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The Radio Society of Great Britain Members' Magazine

RadCom

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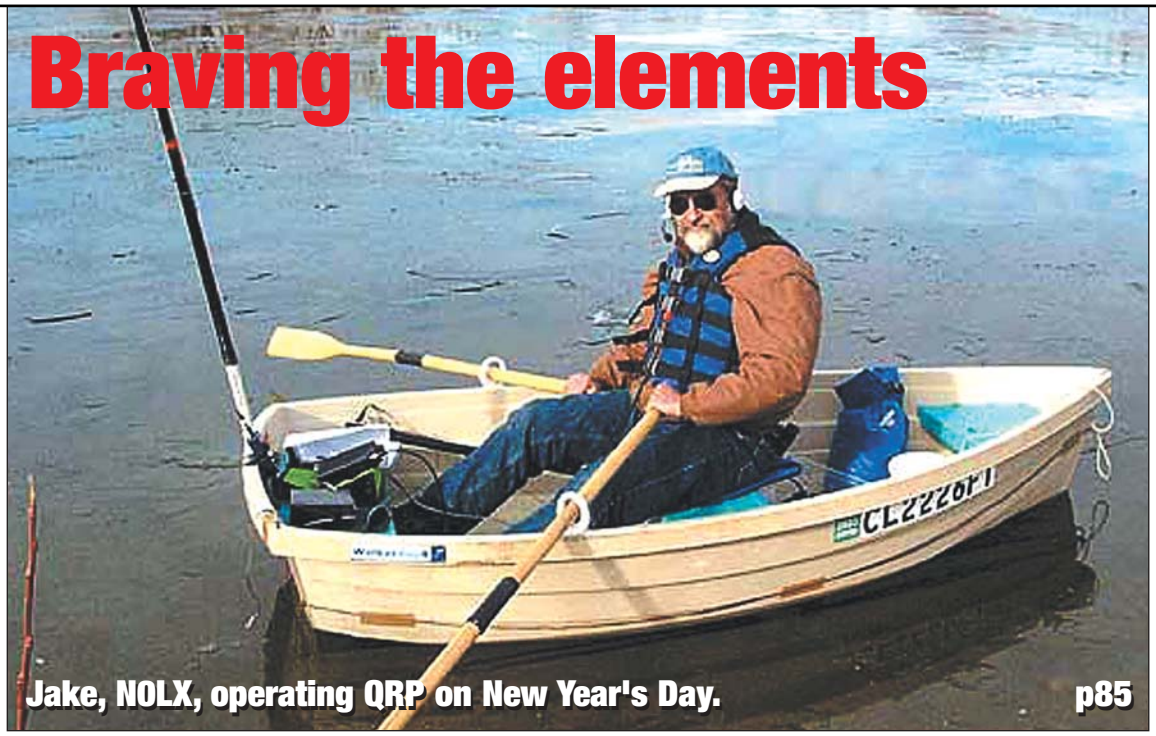
Braving the elements



Jake, NOLX, operating QRP on New Year's Day. p85

Amateur radio in the USA

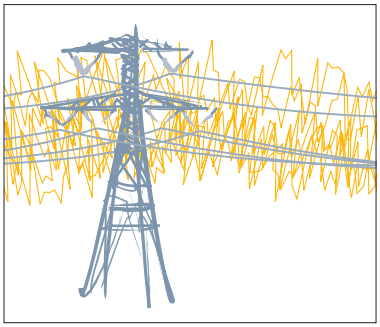
HF back-packing is just one of the topics covered by Dave Ingram, K4TWJ. p16

GB4FUN

A contact with astronaut Mike Foale on board the International Space Station p15

PLT

So why all the fuss about broadband and PLT? Jeff Smith, MI0AEX, explains p58



INSIDE

WIN! A bhi NEIM 1031 Noise Eliminating In-line Module and 1042 Switch Box p17

WATERS & STANTON

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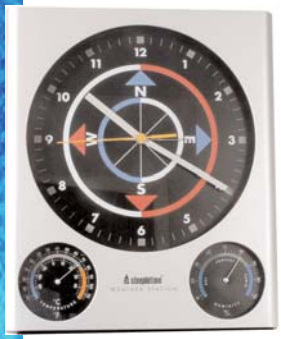


Get this lovely Wall Clock (worth £24.95) with temperature & humidity readout absolutely free. Purchase any transceiver or receiver more than £100 and mention this offer to get your *free* wall clock. Subject to Availability

YAESU FT-7800E BRAND NEW

Yaesu's Powerful low cost answer!

* 2m/70cms Dual Band Mobile
* High power 50W 2m /40W 70cms
* Wide receive inc. civil & military airband
* CTCSS & DCS with direct keypad mic.
* Detachable front panel
* 1000 memories plus five one-touch

£239 C

HORA C-150 2M HANDHELD

£79.95 SPECIAL OFFER

An amazing price for a 2m Handheld! 2W output on AA cells and 5W output on external 13.8V. 1750Hz tone, 20 memories, keypad control, 5 steps inc 12.5kHz, dial illumination receive 130 - 170MHz. You won't find a better deal! Includes flexi antenna, belt clip and instruction manual. (AA cells not included)

ICOM IC-756 PRO II SPECIAL OFFER £1699 C

NEW LOWER PRICE

Flagship of the Icom range of HF transceivers. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit. **With *FREE* Watson HP-100 or HP-200 Headphones, state preference when ordering.**

ICOM IC-7400 SPECIAL OFFER £1299 C

HF/VHF 100W transceiver covers 1.8 - 146MHz Features large LCD with spectrum scope, auto ATU and same DSP system as IC-756PRO II. A great base station!

Comes with *FREE* SP-21 Speaker & SM-20 Desk mic

ICOM IC-703 NEW £589 C

NEW LOWER PRICE

HF/ 50MHz Transceiver 0.1-10W Portable, Mobile, Base-Station. Ideal for Foundation Licence/QRP. Auto ATU, DSP memory keyer. External batt **BP-228 £71.76.**

◄ Rucksack **LC-156 £62.**

ICOM IC-706 IIG DSP £769 C

NEW LOWER PRICE

HF/VHF/UHF mobile DSP transceiver. Its relative small size not only makes it a great mobile rig but also for fixed station use as well. HF general coverage and VHF & UHF .

Heil Traveler single ear "706" headset + PTT **£89.95** →

ICOM IC-718 £449 C

NEW LOWER PRICE

HF 100W transceiver. Covers all HF bands plus wideband receive. C/w auto notch, dual VFO, SWR meter etc. Options include extnl ATU DSP & filters.

KENWOOD TS-2000 £1599 C

Top-of-the-range Kenwood transceiver. HF/VHF/UHF or up to 23cm with the optional module. Built-in auto ATU, DSP and its unique TNC.

ARCP Control Software. **£44.95**

KENWOOD TS-870S DSP £1399 C

HFDSP 100W base station. 1.8 - 30MHz. Excellent all round rig great for DX working with its ability to winkle out weak stations using its true IF DSP. No filters to buy.

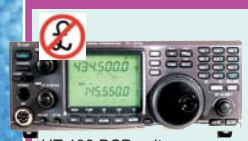
MC-60A base mic with pre-amp. Ideal match. **£117.95** →

KENWOOD TS-570DGE £849 C

HF100W base station with built-in auto ATU. Very popular rig, excellent performance on SSB and CW. Two fitted antenna sockets - very handy.

SP-23 Matching base station receiver **£68.95** →

ICOM IC-910X with 23cm £1249 C



Icom's all mode VHF/UHF transceiver with 23cm. Large clear LCD with lots of facilities. 100W on VHF and 75W on UHF, 10W on 23cm.

UT-106 DSP unit **£84.99**

Basic Model IC-910H £1129

YAESU FT-1000 MKV £2349 C

200W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC PSU - Acknowledged as one of the finest DX rigs on the market. Superb tailored audio and the ability to select Class A bias for dramatic signal purity.

YAESU FT-1000 FIELD £1749 C

100W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC / 13.8V DC - Building on the success of the FT-1000MkV, the Field has become a respected leader in its class.

KENWOOD TS-480SAT & TS-480HX

NEW

The **TS-480SAT** is the 100W version of this new HF+6m transceiver from Kenwood. Smaller than the TS-2000/ TS-B2000 it has many similar features. **TS-480SAT £999 C**

The **TS-480HX** is the 200W version of this new HF+6m transceiver. **TS-480HX £1099 C**

YAESU FT-897 £849 C

NEW LOWER PRICE

100W HF rig plus 2m and 70cms (50W/20W) 13.8V external supply / internal optional FP-30V AC power supply / self powered portable using optional Ni-MH pack at 20W output. Compatible with FC-30 auto ATU and ATAS 120/100 antennas. The "must have" radio for 2003.

YAESU FT-847 £1199 C

1.8 to 440MHz, this all-in-one transceiver offers unbeatable value. 100W on HF plus 6m, and 50W on 2m and 70cm. You get genuine RF clipping on SSB for up to 6dB gain and there are 4 separate antenna sockets.

YAESU FT-857 NEW £699 C

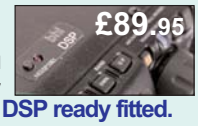
NEW LOWER PRICE

HF / 50 / 144 / 430MHz Mobile Transceiver. HF/6m 100W, 2m 50W, 70cm 20W. (13.8V DC) Developed on the FT-897 and FT-817 transceivers. Built-in features 32 colour display, spectrum scope, AM airband aircraft reception, built-in memory keyer, detachable front panel.

YAESU FT-817 £479 C

NEW LOWER PRICE

bhi NE-DSP1061 Module available!



160m - 70cms. Up to 5W output all modes. ***Ours includes*** **battery and charger.** **Add £90 for DSP ready fitted.**

NEW DSP Module

There is NO new FT-817 DSP! The fact is that the UK manufacturers, **bhi**, (of whom we are their largest distributor), have produced a lovely 4-stage DSP module that can be fitted inside the FT-817. The NE-DSP1061 module costs £89 plus a fitting charge of £25 for retro-fitting to existing models. This includes installing a mini switch and LED on top cover.

TOKYO HY-POWER HL-50B £269.95 C

FT-817 VERSION !

This Linear Amplifier has been specifically designed for use with the FT-817. Enjoy up to 50 Watts output

HING 'TIL 2005!

MONTHS ON SELECTED ITEMS MARKED BY £

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

ICOM IC-E208 NEW £279 C

VHF/UHF FM Dual Band Mobile Transceiver *Freq range 144-146MHz, 430-440MHz Tx *55/50W (3 pwr steps each band) *Wideband Rx 118-173, 230-549 & 810-999MHz *512 memories *FM narrow capability *104x2 DTCS, 50 CTCSS tone squelch *16 DTMF channels *HM-133 remote control mic *Packet ready for 9600/1200bps-mini DIN or 1200bps-mic socket *Supply 13.8V

ICOM IC-2725E £269 C

The Icom IC-2725 dual band FM transceiver is proving very popular. Easy to install, the controller is separated from the main unit - great where space is limited.

ICOM IC-2100H £229 C

2m 55W FM mobile. Commercial grade, rugged construction. One piece die-cast aluminium chassis. Selectable green or amber display.

YAESU FT-8900R NEW £339 C

Want the best of all worlds then the FT-8900R is just the ticket! A rig with four of the most popular mobile bands - 10m/6m/2m & 70cm. Detachable head.

YAESU FT-2800M NEW £159 C

*144-146MHz *FM *137 - 174MHz expanded Rx *RF Pwr 65/25/10/5W *25/12.5kHz channel spacing.The NewFT-2800M from Yaesu with 65 Watts High Power, rugged construction, excellent receiver performance and direct keypad entry.

YAESU FT-8800E £289 B

Dual Band FM Mobile 50/35W
The FT-8800R series operates as two radios in one, with independant two channel operation.
Remote head mounting capability, wideband receive on VHF & UHF and over 1000 memories.

