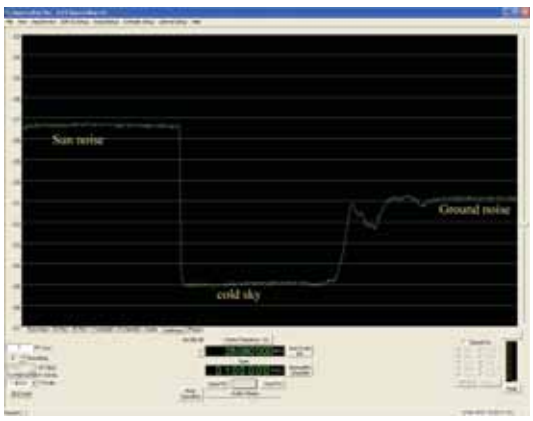


FIGURE 4: A typical Continuum display, from Spectravue, showing Sun, cold sky and warm ground noise levels on a horizontal, scrolling, display.

LAM COMMUNICATIONS

The North's Leading Radio Emporium

52 Sheffield Road, Hoyland Common, Barnsley, S74 0DQ, South Yorkshire

www.lamcommunications.net

sales@lamcommunications.net

Tel: 01226 361700

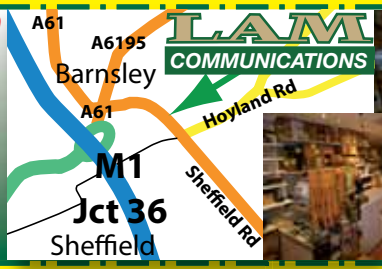
Specialist Dealers in New and Used Equipment Located within 1/2 mile of junction 36, M1 Motorway

Check Our website for more up-to-date and keener Prices!

Check Our website for more up-to-date and keener Prices!

THE ONE STOP SHOP for the North!

WE ARE MAIL-ORDER SPECIALISTS for all of the UK Tracked FedEx



Opening Times:
Mon - Fri 09.30-17.30
Saturday 09.30-16.00

ICOM IC-7600

PRICE £3294.95

A LITTLE WINTER WARMER!

THE NEW IC-9100

ICOM Authorised Dealer

HF / VHF / UHF
160m-23cms Base Station

Arriving Soon - be the first to own this new Rig ORDER YOURS NOW!

HF- VHF- UHF- D Star LAMCO's have all ICOM Rigs in Stock CALL NOW

IC-7800 Flagship HF 160-6M Dual Receiver base station @ **£7995.95**

IC-7700 Single receiver version of the 7800 HF160-6M @ **£5499.95**

IC-7400 HF160-6M + 2M @ **£1359.95**
Package with the SM 20 desk mic and SP 21 speaker @ **£1539.95**

IC-7200 HF160-6M 100w base or portable @ **£769.95**

IC-718 HF160-10M @ **£459.95**

IC-910H 2m/70cm Base @ **£1269.95**

IC-910HX 2m/70cm Base including 23cm module @ **£1469.95**

IC-7000 HF160-6M+2m/70cm @ **£944.95**

IC-706 MKIIG HF160-6M+145/430Mhz, Mobile @ **£734.95**

IC-2820 50W VHF-UHF, D-Star complete @ **£544.95**

IC-E880D 50W dual band Mobile, detactable head unit, Small but powerfull, @ **£CALL**

IC-E80D 5W Dual band handheld wideband RX, Rugged, Water Resistant @ **£CALL**

IC-E92D waterproof dual band VHF-UHF handheld @ **£369.95**
HK-175GPS speaker-mic @ **£229.95**

Icom PS-125 25 Amp PSU @ **£319.95**

DIAMOND ANTENNA

Diamond Antennas Famous for Quality

LAM stock a Comprehensive Range

Call for Our Best Price ££££

FlexRadio Systems
Software Defined Radios

FlexRadio 3000 SDR HF & 6m, Just add your own PC, **available now @ £1394.95**

YAESU

Choice of the World's top DX'ers

FT-2000D HF 160-10 + 6M All modes, 200 Watts, DSP @ **£2329.95**

FT-2000 HF 160-10 + 6M All modes, 100 Watts, DSP @ **£1909.95**

FT-950 HF 160-10 + 6M All modes, 100 Watts, DSP @ **£1089.95**

FT-450AT HF 160-10 + 6M All modes,100W, DSP including internal ATU @ **£649.95**

FT-897D HF 160-10 + 6M All modes, 100 Watts @ **£649.95**

FT-857D HF/50/145/430Mhz @ **£554.95**

FT-817ND the ultimate portable rig HF/50 145/430MHZ all mode QRP @ **£449.95**

FT-8900R 10/6/2/70 dual receive + DTMF 50watts @ **£339.95**

FT-8800E 145/430 mobile @ **£294.95**

FT-7800E 145/430 mobile @ **£204.95**

FT-1802 145 Mobile 50w @ **£119.95**

VX-3R 5w 145/430 handheld @ **£139.95**

VX-7R 5w 145/430 handheld @ **£264.95**

VX-8R 5w 145/430 handheld @ **£379.95**

FT-60 5w 145/430 handheld @ **£149.95**

ALINCO

NEW RADIO's FROM ALINCO

DX-SR8 New HF Transciever 1-34MHz 100w All mode @ **£499.95**

DJ-G7E New Tri-Band handheld 144MHz, 430MHz & 1200MHz with Full duplex operation. 5W 2/70, 1W on 23cms, Water Resistant @ **£299.95**

bhi Products

NES 10-2 MKII Noise eliminating speaker @ **£99.99**

NEIM 1031 DSP Inline Module @ **£139.99**

ANEM 10-2 MKII Amplified Noise cancelling module @ **£99.99**

RADIO MATE Compact Keyboard for the FT817, FT857, FT897 @ **£99.99**

Superfast "Next Day Delivery"
On all orders placed before 2pm

junksale.co.uk
-Buy-Sell-Exchange-Wanted-

VISA MasterCard SWITCH Maestro PayPal

KENWOOD

Listen to the Future

STOP PRESS:

New HF Rig coming soon Order Yours from LAMCO NOW!

TS-2000 HF/50/145/430Mhz @ **£1499.95**

TS-2000X HF/50/145/430Mhz with the 23cm module fitted @ **£1739.95**

TS-480 SAT HF/6 100 watts, includes ATU @ **£739.95**

TS-480 HX HF/6 200Watt High power version, No ATU @ **£839.95**

TM-D710E 145/430Mhz, 50 watts, APRS ready with built in TNC, EchoLink ready @ **£439.95**

TM-V71E 145/430Mhz Dual bander, 50watts, wide band receive @ **£294.95**

THF-7E 145/430Mhz Handheld Wide band receive inc SSB @ **£234.95**

ANTENNA TUNERS

MyDEL

MyDEL CG3000 ATU @ **£285.95**
1.8 - 30 Mhz minimum wire length 8 meters, 10 - 200W PEP, SWR: <2:1, 12V Auto tuning 2 sec (1st tune).>1 sec to memory 200 Memorys
Remote switch optional @ **£ 39.99**

CG5000MKII 500W as above @ **£559.95**

LDG ELECTRONICS

Z100 Plus 100W auto ATU160-6m @ **£143.95**

AT100PRO 100 W 160-6m @ **£194.95**

AT200PRO 200 W 160-6m @ **£214.95**

Z-11PRO portable QRP100 watts ATU @ **£158.95**

IT100 (AT7000) for the Icom IC7000 rig @ **£153.95**

AT897 100 watts 160-6m @ **£183.95**

MFJ

A range of MFJ products catered for!.....
Call LAMCO for availability

USED EQUIPMENT now with 12 months warranty unless otherwise stated

All prices quoted @ 17.5% VAT E&OE

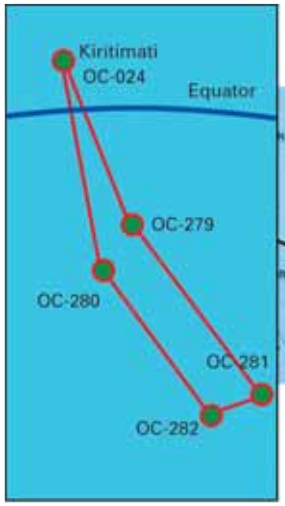
IOTA

Good news! Sunspots return

GOOD NEWS. Sunspots are back. Solar cycle 24 finally stopped teasing us and got properly off the starting blocks at the beginning of the year with the daily sunspot number briefly hitting 71 in early February. The bands were quick to respond, with some excellent DX openings on 15 and 12m despite the short winter days. Keep your fingers crossed for some great conditions over the next few years. IOTA operations tend to be shorter and less well equipped than the major DXCC outings so good propagation is particularly important.

LINE ISLANDS. If all has gone to plan, one of the biggest IOTA trips for a very long time should now be under way. Nils, SM6CAS, Derek, G3KHZ, Steve, G4EDG, Mike, K9AJ and former RadCom editor Steve Telenius Lowe, G4JVG/9M6DXX, accompanied by some Kiribati government officials, planned to leave Christmas Island on 17 March on a long voyage to the Southern Line Islands.

They hope to stop and operate from four IOTA new ones, namely Malden Island (OC-279), Starbuck Island (OC-280), Caroline Island (OC-281) and Vostok Island (OC-282). If all goes well they will be active from each island for four days. They will cover almost 1800 nautical miles and plan to return to Christmas Island on 20 April.



Route of the T32 DXpedition.

This will not be an easy trip as all the islands are uninhabited and there is no sheltered harbour or landing stage on any of them. Getting ashore will require good weather and surf conditions. Check their website at t32line.webnode.com for more details of the trip. Their boat, the sailing vessel Kwai, also has its own website at http://sites.google.com/site/sailcargo/home. QSL direct via SM6CAS.

OTHER ACTIVITY. Pierre, ZS1HF has announced he will be active as ZS8M from the very rare IOTA and DXCC location of Marion Island (AF-021) from the end of April for one year. Pierre will be working on the island as a radio and electronics technician, so will only be able to operate in his spare time. Reportedly he is only taking dipole antennas so this could be a tough one and the pile-ups will be huge.

Elmo, EA5BYP and Javier, EA5KM will be active as 3C0C from Annobon Island (AF-039) for two weeks in April. They will operate CW, SSB and RTTY on 160 to 10m, with an emphasis on the low bands and CW. QSL via EA7FTR, direct or bureau. They will upload their logs to LoTW one year after the expedition. Check their website at www.3c0c-annobon.com for more information.

Maitress Ile, part of Les Minquiers, which is IOTA reference EU-099.

John, VE8EV is planning to activate the very rare Northwest Territories Inuvik Region East Group (NA-182) in late April. At the time of writing he was looking for a CW operator, keen on Arctic winter camping, to join him. The position may still be open so if you are interested, contact John via e-mail at ve8ev@arrl.net. This IOTA group has only been activated once before, by VE8YQ, who was posted to a research station (since closed) on Nicholson Island. His QTH caused the IOTA Committee some grief as there is no such island on any map! Further research, which included direct contact with the Canadian mapping agency, revealed that Nicholson Peninsula on the Arctic coast had just turned into Nicholson Island after some serious coastal erosion and met the IOTA qualification requirements.

Hugh, K6HFA, veteran of a number of new and rare Alaskan IOTAs, is now on a Pacific DXpedition. By mid-March he should be in Tonga where he plans to activate the two most common islands (OC-049 and OC-064) as well as the much rarer Niuafo'ou group (OC-123). He then moves to Wallis Island (OC-054) from 6 to 12 April, Tuvalu (OC-015) from 13 to 21 April and Fiji (either OC-016 or OC-156) from 23 to 26 April. He will be running 100 watts to a vertical, which may make it a bit of a struggle to hear him from Europe unless the higher bands are in good shape. QSL to his home call.

The website for the 18 to 21 June IOTA expedition to the Flannan Isles (EU-118) is now up and running at www.ms0int.com/index.php. Six operators (EA1DR, EA2TA, EA3NT, F4BKV, MM0NDX and SM0MDG) hope to be active on 80 to 10m CW and SSB with two stations – though this is another one that is tricky to land on and will require some good weather. QSL via M0URX, direct or bureau.

ON4EI will be QRV as EJ8GQB from Bere Island (EU-121) off the Irish coast from 21 to 29 March.

A Belgian group including ON4PQ, ON5HC, ON5MF, ON7PQ, ON7USB will be active from the Minquiers Islands (EU-099) south of Jersey, from 31 March to 7 April as MJ/OP9X/P. See their website at www.eu099.be for more information. This is a delightful place in the summer but early April may be a little early for decent weather. Readers seeking some extra background may care to read the Hammond Innes novel *The Wreck of the Mary Deare*, which is set in the islands. Hammond Innes was a keen sailor and knew the area well.

The Camb Hams from the Cambridge area will be QRV from the island of Harris in the Outer Hebrides (EU-010) during the first two weeks of May and are planning a side trip to one of the rarer IOTAs in the area – probably the Monach Islands (EU-111) during the first week.

Finally, the very rare Vietnamese Con Co island (AS-185) is due up from 10 to 18 April. Check www.3w6c.qrv.ch for the latest info.

Book review

Morse, microwaves and antenna design form an interesting mix this month

Morse Code for Radio Amateurs (10th Edition)

by Roger Cooke, G3LDI

Sometimes you pick up a book and you instinctively know that the author loves his subject. This book is a case in point, where well-known Morse exponent and enthusiast Roger Cooke, G3LDI communicates his passion in a clear and very readable style. The opening gripped me immediately with a short history of Samuel Morse (who, at college, considered the study of electricity to be a distraction from his true vocation, art); thence to his invention of the electric telegraph and the code that bears his name.

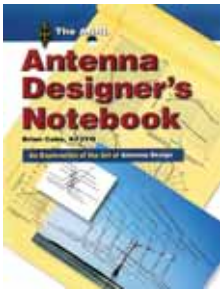
After this scene-setting, Cooke turns his attention to the real amateur radio nitty-gritty – "the quintessential picture [of an amateur] sitting in front of radio equipment with headphones on pounding a Morse key". However, this is by no means the whole story. The book points out that straight keys aren't always the answer; paddles are indispensable at high speed and the computer has its place, particularly in contests.

The main thrust of the book is indisputably intended to enthuse the reader to learn, and use, Morse. Rather than setting out to be a tutorial, G3LDI simply recommends the Koch method as the best way to learn, describing it more in terms of how to use the method rather than the method itself. Certain software is recommended – and included on the free CD that accompanies the book, which also contains audio tracks for a normal CD player. There is also a useful list of websites. Advice continues with tips on how to increase your speed up to the dizzying heights of 30 or even 40 words per minute, by which time you should be comfortable receiving code entirely in your head, only jotting down the odd note as you go. Achieve this and Morse will become an entirely natural second language.

ISBN 978-1-90508-617-7
Size 240 x 174mm, 32 pages
Non Members' Price £7.99
Members' Price £6.79

Morse Code for Radio Amateurs (10th Edition)

by Roger Cooke, G3LDI



Subtitled 'An exploration of the art of antenna design', this book concentrates on specific parts of the author's long and detailed experiments with antennas. Concentrating initially on long Yagis, the author shows how he evolves their design into the 'Boxkite', shown in the photograph on the front cover. He points out how the elements of the Boxkite Yagi bear a striking resemblance to the Lazy-H, but with some important differences that he also identifies. Later chapters concentrate on vertical antennas and ground planes, finally delving into loops and linear loading theory.

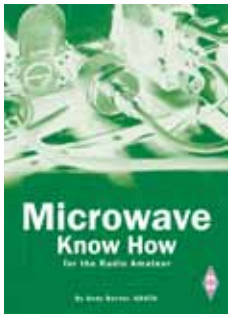
The text is supported by numerous graphs and charts that show the results of modelling simulations run as the antennas were developed. These are supplemented by diagrams of the evolving antenna designs and enlivened by the occasional photograph. There is also a free CD containing many EZNEC models.

Many books present finished aerial designs, but this book provides a unique insight into how the design of an antenna evolves from the initial idea via various iterations until it reaches a satisfactory level of performance. In this respect alone it is well worth consideration; the antenna designs it contains are an additional bonus!

ISBN 978-0-87259-147-9
274 x 210mm, 208 pages
Non Members' Price £27.99
Members' Price £23.99

Microwave Know How for the Radio Amateur

Edited by Andy Barter, G8ATD



Andy Barter's microwave credentials are certainly impressive: enthusiast, editor of VHF-to-microwaves magazine *VHF Communications* and author of several previous books, to select just a few. This latest technical book is sure to find favour with microwave enthusiasts worldwide.

It is fair to say that this is not a beginners' book, but anyone with at least some experience of the higher frequency bands will find this a fascinating treasure-trove of information. It covers a wide range of subjects with two or three generally very practical articles per subject. The exception is the chapter on modifying commercial equipment, which describes how to use five different surplus RF units on 5.7, 10 or 24GHz as appropriate.

It is illustrative to look at a couple of projects. The first that caught my eye was the Vivaldi broad-band directional antenna, which offers good performance over a 10:1 or more frequency range. Making one is easy: photocopy the template in the book, enlarging or reducing according to a very simple criterion to set the working frequency range. Cut out a sheet of metal that shape or etch a PCB using the template as a mask, solder a piece of co-ax to the feed points and voila! You're on the air.

At the other end of the constructional complexity scale, but even more broad-band, is a 10MHz-10GHz noise source with a fairly simple circuit but significant demands on component selection and housing. It's one of those projects that is a lot easier if you have a milling machine but, if you can do it, you'll save a huge amount on buying a commercial noise head.

Most of the content is in the form of articles previously published in specialised microwave-oriented journals, but there are also a couple from recent *RadComs*. The overall quality is very high and, while a reasonable level of background knowledge is assumed, the material is applicable to people with a wide range of experience and skills. If you're into 23cm or higher, this book should be high on your list to buy soon.

ISBN 978-1-90508-656-6
274 x 210mm, 208 pages
Non Members' Price £12.99
Members' Price £11.04

QRP

Four Days in May 2010.

G3RJV, a speaker at the 2010 Four Days in May, signs a QRP book for Oleg Borodin, RV3GM at the 2009 event.

QRP IN THE US. I have mentioned the American 'Four days in May' (FDIM) QRP event several times in this column. The 2010 FDIM is from Thursday 13 to Sunday 16 May 2010. Organised by the American QRP ARCI (QRP Amateur Radio Club International) it is an additional attraction to the Dayton Hamvention in Dayton, Ohio. The Dayton Hamvention is the largest amateur radio event in the world and runs from a Friday to a Sunday morning. The QRP ARCI add an extra day, the Thursday, to the Hamvention and fill it with QRP Seminars and events based at the Holiday Inn, Fairborn, a few miles from the Hamvention location. The club block book the hotel and its conference facilities to put on the Seminar day on Thursday and a whole series of QRP related events throughout the rest of the Hamvention. It is the single largest QRP event and expects to attract at least 400 QRP enthusiasts this year.

In 2010 there are two UK speakers at the Seminar: myself, G3RJV, speaking on homemade receivers and Hans Summers, G0UPL, speaking on QRSS. Full details can be found at www.fdim.qrparci.org/.

THE FDIM 2010 QRP CHALLENGE. Each year at FDIM, attendees have the opportunity to bring their latest projects and enter them into the 'Building Contest'. There are six categories that are judged by the people attending the Friday night event. In 2010 there is a special category called the 'FDIM 2010 QRP Challenge.

The objective is to design and build a QRP transceiver using the following rules:

- The transceiver is limited to a maximum of 72 parts.
- The receiver must be a superhet or other 'single signal' receiver.
- Keying and muting must be included.
- Covers at least one of the standard QRP frequencies
- Capable of battery power for portable use
- Schematic with parts list and functional transceiver be brought (or sent) to FDIM 2010.
- Only one part may be an integrated circuit, all other parts must be discrete components.

Knobs, sockets, tuning dials, copper board, power source and enclosures are not considered parts. I have been asked to be a judge for the challenge and look forward to seeing many innovative projects and reporting back to *RadCom* readers.

DAVE INGRAM, K4TWJ, SK. On the K4TWJ blog for January 21st, Dave Ingram's wife Sandy Ingram, WB4OEE, put in the following sad entry. "It is with great sadness I let you know that Dave passed away Wednesday morning, January 20. Amateur Radio is certainly going to miss his enthusiasm and his wonderful and enduring love for ham radio. He loved to tell the world about ham radio and anybody could join in with little money to invest...or a lot. My thanks go out to each and everyone of you who have sent special Get Well Wishes and prayers for Dave." Dave Ingram was a prolific amateur radio author. His blog records, "I have written over 800 articles/columns and 28 books on all aspects of amateur radio. I now write 3 columns in *CQ Magazine* plus articles for *RadCom* of the UK, *100 Watts* of Thailand, SARL of South Africa and other international ham magazines." Dave was also featured in the new RSGB book *International QRP Collection*.

I have read articles by Dave Ingram for more than 30 years, many of them in the *CQ Magazine*. His great interests were encouraging beginners to build radios, QRP and Morse Keys. His writing was down to earth and colloquial; full of enthusiasm for his subject. I met Dave on a couple of occasions and was immediately drawn to this cheerful, larger than life, character. Sadly, he suffered a massive heart attack on New Year's Eve from which he never recovered. The hobby will be less for the passing of K4TWJ.

UK QRP EVENTS. All of the above news is from the USA and indeed the Americans have a fine history of promoting and encouraging QRP. But to redress the balance I have news of QRP events at home during this year.

The Annual G-QRP Club Convention is on Saturday 23 October at the Rishworth School, on the A672 (Ripponden) road from junction 22 on the M62. The convention opens at 10am with an admission fee of £2. This is a convention, not just a 'radio rally' and the G QRP Club is organising the usual lecture stream in the purpose built lecture theatre. A Buildathon is planned with details to be announced shortly. The regular pie man has promised to serve the usual excellent lunchtime fare of Pie and Mushy Peas. Details and updates on www.gqrp.com.

The 26th Yeovil QRP Convention is on Sunday 25 April at the Digby Hall, Hound Street, Sherborne, Dorset DT9 3AA, adjoining central shopping car park. It opens at 9.30am. There is talk-in on S22/V44 with adequate parking. The convention includes a lecture programme, trade stands, Bring & Buy, catering and disabled facilities. For details, contact Robert on 01935-706715, or by e-mail to robert.farey@btinternet.com or the website at www.yeovil-arc.com.