YAESU FT-1500M £139 B

Built like a battleship, this rugged design benefits from Yaesu's commercial product range. 2m 50W and a DTMF microphone. Great value.

We Price Match!
Call 08000 73 73 88

KENWOOD TMD-700E £449 C

Certainly the best 2m/70cm dual band mobile transceiver with APRS. Does not need extra high cost boards to function. The only extra if required is a compatible GPS receiver.

KENWOOD TM-V7E £359 C

Dual-band 2m/70cm.
A lovely cool blue display, easy to read with 50/35W output. 50W/35W plus 280 memos and five storable operating profiles.

KENWOOD TM-G707E £289 C

Dual Band
If you are looking for simplicity and low cost, here's the answer. 2m &70cms with detachable front panel and "Easy operation mode." GREAT!

YAESU VX-7R £299 B

6m/2m/70cm

Available in Silver or Black

The VX-7R is the best outdoor handie ever. The case, keypad, speaker and connectors are all sealed against water damage. Wide Frequency coverage from 500kHz to 900MHz the VX-7R is ideal for monitoring a variety of broadcasts. The display is a dazzling 132x64 dot matrix providing easy-to-read frequencies and information plus pictorial graphics.

YAESU VX-150 £125 B

The VX-150 is a fully featured compact yet incredibly rugged 2m 5W Handheld. Features include direct keypad frequency entry, CTCSS, DTMF, 1750Hz tone calling, wide/narrow deviation selection. It has a die-cast case, large high output speaker, illuminated keypad and battery voltage meter.

YAESU VX-2E NEW £169 B

Dual Band handy, 1.5W (2m) and 1W (70cm). Full DTMF, CTSS and DCS. With 1300 memories and AM/FM coverage 500kHz-960MHz.

ICOM IC-E90 £269 B

The new E-90 offers triple band coverage of 6m, 2m and 70cms. Up to 5W output and rx coverage from 495kHz - 999MHz makes this a very attractive rig.

ICOM IC-T3H £129 B

The IC-T3H 2m handheld features tough quality but with slim looks. Its striking green polycarbonate case has been ergonomically designed. The rig is capable of providing a powerful 5.5W output with either Ni-Cad or Ni-MH battery packs. Supplied with charger and rechargeable battery.

KENWOOD TH-D7E £319 B

DATA COMMUNICATOR

One of the most successful handhelds over the past few years. It has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit. Plus NMEA, 200 memos, and up to 5W output.

KENWOOD TH-F7E £249 B

WITH EXTRA WIDE RX COVERAGE

NEW LOWER PRICE

- 144-146MHz Tx/Rx: FM
- 430-440MHz Tx/Rx: FM

Up to 6W out with Li-ion battery and "scanner" style coverage from 100kHz to 1300MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

KENWOOD TH-G71E 199 B

If you want an excellent 2m/70cm dual-bander then you can't go wrong with the TH-G71. Fully functional with three power levels, 200 memories, CTCSS tone encoder/decoder, illuminated keypad and backlit LED.

YAESU VX-110 £119 B

Combining the ruggedness of the VX-150 with the simplicity of 8-key operation, the VX-110 is a fully featured 2m hand held ideal for the most demanding of applications. With its die-cast case, large speaker, and illuminated keypad, it is particularly well suited for most conditions. The VX-110 is a very affordable, rugged and reliable handheld.

WEB ORDERING
www.wsplc.com

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FREEPHONE ORDERLINE:
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FAX: 01702 205843

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- W&S @ LOWE, BENTLEY BRIDGE, CHESTERFIELD RD, MATLOCK, DERBYSHIRE, DE4 5LE

ENQUIRIES: 01629 580800

FAX: 01629 832375

SCOTTISH STORE

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carriage charges: A=£2.75, B=£6, C=£10

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TIGERTRONICS SignaLink™ SL-1

SignaLink Model SL-1 & **SignaLink Model SL-1+** Soundcard Radio Interfaces

These advanced soundcard radio interfaces cover most of the digital modes such as PSK-31, MT-63, WSJT, FSK441, Packet, APRS, AMTOR, RTTY and other modes such as CW, SSTV, WeFAX and ACARS®. They require a PC and SoundBlaster® compatible soundcard. All SignaLink Interfaces incorporate Auto PTT and do not require a serial connection to the computer. There are a wide assortment of radio cables for all the common mic/data connections. The SignaLink part number determines which radio cable is supplied with the unit i.e. SL-1RJ45, SL-1RJ11, SL-1+8R (8-pin round), please state which you require when ordering. 2.1mm power plug, jumper wires & CD-ROM included.
The SL-1+ model includes improved Auto-PTT sensitivity, adjustable receive and transmit audio levels, selectable fixed or variable transmit "hang time", Voice modes plus the ability to use the radio's mic, data or accessory ports.

SignaLink SL-1 (8R,RJ11,RJ45) **£59.95 B**
SignaLink SL-1+ (8R,RJ11,RJ45) **£69.95 B**
SL-ASSY Accessory cable kit audio & PC **£9.95 A**

WATERS & STANTON

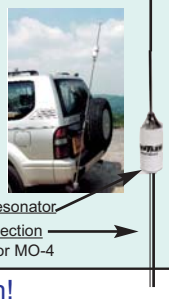
PRICE MATCH

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

VERTICAL ANTENNAS

Hustler Mobiles

Get top performance when on the move. Purchase the **MO-3 base** (137cm) for **£24.95** or the **MO-4 base** (68cm) for **£22.95**. Then add the resonator of your choice. **RM-10, RM-12, RM-15**, all **£19.95** ea. **RM-17, RM-20 £24.95** ea. **RM-40 £26.95, RM-80 £29.95**

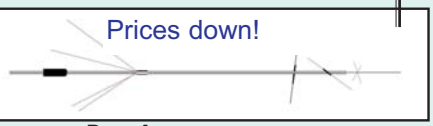


Resonator

MA5V Base vertical
No radials needed

Base section
MO-3 or MO-4

Prices down!



CUSHCRAFT BASE ANTENNAS

MA6V *NEW*	20-17-15-12-10-6m 250W PEP	**£269.95**	C
MA5V	20-17-14-12-10m 250W PEP	**£239.95**	C
R8	40-30-20-17-15-12-10-6m 1.5kW	**£469.95**	C
R6000	20-17-15-12-10-6m 1.5kW PEP	**£329.95**	C

DIAMOND CP6 £239.95 C

*Bands: 3.5 -50MHz *Power: 200W *VSWR: Better than 1.5:1
*Socket: SO-239 *Height: 4.6m *Radials: 1.8m adjustable

Covers five popular HF bands and the 6m band. Low angle radiation makes it ideal for DX work. Outperforms dipoles for long distance contacts and compares favourably with beams located 10m+ above ground. It doesn't need long wire radials. Adjustable rigid radials, DC return helps the antenna get rid of static noise. Antenna is adjustable for each band.

HARI High quality German traps. (Pairs)
200W 20m £44.95 40m £49.95 80m £53.95
1kW 20m £59.95 40m £64.95 80m £73.95

HARI High quality German Baluns
SO-239200W 1:1, 4:1 or 6:1 £25.95 ea.
1kw 1:1 £34.95 4:1 or 6:1 £41.95 ea

HORIZONTAL BEAMS & DIPOLES

CUSHCRAFT Prices down!

Premier HF beam used around the world by serious DX'ers.

X-7	20/15/10m 7 el. Yagi 2kW	**£669.95**	D

Not got the space for a full sized HF beam antenna, then the mini beam MA-5B should be considered.

MA-5B	10-12-15-17-20m 4 el. Yagi 2kW	**£369.95**	C
A4-S	10-15 & 20m 4 el. Yagi 2kW	**£569.95**	D
A3-WS	12 & 17m 3 el. Yagi 2kW	**£379.95**	D
D-3	10-15-20m dipole element 2kW	**£249.95**	C

Don't want a wire antenna but can't fit a Yagi, then consider a rotatable dipole.

D-3W	12-17-30m dipole element 2kW	**£249.95**	C
D-4	10-40m dipole element 2kW	**£349.95**	C
D-40	40m dipole element 2kW	**£319.95**	C
TEN-3	10m 3 el. Yagi 2kW	**£229.95**	C
ASL-2010	13.5-32MHz 8 el. log periodic	**£749.95**	C

RADIO WORKS

A choice of quality wire antennas available to fit almost any circumstances. Prices down!

CW-160	160-10m 76.8m long	**£129.95**	C
CWS-160	160-10m 40.5m long	**£114.95**	C
CW-80	80-10m 40.5m long	**£89.95**	C
CWS-80	80-10m 20.1m long	**£109.95**	C
CW-40	40-10m 20.1m long	**£84.95**	C
CW-20	20-10m 10.36m long	**£89.95**	C
CW-620	20-6m 9.7m (32ft) long	**£89.95**	C
G5RV PLUS	80-10m with balun 31m (102ft) long	**£59.95**	B

WATSON FC-130 FREQUENCY COUNTER £59.95 B

*1MHz-3GHz *Impedance 50 Ohms
*LCD readout *10-digit display
*16 segment bargraph
*BNC Whip Antenna
*Black anodised case *Internal Ni-Cads
*600mAH *6 hours operation
*AC charger *9V DC 300mA
*68 x 80 x 31mm*240g

WATSON HUNTER FREQ. COUNTER £49.95 B

*10MHz-3GHz *Impedance 50 Ohms
*LCD readout *8- digit display
*BNC Whip Antenna
*Black anodised case *Internal Ni-Cads
*AC charger *9V DC 300mA
*68 x 80 x 31mm *210g

PORTABLE ANTENNAS

MIZUHO (FOR FT-817)

ATX-WBN	Walkabout 80-6m Whip 1.5mBNC	**£49.95**	B
ATX-WPL	Walkabout 80-6m Whip1.5mSO-239	**£49.95**	B
ATX-W38	Walkabout 80-6m Whip 1.5m 3/8in	**£49.95**	B

New Low price on Walkabout whips, three to choose from with three different connectors.

AT-80	Single band 80m whip with BNC	**£19.95**	A
AT-40	Single band 40m whip with BNC	**£19.95**	A
AT-30	Single band 30m whip with BNC	**£14.95**	A
AT-20	Single band 20m whip with BNC	**£14.95**	A

Range of single band HF antennas with BNC connection. Ideal for FT-817.

AT-17	Single band 17m whip with BNC	**£14.95**	A
AT-15	Single band 15m whip with BNC	**£14.95**	A
AT-12	Single band 12m whip with BNC	**£14.95**	A
AT-10	Single band 10m whip with BNC	**£14.95**	A

Zero Space - - DX Antennas

From Hustler USA

Run full legal power - 80m to 10m - with no masts or guys to worry about. 50 Ohm feed.

Small garden, planning problems or similar restrictions? Then the Hustler range is the answer. These HF verticals will take 1kW of power, work at ground level, and are self-supporting. A single earth rod will get you going. Add buried radials for even better results. Many hams have got on the HF bands with just this simple system. So why not join in the fun. These are rugged, well-built antennas that American hams have been using for years. Now they are available in the UK from our three stores.

4BTV
40-20-15-10m. 6.52m high. Full band coverage.
£159.95 C

5BTV
80-40-20-15-10m. 7.64m high. Full band coverage (100kHz on 80m).
£199.95 C

6BTV
80-40-30-20-15-10m. 7.3m high. Full band coverage (100KHz on 80m).
£219.95 C

MFJ Compact Portable Tuners

MFJ-971
QRP portable tuner, 300/30/6W. Wire, coax or balanced. **£99.95 B**

MFJ-902 Travel Tuner
Smallest 150W ATU in the world! 3.5 - 30MHz coax or end fed wires. Real air spaced capacitors! **£74.95 B**

MFJ Power Tuners

MFJ-989C £359.95 C
3kW 1.8 - 30MHz. Wire, balanced and coax feed. Full metering and switching

3kW fast differential tuning design. 1.8 - 30MHz. Wire balanced and coax systems. Full metering and switching.