The 14 Red Rose QRP Festival is on Sunday 6 June, 11am to 3pm at the Formby Hall, Alder Street (off High Street), Atherton, Manchester M46 9EY. The admission is £2 with children under 14 free. There is easy access from all directions (M6, M61, M60). The event features: trade and individual stalls; club stands; including RSGB and G QRP Club; a very low cost Bring & Buy (No sell, no pay!) plus sales of new and surplus equipment and components. Some tables available at £8 but please book early. Contact: Les Jackson, G4HZJ by e-mail at g4hzj@ntlworld.com or phone 01942 870634.

The South Normanton Alfreton and District Amateur Radio Club (SNADARC) in association with the G-QRP Club are organising the 9th Junction 28 QRP Rally on Sunday 13 June at Alfreton Leisure Centre, Church Street, Alfreton, Derbyshire DE55 7AH. The event is just 10 minutes from M1 junction 28 and A38. It is a fully accessible venue with parking. The rally features amateur radio, electronics and related items, Bring & Buy and special interest group plus a licensed bar and food. It is open to the public from 10am. Further details from Russell Bradley, G0OKD on 01773 783658 or by e-mail to russell.bradleyG0OKD@ntlworld.com. The Club website is at www.snadarc.com.

MAHA Professional Range

Advanced Batteries & Chargers

"Approved by the toughest customers"
Military & Defense, NASA, Kodak, Rockwell
….and many more

MH-C9000

The Ultimate Charger Analyser with four independent slots for AA/AAA batteries, it's like having four units in one!

- Match battery capacities and bring life back to old or unused batteries
- Five modes of operation: Charge, Refresh & Analyse, Battery forming, Discharge, Cycle
- 29 selectable charging and discharging rates for best battery performance
- Battery matching – to reduce weakest link
- Battery forming – restore old batteries
- Endless programming possibility – over 10,000 ways
- Large backlit display to give comprehensive battery information

£49.95

MH-C808M

- Charge AA/AAA/C/D NiMH batteries
- 8 independent charging circuits
- Ultra fast recharge time
- Built in battery conditioning system
- Worldwide mains adaptor

£79.95

MH-C490F

- Charge one to four 9V batteries independantly
- 2 hour charge time
- Revive older 9V batteries
- Mains or 12V car operation

£24.95

MH-C800S

- Charge AA/AAA NiMH batteries
- 8 independent charging circuits
- Ultra fast recharge time
- Built in battery conditioning system
- Worldwide mains adaptor

£49.95

MH-C401FS

- Rapid cool charger- with batteries!
- 100 minute or 5 hour switchable charger
- Unique charging system - batteries accept more complete charge.
- Four independent charging circuits
- Mains or 12V car powered

Supplied with : -

- Four AA 2,700mAh NiMH batteries
- Car adapter kit
- Mains adapter
- Battery case

£39.95

MH-C1090F

- Ten way version of MH-C490F above
- Charge one to ten 9V batteries independantly

£49.95

MH-C801D

- Heavy duty version of C800S above
- 1 hour charge

£59.95

Batteries

Powerex Batteries

Extra High capacity - recharge up to 1000 times!

MH-2700 .....AA 2,700 mAh 1.2V (pack 4).....£14.95
MH-D110.....D 11,000mAh 1.2V (pack 2).....£22.95
MH-C500.....C 5,000 mAh 1.2V (pack 2).....£16.95
MH-84V .....PP3 300mAh 8.4V £9.95

Imedion Batteries

Retains 85% charge for one year!

AAA .....800mAh (pack 4).....£11.95
AA .....2100mAh (pack 4).....£12.95

MH-204W

Intelligent battery Charger

- 1-2 hour charge for AA and AAA batteries
- Revive old batteries
- Bring dead batteries back to life

MH-204W
Charger only ***£19.95***

MH204W+
with four 2,700mAh AA batteries...***£29.95***

nevada®

sales **023 9231 3090** web **www.mahaenergy.co.uk**

UK Distributors of Imedion, Powerex, Maha Batteries and Chargers

Also available from

maplin
www.maplin.co.uk

cpc
www.cpc.co.uk

SHOWROOM & MAIL ORDER:
Unit 1,
Purfleet Industrial Estate,
Off Juliette Way,
Aveley RM15 4YA

LOOK OUT FOR OUR SPECIAL OFFER "BUNDLES"

Haydon Communications

LOCAL TO GLOBAL

TEL: 01708 862524
FAX: 01708 868441

Mail Order & showroom open:
Mon-Thurs: 10.00am - 4.00pm
Friday: 10.00am - 3.00pm.
Prices held as low as possible.
That's our promise!

TO ORDER ON-LINE SEE www.haydon.info

2-year Yaesu (UK) warranty on all Yaesu products – guaranteed

E&OE

PSUs

NISSEI MS-1228

28A at 13.8V yet under 2kgs. (H 57mm, W 174mm, D 200mm approx). Fully voltage protected. Cigar socket & extra sockets at front/rear. Ultra slim.

NISSEI HAVE BECOME RENOWNED FOR PUTTING QUALITY FIRST, YET MAINTAINING A GOOD PRICING STRUCTURE. A TRULY SUPERB POWER SUPPLY UNIT

'Smallest version to date' now with cigar socket.

QUALITY MADE PRODUCT **£79.99**

NISSEI PS-300

Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear. Dim'ns: 256(W) x 135(H) x 280(D)mm. A truly professionally made unit built to outlast most PSUs.

30 AMP/12 VOLT PSU

TRUE 'LINEAR' PSU

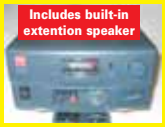
SALE PRICE **£134.99**

DIAMOND GSV-3000

"Linear power supply". 30 amp @ 13.8V. 1-15V variable.

Diamond quality PSU **£189.99**

DIAMOND GZV-4000



Includes built-in extention speaker

Diamond quality power supplies/ switch mode. 40 amp version.

OUR PRICE **£174.99**

GZV-2500 25 amp version of GZV-4000.....sale price £119.99

HF TRANCEIVERS

FT-2000D

IF/DSP marvel (200W)

OUR PRICE **£2350.00**

OR GO LARGE FT-2000D + SP-2000 SPEAKER **£2450.00**

FT-950

HF + 6m IF DSP

OUR PRICE **£1089.99**

OR GO LARGE FT-950 + NISSEI PS-300 **£1150.00**

FT-450

HF + 6m/ IF DSP

FT-450 only.....**£569.99**

FT-450 + MS-1228....**£599.99**

FT-897D

Includes DSP

OUR PRICE **£629.99**

OR GO LARGE FT-897 + MS-1228 **£659.99**

FT-857D DSP

HF + 6m + 2m + 70cm.

OUR PRICE **£549.99**

OR GO LARGE FT-857 + MS-1228 **£579.99**

FT-817 ND

HF + 6m + 2m + 70cms. Incl's battery/charger + antennas. Optional case £22. Extra spare battery £49.99

OUR PRICE **£429.99**

FT-2000

IF DSP/ HF marvel

OUR PRICE **£1845.00**

OR GO LARGE FT-2000 + SP-2000 SPEAKER **£1945.00**

TS-2000E

HF + 6m + 2m + 70cm. Not only is this Kenwood's top machine with IF DSP, it also uses cutting-edge technology in a streamlined package. Not for the faint hearted!

Free MS-1228 28-amp PSU **£1449**

TS-2000X + FREE MS-1228 PSU £1699.99
TS-480HX £829.99
TS-480SAT £735.99

MD-200

Broadcast quality dynamic mic. It sounds & looks superb. Fits 8-pin round & 8-pin modular radios. (Optional 6-pin modular adapter £19.99)

SALE PRICE **£195.99**

MD-100

Superb quality microphone at an affordable price.

SALE PRICE **£129.99**

SP-2000

External speaker + audio filters. features a large 4.7"/120mm speaker along with a 3-selection hi-cut and 2 section low cut. Dual switched input + headphone socket.

SALE PRICE **£139.99**

FP-1030

Superb, high quality Yaesu. 30 amp PSU with variable voltage & multiple outlets.

SALE PRICE **£159.99**

ANTENNAS

DIAMOND V-2000

6m + 2m + 70cm. 2 section (2.5m long) PL-259 fitting.

Superb quality

£124.99

ATAS-120

Military spec mobile antenna – superbly made. Covers HF + 6m + 2m + 70cm. *Fully automatic. (*certain Yaesu radios).

SALE PRICE **£249.99**

INTRUDER II

11 band (80-10 6/2/70cm). PL-259 fitting. Colapses to 95cm (~ 3 ft).

£37.99 (2 for £70.00)

NEW INTRUDER III

13 band (80-10/6/2). PL-259 fitting. Includes WARC bands. 13 band version of Intruder II.

£54.99 (2 for £99.00)

DIAMOND CP-6

A superb (diamond quality) 6 band trap verticle antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m (15ft tall).

SEND SAE FOR DATA SHEET

SALE PRICE **£289.99**

VHF/UHF TRANS

YAESU FT-8900r

10m + 6m + 2m + 70cm. (up to 50W).

+ FREE 6m/2m/70cm mobile antenna

Includes DTMF mic + wideband receive

£325.00

YAESU FTM-10R/E

2m/70cm mobile + wide Rx. Blue tooth facility.

Blue tooth adapter £79.99

Wide Rx

£259.99

YAESU FT-7800E

2m/70cm + wide Rx. (50W/35W) includes DT, MF, mic

In-car kit £20.00. Extra DC lead £17.00

£179.99

FT-2800M

2m/65W incls. DTMF

£127.95

FT-8800

2m/70cm + wide Rx

£285.00

YAESU VX-7R

6m/2m70cm + wide RX. An amazing 6W water proof hand-held.

Available in black or silver

£229.99

NEW YAESU VX-3E

2m/70cm Tx Rx:- 500kHz-1GHz. Includes:- battery/charger.

£139.99

YAESU VX-8E

6m/2m/70cm. New model. SALE PRICE **£349.99**

KENWOOD TH-F7E

2m/70cm Tx. Rx: 0.1-1000MHz (AM/WFM/FM/SSB). Incl's battery pack (Lion) + charger.

Includes free remote mic

£229.99

ALINCO DJ-596E

2m + 70cm Handie. Includes nickle metal N.M.H.I and charger.

Includes free remote mic

£179.99

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W) .....£79.95 P&P £6.50
RS-102 1.8-150MHz (200W) .....£49.95 P&P £6.50
RS-402 125-525MHz (200W) .....£49.95 P&P £6.50
RS-3000 1.8-60MHz (3kW) Incls mod meter £59.95 P&P £6.50
RS-40 144/430MHz Pocket PWR/SWR.....£34.99 P&P £5
DL-30 diamond dummy load (100W max).....£29.99 P&P £5

D-308B DELUXE DESK MIC

(with up/down). Many amateurs (over 4000) have been pleased with it's performance. Includes 8-pin round Yaesu mic lead. Icom/Kenwood & other leads available. Phone (£19.99 each).

Replacement foam windshield £3.00 + P&P.

Truly remarkable audio on both SSB & FM/AM

SALE PRICE **£79.99**

ACCS

SGC BARGAINS

SGC MAC-200 New auto tuner 1.8-54MHz (200W) wire, vertical, dipole. You name it. (5 selectable outputs).

£289.99

SGC-239 Mini tower ATU (1.8-30MHz) £199.99
SGC-237 HF+6m Tuner..... £309.99
SGC-230 (HF-200W) ATU..... £449.99
SGC-Smart lock (specify model)..... £69.99

MFJ-993B INTELLITUNER

Fully automatic (1.8-30MHz). 300W SSB.

Easy to use ATU.

SALE PRICE **£239.99**

MFJ-949E

SALE PRICE **£174.99**

● 1.8-30MHz 300W ATU ● Large cross needle meter ● 30/300W PEP power meter ● VSWR ● 3-way antenna selector ● Internal balun + dummy load.

MFJ-259B

HF digital SWR analyser – 1.8-170MHz. (Optional DIP coils £29.99 (Optional case £29.99)

£259.99

MFJ-269 HF+VHF+UHF analyser.....£325.99
MFJ-269P HF+VHF+UHF analyser professional version..... £349.99
MFJ-901B Superb versitile ATU.....£99.99
MFJ-260C 300W dummy load £49.99
MFJ-264 1.5kW dummy load.....£79.99
MFJ-969 Rollercoaster ATU (300W).....£199.99
MFJ-962D 1.5kW (metered) antenna tuner... special offer £249.99

LIMITED STOCK

10m PNEUMATIC MAST

We have a small quantity of "military spec" pump-up masts (part of a Government order). All brand new in a crate and supplied with cover (close HT ≈ 6 foot). Anodised green finish.
40m guy kit pack £49.99
Ground fixing spikes (3-off) £35.00
2 foot all ground fixing kit..... £99.99
(Can be hand operated or by compressor/foot pump)

OUR PRICE **£1099.99** Del £40.00.

NEW DIAMOND BB6W

2-30MHz (250W) 6.4m long. End-fed wire antenna. Icludes matching balun. Sling up & away you go.

£199.99

NEW DIAMOND WD-330

Amazing performance. Twin folded dipole. 2-30MHz – and it really works. No ATU required (25mts long). Supplied with 30 mtr PL-259 feeder – ready to go. If you want great transmission, look no where else.
Japanees quality made product

WOW **£199.99**

CUSHCRAFT BARGAINS *Delivery £15.00*

MA5B	Mini beam 10, 12, 15, 17, 20m.....	WOW £419.99
A4S	4 ele beam (10 - 20m).....	£649.99
A3S	3 ele beam (10-20m).....	WOW £539.99
R-8E	Vertical (40 - 6m) "special".....	SPECIAL £499.99

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

£199.99

SEND SAE FOR LEAFLET

W-8010 DIAMOND SHORTENED DIPOLE

80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain. Superb Japanese quality antenna system.

£159.99

Standard & Deluxe G5RV P&P on either full/half size £7.50

Half size 51ft (now includes heavy duty 300Ω ribbon).....£24.95
Full size - 102ft (now includes heavy duty 300Ω ribbon)...£28.95
Half size (Deluxe) - 51ft (40-10m) £36.95
Full size (Deluxe)- 102ft (80-10m) £42.95
In-line choke balun £39.99

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end).....£34.99 P&P £4.00 (a pair)

TRAPS BACK IN STOCK

BALUNS & TRAPS (1kW)

Baluns 1:1 or 4:1 or 6:1 .....£34.99 each P&P £4
Traps 80m or 40m or 20m or 15m..... £39.99 pair P&P £5

DOUBLE THICK FERRITE RINGS

A superb quality ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £12.00 P&P £4.00
12 for £20.00 P&P £5.00
50 for £40.00 P&P £10.00

COAX SWITCHES (P&P £6.00)

2 way CX-201 (0-1GHz) SO239.....£19.95
2 way CX-201 'N' (0-1GHz) 'N' £24.95
4 way CX-401 (0-500MHz) SO239.....£79.95
4 way CX-401 'N' (0-500MHz) 'N' £89.95

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF .....£22.00 P&P £3
DC-2 Standard 2-pin/15A fits most VHF/UHF.... £10.00 P&P £3
DC-3 Fits Yaesu FT-7800/8800/8900, etc ..... £17.50 P&P £3

YAESU REPLACEMENT MICS

MH-IC8 8 pin Yaesu mic (8-pin round) .....£39.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-pin round) .....£34.99 P&P £5
MH-31A8J 8 pin modular .....£34.99 P&P £5

COAX BARGAINS

True military spec real UK coax

RG-58 Military spec x 100m.
£49.99 or 2 for £90.00
Coax stripping tool (for RG-58).....£4.99
RG-213 Military spec x 100m (10mm dia).
£129.99/100m or 2 for £229.99

Q-TEK TRI-MAGMOUNT

Very heavy duty. Available:- SO-259 or 3/8 – specify. **£44.99**

W-8681 PROFESSIONAL WEATHER STATION

● No cable connection needed ● Touch LCD screen ● Atomic locked Date & Time ● Indoor/ Outdoor Temperature (C or F) ● Wind Speed & Direction (mph or kmph) ● Rain gauge (inches or mm) self emptying ● Indoor/Outdoor Humidity ● Barometer Pressure with trends ● Forecaster & Weather Alarm ● USB connection to PC ● PC "EASYWEATHER" software programme ● Historic data storage & display ● LCD panel wall mounts or desk mounts ● Batteries last over 12 months
Professional version SALE PRICE **£69.99**

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc.

Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for £10.00 or 6 for £25.00 (P&P £4.00)

HEAVY DUTY SWAGED MAST SET

New extra heavy duty 2" mast set. 4 sections x 5½ foot slot together.

£69.99 each. TWO FOR £130.00 DEL £15.00

NEW SWAGED MAST SETS

20 foot mast. 1½" – 4 x 5 foot sections. (Swaged) **£43.99**

20 foot mast. 1¼" – 4 x 5 foot sections. (Swaged) **£41.99**

H/DUTY CAR BOOT MAST SET

18 foot (1½" dia).
18 foot – 6 x 3 foot (1½") slot together ally sections.

£43.99 each.

TWO FOR £79.99 DEL DEL £13.00

NEW CAR BOOT MAST SET

Superb 18 foot (6 x 3 foot sections) that slot together.
Dia: 1¼" ideal to take anywhere. **£43.99**

2 for £69.99 del £13.00

HANGING PULLY

Heavy duty die-cast hanging pulley. Hook and go!

£24.99

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling.
(Fits up to 2" mast) **£12.99** + P&P £4.50
30m pack (4.4mm) nylon guy rope £12.50
132m roll 4.4m nylon guy (480Kg b/f) .....£40.00 Del £7.50

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

£12.99 + P&P £4.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on WALL BRACKET £2.99 P&P £1.00
30m pack (4.4mm) nylon guy (480kg).....£12.50
132m (4.4mm) nylon guy (480Kg) £40.00

BARGAIN WINCH

500kg brake winch. BARGAIN PRICE

£79.99 Del £10.00

(Now includes cable grip)
Winch wall bracket.....£22.99

LOW LOSS PATCH LEADS £3.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	£9.99
PL-259 - PL-259	1m	£11.99
PL-259 - PL-259	4m	£14.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£9.99

EP-300

Over the ear earpiece.

£9.95

P&P £3.00

DB-770H (BNC)

2m/70cm Tx + wide Rx. High gain up to 5.5dB.

£54.99

P&P £5.00

MT-3302

Heavy duty universal mount.

Includes 5m cable **£29.99**

MT-6601

Adjustable roof rack/window bar mount

£19.99

YAESU G-450C

Heavy duty rotator for HF beams, etc. Supplied with circular display control box and 25m of rotator cable.

WOW **£309.99**

G-650C extra heavy duty rotator + 25m cable..... £349.99
G-1000DXC extra heavy duty rotator + 25m cable £419.99
G-2800DXC The goliath of rotators..... £749.99
GS-065 thrust bearing..... £54.99
GC-038 lower mast clamps £32.99
G-250 lightweight rotator..... £95.00

AR788

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable £1 per mtr.

OUR PRICE **£79.99**

AE-201 thrust bearing.....£24.99

DIAMOND YAGIS No tuning required

2m/10 element No tuning required SO-239 feed..... £74.99
70cms/10 element No tuning required SO-239 feed..... £48.99

Q-TEK COLINEARS (VHF/UHF) Del £12.50

X-30 GF 144/70, 3/6dB (1.1m)..... £44.99
X-50 GF 144/70, 4.5/7.2dB (1.7m)..... £59.99
X-300 GF 144/70,6.5/9dB (3m)..... £79.99
X-510H GF 144/70, 8.5/11dB (5.4m) £139.99
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m).... £89.99

DUPLEXERS & TRIPLEXERS

MX-2000 50/144/430MHz Triplexer.....£59.99
TSA-6011 144/430/1200MHz Triplexer.....£59.99
MX-72 144/430MHz.....£34.99
MX-72 "N" 144/430.....£35.99

MOBILE ANTENNAS Del £10.00

DB-7900 2m/70cm (5.5/7.2dB) 1.6m (PL-259).....£39.99
DB-770M 2m/70cm (3.5/5.5dB) 1m (PL-259).....£24.99
Diamond HV-7CX 7/14/21/28/50/144/430.....£129.99
Diamond CR-8900 10/6/2m/70cm (1.26m) £99.99
Diamond AZ-506 2m/70cm – only 0.67m long.....£39.99
PL-62M 6m/2m (1.4m) PL-259 .....£23.99
PL-627 6m/2m/70cm (1.7m) PL-259.....£44.99

LIGHTNING ARRESTER

SP-350V Replacement fuses £5.00

DC-1000MHz (400W through power). SO-239 fitting. **£24.95** P&P £3.00

Station log books:- 3 for £10

ALLUMINIUM POLES

20 foot (collection only) 2".....£49.99
10 foot (collection only) 2".....£29.99
2.4m (2") Ally pole.....£29.99
5 foot x 2" pole.....£14.99

COPPER ANTENNA WIRE ETC

Hard drawn (50m roll).....£19.99 P&P £7.50
New: 50m roll 'PTFE' coated, stranded antenna wire.£19.99 P&P £7.50
Flexweave (H/duty 50 mtrs).....£39.99 P&P £7.50
Flexweave H/duty (18 mtrs).....£18.95 P&P £7.50
Flexweave (PVC coated 18 mtrs).....£19.95 P&P £7.50
Flexweave (PVC coated 50 mtrs).....£50.00 P&P £7.50
Special 200mtr roll PVC coated flexweave .....£150.00 P&P £10.00
Copper plated earth rod (4ft).....£14.99 P&P £8.00
Copper plated earth rod (4ft) + earth wire.....£24.99 P&P £8.00
New RF grounding wire (10m pack) PVC coated .....£14.99 P&P £5

METALWORK & BITS (Del Phone)

2" mast-floor base plate.....£14.99
6" stand off brackets (no U-bolts)..... £8.99
9" stand off brackets (no U-bolts)..... £10.99
12" T & K brackets (pair) £18.99
18" T & K brackets (pair) £22.99
24" T & K brackets (pair) £26.99

All bracket measurements are from wall to end of bracket

U-bolts (1.5" or 2") each.....£1.50
8mm screw bolt wall fixings.....£1.70
8-nut universal clamp (2" to 2").....£7.99
2" extra long U-bolt/clamp.....£5.50
2" crossover plate with U-bolts.....£14.99
15" long (2") sleeve joiner.....£18.99
3-way guy ring.....£5.99
4-way guy ring.....£6.99
Heavy duty guy kit (wire clamp, etc.).....£49.99
Set of 3 powder coated heavy duty fixing spikes (~0.7m long)....£29.99
30m pack (4.4m) 480kg B/F nylon guy.....£12.50
Roll of self-amalgamating tape.....£7.99

MFJ-1117

DC High current distribution unit..... £59.99

MFJ-1118 metered

High current distribution unit £99.99

RH-9000 BNC

40cm flexible whip for the ultimate in gain. **£29.99** P&P £4.00
Tx:- 2m + 70cm (Rx:- 25MHz-2.9GHz).

RH-9090 SMA

40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm.
Rx:- 25MHz-2.9GHz **£34.99** P&P £4.00

Sport Radio

Promoting activity and 'portable' operation from home

PHOTO 1: The mast and 70cm antenna that GW4EVX erects in his back garden for the UKACs.

PROMOTING ACTIVITY. Mark Haynes, M0DXR, wrote, saying; "I am very keen on trying to generate increased activity in contests by local hams. For example, there are so many radio amateurs with SSB abilities on 2m, 70cm and 6m. Even if running just a vertical antenna, many stations can be worked in the Tuesday evening RSGB UK Activity Contests. I actually managed to work France and Belgium in a recent contest just with 50 watts into a very small collinear. I am starting to send a mini contest calendar every month to local hams to try to encourage them to pop up in the contests, even if just to give away some points. This might be something for others to try."

Interestingly, G4CLA has independently extended the idea a little and set up a system on the Contest Committee website whereby entrants can create and maintain their own personal contest calendar. They can set up any number of e-mail alerts for each contest and can even set up an alert for all (HF and/or VHF) contests if they are really keen. He has tried to keep the system simple and easy to use, so no registration is required other than to confirm an e-mail address before the system starts sending alerts. Once set up, the calendars contain links to the rules for each contest.

To conclude, what I'd like to mention to those just starting out in the UKACs is that even a simple horizontally polarised antenna such as a dipole will get you much better results than a big collinear. This is because all the serious players use horizontal beams and at VHF/UHF there is a big loss between antennas of the opposite polarisation.

ALMOST PORTABLE. Ron Price, GW4EVX, e-mailed to say he always enjoys reading Sport Radio and thought I might like some more ideas to encourage people to take part in VHF/UHF contests. Well, anything that encourages people to participate has to be good! He says "While many have multi-mode rigs there are few who have a suitable antenna at their home station to make a serious contest entry. My only permanent antennas at home are a 2m/70cm collinear and a 7-element 2m Yagi, yet I make regular entries in the 6m, 4m, 2m and 70cm UKACs.

"I have been a keen portable contester for many years – both as a backpacker and vehicle based – and have built up a range of equipment that I now put to good use from home in these contests. I set up my portable 8m telescopic mast on the rear patio and operate from my conservatory (**Photo 1**). The guy ropes I attach to permanent eye bolts, two mounted on concrete fence posts and the third on the brickwork of the conservatory (**Photo 2**), so it is a quick and easy job to erect it.

"For 6m I use a HB9CV or 4-ele Yagi, for 4m a 3 or 6-ele Yagi and for 70cm a 19 or 23-ele Yagi (pictured in Photo 1). For 2m I use the 7-ele Yagi on the house chimney.

"Obviously it's not as good as a big tower and the antennas don't even clear the surrounding rooftops, but it gets out quite well and is a good alternative when I can't go out portable.

"I hope it inspires others to give it a go!" Me too.

BEHIND THE SCENES. In February Pete Lindsay, G4CLA, the man behind the RSGB log entry robot told us about why the robot came into being. This month he tells us how it is used and how it works.

"The entry web page gives the entrant a choice of contest with the robot restricting the choice of contests to those taking place this month and the preceding month. Then a choice of sections or bands (for VHF contests) is given. The robot then has enough information about the contest being entered, so it is ready to upload the contest file(s). After checking, the robot then uploads the contest file(s) and after checking if the file is in a known format, it starts its work. For VHF contests it transforms all QSO data into REG1FORMAT, the format adopted by the IARU Region 1 Committee. This enables all logs for IARU Region 1 events to be forwarded to the adjudicating committee in the correct format. It also helps the adjudication processes by presenting all logs in the same format to Mike, G0GJV's adjudication software. For HF contests,

PHOTO 2: One of GW4EVX's eyebolts. When he is going to put the mast up he clips carabiners onto the bolts, then loops the guy ropes through them.

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Apr 4	RoPoCo1	0700-0830	CW	3.5	RST + Postcode received
Apr 5	80m Club Championships	1900-2030	CW	3.5	RST + SN
Apr 14	80m Club Championships	1900-2030	SSB	3.5	RS + SN
Apr 22	80m Club Championships	1900-2030	Data	3.5	RST + SN

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Apr 4	First 70MHz	0900-1200	All	70	RS(T) + SN + Locator
Apr 6	144MHz UKAC & Club Championship	1900-2130	All	144	RS(T) + SN + Locator
Apr 11	First 50MHz	0900-1200	All	50	RS(T) + SN + Locator + Postcode
Apr 13	432MHz UKAC & Club Championship	1900-2130	All	432	RS(T) + SN + Locator
Apr 20	UHF UKAC & Club Championship	1900-2130	All	1.3/2.3	RS(T) + SN + Locator
Apr 27	50MHz UKAC & Club Championship	1900-2130	All	50	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange (info)
Apr 3-4	EA RTTY	1600-1600	RTTY	3.5-28	RST + SN (EAs send Province code)
Apr 3-4	SP DX	1500-1500	CW, SSB	1.8-28	RST + SN (SPs send Province code)
Apr 10-11	Japan International DX	0700-1300	CW	1.8-28	RST + CQ Zone (JAs send Prefecture code)
Apr 10	EU Spring Sprint	1600-2000	CW	3.5-14	Both callsigns + SN + Name (no RST)
Apr 11	International Vintage	0800-2100*	CW, SSB, AM	7-14	RS(T) + Locator
Apr 17	EU Spring Sprint	1600-2000	SSB	3.5-14	Both callsigns + SN + Name (no RS)
Apr 24-25	SP DX RTTY	1200-1200	RTTY	3.5-28	RST + SN (SPs send Province code)

*0800-1200 and 1700-2100

the Cabrillo formatted logs are checked against the published Cabrillo template for the contest. It attempts to check for any missing or additional unnecessary columns and converts the log so that it conforms exactly to the template. Having gone through the formatting processes, it then analyses each QSO in turn, checking for invalid or missing information. This can find all sort of problems, one of the most common being that the log is for the wrong contest or has been logged in BST instead of GMT and therefore some of the QSOs are outside the contest period. The whole log is analysed and the results shown on the entry web page, and a copy sent to the entrant's e-mail address.

"This is where the robot really helps speed up the adjudication process. Previously, fixing any problems found in a log involved sending the entrant an e-mail and as not everyone reads their e-mails every day this could seriously delay adjudication. Now an entrant gets feedback about any problems straight away and can fix them and resubmit in a few minutes. Over the course of the first few months around 20% of submitted logs were changed and resubmitted. That figure diminished during the year and it would seem that more entrants are now checking their log before submitting it.

"In the background the robot compiles all the information it has about the incoming logs for each contest into a database. This information can then be accessed by the adjudicator on a single web page, showing all incoming entries, any outstanding problems with each log and if needed a single 'click to e-mail' facility for each entrant. A subset of this information is also available to entrants on the Logs Received page. Once the entry submission date has passed, the adjudicator can download all the log files via a ZIP file to his PC, which is already formatted into separate folders for each section ready for the adjudication software to do its magic. So far [end of 2009] the robot has received and processed over 8,500 logs."

G4CLA is always interested in any idea that could give the robot new features. A few months ago the ability to view the location of all QSOs on a Google map was added for VHF contests. The next feature will probably be the ability to upload photos, so watch out for that.

For the software gurus out there, the robot is written entirely in Perl and runs on a Linux server.

THIS MONTH'S EVENTS. RSGB HF events begin with the ever-challenging RoPoCo 1 on the 4th. What has often been challenging in the past is finding enough people to work in the second hour of what was a 2-hour event, so this year it has been reduced to 90 minutes in duration. RoPoCo isn't the busiest of events, but what it's all about is logging accuracy, because full postcodes are exchanged. On Monday 5th the first of the month's sessions of Club Championships takes place (CW). The SSB and data sessions follow on the 14th and 22nd.

Moving to VHF/UHF, the First 70MHz Contest is the first event on Sunday 4th. It takes place a little early in the year for there to be a substantial possibility of any Sporadic-E propagation. Two days later we move into the UKACs, with the 2m leg. On the following Sunday – the 11th – the First 6m Contest takes place. Once again, don't hold your breath in anticipation of any Sporadic-E propagation. This is borne out by the fact that hardly anyone was worked outside of the British Isles in 2008 or 2009, whereas several participants enjoyed European DX in 2007. After that it's back to the rest of the UKACs for the remainder of the month.

Internationally, there are two 24-hour contests on the 3rd-4th. The EA RTTY is the first. Single-ops can make a single band or all-band entry, but multi-op stations can only make an all-band entry. If RTTY isn't your thing, maybe the SP DX (CW/SSB) Contest will be more appealing. There are numerous categories, mainly for single ops. One week later it's the 30-hour CW leg of the Japan International DX Contest that will be making the HF bands busy. Work JAs only and exchange RST and CQ Zone (the UK is 14). Once again there are numerous categories, mainly for single ops. If you can only spend a few hours in the shack on Saturday 10th, maybe you would enjoy entering the European CW Sprint. The contest exchange is both callsigns, a serial number and name, but no RST. On Sunday 11th the International Vintage Contest sounds rather different. In this event, which is promoted by the Rimini district of the Italian National Society RAI, entrants are required to use commercial equipment that was built between 1950 and 1980 (or home brew equipment of any age), and computers are not permitted for the sending of CW. As Don, G3XTT said; "I guess there are two types of Vintage contest - vintage gear and vintage ops. Right now I suspect I'm getting close to qualifying for both." The penultimate event of the month is the EU SSB Sprint on the 17th. This is a follow-on event from the EU CW Sprint held one week before. The final event of the month is the SP DX RTTY on the 24-25th, which is also a follow-on from the SP DX (CW/SSB) held on the 3-4th.

KENWOOD

Listen to the Future

Truly a marvel of electronic engineering, Kenwood's stylish all-mode multibander is packed with top-end features yet compact enough for use at home, in your car, or on a DX'pedition. And a handsome 3D front panel -- featuring backlit keys and large amber display -- makes the appearance of this multibander as distinctive as its performance.

● Optional DRU-3A digital recording unit ● IF and AF DSP filters ● Beat-cancel, noise reduction ● TX/RX equalizer ● CW auto-tune ● Speech processor ● Transverter Mode displays up to 19.99999GHz ● Programmable function key ● Electronic keyer ● Key operation announcement with optional VS-3 voice synthesizer ● Auto repeater offset 144MHz

- **All-mode Multibander**
- **Satellite Mode with Doppler effect frequency correction**
- **TNC built-in for DX cluster display**
- **Auto ATU built-in**
- **Dealer expandable RX coverage on VHF/UHF**
- **300 Memory Channels**

ALL BAND ALL-MODE TRANSCEIVER

TS-2000

HF/6/2/70cms

TS-2000X

HF/6/2/70/23cms

Available from all official Kenwood amateur radio dealers. For full details of our dealer network and all Kenwood amateur products contact your local dealer or Kenwood Electronics UK Limited. 01923 655284
e-mail comms@kenwood-electronics.co.uk

Kenwood Electronics UK Limited

www.kenwood-electronics.co.uk

Data

A novel concept for generating radio frequencies from DSP hardware.

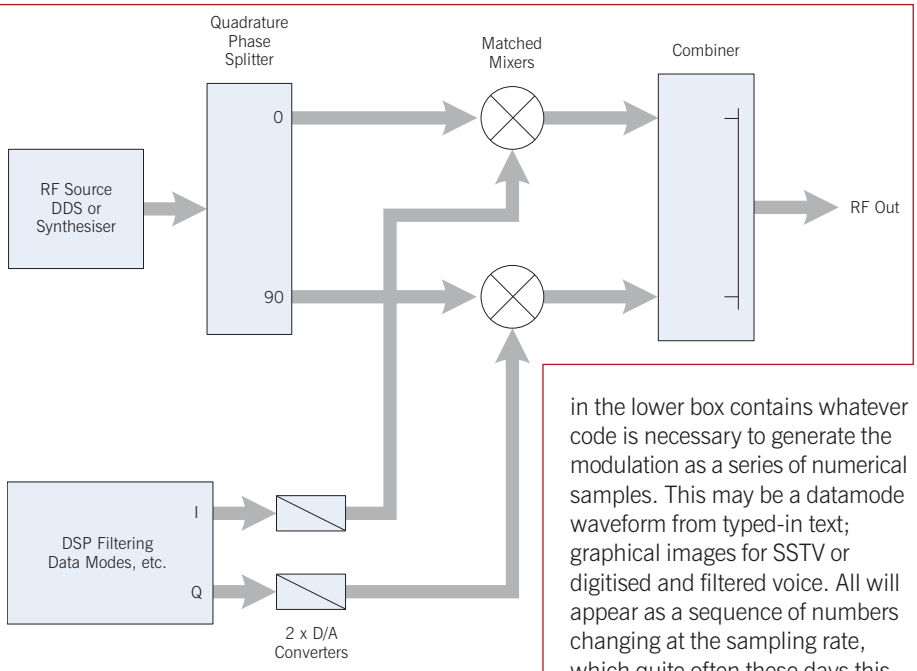


FIGURE 1: The traditional direct conversion approach of converting from digital to RF.

WORLD WIDE APRS NET. Jim, G0JXN/MB7UXN sent in details of 'Net14' The World Wide APRS Net. Net14 is a project supported by a number of radio amateurs with the objective of setting up a world wide network using APRS. The website provides regular news and information on contacts using the callsign MB7UXN-14, and by any other radio amateur who contributes. The Project Setup section provides information on the project and guidance on the setting up of a station to participate with as well as a list of APRS frequencies in general use.

Each month, Jim sends out an e-mail newsletter to supporters and anyone wishing to join the group may request inclusion. Visit the website listed in Websearch to participate.

A NOVEL DSP TRANSMITTER ARCHITECTURE. Alex Brown, M0GJR proposed this novel concept for generating radio frequencies from DSP hardware. His idea is to programme the registers on a Direct Digital Synthesizer (DDS) chip in real time to generate just about any modulation type we may want to transmit. But, to see what is so novel about his idea, we first of all need to take a look at the traditional route of going from digital signals to RF as shown in outline in **Figure 1**. The Digital Signal Processor block in the lower box contains whatever code is necessary to generate the modulation as a series of numerical samples. This may be a datamode waveform from typed-in text; graphical images for SSTV or digitised and filtered voice. All will appear as a sequence of numbers changing at the sampling rate, which quite often these days this is at the modern soundcard value of 48kHz, but can be at any rate subject to the Nyquist limitation that the sampling rate has to be greater than twice the highest frequency of interest forming the modulation.

To facilitate upconversion, the signals are nearly always generated in I/Q format and most DSP processes will already have formed these I/Q pairs of samples early on in the processing chain. The I and Q values are converted as pairs into two analogue signals, then applied to a pair of mixers where they are mixed with zero and 90° phase-shifted versions of the RF carrier and finally combined to give the signal that is subsequently amplified for the transmitted signal. The image-frequency-cancelling I/Q upconversion process has been described several times before in this column, as well as in previous SDR columns. A major problem with its implementation in amateur designs is the wide frequency band we usually want to cover. For an HF transmitter, the 90° phase shift and matching between the two mixers has to be maintained over the entire band of interest, at least 1.8 to 30MHz, and these days 50MHz is amore usual upper limit. Maintaining an accurate 90° I/Q match over this range is virtually impossible, and the solution often adopted is to generate the RF at an intermediate frequency where the match can be controlled, then to frequency mix to the wanted output. All of which massively increases the amount of RF hardware and filtering. Also, two matched and coherent D/A conversions are needed

M0GJR's idea was to see if the DDS could be directly modulated by digital data from the DSP output routines.

Most DDS chips include a programmable register that allows the phase of the output to be changed in discrete steps from a programming word sent from a controller. Several devices, like the 300MHz AD9852 and the 400MHz clocked AD9954 also include another register that allows the amplitude to be changed in the same way. So, was there a way to generate the modulated carrier directly at the wanted frequency directly from the DDS chip? Yes, there is.

Every waveform or signal type can be represented as an instantaneous amplitude and phase. A plain carrier at the centre frequency can be represented by a constant amplitude of '1' and a phase of '0'. The respective pairs of values are converted to binary and sent to the registers on the DDS chip, which then gives its RF output in the normal way. If we change the amplitude value to 0.5, send this to the amplitude register, the RF output drops by 6dB. If we send a value of 180° to the phase register, the output immediately flips polarity. So far so good. Now, imagine we generate a sequence of phase values that are steadily increasing and send these to the phase register. When the value reaches 360° we just wrap-round to zero again.

As an example, we'll choose a sampling rate of 48kHz, and every sample sends a phase value that increases by 7.5° each time. So, 48000 times a second, we send, successively, the numbers 0, 7.5, 15, 22.5….. 345, 352.5, 0, 7.5 – all with a constant amplitude of one. The result is an output waveform from the DDS whose phase is constantly increasing at a rate of 7.5° forty-eight thousand times every second. As 48 * 7.5° = 360° the phase completely wraps round every 48 samples, or 1000 times per second. Which is exactly the same as shifting the frequency up by 1kHz; in other words, we have synthesised a new carrier exactly 1kHz above the nominal DDS-generated frequency. It is now a short step to visualise that if the phase decreased by 7.5° every

ACRONYMS USED THIS MONTH:

APRS: Automatic Packet Reporting System
D/A: Digital to Analogue [conversion]
DDS: Direct Digital Synthesiser - Usually a single chip that synthesises RF signals directly under control of a processor or other digital hardware.
DSP: Digital Signal Processing
Nyquist: The name behind the concept – that a signal must be sampled at a rate of at least twice the highest frequency component present.
SSTV: Slow Scan Television
USB: Universal Serial Bus. The popular interface found on all modern PCs and laptops.

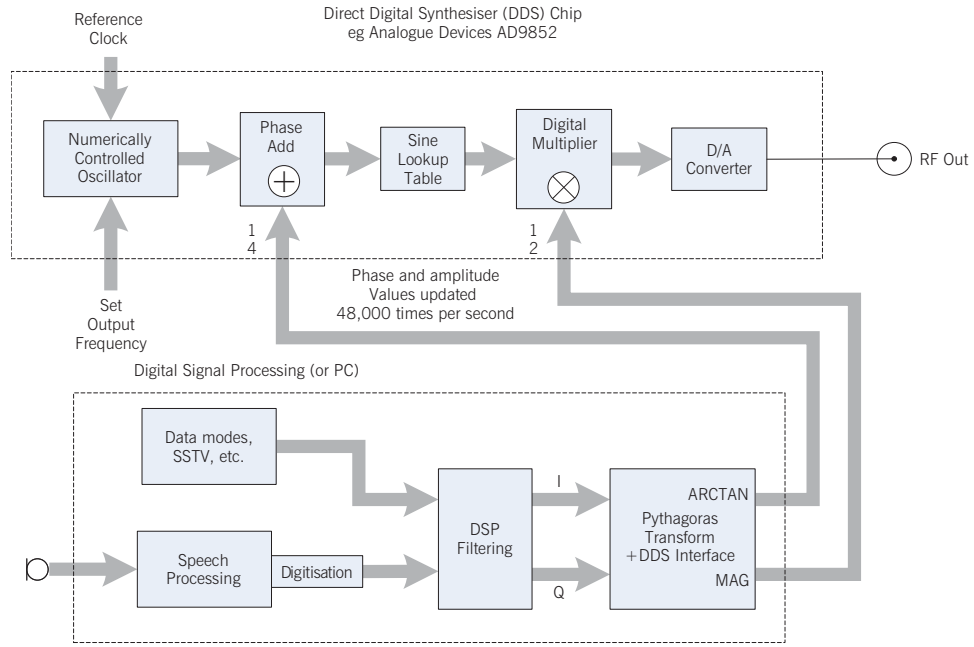


FIGURE 2: M0GJR's solution for generating RF modulation by reprogramming a DDS in real time.

sample the output would be 1kHz *below* the centre frequency, if the step value were 15° the frequency shift is 2kHz and so on. And we can change the amplitude as well. So, we see that provided pairs of amplitude and phase values can be generated at sampling rate from within the DSP for any modulation we want, we can send these to the DDS whose RF output is now the wanted transmitted signal – without the complication of D/A conversion, coherent upconversion and matched I/Q channels. **Figure 2** shows the concept.

PRACTICALITIES. The DDS chip has to be updated at the sampling rate and we'll stay with 48000Hz for this example. The phase register in the AD9852 is 14 bits wide, and the amplitude register is 12 bits meaning that at least 26 bits have to be sent to the chip at the sampling rate. In practice these will most likely be rounded to 16 bits each, or 32 bits in total. Fortunately, all DDS devices have been made with rapid updating of frequency, phase and amplitude firmly at the forefront of the designers mind, and the values can usually be changed at sub microsecond rates. All the DDS chips mentioned have the option of programming them via an 8 bit parallel bus so the amplitude and phase values can be sent in a sequence of byte-wide words. The 32 bit data consists of 4 bytes and register addressing increases this to typically 6 bytes per update, meaning the values have to be sent to the DDS chip at 288k Bytes/second. DSP chips, such as the DSPic, or perhaps a USB + PIC processor interface from a PC, now has to present these bytes at this rate – no great problem with modern low cost devices. (Simpler slower systems can operate at reduced sampling rate if modulation type and sideband limitation permit this).