MFJ-986 £329.95 C

MFJ Popular Tuners

MFJ-949E £159.95 B
1.8 - 30MHz. 300W wire, balanced and coax. Inc dummy load, metering and antenna selector.

Similar to the MFJ-949E, but without internal dummy load. One of the most popular ATUs in the world!

MFJ-948E £139.95 B

MFJ Match Makers

MFJ-910 £24.95 A Mobile Matcher. Connect between mobile whip and transceiver. See your VSWR come down as you switch impedance match.

MFJ-914 £64.95 B

Auto ATU extender. It let's your internal transc. ATU handle difficult coax antennas such as G5RVs etc. Greatly extends the range cpability.

Antenna Analysers

MFJ-259B £259.95 B

Full diagnostic information about your antenna. 1.8 - 170MHz. Totally portable. Great value.

MFJ-269 £349.95 B

The most comprehensive diagnostic analyser ever made. 1.8 - 170 plus 415 - 470MHz

MFJ-969 ATU £199.95 B

The latest design from MFJ, this unit features an active power meter for really accurate PEP measurements. Powered by an internal PP3 battery (not supplied) or an external 12V source. This is one of the most popular 300W models, having a very wide frequency range an excellent power and VSWR accuracy.

MFJ-260C DUMMY LOAD £37.95 B

MFJ-260C 1.5MHz - 150MHz 300W 50 Ohm SO-239
*Size 180 x 57 x63mm • Weight 450g

Handles 300W for 30 seconds and lower powers proportionally longer.

MFJ-901B VERSA TUNER £85.95 B

This compact tuner is a low cost alternative where the main station already has a VSWR meter and just requires the 'bare bones' tuner. It will handle all types of aerials, match coax fed systems, long wires and balanced feeders and is very simple to use. It retains the basic MFJ T-network that has a wide impedance matching capability.

MFJ-461 MORSE READER £84.95 B

The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking, a serial port - if you wish to connect to a computer to display the text on a bigger screen. It can also be connected to your receivers audio if required.

Check our website for more info - www.wsplc.com

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OF GREAT BRITAIN

THE NATIONAL SOCIETY
WHICH REPRESENTS UK
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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.

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Details of the Society's volunteer officers can be found in the RSGB Yearbook 2004

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RSGB matters

Kenwood trophy presentation

Members of the 'Three Counties Foundation Team'. Left to right: Dave, M0OBW; Kath, M1CNY; Mike, G4VSS; John, M5HFJ; 'Pixie', G1PIX; Mike, M0ACK; Albert, G3ZHE; Mark, MW1MDH; 'Uncle Sam', G0SBI; Steve, MW1STE; and Roland, G0GZI. Other members of the team not present include Frank, G1GYJ; Martin, G4LUQ; Pat, M0PAT, and Graham, G1IVV.

At the RSGB AGM on 6 December, Kath and Dave Wilson, M1CNY and M0OBW, were presented with the Kenwood Trophy for their contribution to amateur radio training and education. Dave has written to say: "Kath and I are just two members of the 'Three Counties Foundation Team' and the photograph shows me presenting the Kenwood Trophy to the other members of the team at the Foundation course held at the end of January. The team has now put through in excess of 390 Foundation licence candidates during the last two years. I would like to thank, personally, all the members of the team for their sterling work - the success of the courses is a team effort and without that huge team effort we could not have hoped to have helped so many candidates join this fascinating hobby." As its name suggests, the Three Counties Foundation Team has mainly run Foundation courses, but there is now a demand by M3 licensees to upgrade, so Intermediate courses are now being held in alternate months with Foundation courses.

D-DAY ANNIVERSARY

6 June 2004 marks the 60th anniversary of D-Day. A small number of posters and other publicity material may be available from the RSGB for those wishing to put on special event stations or amateur radio demonstrations *for the general public*. Please write to Commercial Manager Mark Allgar, M1MPA, c/o RSGB HQ or e-mail: mark.allgar@ rsgb.org.uk to request this material. If you are putting on a display or a special event station, please send the details to the *RadCom* office (c/o RSGB HQ or e-mail: radcom@rsgb. org.uk) by the end of April for inclusion in the June *RadCom*.

NEW DRRM

Mike Prowse, G7ERQ (QTHR), has been appointed DRRM for District 111 (Cornwall) with effect from 1 March 2004. Mike can be contacted on 01326 376733, or by e-mail: margy@tremanda.fsnet.co.uk

RSGB CALL CENTRE

In order to help reduce costs and keep the subscription at current levels, the RSGB has decided to move its membership and sales office functions to Calcutta. The new RSGB call centre in India will open on 1 April. General Manager Peter Kirby, G0TWW, commented, "Indian graduates are currently being trained in amateur radio matters at the University of Tirana and it is hoped that they will all take out Foundation licences as soon as possible." All phone numbers will remain unchanged and calls will be routed automatically.

EMC QUIZ

Charles Elliott, G4UJW, the RSGB EMC Committee Membership Service Administrator, has put an EMC quiz on the EMC Committee's website at www.qsl.net/rsgb_emc/EMCQuiz.html Give it a try - apart from being part of the EMC / technical education programme it is also a good bit of fun and clubs may find it useful when organising club quiz evenings. Feedback is also very useful to the committee.

SPECTRUM FORUM WEBSITE

The RSGB Spectrum Forum has a temporary new website at www.g3psm.net/Spectrum_Forum.htm which lists the Forum's Terms of Reference and its members. This will be replaced by a permanent Spectrum Forum website in the future.

AROS TALK

The RSGB Amateur Radio Observation Service coordinator, Barry Scarisbrick, G4ACK, is giving a talk on the work of AROS at the Sudbury & DRA on 6 April. For further details please contact Bryan Panton, G1TWY, tel: 01787 247893.

5MHz OPERATION

Holders of 5MHz NoVs are reminded that CEPT Recommendation T/R61-01 does *not* apply to 5MHz and

licensed radio amateurs operating from TR61-01 countries are subject to the licence conditions laid down by that country. The only countries currently allowing 5MHz operations by individual stations are the United Kingdom and the United States of America and its Dependencies. Only club stations are presently being allowed to use 5MHz in Finland and operations by stations in Norway and New Zealand are for internal emergency communications purposes only. Stations in Canada may use 5MHz frequencies at agreed specified times but activity from Germany is not currently permitted.

UK NoV holders heard operating on 5MHz from outside the UK risk not only the loss of their 5MHz NoV but also the revocation of their licence. These frequencies have been granted to the UK amateur service by the Ministry of Defence for a specific period. Please do not risk the loss of these facilities.

HF BAND PLAN CORRECTION

The current RSGB HF band plan as published in the April 2003 *RadCom* and the 2004 *RSGB Yearbook* has a small omission. The following should be added to the notes for 18 and 24MHz: "The band is not to be used for contests or bulletins".

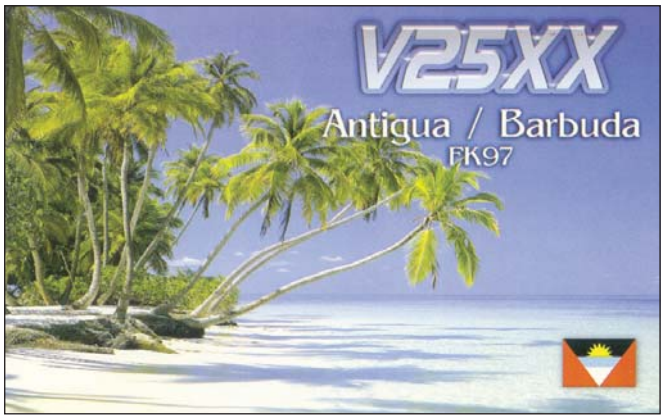
COMPETITION WINNER

The lucky winner of the RSGB *RadCom* / bhi NEDSP1061 noise-eliminating DSP module competition is Mr R Rogers, G3LIA, of Mulbarton, Norfolk. If you were not lucky enough to be the winner, do not fear: there is another bhi competition on page 17 of this issue, in which you could win a bhi NEIM 1031 Noise Eliminating In-line Module *and* their 1042 Switch Box.

QSL BUREAU NEWS

A new RSGB QSL bureau submanager has been appointed in Scotland for many of the Scottish callsign series. Mr G H Anderson, GM0SYU, of 22 Springvale Street, Saltcoats, Ayrshire KA21 5LP has now taken over all the Scottish Advanced (Full) series of callsigns, with the exception of the GM0 and MM0 calls. Mr Anderson takes over from Mr MacLeod, GM4DZX, who is thanked for his years of service to the RSGB QSL bureau.

VHF AWARD NEWS



V25XX QSL submitted by Heath, GW3HWR, for a 6m QSO in June 2003.

The first RSGB VHF Award claim for 2004 came from the south-east and was for the 6m band. From Colen Harlow, G8BTK (BN), cards were received confirming five squares and one new country which enabled Colen to qualify for his 30 country sticker.

Moving further north, Ted Double, G8CDW (PE), sent sufficient cards to qualify for the 250 square level. From Wales, Heath W Rees, GW3HWR (SA), sent a colourful batch of cards (one of which is pictured here) to qualify for his 70 country sticker.

After waiting for some considerable time, Colin Potter, G6FQZ (OX), has sent just three cards, from Afghanistan, Albania and the Gambia which qualify him for that milestone - the '100 Country' increment.

Details on all VHF, UHF and Microwave Awards can be obtained on receipt of an A4 or A5 SASE from the Awards Manager, Tony Jarvis, G6TTL (QTHR). They are also available on the Internet at www.rsgb.org (go to 'Operating', 'VHF/UHF', then 'VHF/UHF Awards'). Queries may also be sent by e-mail to: vhf.awards@rsgb.org.uk

Summary of Award Recipients
50MHz: 30 Countries: G8BTK.
70C: GW3HWR. 100C: G6FQZ.
100 Countries (DX): G6FQZ.
250 Squares: G8CDW.

CORRECTION

'A Useful Audio Level Indicator' - p49, March *RadCom.* In Fig 3, the device shown should be an SI7661CSA, and not a 741. This IC is available from Farnell (http://uk.farnell.com) and RS (http://rswww.com).

TALKING ABOUT AMATEUR RADIO

One of the benefits of the RSGB's new approach to the promotion of amateur radio is much greater interaction with the general public, with teachers and officials involved with education, with the leaders of youth groups, with those responsible for emergency communication, with the organisers of events which need radio amateurs to provide communications support, in short with a whole range of people whose knowledge of amateur radio may be very limited.

These people may view your claims about the value of radio amateurs to our society with some scepticism. They might ask you to explain why you think amateur radio is so important to the UK both economically and socially. Here's how you might go about answering such a question. In my view there are two broad aspects to be considered:

Radio communications is a technology of economic significance

The basis of this statement is that information technology and the communications infrastructure of this country is increasingly seen as a key factor underpinning our economy. There are a number of national initiatives supporting this. The level of understanding of radio communications, both general, scientific and technical, is a critical aspect in creating, exploiting and maintaining this infrastructure. There is widespread concern at the general public's lack of understanding of the technologies involved and their implications. And concerns at the number and availability of engineers and technicians needed to support the communications industry.

Radio communications is an attractive spare time interest supported by a qualified and organised volunteer resource holding important social values.

Apart from being responsible for a number of technical innovations the radio communications enthusiast has accepted responsibility for teaching radio communications courses, supplying emergency and community radio communications, as well as generally promoting an ethos of self help, mutual support and compliance with regulations. This volunteer and unpaid role has been formally recognised by ITU. Arrangements have been made to support the physically disadvantaged who are thus able to participate on an almost equal basis in radio amateur activities. Finally radio amateurs are naturally internationally orientated, a perspective essential in today's world.

Taken separately these are good arguments for the earlier assertion that the radio amateur is of great value to society. Taken together they make a very powerful case indeed. These are the reasons why our new initiatives in education and community communications should be promoted by all radio amateurs. Our initiatives are truly for the benefit of our society as a whole.

Bob Whelan, G3PJT

IOTA 40TH BIRTHDAY BOAT TRIP

To celebrate the 40th anniversary of the RSGB Islands on the Air (IOTA) programme, the Society has arranged a special celebratory boat trip and dinner on Lake Constance during the Friedrichshafen HamRadio show. Tickets for the event will be available to all and will be on sale shortly from the RSGB Shop and at the Show. More details to follow. ♦

W NEW NEW NEW NEW NEW NEW N

RADCOM 2003 CD

All 1224 pages of the UK's best radio magazine published in 2003 are now available on this easy to use CD. This popular product once again provides an easy to use interface and access to every page of *RadCom* 2003 with the popular Acrobat software. 2003 was another bumper year for *RadCom* covering subjects as diverse as the Society's 90th anniversary and WRC 2003. Of course every technical review, column and series are included for you to read and print. If you regularly refer to your old *RadComs* or are just interested in keeping your shelves clear of magazines this CD is for you.

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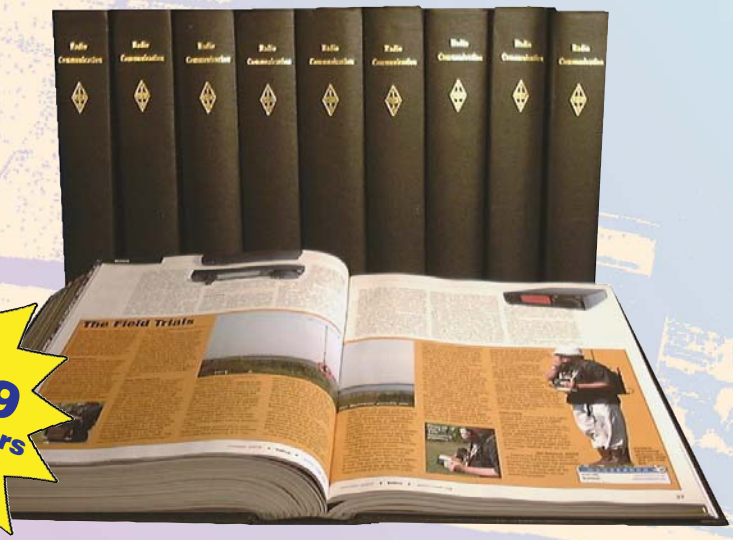

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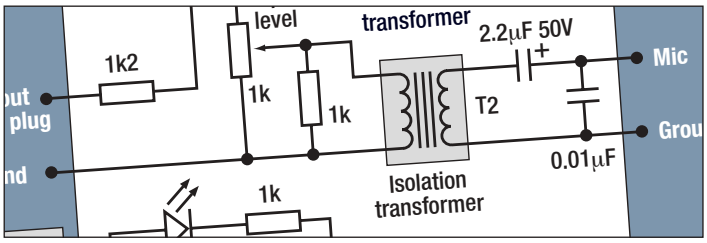
Subscriptions include VAT where applicable.
Special arrangements exist for blind and disabled persons. Details and membership application forms are available from RSGB HQ.

p29 – Pat Hawker, G3VA, describes the popular pastime of refurbishing old equipment



p38 – Simple sound-card-to-radio interface circuits from Peter Homer, G4KQU

Admiral of the Fleet to open special event station and radio museum

Radio exhibition and station at Newhaven Fort

Admiral of the Fleet Sir Henry Leach, GCB, DL will formally open special event station GB2NFM and the radio exhibits at Newhaven Fort Museum in East Sussex on 25 April. The project to display the lifetime radio collection of the late Cyril Fairchild, G3YY, and to combine this with an operational amateur radio station has been under way for over a year. The work entailed clearing and refurbishing a former armoury under a gun emplacement high up overlooking the English Channel. The rooms had to made safe and water tight. Mains power had to be provided and lighting and power outlets installed. Two operational radio shacks and extensive display cabinets were constructed and antennas erected in a way that ensured safety and security, vital considerations as members of the public have access whenever the fort is open.

Part of the fort towards the end of 2003. Work continues.

All this work was financed and carried out on a voluntary basis by members of Worthing & DARC, where Cyril was a member. The opening ceremony will be performed by Sir Henry at 3.00pm. Newhaven Fort is a great day out for families as well as those seeking to learn about Britain's defensive past - or even to indulge in a little nostalgia. Further details from Roy, G4GPX, tel: 01903 753893; e-mail: publicity@wadarc.org.uk or see www.newhavenfort.org.uk

Big RSGB presence at Kempton show

The RSGB is sponsoring the lecture stream and the 'Meet 'n' Greet' area at the Radio Fairs West London Radio and Electronics Fair at Kempton Park Racecourse on 18 April.

Come and chat to officers of the RSGB in the 'Meet 'n' Greet' area, where you can also learn about the new Radio Communications Foundation charity. Five expert speakers have been lined up for a series of lectures aimed at newcomers to amateur radio and those wishing to improve their knowledge of specialist subjects, and this area too has been sponsored by the RSGB this year.

RSGB videos will be shown on TVs around the venue and of course the show also features an RSGB book stall.

PHOTO: ROB MCTAIT, G2BKZ

Radiosport calls it a day

There will be no more amateur radio shows staged by Radiosport. The company's website at www.radiosport.co.uk carries a report entitled 'The end of an era' in which Radiosport's Directors say it is time for them to retire. Blaming the ageing profile of amateur radio enthusiasts and diminishing interest, Radiosport said that "the amateur radio trade can now only support a fraction of the number of dealers there once were." It was Radiosport which organised the popular radio shows at Picketts Lock and, more recently, in Ware and Stevenage in Hertfordshire.

Lord Mayor pays tribute to Raynet volunteers

The Lord Mayor of Chester has publicly thanked local Raynet representatives for their behind-the-scenes work in the event of a major emergency. Cheshire Raynet members recently visited the offices of all district councils in Cheshire to test their equipment. The Lord Mayor, Cllr Barry Cowper, thanked them for their work, saying: "It's important that we recognise the vital work that Raynet does behind the scenes in Chester and I was delighted to invite members to the Town Hall to talk to them about their role and thank them officially on behalf of the district." Greg Mossop, G0DUB, Raynet group controller for Chester and Ellesmere Port, said: "Cheshire was at the forefront when the network was first formed 50 years ago, so obviously we're very pleased that our work is being recognised."

David Mullock, G7GFC; Jane Mossop, G1GWS; Greg Mossop, G0DUB; David Hicks, G6IFA; the Lord Mayor of Chester Councillor Barry Cowper; Alan Hopkinson, G8OJQ; Graham Pemberton, G7NEH; and Lady Mayoress of Chester Gwynn Cowper.

A long road

Tony Whitaker, G3RKL, began a 750km long walk along the length of New Zealand's South Island on 21 February. He plans to arrive in Blenheim, at the north of the South Island, on 8 April. Tony has an FT-817 transceiver with him and is operating as ZL6SHS on HF and Internet-linked repeaters along the route. Pictures and news on his progress are being posted on Ian Abel's, G3ZHI, website at www.qsl.net/g3zhi/g3rkl.htm

NEWS BRIEFS

- The word on the amateur radio street is that Martin Lynch & Sons may soon be moving to new headquarters. In advance of any move, though, Martin has announced a new easy-to-remember telephone number: 0845 2300 599 - which is a local rate number from wherever you call in the country. This new phone number is available *now*.
- Paul Berkeley, M0CJX, is planning to buy another batch of PicATUne auto ATU (see *RadCom* Sep 2000 to Jan 2001) PCBs. Anyone interested in reserving one or more set(s) should contact Paul on tel: 01737 279108 or e-mail: m0cjx@ntlworld.com Information and tips on the boards and project in general can be found on www.picatune.co.uk
- Geoffrey Wiggins, G3XMG, has been installed as the Worshipful Master of Radio Fraternity Lodge No 8040. All enquiries about membership are welcome from existing Freemasons and radio amateurs interested in joining. Tel: 01202 475048.
- A new net has been started in the Coventry area to encourage and promote the use of CW. It is dedicated to the memory of C E Sutton, G3AQ, and is on 144.060MHz at 8.00pm - 8.30pm each Monday (straight keys), Tuesday (electronic keyers) and Wednesday (bug keys).
- The German Alpine Region is, since 1 March, the latest area to have its own SOTA scheme. Since its start on 1 March 2002 there have been over 2000 hilltop activations and 15,000 SOTA contacts made. There will be a SOTA stand at the Norbreck Rally in Blackpool on 21 March.
- Angie Sitton, G0HGA, has started a Yahoo group on the Internet for UK radio amateurs resident abroad. To join, go to http://groups.yahoo.com/group/UK_Radio_Hams_Abroad and click on 'Join This Group'.

Broadcast listeners club publication

The broadcast-listeners British DX Club (www.bdxc.org.uk) has just published the 19th edition of its *Radio Stations in the United Kingdom* booklet. The 60-page publication includes up-to-date listings by frequency and station name of all medium-wave and FM services in the UK - including BBC, independent, low power AM and FM services. An extra booklet covering all Irish stations is also included. It is available from British DX Club, 126 Bargery Road, Catford, London SE6 2LR at £3.00 (overseas: £3.50, 5 euros, $5 or 7 IRCs.)

Rodrigues Island DXpedition latest

The 3B9C DXpedition to Rodrigues Island (see *RadCom* March 2003 pp28 / 29) should be starting as this issue of *RadCom* is received by members. In addition to Yaesu as the Principal Sponsor of the DXpedition, the 3B9C team has announced major donations from both ML&S and Nevada. These donations will be used to offset the very high logistics costs.

The organisers of the DXpedition have provided details of the Nevada Rodrigues Trophies. These will be awarded to stations who work 3B9C on the highest number of band-mode slots. In the case of UK stations, there are 10 trophies available, two each in the following sections: High power - using any antenna system; Low power - for stations using 100W or less *and* single-element antennas such as a dipole or vertical; Local clubs; M3 licensees; and Newly-licensed HF stations (licensed for *HF* operation since 1 January 2003).

There are also two trophies available for SWLs world-wide who log 3B9C on the most band-mode slots. For details of how to apply, see the 3B9C website at www.fsdxa.com/3b9c/nevada-trophy.html

School activity

David Mackinder, G4DWP, a teacher at the Priory LSST school in Lincoln, would like to hear from teachers or pupils who wish to join them in a 'schools net'. David started a radio club at the school following a very successful visit by the GB4FUN 'fun bus' last year. Six Year 8 pupils, all aged 13, have passed the Foundation exam and have M3 callsigns. Immediate plans now are to run another course and to get the pupils involved in some construction work. The school's callsign is MX0PSL and the school shack is equipped with an FT-840, an FT-101ZD and a doublet antenna. He says, "The school is very supportive of the activity and in addition to the club after school on a Tuesday I also have one hour on a Wednesday afternoon with Year 13 (6th form) students which is held in lesson time. Three of them are also now ready to take the exam." David says the school is in contact with school stations in Germany and Finland, but so far none in the UK. If you know of a school station which would be interested in making regular contacts with the Lincoln Priory LSST school, please e-mail: djm@priorylsst.co.uk

PHOTO COURTESY OF *LINCOLN CHRONICLE*

Five of the six new Foundation licensees at the Priory LSST school in Lincoln.