SOME DSP MATHS. Forming instantaneous values of amplitude and phase may sound a bit complicated at first sight, but first of all consider generating a PSK31 waveform from first principles. The bit pattern to be sent consists of 0 or 1 representing 0 or 180° phase shifts. Each time the phase changes, the amplitude ramps in a nicely controlled way from maximum to zero and back to maximum…. So, at each sample point we look up the new phase value and programme this one-of-two values into the DDS directly. We also look up the amplitude from a table and programme this in. Hey presto, directly generated PSK31!

Now what about voice? Whilst the instantaneous amplitude is easy enough to visualise – it's what we see on a scope trace – what on earth is the instantaneous value of the phase of a voice signal? It was this issue that caused a lot of head scratching when Alex first proposed this idea. We need to consider, first of all, the basics of frequency conversion. Remember that any signal that is directly upconverted in a mixer will generate both sum and difference frequencies, so any single tone input to a mixer will form two output frequencies at $F_{RF} + F_{TONE}$ and $F_{RF} - F_{TONE}$. Another way of looking at this is to say that the input actually consists simultaneously of both positive and negative frequencies. We don't actually see the negative frequency as anything different from the positive one; it is just a mathematical way of representing the input waveform. In a traditional DSP frequency conversion procedure this frequency-image problem is prevented by using I/Q conversion, so one mixer component is cancelled with the other reinforced. Tones are formed with 0 and 90° I/Q components directly from a lookup table. Voice signals can be passed through a Hilbert transform, which is a mathematical process that imparts a 90° phase shift to all frequencies passed though it. Our aim in all cases is to generate two parallel 0 and 90° shifted I/Q streams of our signal, this being the most convenient way to do all DSP functions like filtering, frequency conversion, clipping and levelling. Now, if we want to use the traditional I/Q upconverter described at the beginning that's it: convert the I/Q data to analogue and mix up. But, for our new direct generation scheme, how do we convert to amplitude and phase values to send to the DDS?

The answer is given by Pythagoras (*yes, that Pythagoras… the sum of the squares on either side of the hypotenuse…*) and suggests that I / Q pairs can always be represented exactly by a magnitude and angle **R**, **Ø**.

Conversely, any amplitude and phase can be represented exactly by a pair of I / Q values. The duality is shown graphically in **Figure 3** and the two forms, called Cartesian and Polar representation, are related by

$I = R.COS(Ø)$ and $Q = R.SIN(Ø)$

and

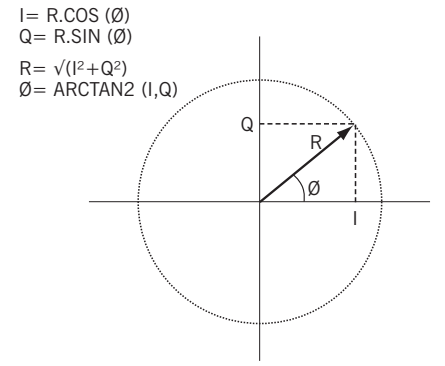
$R = \sqrt{(I^2 + Q^2)}$ and $Ø = ARCTAN2(I, Q)$

(ARCTAN2 is the modified inverse-tangent function giving unambiguous 0 – 360 phase).

The complication with driving DDS chips is in calculating the ARCTAN2 in DSP, and to a lesser degree the square root. Fortunately, conversion between polar and rectangular formats is very often needed in DSP code, and a lot of work has been done in the past on routines to calculate the conversions as efficiently as possible. Many start off using a lookup table to quickly get an approximate starting value, then use an iterative search for successively closer approximations until the desired accuracy is reached. Another solution is the Cordic algorithm [1] that generates both phase and magnitude in a progressive sequence of operations optimised for simple binary arithmetic.

REFERENCES

Worldwide ARPS Net: www.net14.org.uk.
ARPS: www.aprs.org/.
The Cordic Algorithm: www.dspguru.com/dsp/faqs/cordic.



ICOM

What You've All Been Waiting For!

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

LCD not shown with accurate colour

New! IC-E80D VHF/UHF Dualband Handheld

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

New! ID-E880 VHF/UHF Dualband Mobile

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

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

Join the Worldwide D-Star Community!

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

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

2-Year Warranty

DIGITAL

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

RadioFairs

Kempton Radio & Electronics Show
Sunday 18th April 2010

Opening Time 10am, Admission £4, Tickets 9.15am, Disabled Access 9.45am, Under 16's free Entry

- Easy access from all of the UK via the M25, M3, M40 and M1 with plenty of free parking. Mainline railway station within walking distance of the show.
- RSGB book stand
- Major UK distributors present showing the latest equipment from the Yaesu/Vertex, Kenwood, Icom, Alinco etc.
- Trade stands selling antenna, components, batteries, computers, disks, software, etc, etc.
- Larger area for club stands with local clubs represented.
- Massive Bring and Buy stand
- Major UK organisations such as AMSAT, BATC, WAB etc represented.
- Main UK Radio and Electronics Publishers present
- Superb Panoramic Restaurant.
- Admission £4, under 16 free.

For Trader table bookings please phone, fax or email your order - flea tables subject to availability

www.radiofairs.co.uk **info@radiofairs.co.uk** **For Bookings Tel:07921 567651 or Fax: 0208 644 8349**

Start Here

Filtering signals within amateur bands

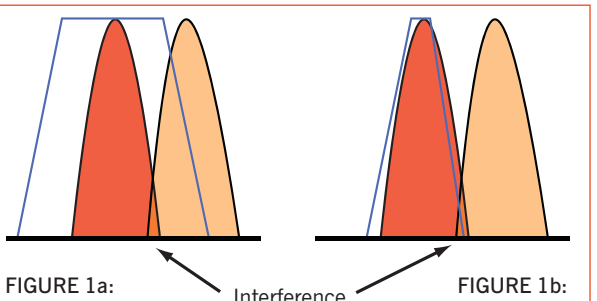


FIGURE 1a: Two signals that overlap. Both are within the received audio (blue).

FIGURE 1b: Filters (blue) adjusted to minimise the interfering (right) signal while passing the maximum of the wanted (left) signal.

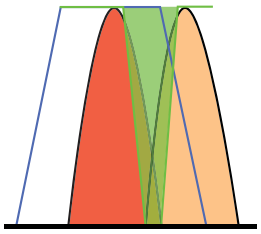


FIGURE 2: Notch filter removes audio in the green area, cancelling interference with minimum wanted signal loss.

INTRODUCTION. There are many situations within our hobby when it's necessary to try and remove some form of interference. Familiar situations include excluding QRM from tightly packed stations in contests, blocking strong signals from local stations and removing spurious 'squawks' that your radio generates or picks up from surrounding electronic equipment.

HOW MUCH DO WE NEED TO HEAR?

The amount of space (bandwidth) that a signal occupies is a key factor in determining how effective a filter will be. The *ARRL Handbook* gives a similar version of the following table for the required bandwidths of several common operating modes:

Mode/Source	Required Bandwidth
Telephone quality speech/SSB	200Hz to 3kHz
High-fidelity speech	20Hz to 15kHz
Morse code / PSK31	200Hz or less
RTTY (Radioteletype)	1000Hz (typ.)
SSTV	200Hz to 3kHz
PAL television	50Hz to 5MHz

For a filter to be effective, it should allow you to be on frequency and listening to precisely the required bandwidth for that particular signal. A wider bandwidth may introduce extra noise or QRM, while a smaller bandwidth may remove too much of the signal for it to remain intelligible.

WHERE DOES THE FILTERING TAKE PLACE?

Filtering can take place at both the intermediate frequency (IF) and audio (AF) stages of a radio. In commercial equipment it is fairly common to have a fixed filter at the IF stage that can be upgraded if you buy a new filter for it. On the other hand, many modern rigs have fully configurable filtering by DSP (Digital Signal Processing), which may take place at both IF and AF.

HOW DO I USE A FILTER? Good filters can provide hours of additional enjoyment and greatly reduce operator fatigue, helping to pull weak signals out of the noise and improving contest rates; used incorrectly though, they can be the source of much frustration. IF filters are normally fitted directly in the radio and activated by the press of a button. These generally provide improved reception without adjustments.

AF filters can be trickier, especially since modern radios tend to have a single set of AF filter settings for all modes you operate. To set up an AF filter within a radio you need to tune the receiver to the frequency of as the station you want to receive (make sure you don't have any transmit or receive offsets on!). Then insert the filter by selecting the appropriate button/menu option. If you can customise the bandwidth of the filter, you can then adjust the upper and lower bounds of the filter to match the bandwidth of the signal you want (see **Figure 1**) without losing too much clarity or having too much interference. In most cases when you've done this for one station, providing you don't change operating mode, the same settings should be good for most other stations. Typical AF filter bandwidths are shown in the table.

LIMITATIONS OF FILTERING. The effectiveness of a filter depends on what exactly you're trying to do with it. No matter how good a filter is, if two stations are on about the same frequency and are of similar strengths then no filter will make much improvement. This is because the two signals are on the same frequency you want to receive, so you'll either eliminate them both or continue to hear them both.

One solution - though not often practicable for beginners - is to use a directional antenna and then turn it towards the station you want to hear so that it becomes the stronger signal and then filter the best you can. Alternatively, if you have interference that is more noise-like you could try various kinds of DSP noise reduction or an external noise cancellation device. The latter requires a separate external antenna of its own, careful adjustment, and will only work for one noise source at a time. But noise reducers and noise cancellers cannot normally be expected to help with QRM from other amateur stations.

A compromise solution is to use a notch filter (see **Figure 2**). This allows you to remove a part or all of an annoying signal that falls within received bandwidth of your radio. Notch filters can be used at the same time as other filters. Some modern radios have automatic notch filters, which try to determine the signal you want notched out rather than manually tuning the notch filter to where you want it. They are often useful for removing interfering single-frequency carriers (continuous tones) from SSB signals, but they are completely useless on CW!

WHICH BUTTONS CONTROL THE FILTERS ON MY RADIO? Modern radios usually label filter controls quite consistently irrespective of brand. The filter controls may all be on the front panel or hidden away in the menu system, activated by a single button.

Controls for varying the shape of the filters (usually audio frequency but in higher performance radios, IF filters) are often called High Cut, Low Cut and Width. The terminology can be potentially confusing as High Cut controls the cutoff point on a low pass filter (so on menu driven radios it may be marked as LPF Cut Off). Similarly, Low Cut changes the cutoff point on a high pass filter, so may be marked HPF Cut Off (see **Figure 3**). These allow you to reduce the received high and low frequency parts of your audio bandwidth respectively. As you restrict the range of audio you receive using the filters, you are effectively steepening the shape of the received audio. The shape of the received audio is often referred to as the bandpass skirt due to its appearance; increasing (or decreasing) the filtering of a station is known as narrowing (or broadening) the bandpass skirt.

The Width control often consists of two controls to allow you to vary the responses of built in high and low pass filters independently as in the manner of the High Cut and Low Cut controls above. However the width control may in some cases also able to reduce the overall bandwidth of the received audio by changing both the high pass and low pass filters equally at the same time.

Higher performance radios sometimes have another filter control called Shift, which allows the whole audio bandwidth to be shifted up or down in frequency around the operating frequency. This can be very useful if you have interference that is very close to your operating frequency and cannot narrow your filters any further.

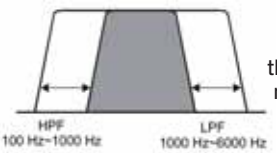
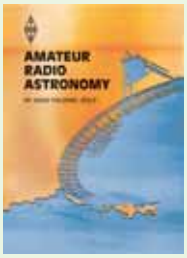


FIGURE 3: Diagram from the Yaesu FT897 manual showing the internal filter ranges.

Satellites, Microwaves



Amateur Radio Astronomy

By John Fielding, ZS5JF

For anyone with a passing interest in radio astronomy this book is a revelation. *Amateur Radio Astronomy* shows how much radio amateurs have contributed to the science of radio astronomy and how the average amateur can make and set up equipment to study the signals coming from space. This book has no equivalent published elsewhere and the author has achieved a great balance between historical narrative and technical information. *Amateur Radio Astronomy* is not only 'a great read' but a practical reference for this fascinating topic.

Size 240x174mm, 320 pages, ISBN 9781-905086-16-0

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

ARRL Satellite Handbook

By Steve Ford, WB8IMY

The *ARRL Satellite Handbook* brings the thrill of satellite communications within your reach. Filled with understandable descriptions and illustrations, this book includes all the tools you need to participate in this exciting field. It's designed to give a broad introduction to the subject, while providing the practical fundamentals you need to explore, track and operate ham radio satellites on your own. Plus, understanding satellite orbits and subsystems by Dr Martin Davidoff, K2UBC.

Size 210x274mm 232 pages, ISBN 9781-9050-8647-4

Non Members' Price £19.99 **RSGB Members' Price £16.99**

For more Amateur Radio books visit
www.rsgbshop.org

Microwave Projects

Edited by Andy Barter, G8ATD

Microwave Projects is aimed at those who are interested in building equipment for the amateur radio microwave bands. Packed full of ideas from around the world this book covers the subject with a variety of projects. The book has many contributors who have a wealth of experience in this area and they have produced many projects, design ideas, complete designs and modifications of commercial equipment, for the book. This title provides much useful information as to what can be achieved effectively and economically. Aimed at both the relative novice and the "old hand" the book also covers useful theory of designing microwave circuits and test equipment for the projects. *Microwave Projects* is a must have book for all those who are already active on the microwave bands and those looking for interesting projects to embark on.

Size 173x240mm, 200 pages
ISBN 9781-872309-90-2

Non Members' Price £16.99

RSGB Members' Price £14.44

Microwave Projects 2

Edited by Andy Barter, G8ATD

Following the huge success of *Microwave Projects*, Andy Barter, G8ATD brings you more innovative projects from around the world. If you are interested in building equipment for the amateur radio microwave bands, the designs in this book are sure to please you. Projects have been selected from international authors and all of the projects use modern techniques and up to date components. Details of how to obtain ready-made boards are included with most projects.

The book includes chapters covering:

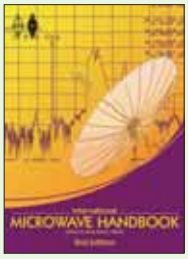
- Transverters and transmitters
- Receive amplifiers
- Power amplifiers
- Filters

If you are interested the microwave bands or just in amateur radio construction, *Microwave Projects 2* provides great ideas and projects to satisfy everyone.

Size 240x175mm, 216 pages
ISBN 9781-905086-09-2

Non Members' Price £16.99

RSGB Members' Price £14.44



International Microwave Handbook

2nd Edition
Edited by Andy Barter, G8ATD

The microwave bands are a very popular part of the amateur radio spectrum. They provide the space to experiment with many of the modern modes of transmission and, with the availability of high performance components, kits and ready built units, there is ample opportunity for everyone to take advantage of these interesting bands. The fundamental principles used to design and construct equipment for the microwave bands are all covered. Techniques and devices lead the reader to understand the wide range of modern components and equipment available that can reasonably be used by radio amateurs - these range from those that can be used by most radio amateurs to those that require a high degree of skill. For those considering the move to the microwave bands or those already active, this book is the best guide to this exciting area of amateur radio.

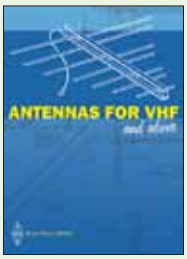
Size 240x174mm, 544 pages
ISBN 9781-9050-8644-3

Non Members' Price £16.99

RSGB Members' Price £14.44

& VHF/UHF books

RSGB shop



Antennas for VHF and above

By Ian Poole, G3YWX

The VHF, UHF and microwave bands provide an exciting opportunity for experimentation with antennas. Antenna sizes at these frequencies mean that they do not occupy great amounts of space and most people can experiment with constructing their own. *Antennas for VHF and above*, provides the basic theory and constructional details for many antenna designs. The reader is taken through the essentials with details of the way the antenna works and the constructional information needed. This book is a mine of information for anyone wishing to understand or construct antennas for the VHF, UHF and microwave bands and is a valuable resource for newcomers or experienced hands.

Size 240x174mm, 144 pages, ISBN 9781-9050-8645-0

Non Members' Price £12.99 **RSGB Members' Price £11.04**

6 Metre Handbook

By Don Field, G3XTT

Not for nothing is 6 metres (50MHz) known to radio amateurs as the 'Magic Band'. One minute there may be no propagation at all, the next moment the band is full of big signals via Sporadic E. The *6 Metre Handbook* fully details the equipment and antennas used. There is coverage of the basic operating on 'Six'. The practical guide to 6m propagation provides details of long-distance openings that just do not occur on any other frequency band even at the sunspot minimum. There is information that covers the history of the band and provides a perspective of 6m from around the world. The *6 Metre Handbook* helps you get the best out of 6m.

Size 240x174mm, 176 pages, ISBN 9781-9050-8647-4

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

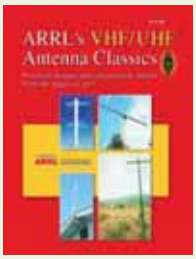
ARRL VHF Digital Handbook

By Steve Ford, WB8IMY

Following on from the popular *ARRL HF Digital Handbook* Steve Ford WB8IMY has produced *ARRL VHF Digital Handbook*. This isn't complicated "owners manual" full of jargon but a unique how-to approach in friendly, conversational style. Getting started often requires little more than a VHF radio and a computer to start using digital radio applications for fun, technical achievement, and public service. Readers will soon understand how to setup and operate their equipment and software, and make the best use of their VHF digital station. The book covers in detail packet radio fundamentals, APRS, Winlink 2000 and more. There is a section covering D-STAR and one on high speed multimedia. Readers are also treated to sections on "digital meteor scatter", "Moonbounce" and weak signal operating using "WSJT". This book is a great read and the ideal introduction to VHF digital operation.

ISBN 9780-8725-9122-6

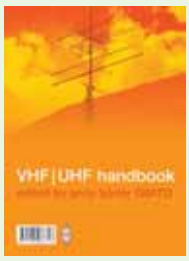
Non Members' Price £14.99
RSGB Members' Price £12.74



ARRL's VHF/UHF Antenna Classics

ARRL's VHF/UHF Antenna Classics includes antenna project articles gathered from the 1983 to 2003 issues of QST. Designs include ground planes, J-poles, mobile antennas, Yagis and more. VHF and UHF antennas are among the smallest and often easiest to build. Many of the projects included in this book require inexpensive parts which you can find at most hardware stores. Build a better antenna for your hand-held radio. Construct a 2-meter Yagi that will rival similar commercial antennas. Build a dual-band vertical for 146 and 445-MHz. The results will be rewarding! ISBN 0-87259-907-8

Non Members' Price £12.99 **RSGB Members' Price £11.04**



VHF/UHF Handbook

Edited by Andy Barter, G8ATD

The *VHF/UHF Handbook* is THE guide to theory and practice in the VHF and UHF bands.

This book provides a wide range of interesting operating modes and techniques alongside the VHF/UHF basics. Substantially updated from the previous edition the *VHF/UHF Handbook* is an invaluable source of information for the seasoned operator and the best introduction for newcomers to the bands.

Size 174x240mm, 320 pages
ISBN 9781-9050-8631-3

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

Guide to VHF/UHF Amateur Radio

By Ian Poole, G3YWX

The VHF and UHF bands are some of the most interesting, useful and challenging of those available. Ian Poole explains just how to get the most from your VHF/UHF station. A chapter explains how to transmit and receive computer data on these bands. This hand-sized book contains everything you will need to help you enjoy VHF/UHF amateur radio to the full.

Size 212x148mm, 112 pages
ISBN 9781-872309-58-3

Non Members' Price £9.99
RSGB Members' Price £8.49

Radio Society of Great Britain
3 Abbey Court, Fraser Road, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

Getting listed here and on GB2RS is easy. E-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282, 29 October, On the Air. It's that simple. The deadline for the May *RadCom* is 1 April and for the June edition it's 1 May. For GB2RS, the deadline is 10am on the Tuesday for the week of broadcast.