International Museums Weekend 2004

The fourth 'International Museums Weekend' (IMW) will take place on the weekend of 19 / 20 June. Everyone is welcome to join in from their local museum for this very enjoyable and friendly event. Registration of those taking part from a museum site is essential, but is free of cost via the www.ukradioamateur.org/imw website. Those without Internet access who want to take part should contact the organiser, Harry, M1BYT, on 0113 2866 897.

World Amateur Radio Day

IARU's 'World Amateur Radio Day' (WARD) takes place on **18 April** each year. The Polish commercial amateur radio magazine *MK QTC*, with the support of the Polish national amateur society, PZK, is issuing the World Amateur Radio Day 2004 award. It is available to anyone making either 10 QSOs (or SWLs hearing) on the HF bands or 5 on the VHF/UHF bands between 0000 and 2400UTC on 18 April 2004. Send a log extract to: Redakcja *MK QTC*, ul Wielmozy 5b, 82-337 Suchacz-Zamek, Poland, by 31 May. The cost is 10 IRCs, $5 or 5 euros. Further information from: qtc@post.pl or see http://qtc.radio.org.pl/ward2004

Radio family mourns Jack's passing

Jack Brooker, MBE, G3JMB, has become a silent key. Jack was the head of an extended amateur radio family. His eldest daughter Jose is G3ZZZ and she is married to Chris, G8GHH. Jack's second daughter Mary is married to Allan, G8LSD. Jack's son Peter is not interested in things radio, but Peter's son Jesse, who has just turned 13, hopes to study for the Foundation licence soon. Jack was well known for his microwave work and was one of the early pioneers of 10GHz narrowband operation. An obituary can be found at www.r-type.org/g3jmb

Jack Brooker, MBE, G3JMB, SK.

Club and Regional News

1 Scotland West & Western Isles

PAISLEY (YMCA) ARC
14, Solid state power amplifiers.
28, Shack night. Jim, GM3UWX.

2 Scotland East & the Highlands

ABERDEEN ARS
2, Junk sale.
9, *Echolink* & amateur radio, Ellis, GM4JLZ.
16, Construction night.
23, Foxhunt.
30, Morse practice, on air. Ellis, GM4JLZ, 01224 580 594.
COCKENZIE & PORT SETON ARC
24, 10-pin bowling. Bob, GM4UYZ, 01875 811 723.
LOTHIANS RS
12, Video, Peter, GM4DIJ.
26, Test gear & tune up. Toby, MM0TSS, 07739 742 367.

3 North West

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SOUTH MANCHESTER R & CC
2, Technical Topics.
9, Closed (Good Friday).
16, DSP & amateur radio, Chris, G8APB.
23, 'A Welsh Childhood', Dave, G0BJK.
30, 'The End of Sweet Rationing', Ged, G8RSI. Ed, 0161 969 1964.
STOCKPORT RS
6, Practical skills: work 3B9C Rodrigues DXpedition.
20, *IRLP*, Steve, M1ERS, Trevor, 2E0TWS. David, M1ANT, 0161 456 7832.
THORNTON CLEVELEYS ARS
19, Technical Q&A.
26, 'Test Instruments'. Jack, G4BFH, jack.duddington@btinternet.com

4 North East

GOOLE R & ES
14, Contest preparation, Lionel Winder, Selby.
21, Social, The Black Swan, Asselby.
28, RSGB Matters, G0VRM, The Black Swan, Asselby. Richard, G0GLZ, 01405 769894.
GREAT LUMLEY AR & ES
21, Talk TBA. Nancy, 0191 447 0036, 07990 760 920, Nancybone2001@yahoo.co.uk
GRIMSBY ARS
1, PSK, Norman, G2DBW.
15, Construction night, John. George, G4EBK, 01472 887720.
HALIFAX & DARS
20, RSGB bookstall, G7GJU. Tom, M0TKA, 01484 715079.
KEIGHLEY ARS
15, Film.
29, Junk sale. Cath, G0OSA, 01535 656155.
NORTH WAKEFIELD RC
1, Visit from Mayor of Morley, Cllr Joseph Tetley.
8, *SuperDuper* training, G4RCG and G4IAU.
15, Planning for Farne Islands IOTA expedition.
17, DXpedition to Farne Islands.
22, Corned beef hash evening.
29, Merchant Navy, talk & slide show, John, G7JTH. www.g4nok.org
SCUNTHORPE STEEL ARC
6, Intelligent rotator controller, John, G0JRB. Alistair, M1ECF, 01427 872976.
SHEFFIELD ARC
5, 'Development of Microscope', Geoff, M1GWA.
12, Closed (Easter holiday).
19, HF radio.
26, RSGB bookstall. Nick, G4FAL, 0114 255 2893.
TYNEMOUTH ARC
23, SSTV, G0SBN. Glen, G0SBN.

5 West Midlands

COVENTRY ARS
2, Equipment sale.
9, On air, Novice class, CW practice.
16, 2m DF hunt.
23, All about noise bridges.
30, On air, Novice class, CW practice. John, G8SEQ, 024 7627 3190, johng8seq@ntlworld.com
GLOUCESTER AR & ES
12, /P from escarpment site.
19, 26, On air HF / workshop. Tony, 01452 618930 office hours.
KIDDERMINSTER & DARS
6, 'Secret Listeners' & 'Code Breakers' videos, Gordon, G3LZT. Tony, G1OZB, 01299 400172.
MID-WARWICKSHIRE ARS
13, 'Working 23cm or less', George, G8AIM.
27, 'Broadcast Antennas 2', Nigel, ex-G7TMA. Bernard, M1AUK, 01926 420913.
SALOP ARS
1, Junk sale.
29, 'Foxhunt'. John, G0GTN, 01743 249943.
ST LEONARD'S ARS
1, *UI-View*, John, G0FSM.
8, Shack night.
15, 'Dits 'n' dahs', Stan, G0BYA.
22, Planning meeting.
29, HF antennas for small gardens. Derek, G0EYX, 01785 604904.
STRATFORD UPON AVON DRS
12, On air.
26, AGM & surplus sale, G4OHJ. Terry, G3MXH, 01789 294387.
TELFORD & DARS
7, Open evening, on air. Mike, G3JKX, 01952 299677.

6 North Wales

WREXHAM & DARS
6, Science Festival debrief.
20, Berlin Radio, Adrian, M1LCR. Mark, MW3MDH, www.qsl.net/wars

7 South Wales

No club details received.

8 Northern Ireland

BANGOR & DARS
7, Constructor's contest. ARGONI update, Mike, GI4XSF. N Ireland's first ATV & 6m repeaters. Mike, GI4XSF, 028 4277 2383.

9 London & Thames Valley

AYLESBURY VALE RS
14, Discussion. Roger, G3MEH, 01442 826 651, roger@g3meh.fsnet.co.uk
CRYSTAL PALACE R & EC
2, HF band predictions, club projects.
16, Building low-cost dummy load, G1PKS, G3OOU. Bob, G3OOU, 01737 552 170 or Victor, G1PKS, 020 8653 2946.
DORKING & DRS
18, West London Radio & Electronics Rally, Kempton, John, G0GNA. John, G3AEZ, 01306 631236.
ECHELFORD ARS
22, AGM. Robin, G3TDR, 01784 456513.
MAIDENHEAD & DARC
1, Time and the navigator, G3TWG. John, G8RYW, 01628 628463.
RS OF HARROW
2, Annual dinner.
23, 'So you want to learn Morse?' Jim, G0AOT, 01895 476 933 or 020 7278 6421.
SHEFFORD & DARS
1, Spring junk sale.
8, Where can I buy a pre-amp?
15, Hints and kinks.
22, Videoconferencing.
29, *Photoshop* Q&A. David, G8UOD, 01234 742757.
SILVERTHORN RC
2, Club meal, *Queen Elizabeth*, Chingford.
9, Closed (Good Friday).
16, Informal.
23, On air.
30, Informal. Les, G0CIB, 07980 275081.
SOUTHGATE ARC
8, Junk sale. Mike, M0ASA, 020 8366 0698.
SURREY RCC
5, AGM. Ray, G4FFY, 020 8644 7589.
WIMBLEDON & DARS
30, Packet on air, Kim, G6JXA. Jim, M0CON, 020 8874 7456.

10 South & South East

CHIPPENHAM & DARC
6, AGM. Andrew, G4GWR, andrew@scott-green.fsnet.co.uk
CRAWLEY ARC
28, On-air receiver comparisons. John, G3VLH, 01342 714402.
FAREHAM & DARS
14, DF: how does it work?
21, 28, Club project: bring tools & soldering iron. Steve, G7HEP, 01329 663673.
FARNBOROUGH & DRS
14, Cody & the RAE, Percy Vickery.
28, Kit building, Alan, M5VYR. Norman, G0VYR, 01483 835320.
HARWELL ARS
13, RSGB Regional Manager, Ivan, G3GKC. Angus, G0UGO, hars.g3pia@tiscali.co.uk
HASTINGS ELECTRONICS & RC
21, Club auction, William Parker School. R C Gornall, G7DME, 01424 444466.
HORNDEAN & DARC
6, Social evening.
27, Audio filter design, Andrew, G0AMS. Stuart, G0FYX, 023 9247 2846.
HORSHAM ARC
1, Bring, show & tell. David, G4JHI, 01403 252221.
SOUTHDOWN ARS
5, Antiques & collectables, John Waters. Foundation course. John, G3DQY, 01424 424319.
SWINDON & DARC
15, Digital photography, Den, M0ACM.
29, PSK31 & other digital modes, Ian, G4DIE. Mike, M5CBS, 01793 826465.

TROWBRIDGE & DARC
7, Lightning video. Ian, G0GRI, 01225 864698 evenings / weekends.
WORTHING & DARC
7, Setting-up and operating stations.
14, Early electrical medical equipment.
21, D-day radio navigation.
25, Opening Newhaven Fort Radio Exhibition GB2NFM.
28, DXpeditions, M0GMT. Roy, G4GPX, 01903 753893.

11 South West & Channel Islands

CORNISH RAC
1, AGM.
19, Computer section.
23-25 International Marconi Day. John, G4LJY, 01872 863849.
SOUTH BRISTOL ARC
7, Computer clinic.
14, Wine & cheese evening.
21, Horticultural evening.
28, On air. Len, G4RZY, 01275 834282.
SOUTH DORSET RS
13, AGM. Carol, 2E1RBH, 01305 820400.
TORBAY ARS
9, Closed (Good Friday).
23, Annual 90/10 sale. Dave, g6fsp@tars.org.uk
WEST SOMERSET ARC
6, AGM, Raynet talk, Construction contest. Jean, G0SZO, 01984 633060.
YEOVIL ARC
1, A day in the life of Dennis.
8, Sunspot cycle
24, Rob, G3MYM.
15, QRP Convention briefing.
18, QRP Convention, Digby Hall.
22, AGM.
29, On air. Derek, M0WOB, 01935 414452, m0wob@tiscali.co.uk

12 East & East Anglia

BRAINTREE & DARS
5, Computer learning. John, M5AJB, 01787 460947.
CHELMSFORD ARS
6, 'Merchant Navy Radio Operators', Donald,G0VIS. George, G3UTC, 01277 622707, george3utc@btopenworld.com
DOVER ARC
7, AGM.
14, No meeting (net on 'KS).
21, Evening meal.
28, Operating night. David Harding, G0DQI.

EAST KENT RS
5, Cheese & wine. Paul, G3VJF, mail@paulnic.com
FELIXSTOWE & DARS
3, 4, Foundation course, Paul, G4YQC.
5, AGM.
19, Junk sale & auction. Paul, G4YQC, paul.whiting@bt.com
HARWICH ARIG
14, Power measurements, Dave, G3PEN. Tony, G4EYE, 01255 886065.
KING'S LYNN ARC
22, Surplus equipment sale. Mike, G0SHC.
NORFOLK ARC
7, AGM.
21, Club dinner.
28, CW NFD briefing, Malcolm, G3PDH. Reg, G0VDO, 01603 429269.