1 SCOTLAND SOUTH & WESTERN ISLES

AYR ARG
Charlie, MM0GNS, 01563 551704, cgnstewart@hotmail.com
14 Construction night
28 Plasma cosmology

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723
2 Normal club night
17 10 pin bowling night, Fountainbridge Megabowl

KILMARNOCK & LOUDOUN ARC
Graham, MM3GDC, mm3gdc@btinternet.com
13 Club night
27 Sun & sun spots cycles by Lyn Smith of the British Astronomical Association

LIVINGSTON & DARS
Norman, 07740 946192, uk.groups.yahoo/group/ms0liv
6, 20 Club evening
13 Operating evening
27 Morse code practice

LOTHIANS RS
Andy Sinclair, lrs_secretary@moosedata.com
14 Surplus equipment auction at St Fillans Church Hall
28 DXpedition to Antarctica VP8 by Gavin Taylor, GM0GAV

PAISLEY (YMCA) ARC
Bill Anderson, 2M0BZZ, 01505 613633, bill@3bis.co.uk
7, 14 College/Easter break
21/28 Advanced licence exam (TBC)

2 SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, GM1BAN@RSGB.ORG.UK

ABERDEEN ARS
Lewis, GM4AJR, 01224 575 663, www.radioclubs.net/aars/
1 Junk sale
8 SDR by Allan, GM4ZUK
15 Construction night
22 Fifty years of QRM by Kit, GM4EMX
29 Beginner's night – construction techniques

3 NORTH WEST

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

SOUTH MANCHESTER R&CC
Ron, G3SVW, 0161 969 3999
1 Shack workshop night
8 SBS-1 passive radar by Derek, G1AFI
15 Locks, lock sport and lock picking by Scott, 2E0JIR
26 Monthly technical forum
29 Tuning your valve power amplifier by Bill, G4EDM

THORNTON CLEVELEYS ARS
John Foster, 2E0EZY, 01253 399377
12 Natter night/club on air
19 Who'd have a shack like this? by G8RDP
26 RIS to Ofcom by Alan, G4EWS

4 NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, G0UGE, G0UGE@RSGB.ORG.UK

ANGEL OF THE NORTH ARC
Nancy Bone, G7UUR, 0191 477 0036, nancybone2001@yahoo.co.uk
11 NARSA @ Norbreck
12 On the air, natter night
19 Preparation for exam & OTA
21 Advanced licence exam
26 Computer logging, digital modes and interfaces by Zoltan Derzsi, M0MDP

DENBY DALE RC
Gerald, G3SDY, 01484 602905
7 Display of vintage equipment
21 Waterways by Geoff, G0PFH

HALIFAX & DARS
Anthony Vinters, 01422 822636, tony@g0wfg.demon.co.uk
20 SDR by Martin, M0GQB

HORNSEA ARC
Gordon MacNaught, G3WOV, 01377 240573, gmacnaughtwov@yahoo.co.uk
5 80m CC CW - home stations
7 A Railway Journey by Ted, G4UOZ
14 80m CC SSB - club station
21 1st foxhunt - G4YTV, G3RMX
22 80m CC data - home stations
28 Activity, shack, workshop, DVD

OTLEY ARS
Paul, 2E0PAK, 07768 996370, m6wat@pekae.co.uk
6 144MHz UKAC & club natter night
11 First 50MHz contest
13 Shack night
20 Member presentation
24 Marconi Day (24h OTA)
27 50MHz UKAC

SHEFFIELD ARC
Trevor Wood, M0TWS, trevorwood6@yahoo.co.uk
5 Homebrew by G0IYV; RSGB 80m CC CW
12 A homebrew digimode QRP xcvr by G6DCT
19 DIY radar by G8AGN
26 Contest workshop, VHF NFD planning

YORK RC
Tony Skaife G4XIV, 01904 330502, g4xiv@ntlworld.com
1, 22, 29 Foundation lessons
8 Foundation lessons + Morse tuition
15 Club night

5 WEST MIDLANDS

REGIONAL REP: TREVOR BAILEY, M0KMB, M0KMB@RSGB.ORG.UK

BROMSGROVE & DARC
Chris, M0BQE, 01905 776 869, M0BQE@hotmail.com
2 QSL card night
16 VHF Hills on the Air competition
23 Committee meeting
30 Remote operation

COVENTRY ARS
John, G8SEQ, 07958 777363
2 DXpedition to Lesotho by Bob Nash, G4GEE/7P8DD
9 Committee forum & surplus equipment sale
16 2nd Round 2m DF trophy
23 Quiz night
30 Radio workshop HF/VHF/UHF, operating 6m, 4m, satellites

GLOUCESTER AR&ES
Anne, 2E1GKY, 01452 548478, daytime, www.g4aym.org.uk
5 Operating at Crickley Hill
12 Severn Tales by Chris Witts, the Mayor of Gloucester
19 Operating club equipment
26 Construction competition

KIDDERMINSTER & DARS
Barry, G4CTU, 01562 823966
6 PICs by Mike, G1NQW

MIDLAND ARS
Norman, G8BHE, QTHR, 01214 229 787
7 General meeting, shack OTA & training
14 Committee meeting & training
21 Field day planning & training
28 Laptop computer evening & training

MID-WARWICKSHIRE ARS
Bernard, M1AUK, 01926 420 913
13 Unprepared talks on randomly chosen amateur radio topics
27 Used equipment and book sale night

SALOP ARS
www.salop-ars.org.uk
1, 29 Natter night, Morse classes with G0EML, Foundation course
15 Natter night; Foundation course
22 Talk on receivers by Pat, G3YFK

SOUTH BIRMINGHAM RS
Don, 0121 458 1603
7 Lecture in main hall
9, 16, 23, 30 Construction evening
12 Contest meeting and rag chew
19 Committee meeting
26 Field day planning meeting

STRATFORD UPON AVON DRS
G0CHO, 01608 664488, cousbey@theiet.org
12 Repeater coverage measurement by G0CHO
26 Walking HF ARDF by G6MMD

6 NORTH WALES

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

DRAGON ARC
Stewart Rolfe, GW0ETF, 01248 362229
5 SOTA by John Brimecombe, GW3GUX
19 Discussion, prep for IMD

MEIRION ARS
John, MW0VTK, 07868 738016, meirionars.multiply.com
1 Club construction competition

PORTHMADOG AND DISTRICT ARS
Glyn MW5CAD 01286 830078
15 Surplus equipment sale

WREXHAM ARS
Glyn, MW0BNB, www.qsl.net/wars/
6 Where on Earth are we? by Glyn
20 Visit by RSGB President Dave Wilson

7 SOUTH WALES

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

CARMARTHAN ARS
Alastair Underwood, GW0AJU, 01267 290822, alastairu@btopenworld.com
6, 20 Exam tuition evening

CHEPSTOW & DARS
Wil Oliver, MW6KGB, 01291 621342
6 HF Propagation by Mike, GW3YKZ

LLANELLI ARS
Craig, MW0MXT, 01269 840292, craig@mw0mxt.co.uk
5 OTA
12 Social evening
19 AGM
26 Club raffle

MARCHES ARS
Dave, MW0AYM, 01691 777242
13 Video evening
27 Talk on EchoLink or PSK31

8 NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, MI5JYK@RSGB.ORG.UK

No club events received this month.

9 LONDON & THAMES VALLEY

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

AYLESBURY VALE RS
Roger, G3MEH, 01442 826 651
14 Discussion evening

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
5 Propagation for beginners
19 Propagation 2 by G4XDU

COULSDON ATS
Andy, G8JAC, g8jac@btinternet.com
12 Lecture on microwaves

CRAY VALLEY RS
Bob, 2E0RCV, 020 8265 7735 after 8pm
1 20 years in the Royal Signals Territorial Army by Malcolm, G8MCA
15 AGM

DORKING & DRS
Garth, G3NPC, 01737 359472, garth@swansons.org.uk
27 DF techniques & events by Alister Watt, G3ZBU

ECHELFORD ARS
John, G4GSC, 01784 451898
8 Weak Signal Propagation Network by Walter Blanchard, G3JKV
22 Natter night, bring & buy, CW practice

EDGWARE & DRS
Mike, G4RNW, 020 8950 0658, michael.stewart5@ntlworld.com
8 Useful gadgets for the workshop
22 Simple contesting

NEWBURY & DARS
Richard, G3ZGC, 01635 46241, richard.jolliffe@vodafone.com
25 Andover Radio Club Boot Sale
28 Ask the experts

RADIO SOCIETY OF HARROW
Linda, G7RJL on 0208 386 8586, www.g3efx.org.uk
9 Bring and buy
23 Long weekend 1940s House at Bushey

READING & DARC
Pete, G8FRC, 01189 695 697
8 Spring junk sale, rules www.radarc.org
22 Visit to Martin Lynch at Chertsey

SHEFFORD & DARS
David, G8UOD, 01234 742 757, www.sadars.co.uk
8 Enigma and the Bombe by Ian Wade, G3NRW
10 Club dinner, Stratton House Hotel
15 Spring junk sale
22 GB4FUN by Carlos, G0AKI/G3VHF

SOUTHGATE ARC
David Sharp, M0XDS, david.sharp1@tesco.net
14 Computer clinic with Keith, G8RPA

SURREY RADIO CONTACT CLUB
Ray, G4FFY, 020 8644 7589
12 AGM
26 Club fix-it and natter night

SUTTON & CHEAM RS
John, G0BWV, 020 8644 9945, info@scrs.org.uk
15 Kite and balloon supported antennas by Roger Stafford, G4ROJ

VERULAM ARC
Ralph, 01923 265572, g1bsz@aol.com
20 SOTA by M0TAZ

WHITTON AMATEUR RADIO GROUP
www.warg.info
2 Introduction to digimodes
7 Intermediate course
16 Visit and talk by Radio Fairs
30 RSGB update by Alison Johnston, G8ROG, RSGB RM

WIMBLEDON & DARS
Jim, M0CON, 020 8874 7456, www.gx3wim.org.uk
9 Surplus equipment sale
30 OTA (SSB)

10 SOUTH & SOUTH EAST

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

ANDOVER RAC
Martin, M0MWS, 07776181646, www.arac.co.uk
25 ARAC boot sale

BASINGSTOKE ARC
Clive, G4ODM, 01256 326050
12 Construction and photographic contest

BREDE STEAM ARS
Steve, 01424 720815, M0NUC@aol.com
3, 6, 13, 20, 27 At the shack

CRAWLEY ARC
John, G3VLH, 01342 714 402
28 Antenna Measuring Instruments: bring along your VNA, noise bridge, GDO etc

FARNBOROUGH & DRS
Derek, G3OFA, mail@farnboroughradio.org.uk, www.farnboroughradio.org.uk
14 Club natter night
28 Skittles at Blacknest

HARWELL ARS
Malcolm, G8NRP, 01235 524844, info@g3pia.org.uk
13 Liz Jones, M0ACL visit to Falkland Is
27 Shack activity night

HASTINGS E&RC
Gordon, 01424 431 909, gordon@gsweet.fsnet.co.uk www.herc.uk.net
24 Spring used & surplus auction

HORNDEAN & DARC
Stuart, G0FYX, 023 9247 2846, www.hdarc.co.uk
6 Natter night/social evening
27 160m mobile and fixed station antennas by John, G3MYI

MID-SUSSEX ARS
Peter, G4AKG, 01444 239371
9 Electricity in the home by John Narborough
16 Radio night
23 Fox hunt
30 Radio night and table top sale

SOUTHDOWN ARS
John, G3DQY, 01424 424 319
7 Standing waves demonstration DVD
12 Operating at Hailsham shack

SWINDON & DARC
Den, M0ACM, 07810 317750, www.sdarc.net
8, 22 Natter night
15 RF Measurements by Ian, G8JHC
29 After Enigma – the move to electronic ciphers by Richard, M1CFW

TROWBRIDGE & DARC
Ian, G0GRI, 01225 864 698, E/W
7 Equipment for 70MHz by Graham Kimbell, G3TCT
21 Natter night

WATERLOOVILLE ARC
Rich, G4IBW, 02392680852, g4ibw1@ntlworld.com
9, 20 Exam course
29 CW Night

WORTHING & DARC
Roy, G4GPX, 01903 753 893
7 NVIS antennas and operating by Chris Saunders, G4ZCS
14 Discussion evening & 80m CC SSB Contest
21 Adhesives, solders & brazing by Norman Billingham, M0EBI
28 GX3WOR OTA & discussion

11 SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, G7SME@RSGB.ORG.UK

BLACKMOOR VALE ARS
Tony, G0GFL, 01258 860741
4 80m Fox Hunt, Blandford, G0GFL
6 VHF in the club shack
13 AGM
20 HF in the club shack
25 Attending Yeovil QRP Rally
27 Planning for 2010/11

BRISTOL RSGB GROUP
Robin, G3TKF, 01225 420442
26 Talk about GB3WX 6/10m crossband repeater

CORNISH AMATEUR RADIO CLUB
Steve, G7VOH, 01209 844939, G7VOH@btinternet.com
7 AGM
11 International Marconi Day (IMD)
12 Computer Section - Photoshop layers by Alex, G4DEO
23 Setting up for IMD
24 International Marconi Day
25 Dismantling after IMD

NORTH BRISTOL ARC
Dick, 01454 218362 or e-mail g0xay@aol.com or www.nbarc.org.uk
2 Club net on 145.450MHz
9 Eddystone receivers: talk and hands-on by Ian Nutt, M0ECQ
16 Shack operation
23 Silicon wafer technology by David Eastlake, M6DJE
30 Committee meeting

SALTASH & DARC
Brian, M0BHG, 01752 844321
2 DVD on space shuttle amateur radio

SOUTH BRISTOL ARC
Len, G4RZY, 01275 834 282
1 Open wire feeders
8 D-Star operation
15 Wine & cheese evening
22 Surplus equipment sale
29 OTA

TAUNTON & DARC
William, G3WNI, 01823 666 234, g3wni@btinternet.com
7 Quiz with Dave, M0CIF
14, 28 Operating Club station

THORNBURY & SOUTH GLOUCESTERSHIRE ARC
Tony, G0WMB, 01454 417048, tonytsgarc@sky.com
7 AGM
14, 28 OTA
21 Video night

TORBAY ARS
Dave, G6FSP, g6fsp@tars.org.uk
9, 23 Operating night
16 Natter night
30 90/10 sale

WEST DEVON RC
Jules Cuddy, M1AGY, 01752291588
6 RSGB and radio today by Jules Cuddy, M1AGY
20 Summer trip natter night, all welcome

YEOVIL ARC
Steve Crask, G7AHP, steve@g7ahp.co.uk
15 QRP Convention briefing
29 AGM

12 EAST & EAST ANGLIA

REGIONAL REP: PHILLIP BROOKS, G4NZQ, G4NZQ@RSGB.ORG.UK

BITTERN DX GROUP
Linda, G0AJJ, 01692 404154, secretary@bittern-dxers.org.uk
8 Informal meeting
29 Arrangements for training days and events in May

BRAINTREE & DARS
John, M5AJB, 01787 460 947
19 Construction contest

CHELMSFORD ARS
Martyn, G1EFL, 01245 469 008, www.g0mwt.org.uk
6 WWII Wireless Intercept and Secret stations by Stan Ames, G4OAV
13, 20, 27 Club net
14 Committee meeting, Danbury
24 GX0MWT at Sandford Mill for IMD

DARENTH VALLEY RADIO SOCIETY
Ray, G0FDU@G0KDV.COM
14 AGM
28 Trip to HMS Belfast, email Ray G0FDU first

DOVER RC
Brian, G4SAU, g4sau@darc.org.uk
21 Advanced exam; natter & operating night
28 AGM

FELIXSTOWE & DARS
Paul, G4YQC, pjw@btinternet.com
19 Visit by RadCom editor Elaine Richards, G4LFM

GORLESTON ARS
David, G3OEP, QTHR, 01493 662 323
24 Lunch time meeting at the Short Blue Hotel, Gorleston

HARWICH ARIG
Kevan, 2E0WMG 07766543784 kevan2e0wmg@live.co.uk
14 Foundations in concrete by M0JVC

KING'S LYNN ARC
Ray, G3RSV, ral-g3rsv@supanet.com, www.klarc.org.uk
1, 8, 15, 22, 29 Club night & 2m club net

LOWESTOFT & DISTRICT PYE ARC
Phil, G0JSG, 01502585448, phillip.holden@virgin.net
1, 8, 22 Club night at shack
15 Table Top & Junk Sale

NORFOLK ARC
Chris Danby, G0DWV, 01603 419204, cmdanby@btinternet.com
7 AGM & members' construction competition
14 Informal, construction & workshop plus RSGB CC
21 Operating from K3LR super station by Mark Haynes, M0DXR
28 Table Top Sale, construction & workshop plus Bright Sparks

PETERBOROUGH & DARC
David Howlett, M0VTG, padarc@tesco.net
28 Early amateur television by Ron, G8GRT

SOUTH ESSEX ARS
Norman, M0FZW, 01268 692776, secretary@southessex-ars.co.uk
14 Propagation software by Carl, G3PEM

13 EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, G0EJQ@RSGB.ORG.UK

BOLSOVER ARS
postmaster@g4rsb.org.uk, www.g4rsb.org.uk
7 Natter night
14 Colin's quiz
18 Net at 8pm on GB3RB to celebrate repeater's 6th birthday
21 Fox hunting part two
28 Committee meeting

FRISKNEY AND EAST LINCOLNSHIRE COMMUNICATIONS CLUB
Chris, M0MFP, 01507 442240
5 Activating GB0BS, Boston and Rural Boy Scouts, at Butterwick
6 Planning permission by M5ZZZ

HINKLEY ARS
John, M0JAV, m0jav@lowgables.co.uk, 07836 731544
7 Social evening
14 Tuning VHF Yagis for performance by John Rogers, M0JAV
21 D-Star and PC software for repeaters by John Naylor, G4KLX
28 OTA

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO, 01427 788356, pamelagrose@tiscali.co.uk
7, 21 G5FZ on air and natter night
14 Surplus equipment sale, Village Hall, Aisthorpe
28 The development of telegraphy by Roy, G4WPW

LOUGHBOROUGH & DARC
Chris, G1ETZ, 01509 504 319
6 Practical computer night
13 Knitting machines by Albert, G1KSC
20 All about WAB by Dave, G4IAR.
27 Practical evening

MELTON MOWBRAY ARS
Geoff, G3STG, 01664 480 733, G3STG@btinternet.com
16 All the latest from WAB

RAF WADDINGTON ARC
Bob, G3VCA, g3vca@pyewipe.co.uk
1 Practical night
8 Search & rescue dogs & RAYNET, by Stan Mathason from CANTECH S&R Dogs Service
15, 29 Practical night
22 HF 80m CC
24 Weekend event V Force Re-union, Newark Air Museum, GB0VVV

SOUTH NOTTS ARC
Terry, M0RIA, www.radioclubs.net/snarc
6 2m Contest
7 Brains Trust - ask the panel
14 Component theory: capacitors with G4EDX
21 OTA and Morse
24 Foundation and Intermediate theory weekend and exam
28 Homebrew No. 1 reworked, M0RIA

SPALDING & DARS
Graham Boor, G8NWC, 07947 764481, secretary@sdars.org.uk, www.sdars.org.uk
6 144UKAC at the Portakabin
16 Nostalgic look back at the origins of the club and rally, with DVD, by Roy, G3VPR

WELLAND VALLEY ARS
Peter D Rivers, G4XEX, QTHR, 01858 432105, g4xex@fsmail.net
19 AGM

HELPLINES

IMPORTANT NOTICE

RESPONDENTS ARE ADVISED NOT TO SEND ORIGINAL DOCUMENTS, BUT TO COPY THEM AND SEND THE COPIES.

Helplines is a free service that can be used to ask other members for help on amateur radio related matters. Items for inclusion can be e-mailed to radcom@rsgb.org.uk.

• Graham Stones, G7KYX is looking for assistance or advice on winding small coils using 0.16mm wire. Any help would be most welcome – please telephone 01295 871624.

HF F-Layer Propagation Predictions for April 2010

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	7.....778	87.....37888	.4..4566883.	..37777784..	....77777...	.....	.....	.....
*** Asia								
Yakutsk	.....	.....33.	..3...35677.	...6665.....	.....	.....	.....	.....
Tokyo	.....3..	.....77..	.....2..	.....	.....	.....	.....	.....
Singapore	.....22.	37872	.....254..	.....3...	.....	.....	.....	.....
Hyderabad	.....	1443	.....353.	.....3....	.....	.....	.....	.....
Tel Aviv	97.....5899	895....49999	..5....6883.	....556783..	.....5...	.....	.....	.....
*** Oceania								
Wellington	.....	.....	.....	.....	.....	.....	.....	.....
Well (ZL) (LP)	..1.....	.78.....7..	789.....987	6.8.....876	.....	.....	.....	.....
Perth	.....	.....2666.	.....3653.	.....	.....	.....	.....	.....
Sydney	.....	.....377..	.....676..	.....55...	.....	.....	.....	.....
Melbourne (LP)	.....	.699.....	67996.....5	...96.....66	...8.....6.	.....	.....	.....
Honolulu	.....	..2.....	...33.....	.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....7...	.....4...	.....	.....	.....
W. Samoa	.....	.....	...33.....	.....33.....	.....3.....	.....	.....	.....
*** Africa								
Mauritius	2.....222	6.....7877	48875	.....687..	.....67...	.....45...	.....	.....
Johanesburg	.....	.2.....2454	46.....9988	..3....7985.	.....47...	.....5...	.....	.....
Ibadan	22.....12	77.....666	776.....4766	..73....78..	...64.5688..	...4..6777..	.....6...	.....
Nairobi	1.....	5.....444	65.....4666	.....266..	.....566..	.....566...	.....	.....
Canary Isles	773.....777	887.....3888	8785...47888	..55..36876.	....888888..	....667788..	.....6...	.....
*** S. America								
Buenos Aires	.....	224.....2	436.....65	.....54.	.....	.....	.....	.....
Rio de Janeiro	.....	335.....44	547.....886	.....85.	.....3..	.....	.....	.....
Lima	.....	2.2.....2	3.35.....65	...3.....5.	.....	.....	.....	.....
Caracas	1.....	332.....4	5376.....87	....5....68.	.....3..	.....	.....	.....
*** N. America								
Guatemala	.....	.....	...5.....5	.....	.....	.....	.....	.....
New Orleans	33.....	665.....4	..3.....6	.....4.	.....	.....	.....	.....
Washington	45.....	7772.....7	57	.....3.3457.	.....45..	.....	.....	.....
Quebec	77.....5	546.....66	...3.....46.	.....3556..	.....	.....	.....	.....
Anchorage	.....	.....	..43.....5.	.....3..	.....	.....	.....	.....
Vancouver	.....	.2.....	.....	.....	.....	.....	.....	.....
San Francisco	.....	.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....5....	.....4....	.....	.....

KEY: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low, **blue** when it is expected to be fair and **red** when it is expected to be strong. The RSGB Propagation Studies Committee provides propagation predictions on the internet at www.rsgb.org.uk/propagation/index.php. An input power of 100W and a dipole aerial has been used in the preparation of these predictions; therefore a better equipped station should expect better results. The predicted smoothed sunspot numbers for April, May and June are respectively (SIDC classical method – Waldmeier's standard) 4, 4, 3 and (combined method) 27, 30, 34. The provisional mean sunspot number for February was 18.6. The daily maximum / minimum numbers were 39 on 8 February and 8 on 4 & 5 February 2010.

RadCom

Yaesu FT-950 Transceiver

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

HF/50 MHz 100 W Transceiver
FT-950

Recommended Retail Price
£1275.95 inc VAT

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

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

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

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

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

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

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

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

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

DMU-2000
Data Management Unit (option)

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

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

YAESU
Choice of the World's top DX'ers

FREE MEMBERS' ADS

Charges are waived for Members' Ads submitted by e-mail to memads@rsgb.org.uk. One ad per member per month; other important terms & conditions apply (see grey box on page 89).

FOR SALE

ALTRON 50 FOOT, 3 section galvanized telescopic lattice tower with hand winch. At present ground post mounted. Also 3-element HF beam. Reasonable offers. Trevor, G4ETP, 01752 893377 (Ivybridge, S. Devon).

AMATEUR RADIO FROM FRANCE! Fully equipped self-catering Gite, sleeps 3-5, located in SW France (Chatente Maritime) 1km from beach near the Ile D'Oleron (S of La Rochelle), including use of radio shack/workshop (not transceivers – bring your own HF rig) and aerials – Versatower, Carolina Windom, and VHF whip.