13 East Midlands

EAGLE RADIO GROUP
13, 'The importance of matching & coupling in physical relationships and the benefits that can be achieved', Nevil, G3VDV. Terry, G0SWS, 01507 478590.
MELTON MOWBRAY ARS
16, DXpeditions, Ken, G30CA. Phil, G4LWB, Phil@croxtonkerr.fsnet.co.uk
NUNSFIELD HOUSE ARG
2, RSGB talk, & VHF DXing, Bryn, G4DEZ. Pete, G6KUI, 01332 755900.
RAF WADDINGTON ARC
8, Chairman's Lecture, Bob, G3VCA. Martin, M3MDF, martin@farmer4.freeserve.co.uk

Items for club news should be sent to the *RadCom* Office at HQ to arrive by the 26th of the month, ie approximately a month before publication (eg 26 January for the March Issue). News items should be sent in writing (fax, letter or e-mail: gb2rs@rsgb.org.uk) by the club secretary or the person responsible for publicity. Post cards for this purpose are available from RSGB HQ. A database of all meetings is shared between *RadCom* and GB2RS, so information only needs to be sent once.

St LEONARDS ARS & GB4FUN ALL AT SEA?

The St Leonard's ARS and GB4FUN visited the Stafford & Rugeley Sea Cadet unit at their Riverside HQ in Stafford on 17 January to support their drive to get cadets, 10 years old and upwards, interested in taking their communications courses. Despite the appropriate-sounding location, there was not a ship to be seen! The event was supported by Roy Clarke, G8AYD, RSGB Regional Manager for the West Midlands and the RSGB regional team. The cadet's CO, Lt Graham Townsend RNR, invited other Sea Cadet units to attend the demonstration. He and five of his cadets were to take the Foundation course over the weekend, with the St Leonard's ARS providing the instructors.

On the day, cadets from Stafford, Rugeley and Kidsgrove attended in force. The cadets were given an introduction to amateur radio with a showing of the latest RSGB video. Carlos Eavis, G0AKI, in GB4FUN, was kept busy all day with a constant stream of eager cadets. Undoubtedly the hit of the day was the 'Bob the Builder' helmet (see *RadCom* February 2004, p15). Many cadets sent greetings messages to local amateurs and the club had arranged for some of its members to be on hand to provide 2m FM contacts from their homes, rather than rely on chance contacts. This proved very successful, as good, solid, contacts were guaranteed.

10-year old Kerry Townsend and Ryan Slezak demonstrating the 'Bob the Builder' hat and two-way radio.

Following the demonstrations in GB4FUN, the cadets visited a display of home-constructed equipment organised by the St Leonard's ARS, ranging from a Blue Peter-style crystal set, made from a toilet roll, to test equipment, showing that amateur radio doesn't have to cost the earth. There was also a demonstration of Morse code, and several cadets took to this enthusiastically. One 10-year old girl managed to cope with an iambic keyer. Local paper the *Express and Star* turned up and featured GB4FUN and the cadets in an article and photo.

Lt Townsend said: "Saturday was a great success. The initial interest from the kids before the day was roughly six; I have now *all* of the cadets wishing to learn about radio and take the exam! This success was purely down the great effort of the people concerned. I cannot thank you enough for your enthusiasm and professionalism. The GB4FUN bus is an excellent hands-on opportunity for the cadets to learn and gain interest; it is a credit to the Society." He added that he intends that amateur radio courses will be run from the unit on a regular basis. Civilians will be welcome to join any course. He also intends the unit to become affiliated to the Society, and to become a registered exam centre.

50TH ANNIVERSARY OF FIRST TRANSISTORISED QSO

Fifty years ago, on 21 February 1954, radio history was made when the Yeovil ARC made what is almost without doubt the world's first long-distance radio contact with a transistor transmitter. This event was also probably the first time that a provincial amateur radio club had advanced the science of radio communications.

To mark the 50th anniversary, there was a talk by Rob Micklewright, G3MYM, at the Yeovil club on 19 February 2004. A reconstruction of a typical mid-1950s amateur radio station was also on display. The room was filled to capacity with members not only from Yeovil, but also visitors from the South▶

PHOTO: BRIAN, G4PDG.

Left to right: Nobby, G3BEC; Frank, G3CFV; Rob, G3MYM; and Clive Banbury, with a typical 1950s amateur radio station.

Dorset, Blackmore Vale and Taunton clubs. Also present were four of the original participants of the 1954 event.

G3MYM spoke about the development of the first transistor transmitters and showed why the 85 miles of the Yeovil ARC contact was such an incredible distance for a transistor transmitter in those days. In September 1954 the club was invited to display the transmitter at the prestigious four-day National Amateur Radio Convention that was held in Bristol.

After Rob's talk, there was a buffet provided by one of the original participants in the event, making a fitting finale to a very successful evening.

GMDX GROUP ANNUAL CONVENTION

The GMDX Group (www.gmdx.org.uk), a national affiliated society, is holding its seventh annual convention and dinner on Saturday 3 April at the King Robert Hotel, Whins of Milton, Stirling, starting at 12.30pm (bar lunches available from 11.30am). The provisional programme includes presentations by Ian 'In Practice' White, G3SEK, on amplifier technology; Steve Taylor, G4EDG, on the VK9ML Mellish Reef DXpedition; and Fred Handscombe, G4BWP, on 'Ougadougou to Niamey'. Yaesu UK has generously donated an FT-857 as the star prize in the Convention's raffle. In the evening, a DX Dinner takes place. The dinner costs £17 and should be pre-booked. Further information from Sheree Ferguson, 19 Leighton Avenue, Perthshire FK15 0EB. Special room rates have been negotiated with the King Robert Hotel for Convention delegates: contact the hotel direct on tel: 01786 811666.

CHANGE OF VENUE

In last month's *RadCom* we reported (on page 16) on the Wrexham ARS's exhibit and GB2WSF demonstration station at the Wrexham Science Festival's 'Scientriffic' event on 27 March. The club has just been informed that the venue has now been changed to the 'D' block of the NEWI main building. As Mark, MW1MDH, Chairman of the Wrexham ARS, says: "Best advice is to look for the aerials!"

ESSEX TRAINING STAND

One problem facing newcomers is the lack of sufficient courses. To improve the situation in Essex, Trevor, M5AKA (RSGB Deputy Regional Manager), and Christopher, G0IPU (Intermediate Senior Instructor), have set up Training stands at local rallies. The object is to try to encourage more amateurs to take up the challenge of training newcomers, as well as to provide information on those courses that are currently running.

A stand was run recently at the Canvey rally and it generated a lot of interest. There were about a dozen newcomers who were trying to find a Foundation course who were given the location of the nearest course to them, which for some means an hour's drive. Information and advice was also given out on how amateurs could set up and run their own local Foundation courses, and it is hoped that new courses will start a result.

As a follow-up it is planned to give talks to local clubs to encourage them to become involved in training. Further information from the CARS Training Manager Clive Ward, M0SIX, tel: 01245 224577; Mob: 07860 418835; e-mail: training@g0mwt.org.uk

Members of the Foyle and District Amateur Radio Club with their prize donated by Tennamast.

TRANSMISSION 2003 WINNERS

The Foyle and District Amateur Radio Club in Co Tyrone, Northern Ireland, were the club winners of the British Wireless For The Blind Fund's 'Transmission' event held in September last year. Their prize is a drive-over wheel mount made and donated by Tennamast of Scotland.

FARNE ISLANDS TRIP FOR IN WAKEFIELD CLUB

The GX4NOK/P Farne Island DXpedition team.

The North Wakefield Radio Club (www.g4nok.org) will be operating from the island of Inner Farne off the coast of Northumberland using club callsign GX4NOK/P during daylight hours on 17 and 18 April. The island counts as EU-109 for the RSGB Islands on the Air awards programme. Club members plan to operate on 40, 30, 20, 17 and 2 metres. Further information during the DXpedition will be found on the club's website.

The island has two lighthouses (ENG060 and ENG040) as well as being a rare IOTA island and WAB square (NU23NLD). The North Wakefield Radio Club extends thanks to the National Trust for giving permission for the activation to take place from this important bird sanctuary, as well as to Leeds Amateur Radio for their QSL card sponsorship.

RADIO COURSES

The Southdown ARS, based in Eastbourne, East Sussex, offers several radio courses. The Foundation course is usually run with small groups 'on demand'. The next Intermediate course will be starting in September but particularly experienced or qualified candidates may be taken on an individual basis. Students must have been successful at the Foundation level before the start. It is also planned to start an Advanced licence course in September (students must have been successful at the Intermediate level before commencing the course). 'Life after the Advanced' is the name of a continuous rolling course aimed particularly at newly-licensed Advanced holders. Each session ends with about half an hour Morse practice. For further information please contact Jim, G4DRV, tel: 01323 728479; e-mail: jim.g4drv@tiscali.co.uk

TON UP FOR WORTHING

The Worthing and District Amateur Radio Club has once again exceeded 100 members - but this year the magic 'ton' was achieved before the end of January! Members come from all over East and West Sussex to the meetings held every Wednesday evening from 8.00pm at Lancing Parish Hall. Chairman Eddie Wilson, G0ECW, said, "There are many reasons for our success but primarily I believe it is the light-hearted atmosphere and positive support from the members, coupled with interesting topics at the weekly meetings." The club magazine *Ragchew* has been published continuously for over 50 years. Phil Godbold, G4UDU, commented, "I'm proud to be President of such a vibrant club. We take part in contests, run special event stations, hold licence courses, have a thriving CW following, run club nets almost every day of the week, collect for charity and have our own operational radio station at Newhaven Fort Museum, GB2NFM. There's never a dull moment!"

ON THE RADIO

The Eagle Radio Group in Mablethorpe recently broadcast from the BBC Radio Lincolnshire bus. They used their time on the air to promote amateur radio and to demonstrate *Echolink* via GB4IPE-L. While contacts were made around the world throughout the afternoon, listeners to BBC Radio Lincolnshire phoned in to ask club members questions. The radio programme included a competition to find the best-radio related piece of music and the afternoon ended with the inevitable *Radio Ga Ga*. The BBC bus tours the towns and villages of Lincolnshire and is part recording studio and part IT training, equipped with a server and 10 operating positions.

Terry, G0SWS; Lucy Wheeler (BBC presenter) and Charles, G0CBM, with the BBC Radio Lincolnshire bus.

Out of this world contact for GB4FUN

Pupils and teachers at The King's School in Canterbury were over the moon when GB4FUN made contact with Mike Foale on board the International Space Station on 28 January.

The historic contact took place at 1745UTC using equipment from the RSGB's mobile amateur radio demonstration vehicle, GB4FUN. British-born astronaut Michael Foale, who holds the American callsign KB5UAC, was himself a pupil at The King's School between 1970 and 1974. It is believed to be the first time that any astronaut has contacted his old school through ARISS, the Amateur Radio on the International Space Station programme.

Intense preparations for the contact had been taking place over several days. The station would appear over the western horizon and pass almost directly overhead the school, before disappearing over the horizon to the east. GB4FUN's antennas, under computer control, would be tracking the Space Station as it passed overhead. Since it was an almost overhead pass, there was a theoretical maximum of about 10 minutes in which it was possible to keep in radio contact.

Immediately before the scheduled contact time, the school's Head of Science, Dr Jonathan Allday, spoke to the invited audience of 100 which included the Lord Mayor, school governors and veteran BBC space correspondent Reginald Turnill, as well as pupils and parents. Jonathan thanked the RSGB's Carlos Eavis, G0AKI, and Howard Long, G6LVB, of ARISS, who had worked so hard and left nothing to chance to ensure the success of the contact.