Long garden for experimental antennae – come and try it! Excellent sea path to west/southwest (S America, S Atlantic), also all Europe. Gite has TV (inc satellite), DVD, VHS, stereo, computer on broadband ADSL. Available all year, prices on application – call Tim & Monica Cherry, 0033 5 46854480 or email Robert.cherry@wanadoo.fr.

AR88LF + H/B £50, BC221, £20. B Giddings, G1JLG, QTHR, 01702 585228, (Southend).

CALLING ALL KOI FISH ENTHUSIASTS. The ultimate Koi number plate for your new car. The plate is KO10KOY, reads KOI O KOY. £1299 or near offer. Martin, M0CMH on 07855 292759, postcode IG6 2TT.

CLEARANCE SALE OF SK G4UWJ. KW 107 Antenna Tuner 1kW, £100. Swan 350 transceiver with Swan power supply/speaker, £200. DRAE 24A PSU 13.5V, £20. Shure 444 mic, £50. Yaesu YH55 headset, £15. KW 600 linear, offers. Tono 2m 90G linear, £40. Hansen SWR & power meter 3-150MHz, £20. AEG 50A SWR meter, £7. Please call Pesi Sorab, G3NDO, on 0239 246 5121 (Hayling Island).

COMET WIDE BAND VERTICAL CHA 250B 80-6m as new in box, £200 ono. P C Mason, M6PCM, 01344 429904 (Bracknell).

EDDYSTONE ROUND BLACK LOUDSPEAKER, £80. Microwave Modules amplifier MM432/50, £60. Milling, a complete course book, £5. Carriage extra. Carl, G3XGK, QTHR, 01502 564160 (Lowestoft).

SILENT KEYS

We regret to record the passing of the following members:

Mr M H Stedman, G3FFY	19/1/2010
Mr P Schofield, G4YYJ	11/2/2010
Mr N Richins, G3VKR	20/2/2010
Mr V J Reynolds, G3COY	
Mr K Tompkinson, G1PAG	
Mr W Hirst, G3YXK	13/2/2010
Mr A K Barker, G3NXQ	23/2/2010
Mr W Foulsham, G0MWF	16/2/2010
Mr B E Holden, G7MPS	13/2/2010
Mr E A Perkins, G3MA	15/2/2010
Mr E G Taylor, M0EGT	5/2/2010
Mr J Peach, G5JP	5/2/2010
Mr A N Lawes, GW3GFM	
Mr P Avill, G3TPX	10/2/2010
Mr E J Baxter, G0TII	31/5/2009
Mr J B Gleed, G1STL	5/2/2010
Mr P P Rushen, G0XBE	2/2010
Mr D G Saxton, G0CZQ	1/2010
Mr H Hoover, W6ZH	4/2/2010
Mr M L Sheridan, G1CRD	30/1/2010
Capt L A F Hughes, G0MPL	11/1/2010
Mr D C Meldrum, G0EGB	21/1/2010
Mr N R Parr, G1OTJ	16/6/2009
Mr A E Burnard, G2FCA	
Mr J A Wilkes, G3FRX	3/2/2010
Mr P P Cuffe, G0IEP	
Mr D H Parr, G3MIR	25/2/2010
Mr J B Gardner, G3WDV	7/9/2009
Mr A J W Harrison, G0RVQ	
Mr J R Paton, GM4LGR	19/9/2009

CONGRATULATIONS

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

60 years

Mr MB Greenberg	RS20443
Mr G G Kenyon	G3HMF

50 years

Mr C Bowden	G3OCB
Mr DW Bowers	GW4AVC
Dr D J Harvey	RS25435
Mr D J Hoy	RS22775
Mr A E Pritchard	GW3ODB

FT847 MINT complete with manual. MFJ 948 300W ATU, large SWR meter. Watson desk mic new. Carolina Windom 620 antenna just 34', 20-6m, VGC. £750 complete, can split. David, 2E1CIK, 01904 634112 (York).

GAP TITAN-DX 8 band vertical antenna. Bought only in October 2009 for almost £360 from a well known company. Covers 80-40-30-20-17-15-12 and 10m. It is complete and in excellent working order and has been dismantled ready for collection. Genuine reason for sale at the sensible price of £270. Eddie, M0NOV, 01636 626520 (Beckingham, Lincoln).

ICOM 746 exc condx £470. Yaesu FT-450 exc condx £370. Sony ICF-2001D VGC £160. Eddystone 830/7 boxed, manual, spare set of valves, VGC but fault in AF, £180. Buyer collects. R P Hughes, G4HAG, -114 2747950 (Sheffield).

ICOM FL44A 2.4kHz SSB FILTER, £20. Icom FL32A 500Hz CW filter, £20. MFJ4116 bias tees, £30 for 2 units. Icom R71 service manual, £12. M6A double balanced mixers with BT8 transformers, £20 for 12 units. All prices include postage. G3TDJ, G3TDJ@yahoo.co.uk, 01288 361739 (Bude).

ICOM IC7400 all mode HF to 2m 100W transceiver. Top DSP rig. Auto ATU, HM36 mic, handbook. In excellent condition and little used. Original packing. £850 ono +P&P. Bob, G3IXZ on 01568 797868 (Herefordshire).

ICOM IC8500 RX all mode, wide band. One owner, as new. Still under Icom warranty. Manual, box etc. £875. Derrick, 01377 257621 (East Yorkshire).

JANE'S MILITARY COMMUNICATIONS no. 11 (1990-1991) £25, post paid. John, G8BXO, 01769 573382 (South Molton, Devon).

KENT TWIN PADDLE KEY, £50, ZX3 6M 3-ele Yagi, £55, 2m 7-ele ZL Special, £45, G5RV, £10, All plus postage. Graham Badger, G3OHC, 01757 705869 (Selby, not QTHR).

KENWOOD TS-480SAT good condition, boxed. £400 + p&p. Free magazines: RadCom, PW and others, assorted dates between 2000 and 2009. Timothy Lupton, 2E0KEA, 01284 768648, timothy.lupton@gmail.com (Bury St Edmunds, Suffolk).

MARCONI TF2082B and TF2091B noise sets. TF888/3 Rx test set. Manuals. Buyer collects. Oliver Tillett, G3TPJ, 01708 746677 (Romford).

MFJ 1786X LOOP ANTENNA. VGC with auto control unit & X-needle SWR meter. 10 - 30MHz. Close bandwidth, cutting out much adjacent noise. Single coax feed. With short stub mast; longer alloy mast free to purchaser. Cost £459. £200 ono, collection only. G4LZU, 01823 442477 (Somerset).

OFFERS INVITED for the following, suggested prices in brackets. TS530, pristine condition (£275), FT221R with muTek & digi readout (£200). All with manuals. Prospective buyers MUST inspect and collect. A D Hitchcock, G3ESB, 01332 735 896, joalan2@ntlworld.com (Spondon, nr Derby).

PHILLIPS REEL-TO-REEL tape recorder model EL3542a/15e three speed, 7 inch tapes. Drives a bit wobbly-suspect belts causing problem. Has valves which may be of use. Free to good home. E-mail anthony991collier@btinternet.com (Shepperton).

POWER-MITE 22A PSU £35, MFJ 948 ATU 300W 1.8-30MHz, £100. Jim, G4PFR, 01296 623802 (QTHR, Wendover).

RADCOM from January 1991 to December 2003. Buyer collects, £15. C P Haddock, G3UZM on 01395 273090. Exmouth.

SET OF RADCOM AND BULLETINS 1967 TO 2008. Only few missing from the complete set spanning over 40 years. Best offer; buyer collects. Gordon Lean, G3WJG, QTHR, 01923 283337, gordon@avcomm.co.uk (Rickmansworth).

TELETYPE ASR33 WITH STAND. Free to good home. To be collected from mid Derbyshire. G3VLF, 01773 853497.

TEN-TEC ORION I. Superb radio, excellent condition, non-smoker, dust cover. Non-ATU version, with latest firmware and hardware upgrades. Inrad 600Hz CW filter, mic, leads, manual, user DVD, etc. £1200, collect or carriage/insurance extra. Rob, G4LMW, 07970 885614, g4lmw@btconnect.com, (Newbury, Berkshire).

TRIO/KENWOOD TS-940 in good condition but phase lock has gone u/s; for spares or repair. Realistic offers considered. Mel Arthur, G0BVS, 024 7673 0297, mel.arthur1@ntlworld.com (Bedworth, Nuneaton).

YAESU FT-857D, HF, VHF, UHF transceiver, good condx, very little use, comes with manual but no box, £350.00 plus £15.00 postage. James, M0CYZ on 07933 256365 (North Yorkshire).

YAESU SP-8 SPEAKER, as new, boxed, manual, £75. AT-230 antenna tuner, good condx £55. Oscilloscope, Goldstar os-9020A, 20MHz, good cond., box, manual, £40. All items collect only please. John, GW8IQC, QTHR, 01633 664482 (Newport, Gwent).

WANTED

COLLINS MECHANICAL FILTERS type F455Z-4 and F455Z-5. Contact Adair, G3MDQ on 01395 444121, adairheaney@yahoo.co.uk (Devon).

COLLINS: KWS-1, 75A-4, 270G, KWM-2A, 516F-2, 30S-1, 30L-1, etc. All items for own use and a good home will be provided. Will collect and pay cash. Steve Westell, G3YFG, 07793 665000, g3yfg@btconnect.com (Lancs).

DISABLED FAN OF OLD DAYS seeks pre-1975 QSLs, magazines etc. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk IP18 6PQ.

EXCHANGE SGC SC-2000 HF transceiver for any up to date HF transceiver, preferably with DSP etc. Richard, M3HDL, 07742 263834 (Kirkby-in-Ashfield, Notts).

HEATHKIT DX100U. Prefer in working order but anything considered. DX100U manual. Jim Shewan, G3UZB, 01642 470623 (Redcar).

KOKUSAI 455kHz MECHANICAL FILTER for KW2000B restoration project. Tony, G3MJX, on 01263 824155 (Sheringham).

KW204 TX, best condition possible. KW204/202 unit considered, WHY? G Gallamore, G8BRU not QTHR. Tel: 0161 775 4737 (Gtr. Manchester).

LISTENERS with low-noise HF reception facilities to monitor wideband slow pulse (5pps) interference concentrated around 8, 16 and 24MHz regions. Signals are not OTHR and have unusual patterns, definitely DX. Overseas observations especially welcome. Des Walsh, EI5CD, QTHR, 00353 87 9360052 (Cork, Ireland).

MAINS TRANSFORMER. Primary 0-220-240, secondaries HT 410-0-410V 180mA, 3.15-0-3.15V 4A, 3.15-0-3.15V 2.5A, 0-5V 3A. G0FZI, 01749 675963 (Somerset).

PHILIPS PM6300 RCL BRIDGE HANDBOOK or circuit diagram to enable repair. Les, G4GRM, 01922 691646, leslie137@btinternet.com (Walsall).

QSL CARDS COLLECTED. Silent key clearout or just not needed. I collect QSL cards for their historic interest, preferably from periods before 1970. Please don't throw them away. I can collect or arrange collection. Tony, G4UZN, 01132 693892, AQuest1263@btinternet.com (Leeds).

RACAL HF ROLLER-COASTER ATU in good condition. Drake MN2700 with B1000 balun. Kenwood SO1 TCXO. Racal RA117 and 1772. Cash waiting. Contact Hugh, G1AUR, on 0771 167 0611, phoenixsound12@hotmail.com (Essex).

TIMEWAVE (AEA) ANC-4 NOISE CANCELLER. Must be in good condition. G3KKP, QTHR, 01943 872231 (Leeds).

TOM WITHERS TW2 transmitter and matching power supply, preferably (but not essentially) working and in reasonable condition. Also interested in any other TW equipment or any information, instruction sheets, photographs, circuit diagrams etc of TW equipment (needed for restoration work). Mike, G4BLH, 07871 594145, tw@brier.plus.com (Nelson).

VNA HP 8754A+8750A+8502A. Consider HP8753 if price good. Carl, G3XGK, 01502 564160, QTHR (Lowestoft).

YAESU FT-990 in good condition/working order. Respectable price paid. Kevin Lamb, G4BUW, 01420 86500, kevinglamb@aol.com (Hampshire).

SPECIAL EVENT STATIONS FOR APRIL 2010

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.

Please note that the QSL Bureau sub-manager for all special event station callsigns (GBxAAA-GBxZZZ) has recently changed and is now Mrs Davina Williams, M0LXT, 20 Neale Close, Wollaston, Northamptonshire, NN29 7UT, e-mail QSLTREK@hotmail.co.uk, web site www.gb-special-event-qsl-status.webs.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with M0LXT?

Date	Callsign	Phonetics	Location	Bands	Keeper
01/04/2010	GB0AOA	Airfields On the Air	Various on The Isle of Man	TLH	GD0HYM
	GB0BME	Bancroft Mill Engine	Barnoldswick	TLHV27	G7WAW
03/04/2010	GB0HDX	Harlaxton Delta Xray	Grantham, Lincs	TLHV27	M0JHW
	GB0GRA	Grantham Radio Amateurs	Grantham, Lincs	TLHV27	M0JHW
04/04/2010	GB0LAD	Landmine Awarness Day	Harrington, Northants	LH	M0RRO
09/04/2010	GB0IMR	International Marine Radio	Newbury, Berkshire	TLH27	G3ZGC
10/04/2010	GB100GLD	GLD= C/S of Marconi Stn re 1st recorded SOS message	Lizard Wireless Stn,	TLHV2	G3PLE
	GB2NOR	Norbreck AR Rally	Blackpool	LH27	G0TAK
	GB0GKA	GKA = Portishead Marine Radio station	Callow, Hertfordshire	TLH27	G3ZRJ
11/04/2010	GB4AFS	Air Formation Signals at Norbreck Rally	Blackpool	LH	G0OZU
12/04/2010	GB2TT	Townhill Telegraph	Southampton	TLHV27	M0XIG
17/04/2010	GB2AGM	Annual General Meeting of the RSGB	Bedford	LHV27	G3VHF
20/04/2010	GB0GAF	Great Alne Festival	Warwickshire	LHV	G4IDF
22/04/2010	GB4MBP	Marconi Bass Point	Lizard, Cornwall	LH	G3MRT
	GB0MD	Marconi Day	Kent	TLHV2	G3NZR
23/04/2010	GB4MIW	Marconi Isle of Wight	Isle of Wight	LH27	G0VZV
	GB0VVV	Vulcan, Victor, Valient	Newark, Notts	LH27	G4DBS
	GB8MD	Marconi Day	Towyn, North Wales	LH2	G3UKV
24/04/2010	GB5FHC	Fraserburgh Heritage Centre	Fraserburgh	LH2	MM0JGP
	GB8IMD	International Marconi Day	Netheravon Camp, Wilts	LHV2	M0MWS
	GB0MGY	MGY= Titanic's Call Sign	Old Harlow, Essex	LH	G0BXL
	GB5LT	Luttrells Tower	Southampton	TLH2	G4YVY
30/04/2010	GG100GCC	Gordon Centenary Camp	Tarves, Aberdeenshire	L2	GM0RAB
	GB10GKA	10th anniversary of the closure of Portishead Radio	Herefordshire	LH2	G3ZRJ
	GG100LNG	Lincolnshire North Guides	Market Rason, Lincs	LHV27	G0MNI

RALLIES & EVENTS

Members of the RSGB Regional Teams will be at the rallies this month that are marked with a diamond.

11 APRIL - CAMBRIDGESHIRE REPEATER GROUP ANNUAL RALLY - Foxton Village Hall, Hardman Road, Foxton, Cambridge CB22 6RN. TI S22, TS, B&B, C, DF, LEC, OT 10.00, £2. Contact Laurence, M0LCM, 01223 654880, e-mail rally2010@cambridgerepeaters.net [www.cambridgerepeaters.net].

11 APRIL - NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION - Norbreck Castle Exhibition Centre, Blackpool. TI, CP, TS, B&B, SIG, MT, LB, C, DF, RSGB Book Stand. OT 10:45/11:00. Dave, M0OBW, 01270 761 608 or e-mail dwilson@btinternet.com [www.g1gyc.demon.co.uk/narsa].

11 APRIL - LOUGH ERNE AMATEUR RADIO CLUB ANNUAL RALLY - The Share Holiday Village, Lisnaskea, Co. Fermanagh BT92 0EQ N. Ireland. Access from Erne/Shannon Waterway. OT 12 noon, CP, B&B, TS, LB, C, DF. Details Iain 028 66326693, e-mail gibbjgbb@aol.com [www.lougherneradioclub.co.uk].

18 APRIL - WEST LONDON RADIO & ELECTRONICS SHOW (KEMPTON RALLY) - Kempton Park Racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. TI, free CP, OT 9.50/10.00. TS, FM, B&B, SIG, C, DF, WIN, LEC. Details Paul, M0CJX, 0845 165 0351, info@radiofairs.co.uk [www.radiofairs.co.uk].

24 APRIL - CANCELLED - 4TH CHESTERFIELD AMATEUR RADIO RALLY - cancelled due to venue price rise. Details of any new plans at www.m0oct.com.

25 APRIL - ANDOVER RADIO AMATEUR CLUB BOOT SALE - Wildhern Village Hall and Playing Field, SP11 0JE, north of Andover just off the A343. TI S22, CP, £1.50, C, DF. Vendors £6 per boot/table, £8 inside the hall. Details Martin, M0MWS, 01980 612070 [www.arac.org.uk].

25 APRIL - 26TH YEOVIL QRP CONVENTION - Digby Hall, Hound St, Sherborne, Dorset. Digby Hall adjoins the central shopping car parking. TI S22 (V44), CP, OT 9.30. LEC, TS, B&B, C, DF. Robert, 01935 706715, e-mail robert.farey@btinternet.com [www.yeovil-arc.com].

2 MAY - DAMBUSTERS HAMFEST

3 MAY - DARTMOOR RADIO RALLY

9 MAY - MAGNUM RADIO RALLY

14–16 MAY - DAYTON HAMVENTION®

23 MAY - DUNSTABLE DOWNS RC

29 MAY - MID ULSTER AMATEUR RADIO CLUB RALLY AND BOOT SALE

6 JUNE - RED ROSE QRP FESTIVAL

6 JUNE - SPALDING & DARS ANNUAL RALLY

6 JUNE - NEWHAVEN FORT AMATEUR RADIO GROUP RALLY AND FORT OPEN DAY

13 JUNE - EAST SUFFOLK WIRELESS REVIVAL (IPSWICH RADIO RALLY)

13 JUNE - 9TH JUNCTION 28 QRP RALLY

20 JUNE - NEWBURY RADIO RALLY AND BOOT SALE

25–27 JUNE - HAMTRONIC SHOW, FRIEDRICHSHAFEN

27 JUNE - WEST OF ENGLAND RADIO RALLY

3 JULY - 1ST STOCKPORT RALLY previously known as REDDISH RALLY

4 JULY - BARFORD NORFOLK RADIO RALLY

11 JULY - CORNISH RAC 47TH MOBILE RALLY

18 JULY - HOT IRON QRP DAY

18 JULY - MCMICHAEL RALLY AND BOOT SALE

18 JULY - MACMILLAN [NORTHAMPTON] HAMFEST

25 JULY - HORNCASTLE SUMMER RALLY

1 AUGUST - KING'S LYNN ARC RALLY & CAR BOOT

8 AUGUST - FLIGHT REFUELLING ARS HAMFEST

13 AUGUST - COCKENZIE & PORT SETON ARC 17TH ANNUAL MINI-RALLY NIGHT

15 AUGUST - FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB RALLY

22 AUGUST - NEW VENUE - NEW DATE - RUGBY ANNUAL RADIO RALLY

29 AUGUST - MILTON KEYNES ARS RALLY

30 AUGUST - HUNTINGDONSHIRE ARS BANK HOLIDAY MONDAY RALLY

5 SEPTEMBER - TELFORD HAMFEST

12 SEPTEMBER - BOOT FAIR/OPEN DAY AT THE MUCKLEBURGH COLLECTION

12 SEPTEMBER - TORBAY ANNUAL COMMUNICATIONS FAIR

13–18 SEPTEMBER - THE 15TH WORLD ARDF CHAMPIONSHIPS

18 SEPTEMBER - NEW RALLY - THE FOG ON THE TYNE RALLY

19 SEPTEMBER - NEW DATE - GREAT NORTHERN HAMFEST

1 & 2 OCTOBER - NATIONAL HAMFEST

3 OCTOBER - AUTUMN MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE

8–10 OCTOBER - RSGB CONVENTION

17 OCTOBER - BLACKWOOD AND DISTRICT ARS RALLY

17 OCTOBER - NEW DATE - HORNSEA AMATEUR RADIO CLUB RALLY

17 OCTOBER - GALASHIELS AND DISTRICT ARS RADIO RALLY

30 & 31 OCTOBER - NORTH WALES RALLY

7 NOVEMBER - WEST LONDON RADIO & ELECTRONICS SHOW (KEMPTON RALLY)

21 NOVEMBER - 33RD CATS RADIO & ELECTRONICS BAZAAR

21 NOVEMBER - PLYMOUTH RADIO CLUB RALLY

28 NOVEMBER - BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY

This list shows all rallies and events we are aware of as at 3 May 2010 . If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to GB2RS@RSGB.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e–mail (to GB2RS@RSGB.org.uk) then we suggest you set your e–mail program to request a 'read' receipt so you can be sure we've seen the details.

TI Talk-In; CP Car Park; £ Admission; OT Opening time - time for disabled visitors appears first, (eg 10.30/11am); TS Trade Stands; FM Flea Market; CBS Car Boot Sale; B&B Bring and Buy; A Auction; SIG Special Interest Groups; MT Morse tests; MA Foundation Morse Assessments; LB Licensed Bar; C Catering; DF Disabled Facilities; WIN prize draw, raffle; LEC Lectures/Seminars; FAM Family attractions; CS Camp Site.

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the email address.
2) **Your advert must clearly show whether it is For Sale or Wanted and must include your name, callsign or membership number, telephone number and postal town, in that order.**
3) The Ad may not contain more than 40 words, excluding the information in (2), and may be edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.
4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but members may re-submit the same advert each month if they wish.
5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in any way. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.
6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
7) The RSGB believes that it is inappropriate for members trading in radio equipment in any way to place members' ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.
8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
9) Members' Ads are accepted and published in good faith.
10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

WARNING

Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement.

The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

CLASSIFIED ADS

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

Copy to: Chris Danby G0DWV, Danby Advertising, Fir Trees, Hall Road, Hainford, Norwich, Norfolk, NR10 3LX Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

FOR SALE

ISOLATED DATA INTERFACES
for PSK31-SSTV-RTTY-CW-FSK-WSJT etc. ALL PREVIOUS MODELS STILL AVAILABLE, See RSGB Reviews SEPT 09 RADCOM. AVAILABLE. PAYPAL REGISTERED. www.g3liv.co.uk johnny@melvin.com 0191 2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000 e. barbara@engineered-composites.co.uk www.engineered-composites.co.uk

PROGRAMMING AND DATA MODE CABLES for Icom, Yaesu, Kenwood, Ten-Tec, Motorola, Vertex, and many other brands at www.radioarena.co.uk Tel. 0845 0942245 info@radioarena.co.uk

CARDS & DESIGN

QSLers 100 full colour cards £24 including Design and Postage, 1000 full colour cards £75 inc Postage, m0dol Chris 24 Westridge, Northampton nn27ra

QSL FACTORY: top quality colour QSL cards. www.qslfactory.com

LOW COST AND HIGH QUALITY QSL cards by LZ1JZ QSL PRINT http://www.LZ1JZ.com

WANTED

Unwanted valve amplifiers, working or not. Known makes only (Kenwood, Yaesu, Drake, Linear Amp, etc), not homebrew. Cash paid. Contact Peter G3ZRS on 01482 862323 or e-mail: g3zrs@hotmail.co.uk

COMPUTER SOFTWARE

MEMORY MANAGEMENT SOFTWARE FOR YAESU RADIOS. http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

AERIALS

G4TPH PORTABLE MAGLOOPS
"I have an ML-40 and I had it hanging on the bedroom door just to try it the first time. I worked Moscow, France , Spain, and I got a contact in to London all on my ft817 running on its battery 2.5 watts ,From Newcastle upon Tyne , There's nothing more to say is there !...Keith M3RCU". Full details of these antennas at www.g4tph.com

GROUNDBREAKING PERFORMANCE!
New pricing, new band coverage, new compact, innovative design. "That'll be the I-PRO!" www.proantennas.co.uk 01489-789960

YAGI ANTENNA INSULATORS - Insulators from £1.50 each. Free Yagi Designs and more insulator info at www.g0ksc.co.uk

LIQUID ELECTRICAL TAPE- waterproofing for outdoors. £9.50. Velcro straps - ideal for supporting temporary antennas. £5.99. Antenna poles. 7m fibreglass. £17.95 Prices include p&p. SOTAbeams, 89 Victoria Road, Macclesfield, SK10 3JA. 01625-425700 www.sotabeams.co.uk

SIRIO 3 AND 4 ELEMENT YAGIS cover 26 - 28 MHz, Lightweight and easy to erect, prices from just £79.95 www.nevadaradio.co.uk

75 OHM PHASING LINES – use our WF-165, 3kW double screened coax, Velocity ratio 0.81, £1.35 per Metre www.nevadaradio.co.uk

COMET H-422 ROTARY DIPOLE – covers 40/20/15/10 we have a couple of ex display units, as new with full one year warranty, for £199 (save over £70 !) first come first served. www.nevadaradio.co.uk

MISCELLANEOUS

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147Khz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

ACCOMMODATION NORTH COAST SCOTLAND. Self catering, B&B, camping. Discounts for licensed amateurs. GM4JYB Tel: 01847 851774. Web: www.dunnethead.iberacal.com Email: briansparks@dunnethead.co.uk

WEST COAST OF SCOTLAND SAILING
Join sailing yacht 'Damsis' for coastal cruising and enjoy use of onboard HF station. Become MM for your holiday. GM0FFB.
Tel 01505 704976.
Web: www.clydeskipperedcharters.co.uk

EQUIPMENT

VHF/UHF ACCESSORIES and aerials, TVI Filters, 4m & 6m Transceivers. GAREX ELECTRONICS PO Box 52, Exeter EX4 8WX Tel: 07714 198374 www.garex.co.uk

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Kent Rigs, 52, Salisbury Road, CHATHAM, Kent, ME4 5NN, 07903 023437

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Call: 01807 580376 email: radiorepairs@btconnect.com

BUSINESS CARDS

CLASSIFIED ADS

NORMAN FITCH, G3FPK 1927-2010

An appreciation, by Laurie Margolis, G3UML

L-R: Norman Fitch, G3FPK, Maurice Margolis, G3NMR & Brian (now Lord) Rix, G2DQU.

The East London/Essex borders, early 1960s. A group of radio amateurs in their 30s and 40s develop together and become good friends. Most were professional or ran small businesses. Most were married with children. Most are now dead – Joe Steele, G3KZI, ran a major glass business and glazed the US Embassy in Grosvenor Square. Jim Farlow, G3BXI, made wooden packing cases for Ford in a large plant in Hainault. Norman Jacobs, G3OGB, made steam irons for the fashion industry. My father, Maurice Margolis, G3NMR, had a small garment making business. There were others, a doctor, a fashion retailer, I've lost track of. All liked working DX and assembled what for their time were good quality stations. They were linked on two metres by converted taxi radios. Another core member of this group was Norman Fitch, G3FPK.

Norman was slightly different. He lived with his parents in Leyton, East London, and never married. If this makes him sound like some isolated Hancock figure, that impression couldn't be more wrong. I remember Norman with flash cars and pretty girlfriends. But he got caught up in caring for aged parents, not that he ever complained, and marriage and family just never quite happened.

He travelled widely, often going down to Monte Carlo to use his 3A2BT callsign, a seriously rare one in those days. He was highly cultured, loved theatre, comedy and music. He adored the great American satirist Tom Lehrer. The Third programme, later Radio 3, was the soundtrack to his life. He was, in many ways, a real renaissance man, across science, engineering and the arts. A staunch Conservative, he saw the incoming 1964 Labour government of Harold Wilson as a personal insult.

Most of the East London group were Jewish. Norman wasn't but loved the humour, friendship, banter, and warmth. Yet another who became one of the group was a brilliant young Canadian eye surgeon, Arthur Leith, VE2MD, who studied and worked in London. Arthur, a Presbyterian of Scottish origin, was heard to declare loudly "Fitch, they'll have us in this bloody tribe yet".

The important thing about Norman Fitch was that he was really clever. He was a fully qualified structural engineer, working on big projects in London and even the Middle East in the early 1960s. In my family, the great slabs of concrete popular at the time in construction were known as pre-stressed Norman Fitch.

He was also an excellent electronic engineer. In the mid-60s, even ahead of the famous British KW2000 transceiver, Norman designed and built from scratch a highly sophisticated HF transceiver that briefly went into production, the Courier CTR-1. I wonder if any are still out there somewhere. He took space above my father's clothes manufacturing business in Pentonville Road, Kings Cross, continued his professional work, but also built and sold transceivers.

Another interest of this group of radio amateurs was mobile operation. A small, noisy vociferous organisation, the Amateur Radio Mobile Society emerged. Norman was the secretary, he and my parents used to edit and distribute their monthly journal, Mobile News. I still have copies – it was funny, irreverent, constantly tweaking the RSGB's tail, and for several years thrived. It meant my parents and Norman were in almost daily contact. ARMS, with Norman at the helm, punched way above its weight. They ran huge mobile rallies at American air bases – Barford St John and Mildenhall, with thousands of people turning up to be enthralled at a glimpse of the American dream in Suffolk and Oxfordshire.

The social side of amateur radio developed fast in the sixties, as international travel became more common. Countless times Norman was at our house in Ilford to meet interesting new Americans, Australians or Canadians.

Norman, together with Joe, G3KZI, was also the driving force behind some lavish amateur radio dinners in London. There were three of them in the mid sixties, known as the London SSB Dinners, held at the Royal Garden Hotel in Kensington. Very many foreign callsigns attended the black-tie, long-dress events, with top class entertainment and valuable equipment as prizes. These gatherings, sophisticated and glitzy, were glamorous in a way that no similar amateur radio events, at least in this country, have ever been since. And the driving force? Of course, Norman Fitch.

My memory of Norman in his Leyton days was as an HF operator, mostly on CW, with a beam looming above his little terraced house. Later, he moved to Surrey, to a terrific VHF location high above Purley by Riddlesdown Common. My brother Jonathan and I visited Norman a couple of years ago and took him for lunch. He was in his mid-80s but bright as a button, still driving, and devoting great energy to his VHF column in *RadCom*. We rather lost touch when my parents died and he moved to Surrey, but I think his interest in VHF was powered by the great site he found himself. The day we were there, the new arch at Wembley Stadium, best part of 20 miles away, was clearly visible.

Although he had no family after his mother died, Norman was busy with his writing and still spent a lot of time on the air, both on VHF and keeping skeds on 20 metres. He still worked some DX – I remember an excellent signal from his dipole when I was operating as VK9LA from Lord Howe Island. He was an early adopter of e-mail and the internet, and was very keen on Echolink, using it to talk to friends in the US and Australia.

Norman was found dead at home on 29 January 2010.

RE: AM I THE OLDEST? (WILLIAM, MW6KGB, LAST WORD, FEBRUARY 2010)

W A Rance, 2E0WAR, ex-GTZM

Congratulations William on your achievement and good luck with the Intermediate. In reply to your query – are you the oldest person to acquire a Foundation licence at 74 years of age? Recently an acquaintance of mine, Ed, passed his Foundation exam and has been issued the call sign M6SJW. Ed will be 83 years old in April 2010 and is virtually without sight!

Oli, G3NFY

Further to the letter in February's edition, I am pleased to mention that one of my students was 84 when he passed his Foundation exam and gained the call M3XFR.

RE: REDUCING LOCAL NOISE ON 80m

Paul, EI5DI

David, G3ZPF makes an apparently reasonable request for the RSGB to organise receivers at low-noise locations in the UK. That way, anyone with local noise problems could access them by the internet.

There's just one snag – it's no longer amateur radio.

The fundamental difference between amateur radio and all other RF-based or wired professional communications systems is that we, as radio amateurs, accept the inherent uncertainties in our mode of communications.

Whether it's remote receivers or transmitters, D-Star, EchoLink or CQ100, they're all helping to stamp out amateur radio – by putting the wires back into wireless.

HAM SPIRIT

Brendan McCartney, G4DYO

Many years ago I avidly chased contacts and QSL cards for 5BWAZ and eventually had 199 cards out of the required 200. When, for various reasons, I went QRT in 1995 all the cards were lost so when I came back into radio again several years ago I set about obtaining replacements for the lost cards. Some were easy, some were difficult and some were impossible due to SK operators, re-issued callsigns, etc, which made tracing the logs impossible.

Back in December, 1982, I worked JT0GM, my only 80m contact with Zone 23, Mongolia. With my station it was a near miracle that I made

it, so that QSO was very precious. My initial attempts to find either the QSL Manager or the operator drew blanks but, thanks to suggestions from several amateurs, I eventually made contact with the operator – Walt – in Russia. Unfortunately, he had no JT0GM cards left so, following discussion with the 5BWAZ Manager, I sent Walt my card and asked him to sign it as proof of the QSO and return it to me. Unfortunately, the envelope with the card and return postage was 'lost' in the post so I thanked Walt… and gave up the chase.

A few weeks ago I received an e-mail from Walt saying that after no contact for 15 years he had located his QSL Manager who had a couple of the old JT0GM cards stored away. Walt had the cards sent to him and then despatched one to me via courier and it arrived a few days later by FedEx.

During 35 years as an amateur – and many more as an SWL – I have never experienced anything quite like this. When I came back to radio I was sadly disappointed at the lowered standards but I got to enjoy DXing once again. The extraordinary kindness shown by Walt demonstrated amateur spirit at its very best and it has rekindled my enthusiasm even more.

PUSHING THE BOUNDARIES

Thomas Brady, G8HEB

I have read with interest many of the letters published over many months. I would like to congratulate Eamon Skelton for his excellent Homebrew articles. These articles surely have appeal for those of all abilities.

I read the article by David Lake on a Homebrew D-Star Repeater. I acknowledge David's obvious technical ability but I was left wondering why, why are we creating such a complex communications medium. The recent devastating earthquake in Haiti indicates that at a time of emergency we need reliable basic communications.

The most suitable communications equipment would need to be portable and may need to be set up in a short space of time. Battery equipment could be recharged from various sources (other batteries, generator set, possible mains, etc)

In summary, this shows the best part of amateur radio, it can mean different things to different people and without the Eamons and Davids of this world, we would still be using spark transmitters. Well done chaps: keep pushing the boundaries of amateur radio.

WRITE TO YOUR MP!

Mike Hall, M0MGH

Could I urge everyone who reads this letter to please write to your MP about the PLT/PLA situation. Please make sure you use your full name, address and telephone number so that you get an official response. If you think you are suffering from PLT interference then check it out on YouTube. Type in *powerlineqrm* in the search box. If you go for an investigation, Ofcom will need to establish that the interference is at least 6dB above the ambient noise floor. If you call in Ofcom, make sure you have all your ducks in a row – correct antennas connected and that all sources of interference from your own QTH are switched off. This is important otherwise it's a £50 charge if you are causing your own interference, free if not. Know where the strongest QRM is before they turn up. Be polite and don't antagonise the Ofcom staff – they are only trying to their job and abuse is going to get you nowhere. Also, if you already have had a PLT unit fitted to your own QTH then you need to rip it out obviously…

Also please note there is a rumour that the PLT devices may be increased in frequency. At present this is just conjecture but I don't see how they can not interfere with Band II FM, aircraft AM (civil and military), and shipping. So, now get to your PCs and pens and paper and get writing to your MP. Stop reading and do it now!

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be e-mailed to radcom@rsgb.org.uk Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right not to publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible. Additional letters may be published on the RSGB members-only website at www.rsgb.org/membersonly/lastword.

500kHz

W A Rance, 2E0WAR, ex-GTZM

In response to Derek, G3HEJ and the 500kHz debate. Like many radio amateurs world-wide I am an ex-merchant marine RO. I am sure that many of us have mixed feelings about its demise as the sacred '500kc/s'. However, one can only feel relieved that its usage is now being allocated to worthy inheritors.

EXPRESS DELIVERY

Ron Tucker, G3KTC

Nice to know whilst camper vanning here in NZ I was able to walk into the public library here in Napier and read the very latest copy of *RadCom*. Mine will be sitting on the mat at home.

SILENT KEY, PETER CUFFE, G0IEP

Peter Mac Dougall, MCIJ, EI/G7VEW

It is with great sadness that I have to report the passing of Peter Cuffe, on 28 January 2010, a true gentleman of the amateur radio world, at the age of 84.

Peter was born in Leenaun, on the lakeside border of counties Mayo and Galway and his working life was first on merchant ships, then on the Fleetwood fishing feet, sailing in Arctic waters. He later became a senior communications officer at sea with Shell oil tankers. He could send and receive Morse messages in several languages at commercial speed and eventually retired to Fleetwood, Lancashire, where he passed his RAE with ease.

He was a conscientious and active member of The Knights of St Columba and took his religion very seriously, but he had a superb sense of humour, a very witty man. He was a great encouragement to me when I 'reclaimed' my lapsed license and a patient mentor when I asked naive questions, catching-up with all I'd missed. He was active on all HF bands and also had an interest in packet radio.

Peter died after a short illness and is survived by his wife Margaret, three sons; John, Tomas and Peter Jr, - and daughters, Philomena and Bernadette - with many charming grandchildren. His nostalgic contributions at the Thornton Cleveleys Amateur Radio Society meetings will be sorely missed but his memory will stay with us fondly. The world is a poorer place for his loss. RIP Peter.

NEED TECHNICAL HELP? DON'T BE AFRAID TO ASK

Tony Brown, G4CCB

Firstly, I owe a big thank you to Elaine Richards, G4LFM, Editor of *RadCom*. This prompted me to write to The Last Word to remind us all that in our hobby we are not alone.

In order to explain, I will give you the background on my situation. A number of years ago, I began a project in the October 1967 issue of the Radio Communications magazine, (later to be renamed *RadCom*) called the Cornishman SSB Transmitter and was also interested in another project, a Transistor SSB transceiver, in the same issue. During a house move many years ago, I lost the original magazine, so the project was put under the shelf until I eventually found a copy of the article.

When it became apparent that the magazine was lost forever, it seemed that it was never going to be completed. I then transferred my building projects to more modern techniques, until I thought that there might still be a copy or reprint of the magazine in existence. This prompted me to write to Elaine to include my plea for help in the Helplines column. It was worth a go, as there are still a lot of the older amateurs out there.

What I did not realise was that RSGB had still got an old copy in the archives, from which Elaine copied the articles and e-mailed them back to me forthwith! This then reminded me that as radio amateurs, we are built on a culture of helping each other in a common interest, whether it be building, operating, or just plain communicating with each other.

With this in mind, if any of you need help or assistance, try what we are good at - communicating. By e-mail, internet, contacts on the radio, through clubs or organisations such as RSGB, (through Helplines,) or just swallowing your pride and asking. It is out there, and there are many people who would willingly answer your call for help!

WATERS & STANTON

Orderline 01702 206835 **General Enquiries** 01702 204965

W&S On The Internet! We Twitter at twitter.com/wsplc

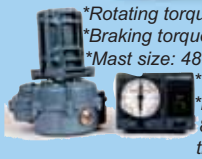
(We also Blog and have a Facebook account ~ Just follow the links from our homepage)

Diamond
VHF/UHF Antennas


A144S5R	5el 2m 9.1dbi 0.95m L	£45.95 D
A144S10R	10el 2m 11.6dbi 2.13m L	£84.95 D
A430S10R	10el 70cm 13.1dbi 1.19m L	£49.95 D
A430S15R	15el 70cm 14.8dbi 2.25m L	£65.95 D
SB144	Boom for dual 2m Yagis	£24.95 A
SB430	Boom for dual 70cm Yagis	£19.95 A
SS144	Stack transformer 2-way 2m	£81.95 C
SS430	Stack transformer 2-way 70cm	£71.95 C
KB144	Mast stand-off for vert. polarise	£18.95 A
KB430	Mast stand-off for vert. polarise	£15.95 A

Create
Rotators

RC5-1 Medium Duty Rotator



Rotating torque: 6kg/m *Braking torque: 80kg/m *Mast size: 48-63mm *Vertical load 400kg *Horizontal load 800kg *Rotation speed: 60-150sec/50Hz *Power requirement: 230V AC 80VA *Weight: 5kg *Cable: 7-core cable (not supplied) *Requires MC-2 lower mast clamp if mounting on pole* **£499.95 D

RC5-3 £599.95 D
Same as above but with preset control.

RC5A-3 £819.95 D
Same as above but heavier duty.

bhi
DSP Audio Equipment

ANEM-MkII
"Noise Away" Amplified Noise Elimination Module. Fits in-line between the equipment & speaker. **£109.95 C**

NES10-2 MKII
Speaker and programmable DSP unit. Offers dramatic noise reduction. **£89.95 C**

NEIM-1031MKII
Noise Eliminating In-Line Module. **£125.95 C**

NEDSP-1061/2-KBD
NEDSP-1061-KBD - Noise Eliminating DSP module fits into FT-817 etc.
NEDSP-1062-KBD - Noise Eliminating DSP module fits into Loudspeaker.
(1061) £89.95 C (1062) £89.95 C

DV-Dongle
D-Star from your PC

This is a "dongle" that you plug in your PC or Macx USB socket. Load up the software and enjoy working through D-Star repeaters all over the world. Great fun for holidays, office etc. **£199.95 C**

Microset
Amplifiers & Power Supplies

SR-100
2m 4-25w in linear for 100W output. **£259.95 C**

R-25	2m 1-4Win / 30W out	£119.95 C
RV-45	2m 3-15W / 45W out	£129.95 C
VUR-30	2m/70cms 1-6/20-30W	£269.95 D
RU-20	70cms 0.8-3 / 15-20W	£169.95 C
RU-45	70cms 3-15 / 45W	£219.95 C
RU-432-95	70cms 6-12/80-95W	£599.95 D

Check out other models @ www.wsplc.com

PC-120
20 Amp variable Power Supply. **£179.95 D**

MOTOROLA We carry a wide range of Motorola licence free radios & approved PMR radios. Check www.wsplc.com

Optoelectronics
Frequency Counters

CUB
A compact highly accurate frequency counter covering 1MHz -2.8GHz.Comes complete with battery pack and charger. **£149.95 C**

Scout	10-400MHz 400 memos.	£339.95 C
V-Sweeper	Wireless video 900 - .5GHz	£649.95 D
X-Sweeper	FM spectrum display scan	£1679.95 D
R-506	RF detect AM/FM to 6GHz	£264.95 C
Spectrum-Scout	10 - 2.8GHz + data display	£459.95 C
M1	10Hz - 2,4GHz counter	£259.95 C

WATSON **NEW**

W-2001 Internet Wireless Weather Station

- *5-day Forecast*
- *Date & Time*
- *World Weather*
- *Backlit LCD*
- *Wireless Link*
- *PC Dongle*
- *Outdoor Sensor*

The W-2001 gives a 5-day forecast for anywhere in the world! The clear LCD screen is wireless linked to your PC via a dongle. Just press the LCD screen panel command and it will interrogate your PC, display and store the results on the wireless linked weather display panel. So you can monitor your local weather trends directly and see an accurate 5-day forecast.

Just £49.95 C

Watson
Power Supplies

Power-Mite-NF

Compact Cont. 22 Amp Switch Mode PSU variable voltage & noise offset. **£69.95 C**

Power-Max-25-NF

Slightly larger than the Power-Mite and ideal companion for any 100W radio. **£89.95 C**

Power-Max-45-NF

38 Amp cont, 45 Amp Peak, Switch Mode PSU with variable voltage, V/A meters, & noise offset. **£119.95 C**

Power-Max-65-NF
65 Amp Low Noise power supply. Patented Noise Control that permits you to move any noise away from the operating frequency. **£209.95 D**

W-25AM

A really hunky, reliable 25 Amp variable supply that easily runs 100W radios with power to spare. **£89.95 C**

W-3A	3A Analogue fixed 13.8V	£24.95 C
W-5A	5A Analogue fixed 13.8V	£29.95 C
W-10AM	10A Analogue variable	£59.95 D
W-10SM	10A Switched fixed	£49.95 D

Manson
Power Supplies

EP-925
30 Amps Peak

A 3-15V DC, 25A (30A peak) power supply able to provide the needs of the modern 100W HF transceiver. **Dual analogue meters *Over current protection *Large power terminals for rigs *Quick snap connectors for ancillaries.* **£99.95 D**

Kent
Morse Keys

Hand-made quality morse keys. Fell the difference!