The school, which was founded in 597 AD, is located within the grounds of Canterbury Cathedral. The antennas from GB4FUN had to be carefully positioned in order to avoid beaming through the numerous ancient stone buildings which surround the school. Even so, it was almost three nail-biting minutes after the theoretical acquisition of signal before the Space Station rose sufficiently above the horizon for contact to be made. During this time GB4FUN operator Carlos, G0AKI, called the Space Station on three separate occasions with no response. The tension in the room was palpable and was only broken when Mike Foale's British accent was eventually heard from space on 145.800MHz FM: "GB4FUN this is NA1SS, reading you loud and clear."

Five pupils - Amanda, Adebosola, Theodor, Lawrence, and Alex - were chosen to represent the school and each asked their questions in turn. Amanda asked the first question: "Is the training you receive an accurate simulation of what it is really like in space?" Mike replied, "Yes, it's pretty close as to how to use the equipment" - but he added that the environment, including weightlessness, was nothing like what can be experienced on earth.

11-year old Theodor from JKS (Junior King's School) asked which experiments being carried out on the ISS were of particular interest to Mike.

Left to right: Alex, Theodor, Lawrence, Adebosola and Amanda wait for the ISS to appear over the horizon.

Alex asks Mike Foale about maintenance procedures on board the ISS, as GB4FUN operator Carlos Eavis, G0AKI, operates the station.

He replied that it was their experiments in cell biology on board the station, which could lead to advances in cancer treatment.

17-year old Alex, who is the current holder of the school's Michael Foale Award, and who met the astronaut when he revisited the school in 2001, asked what manner of routine maintenance was necessary on the space station. Mike's answer was that one of the things they need to do is to get rid of the rubbish, which is burned up in the atmosphere. That particular task had been done earlier in the day, he said, when the space station was travelling over the Pacific.

Due to the late acquisition of the signal, contact was lost after eight minutes as Amanda was asking another of her questions. Nevertheless, the contact was a great success and earned a round of spontaneous applause from the audience which, it was later discovered, was heard by Mike in space.

Events such as this provide an enormous amount of very important positive publicity for amateur radio. The event was covered in the BBC's *South East Today* and on Meridian TV's evening news programme, as well as on BBC local radio, Invicta commercial local radio, in Kent newspapers and on the BBCi website.

Video and audio recordings of the contact, including the BBC and Meridian TV reports, are available on Howard Long's website at www.g6lvb.com/kings (note: some of these files are very large!) ♦

Supporters of the Radio Communications Foundation

We asked members when renewing their membership to include a donation to help to continue to support the work of the Radio Communications Foundation. The following is the list of those members who have kindly sent in a donation by the deadline date for this issue. Contributions continue to be wanted: if you would like to help, please send your donation to RCF, c/o RSGB HQ.

RCF 'Big Hitters'

Bangor & DARS	GI3XRQ
J Creasey	G4RIP

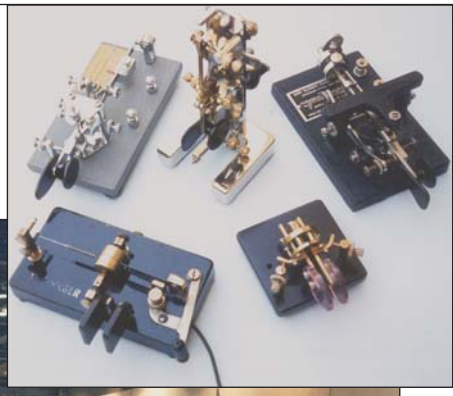
R Issatt	2E1BGV	A Bowmaker	G0REV
Mrs A Cannon	2E1DZP	E J White	G0RJH
H Veyhl	DL4MFL	P G Broad	G0SWU
C Yeates	EI7AAB	T J Barclay	G0TBD
R D Gilling	G0AHV	W W Wright	G0VMO
I L Carter	G0GRI	M Young	G1AAV
A D Pierce	G0GZF	J R Hacker	G1DER
J Louca	G0PHZ	P A Postle	G1DXQ
S H Loveridge	G1HRE	H H Christie	GM4SNP
D Bond	G1NZR	I Fairbairn	GM4VJV
C K Lawson	G3JCL	J Pedley	GM7TUD
M R Coward	G3PRH	D J Barclay	M0BPM
I H Keyser	G3ROO	P Parry	M0DLZ
M L Baker	G3SUK	A M Holden	M0DOW
G G Bulleyment	G3XIV	M J Penn	M0JYY
C I C West	G3YFN	P B Martin	M0KDX
J E Hart	G3ZGA	R H Reeves	M0ROJ
Prof D Mattingly	G4EBC	S J Neale	M0STN
J C Clarke	G4FMU	Trewellard AR Group	M0TRG
J A Hawkings	G4GVE	J Partington	M0YOT
B G Davey	G4ITG	B Cannon	M3BFC
G Robinson	G4IZB	Dr E H N Oakley	M1BWR
S B Green	G4YZM	A E Owst	M1DEL
N S L Shearer	G6DWS	J W Henderson	M1DSU
G L Lamb	G7AMF	W H Jackson	M1FAD
J E Cannell	G7OAI	G F Newport	M3GFN
D A Evans	G7RAB	H Morgan-Jones	M1NTO
A H Wilson	G8BTE	A Curry	M3XAC
P A Hocking	G8ZDS	R D Ross	MI0DJX
J G McVittie	GM0NBG	C McLelland	MI0JZZ
		J E Bence	MM3JSB
		E B Stanmore	MW3EBS
		J J Schallenberg	PA3AUB
		M G Chisholm	RS162251
		I N Wilson	RS177508
		B Blanchard	RS183713
		J A Rogers	VK7JK
		C P Maulick	WB2YZX
		J C Risso	ZB2HW
		F T van Vloten	ZR5CG

The RSGB is also grateful to those many generous members who have sent donations anonymously, or who have asked us not to publish their names.

By Dave Ingram, K4TWJ

4941 Scenic View Drive,
Birmingham, AL 35210.

E-mail: k4twj@k4twj.com



Many of us make hundreds of QSOs with American amateurs each year, but how often do we consider the differences between amateur radio on the other side of 'the pond'? The USA was once considered much more liberal in amateur radio matters than over here but, power limits aside, the US has now fallen well behind the UK in terms of operating privileges for all but the highest class of licence, as well-known US amateur radio columnist Dave Ingram explains.

You say "tomayto" amateur radio in the US

While we enjoy person-to-person communications on a world-wide basis, few of us are familiar with the inside trends and lifestyles of fellow amateurs in distant lands. By looking closer and learning more, however, we can all enrich our own lives in many ways. Such is the subject of this article. The topic, incidentally, was suggested by *RadCom's* editor, and I am honoured to present the end results herein. Let's begin with some interesting variations in often-used radio terms...

Our vocabularies and descriptions of amateur radio activities and events include just enough similarities and differences to prove both confusing and humorous. A large gathering is referred to as a *rally* in the UK, for example, but called a *hamfest* (or *convention*, if quite large) in the US. An outdoor swap circle is a *boot* in the UK - but there are no boots swapped or sold! That is acceptable, however, as a similar outdoor event in the US is called a *boneyard* but no bones are displayed or exchanged. A similar indoor swap circle that is part of a hamfest is called a *flea market* but -you guessed it - there are no fleas swapped, only used gear in which one man's junk becomes another man's junk. Ah, but within said junk one may find a special *boat anchor*: an older, larger and beautifully romantic vacuum *tube* (or *valve*) receiver or transmitter that is delightful to operate but heavy enough to anchor (or sink!) a small ship. In speaking of water, you may have heard US amateurs relating transmit power in liquid terms. A full 1000 watts is called a *gallon* and 500 watts is referred to as a *half-gallon*. Isn't amateur radio grand? Isn't it wonderful being part of such a unique and highly esteemed fraternity?

A radio rally in the US is called a hamfest or convention and its indoor swap circle (like that shown here) is called a flea market. Attendance at these gala events has been noticeably down since the 9/11 terrorist attacks.

Keys, bugs and paddles are special collectables that increase in value almost daily. They are a good inflation hedge, terrific fun to use on the air, and there is a special story of historical significance behind every vintage key.

US LICENCE CLASSES

In tuning across the HF bands, you may also be able to visualise which class licence a US amateur holds according to the frequency range (s)he operates. How so? Although recently streamlined from five to three levels of licence (and Morse code proficiency requirements dropped from 13 and 20WPM to 5WPM), an incentive licensing programme still limits full band access by Technician and General class licensees. Only Extra Class licensees enjoy full access to all of the HF bands. Further, an entry level or 'no-code required Technician' class licensee is restricted to just the 50, 144 and 440MHz bands.

The specific frequencies reserved for Extra Classers are 3500 - 3525 and 3750 - 3850kHz, 7000 - 7025 and 7150 - 7225kHz, 14000 - 14025 and 14150 - 14225kHz, and 21000 - 21025 and 21150 - 21300kHz. In comparing UK and US licences, we notice the UK is much more liberal in its policies. The introductory or 'Foundation' and 'Technician' exams on basic electronics and radio communications procedures are roughly equivalent in level, for example, but the Foundation only restricts 10 metre operation while the Technician precludes operation on *all* HF bands.

The more technical UK Advanced and US General exams on electronics and communications techniques are also roughly equivalent, but General licensees must still pass a 5WPM Morse code test and still cannot operate on Extra Class frequencies. That full access licence requires passing a much higher level technical exam (and the 5WPM Morse code test). Proposals to consider allowing code-free Technicians limited access to some HF bands and dropping Morse proficiency requirements from General and Extra Class licences are presently being debated. The outcome is unpredictable.

Five set frequencies or 'channels' on 60 metres were also recently opened for US use by both General and Extra Class licensees. Unlike the UK authorisations, however, US amateurs are restricted to SSB (USB) on 5332, 5348, 5368, 5373 and

Vying for equal recognition in the 'prized collectable' limelight are microphones, and many older styles are real attention grabbers. Vintage mics can also be retrofitted to work with modern transceivers and, like keys, each has a special story of its history worthy of recognition.

and the UK

5405kHz with 50 watts ERP. With these limitations and different frequency / mode allocations communicating cross-mode and split frequency style between the UK and US should prove quite challenging, but fun!

Overall, the UK's more liberal attitude could easily prove more beneficial in the long run by encouraging more youngsters to become radio amateurs.

SPECIAL INTERESTS

If you have tuned around 14178kHz on 20 metres recently, you have probably heard several exceptionally full-bodied and rich-sounding SSB signals. Indeed, many rival classic AM broadcast stations in their magnificent-sounding audio. What's happening?

Folks are adding broadcast-quality and studio-grade microphones plus professional graphic equalisers to their transceivers and widening transmit bandwidth to transmit really terrific sounding audio. However, these operators also realise that HF spectrum is an asset and a premium, so their transmit bandwidth is usually held back to a normal amount during busy hours. Listen when you have time, but be forewarned: it may inspire you to purchase a fancy new 'do-it-all' transceiver and equally expensive microphone (Heil's new 'Classic' and 'Heritage' mics are very cost-effective alternatives).

While DXing, contesting and QRP are continuously popular pursuits among radio amateurs of all lands, US amateurs are always captivated by the newest transceivers and antennas. The more expensive they get, the more attention they draw, as folks buy gear with more features than they will ever use, with money they do not have, to impress people they don't even know. Is there a lesson here?

Collecting, restoring and occasionally using classic gear, keys and microphones are also very popular special interests among US amateurs of all ages and backgrounds. Indeed, a vast number of US amateurs collect some type of radio-related items - old *AM band* (or *medium wave*) broadcast radios, unusual vacuum tubes [there we go again - *Ed*], antenna insulators or military surplus.