KSKA	Standard straight key	£79.95 C
KSKB	As above in kit form	£59.95 C
KSKK	As above less base	£49.95 C
KT1	As KSKA but steel base	£89.95 C
KTPA	Iambic paddle key	£94.95 C
KTPK	As above but in kit form	£79.95 C
KENT-TWO	Paddle & Straight	£89.95 C

Avair
Power SWR Meters

Great Value Superb Performance!

All models have 12V backlight and include DC Cable.

AV-201 £49.95 C
1.8-160MHz, 5/20/200/1kW

AV-400 £49.95 C
140-525MHz 5/20/200/400W

AV-601 £69.95 C
1.8-160MHz / 140-525MHz

AV-1000 £79.95 C
1.8-160MHz, 430-450MHz, 800-930MHz, 1240-1300MHz. 5W, 20W, 200W, 400W.

Cross Needle Models - Even Lower Prices!

AV-20 £34.95 C
30W / 200W, 3.5-150MHz

AV-40 £34.95 C
15W, 0-150W, 144-470MHz

Watson
Dummy Loads

They feature high tolerance, air-cooled housings with extremely efficient heat ducting. This results in a realistic continuous power rating, together with an impressive VSWR curve.

DM-150PL £34.95 C
DC-1GHz PL-259 30W cont 100W 90 secs

DM-200N £49.95 C
DC-3GHz N-Type 35W cont 100W 2 mins

Ramsey
Kits

CW-7C
A complete CMOS CW keyer kit with case and knobs. **£35.95 B**

FR-146C	2m FM receiver + case	£44.95 C
FR-6C	6m FM receiver + case	£44.95 C
QRP-20C	20m 1W VXCO Tx +case	£39.95 C
QRP-40C	40m 1W VXCO Tx +case	£39.95 C
QAMP-20C	20m 20W linear +case	£49.95 C
QAMP-40C	40m 20W linear +case	£49.95 C
RFS-1	RF switch 1-100W	£22.95 C
SS-70C	Speech scrambler	£39.95 C

Miracle Antennas
Miracle-Whip

A tuneable telescopic whip covering 3.5 to 460MHz. Up to 25 Watts PEP, fitted with PL-259 plug. Great for FT-817 & IC-703 or any other QRP radio. **£109.95 C**

Ducker £109.95 C
HF Mini ATU for helical whips

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

UK'S LOWEST PRICES

www.wsplc.com

www.jayceecoms.com

Peet Bros.
Weather Stations

Ultimeter-100

Desktop weather station with outside sensors.

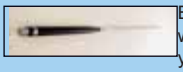
£129.95 C

These are high quality systems made in the USA to exacting standards. All include data software.

Ultimeter-800 inc. humidity **£169.95 D**
Ultimeter-2100 inc. pressure **£249.95 D**
WSF-10100 rain gauge +cable **£79.95 C**

For full range check *www.wsplc.com*

Watson
Walk-About Antennas



Base loaded telescopic whips that plug into your FT-817 and give you total HF portability. Add a wire radial for really great performance!

AT-10	10m single band whip	**£19.95 A**
AT-12	12m single band whip	**£19.95 A**
AT-15	15m single band whip	**£19.95 A**
AT-17	17m single band whip	**£19.95 A**
AT-20	20m single band whip	**£19.95 A**
AT-30	30m single band whip	**£19.95 A**
AT-40	40m single band whip	**£21.95 A**
AT-80	80m single band whip	**£21.95 C**

Tigertronics
SignaLink Interfaces

Tigertronics Signalink Sound Card Interfaces do not require the use of a com port to trigger PTT on the rig. SignaLink have internal links which make them compatible with most of the rigs on the market. Radio lead is supplied, state which when ordering. Extra mic leads are available.

SL-USB-4R	4-Pin Round	£89.95 C
SL-USB-13PDI	Icom 13-Pin Din	£94.95 C
SL-USB-13PDK	Kenwood 13-Pin	£94.95 C
SL-USB-8R	8-Pin Round	£89.95 C
SL-USB-RJ11	Modular RJ-11	£89.95 C
SL-USB-RJ45	Modular RJ-45	£89.95 C

Diamond
Switch Mode Power Supplies

New Lower Prices!

GSV-3000

**Output voltage: 1 - 15V DC*
**Output current 30A continuous*
**Built-in cooling fan*
**Supply 230V AC 50Hz *Weight 9kg*
**Size 250x150x240mm*

£199.95 D

GZV-2500 **£139.95 D**
Output 25A, 5-15V DC, supply 230V AC Switch mode over volts protected.

GZV-4000 **£189.95 D**
Output 40A, 5-15V DC, supply 230V AC Switch mode over volts protected.

GZV-6000 **£369.95 D**
Output 60A, 1-15V DC, supply 230V AC Switch mode over volts protected.

SoftRock
SDR Receivers

We still have a few of these lovely software defind radio kits left. They are quick and simple with the aide of your PC, give amazing performance.

SR-15-Lite	15m receiver	**£15.95 A**
SR-160-Lite	160m receiver	**£15.95 A**
SR-160-LiteMkII	160m rx	**£19.95 A**
SR-30_LiteMKII	30m rx	**£19.95 A**

SSB Electronics
Mast Pre-Amps

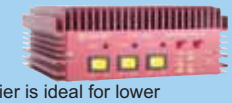
SP-6 Brilliant German engineering. This 6m receiver pre-amp gives you the ultimate reception and over rides cable losses.

£239.95 C

SSB-SP-2000	2m mast pre-amp	£239.95 C
SSB-SP-7000	70cms mast pre-amp	£249.95 C
SSB-SP-23	23cms mast pre-amp	£339.95 C
SSB-SP-13B	13cms mast pre-amp	£299.95 C
DCW-2004	Sequential controlker	£99.95 C
DCW-2004SHF	Seq. cont. 23/13cms	£109.95 C
UEK-3000-21	3cm -2m downconverter	£399.95 D

Microset
Amplifier

27-200T *200W*



This new amplifier is ideal for lower powered radios. Drive levels of between 3-125W (switched ranges) give 120-200W output. makes your FT-817 a 100W + radio! For maximum power you need a PSU (like Watson Power-Max-45-NF) that delivers up to 30 Amps. For customers purchasing with PSU, phone for package deal.

£199.95 C

Nissei
X-Needle Meters

NEW

A Cross Needle Meter means no more having to adjust for full scale deflection.Instant VSWR and power read-ings. This new range are amazing value and all have PEP selectors & fwd/reflected average/PEP.

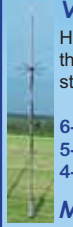
RX-103	1.6-60MHz 20/200W/2kW	£49.95 C
RX-203	1.8-200MHz 2/20/200W	£49.95 C
RX-403	125-525MHz 2/20/200W	£49.95 C
RX-503	1.8-525MHz 2/20/200W	£69.95 C

Daily Suprise Bargains - CLICK IT!

eBay

Go to www.wsplc.com then click on the link to our ebay shop.

Hustler
HF & Mobile Antennas



Verticals

Hustler verticals are known around the world for their performance and sturdy construction.

6-BTV	6 band inc 30m	**£259.95 D**
5-BTV	5 band 80-10m	**£219.95 D**
4-BTV	4 band 40 - 10m	**£179.95 D**

Mobiles

Base Whip Sections

MO-1	137cm Folds 1/3rd Up	**£38.95 C**
MO-2	137cm Folds Halfway Up	**£38.95 C**
MO-3	137cm Non Folding	**£29.95 C**
MO-4	67cm Non Folding	**£26.95 C**

Resonator Top Section

RM-10	10m	150-250kHz	**£21.95 C**
RM-11	11m	150-250kHz	**£21.95 C**
RM-12	12m	90-120kHz	**£21.95 C**
RM-15	15m	100-150kHz	**£21.95 C**
RM-17	17m	120-150kHz	**£26.95 C**
RM-20	20m	80-100kHz	**£26.95 C**
RM-30	30m	50-60kHz	**£29.95 C**
RM-35	40-30m	7-10MHz	**£29.95 C**
RM-40	40m	40-50kHz	**£29.95 C**
RM-50	60-40m	5-7MHz	**£29.95 C**
RM-60	60m	5MHz	**£32.95 C**
RM-80	80m	25-30kHz	**£32.95 C**

Diamond
HF Antenna

BB7V

The small space answer!

** HF 2 - 30MHz Vertical*
** No radials needed*
** 250W PEP 6.7m length*
** VSWR less than 2:1*
** Weight 2.3kg*
** 50 Ohms SO-239*

£325.95 C

Ameritron
HF Linear Amp

New Lower Prices!

AL-811XCE

Ideal for UK Licence Limits. Low cost valve replacement.

- *1.8 - 30MHz (Inc WARC)*
- *Output: 600W PEP (800W AL811HXCE)*
- *Valves: 3 x 811A • Weight: 14.51kg*
- *Size: 380x350x210mm*

£899.95 D

AL-811HXCE £999.95 D

AL-800XCE

This linear is a real workhorse and will coast along at normal UK limits. This means that everything is kept very linear. For contests it can be run endlessly and of course the gain available from this linear far exceeds any normal HF beam - you get around 9dB gain!

- *1.8 - 30MHz (inc WARC)*
- *Output: 1.25kW • 3CX800A7*
- *Voltage: 2,300V • Weight: 23kg*
- *Size: 420x369x216mm*

£2159.95 D

AL-800HXCE £3179.95 D

Watson
VHF/UHF Antennas

VHF-UHF Verticals

W-30	2m/70cms 3/6dB length 1.15m 150W SO-239	**£49.95 C**
W-50	2m/70cms 4.5/7.2dB length 1.8m 150W SO-239	**£54.95 C**
W-300	2m/70cms 6.5/9dB length 3/1m 150W SO-239	**£74.95 D**
W-2000	6m/2m/70cms 2.15/6.2/8.4dB length 2.5m 150W	**£89.95 C**

VHF-UHF Mobile Whips

W-2LE	2m 0dBv length 0.48m		**£10.95 C**
W-285	2m 3.4dBv L. 1.33m		**£14.95 C**
W-77LS	2m/70cm 0/2.4dBv L. 0.43m		**£14.95 C**
W-770HB	2m/70cm 3/5.5dBv L. 1.1m		**£19.95 C**
W-7900	2m/70cm 5/7.5dBv L. 1.58m		**£31.95 C**
W-627	6/2/70cm 2/4.5/7.2dBv L.1.6m		**£34.95 C**

GAP Antennas
HF Verticals for DX

Challenger-DX 8-band HF-VHF

• Bands: 80/40/20/15/12/10/6/2m. • 2kW PEP SSB • VSWR: Better than 2:1 • Height 9.6m (31.5ft) • Radials 3 x 7.6m (25ft) • 3ft drop-in ground socket supplied • Can be mast mounted • Weight 8kg

£299.95 D

Voyager-DX 4-Band LF

• Bands: 160, 80, 40, 20m • 2kW PEP SSB • VSWR: Better than 2:1 • Height 13.72m (45ft) • Radials 3 x 17.4m (57ft) • Requires guys - brackets supplied • 2ft ground pivot assembly included • Weight 13.6kg

£399.95 D

Eagle-DX 6-Band

• Bands: 40, 20, 17, 15, 12, 10m • 2kW PEP SSB • VSWR: Better than 2:1 • GAP centre fed • Height 6.4m (21ft) • 2m (80in) 3 x counterpoises • Support pipe user (31.75mm max) • Weight: 4.9kg.

£339.95 D

Watson
Coax Switches

Cost effective premium grade RF coax switches.

NEW

3-Way Switches

CX-SW3N DC-1.5GHz 3-way coax switch 1.5kW 3x N-Type Connectors. **£49.95 C**

CX-SW3PL DC-800MHz 3-way coax switch 1.5kW 3x SO-239 Connectors. **£41.95 C**

2-Way Switches

CX-SW2N DC - 3GHz 2-way coax switch 2kW 3x N-Type Connectors. **£32.95 C**

CX-SW2PL DC - 1GHz 2-way coax switch 2kW 3x SO-239 Connectors. **£26.95 C**

Finger Dimple
Knobs & Dimples

FD-817	Kranker Knob for FT-817	**£19.95 A**
FD-857	Kranker Knob for FT-857	**£19.95 A**
FD-BLK	2x Black Finger Dimple	**£6.50 A**
FD-GRY	2x Grey Finger Dimple	**£6.50 A**
VOCT	Velcro Pack 25x Cable Ties	**£5.95 A**

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

ML&S are Officially Yaesu's Largest UK Dealer

YAESU

Yaesu FTM-350E

Latest Dual-Band APRS Mobile from Yaesu!

- High Speed Bandscope
- Optional FGPS-1 Internal GPS Unit
- Optional FGPS-2 External GPS Unit
- Optional FPR-1 Monitor Unit
- 500+500 Alpha Memories
- Bluetooth Ready
- Built in Barometric Pressure Sensor
- Large Dot Matrix Display
- Selectable Eight Color Display
- Extended Receive
- AM & FM, FM Stereo Broadcast Bands
- Easy menu system
- WIRES™ Ready
- 1200/9600 Packet Port [DIN]
- Built-in APRS® TNC
- Remotable Control Head
- Suction Type Control Head Mount
- Line Input Jack on rear panel

Available soon. Price TBA.

Yaesu FT-2000 PEP

Performance, Excitement, Perfection!

The DX choice of 3B7C.
Always in stock. Always on demo. Two flavours, 100W or 200W, you choose.

FT-2000: £2099.95
FT-2000D: £2695.95

FT-2000 Accessories

Yaesu CABPC-YAESU-USB At last we have USB Cables for FT-450/950 & FT-2000. These can be used for programming and Control of these radio's (Note to Firmware update the FT-2000 you will also need the FT-2000-PROG-PLUG at £5.00 inc VAT) **£25.49**

Yaesu Com Port Control and Programming Kit This allows computer control of the Yaesu FT-2000/FT-950/FT-450 and the programming of firmware updates without removing the feet of the radio. **£25.54**

Yaesu FT-2000 Memory Stick This 1GB memory stick includes Yaesu control software and the latest (ver.133) firmware update. **£24.95**

MyDEL 9-PD to USB The MyDEL 9-PD to USB is a 9-pin to USB cable which allows you to connect your Yaesu FT-2000 to your Windows XP computer for firmware upgrades. **£29.96**

Yaesu MD-100A8X The Yaesu MD-200A8X is a ultra high-fidelity desk top microphone. **£204.30**

Yaesu MD-100A8X Yaesu MD-100A8X is a desk top microphone. **£153.21**

Yaesu FH-2 The FH-2 is a Remote Control Keypad built for the FT-2000. ..... **£43.89**

Yaesu FT-2000 & FT-2000D Mini-Manual. Size, 4.5x8 inches. Twenty high-quality laminated pages, loaded with detailed instructions covering all aspects of using these superb HF rigs **£19.99**

Yaesu MTU-160 The MTU-160 is an external µ-tuning unit for the FT-2000 on the 160 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

Yaesu MTU-80/40 The MTU-80/40 is an external µ-tuning unit for the FT-2000 on the 80 and 40 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

Yaesu MTU-30/20 The MTU-30/20 is an external µ-tuning unit for the FT-2000 on the 30/20 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

Yaesu YF-122C 7-pole Collins CW Filter (500Hz/2Khz: -6db/-60db) for FT-817, FT-857, FT-897 and FT-2000 ..... **£118.48**

Yaesu YF-122CN 7-pole Collins Narrow CW Filter (300Hz/2Khz: -6db/-60db) for FT-857 and FT-2000. ..... **£129.71**

FT-950 HF Base Transceiver

Yaesu's "Midship Radio"
All FT-950s supplied by ML&S are latest PEP factory

Only £1129.95 Available from stock

FT-950 Accessories

CABPC-YAESU-USB
USB Cables for FT-450/950 & FT-2000 ..... **£25.49**

Yaesu FT-950 (Mini-Manual) **£16.99**

Yaesu Com Port Control and Programming Kit **£25.54**

DVS-6 Voice Memory Unit **£44.90**

MD-100A8X Desk top microphone **£153.21**

MD-200A8X Ultra high-fidelity desk top microphone **£204.30**

MTU-160 External µ-tuning unit for the FT-2000 on the 160 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

MTU-30/20 External µ-tuning unit for the FT-2000 on the 30/20 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

FP-1030A Microprocessor-controlled antenna impedance matching network designed to provide all-amateur-band transmitting capability with the FT-897/857 series of transceivers, when used with an end-fed random wire or long whip antenna. **£314.65**

FH-2 Remote Control Keypad built for the FT-2000. ..... **£43.89**

Quadra - VL-1000 1 kW, HF & 6M Solid State Linear Amplifier and PSU (VL1000 & VP1000) **£3,678.21**

SP-2000 Base station external speaker built for the FT-2000. ..... **£136.87**

YA-30 Broadband folded dipole antenna working between 1.5-30 Mhz, which comes with 30 meters of cable. **£250.28**

Yaesu VX-8E

Latest 6/2/70 Handie with optional Bluetooth, APRS & GPS £336.95

Buy a Yaesu VX-8E, the FGPS-2 GPS & MH-74 Mic for only £429.95

VX-8E Accessories

Nifty HT Desk Stand mkII
Convenient desk top holder **£35.76**

Maldol MMG-SM Minimag
Quality, stable, Maldol miniature magnetic mount. **£20.39**

Yaesu BH-1 Stereo Bluetooth Headset **£134.82**

Yaesu BH-2 Bluetooth Headset **£123.58**

Yaesu BU-1 Internal Bluetooth Unit **£82.71**

Yaesu CD-40 Charger Cradle for BH-1/BH-2 ..... **£10.17**

Yaesu CD-41 Rapid Charger Requires NC-86U **£17.32**

Yaesu CN-3 SMA to BNC Adaptor **£8.12**

Yaesu CSC-93 Soft Case **£15.28**

Yaesu CT-131 Microphone Adaptor Cable **£30.60**

Yaesu CT-134 Cloning Cable **£36.74**

Yaesu CT-136 GPS Antenna adapter for FGPS-2 ..... **£27.54**

Yaesu E-DC-5B DC Cable with Cigarette Plug **£29.58**

Yaesu E-DC-6 DC Cable for Handhelds **£7.10**

Yaesu FBA-39 Dry Cell Battery Case **£22.44**

Yaesu FEP-4 Earpiece for BH-1 Bluetooth Headset **£16.30**

Yaesu FGPS-2 GPS Unit Requires CT-136 or MH-74A7A **£71.48**

Yaesu FNB-101LI 7.4V 1100mAh Lithium Ion Battery **£45.94**

Yaesu FNB-102LI 7.4V 1800mAh Lithium Ion Battery **£61.26**

Yaesu MH-74A7A Waterproof Speaker Microphone **£43.89**

Yaesu NC-85U AC Charger for BH-1/BH-2 ..... **£22.44**

Yaesu NC-86U AC Charger for VX-8 ..... **£10.17**

Yaesu VX-8E (Mini-Manual)
Sixteen high-quality laminated pages, loaded with detailed instructions. Ideal for setting-up and operating the VX-8R quad-band transceiver **£14.99**

Yaesu FT-450 HF Base Transceiver with & without ATU. HF & 6m Full DSP

FT-450 shown with optional Bail Stand.

The Yaesu FT-450 is a major new HF & 6m transceiver offering full a 400MHz IF DSP design at a very low price. Available with or without internal ATU, this new rig offers serious performance for those who are not bothered about the upper V/U bands.

Yaesu FT-450 without ATU: £589.95

Yaesu FT-450AT with ATU: £639.95

Options:
MyDEL MP-8230 23Amp PSU **£69.95**
Stand-FT450 Bail Stand **£19.95**
ATU-450 Optional internal ATU **£163.43**
MMB-90 Mobile Bracket **£19.36**
MHG-1 Carry Handle **£10.17**
MH-36E8J DTMF Mic **£71.48**
MD-100 Desk Mic **£149.95**
MD-200A8X Super Deluxe Desk Mic **£199.95**
YH-77STA Headphones **£56.14**
MLS-200 High Power weatherproof speaker **£28.55**
ATAS-120A Fully Auto Mobile 7.50MHz Antenna **£239.95**

Yaesu VX-3E. ML&S £138.95
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.

Yaesu FT-60R. ML&S £145.95
Latest twin band handie complete and ready to go.

Yaesu VX-6R. ML&S £199.95
Yet another 2/70 handie from Yaesu.

Yaesu VX-7R. ML&S £259.95
The UKs best selling Triple Band Handie.

Yaesu FT-7900. NEW! Replacement for the popular FT-7800. See Website for details.

FT-1900 NEW! Replacement for FT-1802. See Website for details.

FT-2900 NEW! Replacement for FT-2800. See Website for details.

Yaesu FTM-10R. ML&S £269.95 A small compact dual band 2m/70cm transceiver with high power output of 50W on 2m and 40W on 70cm, (adjustable power levels of 50/40W, 20/20W, 5/5W). Receive range from 0.5–1.8MHz, 76–108MHz, 137–222MHz and 300–999MHz.

Yaesu FT-8800. ML&S £295.95
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

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

Yaesu FT-897D
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W) Bundle Price: £CALL (Rig only: £669.95)

Yaesu FT-857D The Ultimate HF Mobile Installation! Plus ATAS-120D 40m-70cm Auto Antenna
Bundle Price: £819.95 (Rig only: £589.95)

Yaesu FT-817ND Only £449.95
The world's only all-band portable transceiver.

All ML&S FT-817NDs include; 2 Years warranty, metal hydride batteries, charger, mic, etc.

E&EO

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

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

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS

Tel: 0845 2300 599

(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)

Web: www.hamradio.co.uk E-mail: sales@hamradio.co.uk