Anything that may be considered scarce or vintage is in demand - and rising in value. Collins's famous S-line, the KWM-2 and 75A4/KWS-1 (the 'Gold Dust Twins') are shining examples of that fact. After hitting

WIN! A bhi NEIM 1031 Noise Eliminating In-line Module and 1042 Switch Box

A bhi NEIM 1031 Noise Eliminating In-line Module and 1042 Switch Box can be won in our exclusive competition, courtesy of bhi Amateur Radio Solutions

The bhi NEIM 1031 Noise Eliminating In-line Module and 1042 Switch Box were reviewed by Chris Lorek, G4HCL, in last month's *RadCom* (see March 2004 *RadCom* page 37). Chris has used a number of bhi DSP units before and confirmed that the NEIM 1031 "replicated the excellent on-air results found in the past." Of the 1042 Switch Box he said, "What a good idea, and a very useful add-on to the DSP filter system."

The prizes in our competition are a bhi NEIM 1031 Noise Eliminating In-line Module *and* the 1042 Switch Box unit.

The full rules are listed below. (Hint: re-reading Chris Lorek's review in the March 2004 *RadCom* will help you with the answers!)

COMPETITION RULES

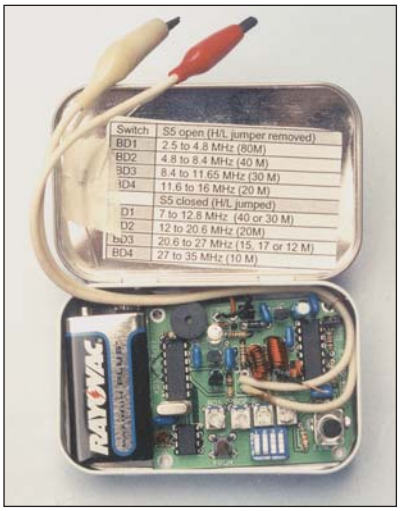
Look at the three multiple choice questions below. Write your answers on **a postcard or the back of a sealed envelope** (no letters accepted) and send to: bhi Competition, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Entries must be received at RSGB HQ by first post on **Friday 30 April.** You *must* be a current member of the RSGB on the closing date of the competition (30/4/04) in order to enter. The winner will be announced in the June *RadCom*.

Q1. *The bhi NEIM 1031 Noise Eliminating In-line Module is fitted:*
(a) instead of an external loudspeaker (b) between the receiver or transceiver and an external loudspeaker (c) inside the receiver or transceiver.

Q2. *How many levels of noise filtering is provided by the bhi NEIM 1031 Noise Eliminating In-line Module?*
(a) 4 (b) 6 (c) 8.

Q3. *How many audio sources can be switched using the bhi 1042 Switch Box?*
(a) 3 (b) 4 (c) 6.

THE SMALL PRINT Only one entry per member (multiple entries will be disqualified). No other correspondence can be entered into. All entries will become the property of the RSGB. Please state on your entry if you do *not* wish to receive further promotional material or offers from the RSGB. The competition is open to current RSGB members only. Employees of the RSGB and of bhi are not eligible to enter.



rock bottom a few years ago, they are now flourishing in popularity and sky-rocketing in value. Restoring the units and fitting them with a full line of new tubes or valves is expensive, true, but the rigs with their marvellous big dials, weighted full-size knobs and warm glowing innards are a blast of fun to operate. Wow!

Key and mic collections are equally popular, especially since they maintain and increase in value even better than bank interest rates on savings accounts or investments in the stock market. A modest collection of keys occupies minuscule space compared with older transmitters and receivers, and they can also be used for super on-the-air enjoyment. Further, there is a very special story of use or of amateur radio's proud history behind every old-time key: a story we hope every amateur today will eventually pass on to future generation amateurs with similar "pass it on" stipulations.

Special interests and activities within US amateur radio clubs are also changing with today's changing times. There is a noticeable focus on VHF and UHF band activities, computers, software and I-links, the arrangement of linking repeaters in different areas via the Internet.

Meanwhile, interest in QRP among serious and dedicated amateurs is rising and independent QRP clubs are flourishing like never before. Some of the most active clubs are the North California QRP Club (NorCal) and the New Jersey QRP Club. These two have now merged to form the American QRP Club. There are also the St Louis, Arizona, Colorado, and at least 25 more clubs.

Many of these clubs produce their own newsletters and often inexpensive QRP kits. One particularly attractive new kit is the 'Antenna Dipper' available from N0MQ and the 4 States QRP Group and shown in the photograph. You connect the Dipper to your antenna's coaxial cable feedline, adjust its potentiometer for minimum brightness of an on-board LED, and it indicates the approximate SWR and 'announces' its resonant frequency in Morse code. It is also handy for pre-tuning an antenna tuner. You just set the potentiometer to the desired resonant frequency, then adjust the tuner for minimum brightness on the Dipper's LED. The Dipper covers 80 to 10 metres, operates from a 9-volt battery and fits in an Altoids tin. Yes, you know it is big-time QRP if it fits in an Altoids tin!

The unique 'Antenna Dipper' kit measures the SWR of a connected antenna and announces its resonant frequency in Morse code on a built-in mini-speaker. The kit is produced by the 4 States QRP Group, it is very low cost and it fits in an Altoids tin.

Rhonda Comer, KG4FVL, demonstrates the concept of HF back-packing. An Icom IC-703 and small battery pack are in the back-pack and a W6MMA 'Super Antenna' is mounted on the pack. The transceiver's removable front panel is fitted into a small belt-carried pouch. This set-up is capable of globe-spanning communications while walking.

TIMELY TRENDS

The September 11, 2001 terrorist attacks on the US noticeably changed general altitudes on everything from air travel to large public gatherings. As a result, attendance at amateur radio rallies or conventions has dropped noticeably and is very slow in recovering. A respectable number of radio amateurs in the US has also become more concerned about emergency preparedness and the ability to communicate during a crisis, and they have implemented their own survival plans. These plans typically involve designating a retired family member (who is often at home) as a 'health and welfare' check-in point for the entire family. An on-the-air check-in time / frequency schedule for radio associates plus a wallet sheet on communications specifics and a portable HF or VHF station complete with batteries, antenna, snacks and water round out the package. Ideally, the emergency-ready amateur can set up a complete station plus monitor both local and international affairs from several sources at a moment's notice.

Emergency preparedness has also increased interest in HF mobiling and HF back-packing: a new area that includes 'pedestrian mobiling' or 'walk-and-talk HFing'. A typical pedestrian mobile set-up consists of a small transceiver like Yaesu's FT-817 or Icom's IC-703, a small battery and a portable multiband antenna such as the 'Walkabout' packed into a carry bag. A trailing quarter-wave (or longer) wire is used with the set-up as a ground-simulating counterpoise (vitally important!) and the HF back-packer can communicate world-wide under favourable band conditions.

CONCLUSION

Although radio amateurs in the UK and the US are separated by a large ocean, our interest in and enthusiasm for the world's greatest hobby is remarkably similar. We enjoy working with electronic equipment, communicating with fellow amateurs and pioneering technological frontiers. Just as amateur radio today evolved from wireless spark communications of yesteryear, tomorrow's concepts and techniques will be radically different from those of the present. I feel quite confident in stating, however, we will change with the times, we will survive and like always, we will continue to be at least 10dB above the general population! May you always stand tall, be proud of your amateur radio heritage, and may the force of good signals always be with you! ♦

FURTHER DETAILS

4 States QRP Group. 603 N Free King Highway, Pittsburg, KS 66762, USA

HF back-packing: Full 'how to do it' details plus reports on various antennas and accessories are included in my book *Ultra Light HF'n*, available direct from the author at $16 autographed or $19 unautographed plus P&P ($7.65 via air or $3.80 via surface.

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American QRP Club	www.AmQRP.org
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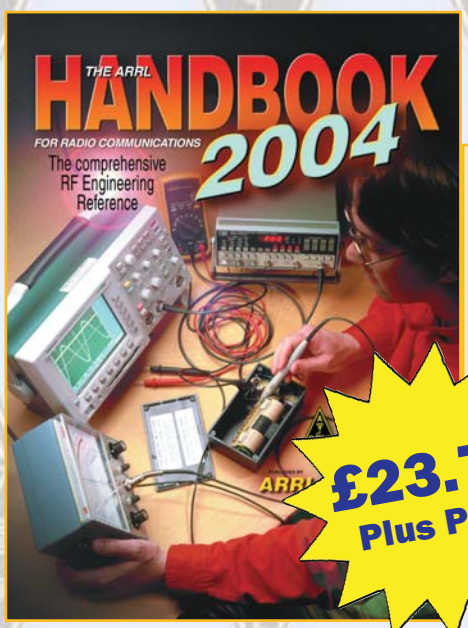

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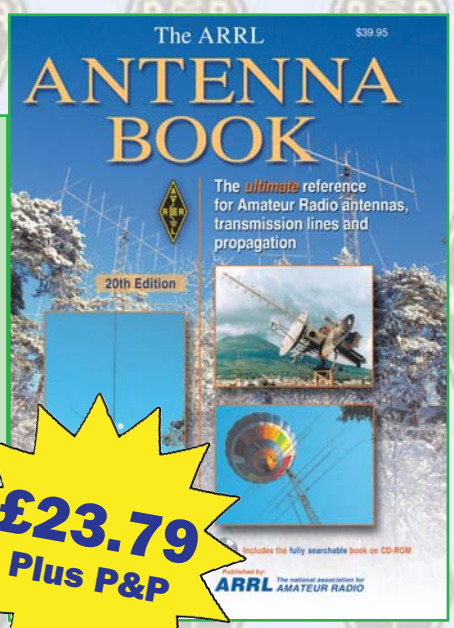

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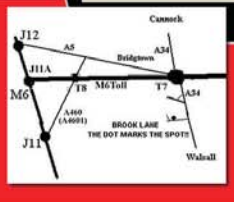

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Steve Hartley says, "News has been stacking up in the G0FUW shack, so let's try to clear the decks!"

Newcomers' news

Geoff Chance, M0GRC, of the Cornish Radio Amateurs Club, has asked me to mention International Marconi Day, which takes place on Saturday 24 April. The event commemorates the achievements of Guglielmo Marconi. It's not a contest, but certificates can be obtained by contacting special Marconi stations. Last year saw nine awards go to Foundation licensees but only one to an Intermediate station. Let's see if we can top that this year with as many newcomers getting in on the act as possible. Full details of the awards and how to claim them can be found on the International Marconi Day website (see 'Websearch' below).

'TT' FOR NEWCOMERS?

In the January 'Newcomers' News' column Arthur Scothern, 2E1HVB, raised the idea of a 'Technical Topics for Newcomers'. Now, James Farrant has written to say that he studied for, and passed, the (old style) Radio Amateurs Exam under the excellent tutelage of Alan Betts, G0HIQ. However, he has yet to go on the air because he feels there is a gap between his theoretical knowledge, and the more practical experience needed in order to operate a station in a responsible manner. I will let James take up the story. "My professional day job has precluded membership of a club where I might have the opportunity to learn from those more experienced than me, so for me, 'self-training in wireless telegraphy' is likely to remain 'solo-training'. Consequently, I and others like me will continue to rely on the written and published word for the supplementary knowledge needed 'beyond the RAE'."

RadCom editor Steve Telenius-Lowe, G4JVG, responds: "While James is to be congratulated for passing the Full RAE 'from scratch', it was precisely the lack of operating experience provided by the Full RAE syllabus that led to the inclusion of practical elements in the Foundation and Intermediate courses. For people like him, and Arthur, the 'Down to Earth' section in *RadCom* already fulfils the role requested, both in terms of providing guidance in operating techniques and help in understanding technical principles of amateur radio. 'Down to Earth' is intended specifically for newcomers, although in this instance 'newcomers' doesn't necessarily mean absolute beginners to amateur radio. Many quite experienced radio amateurs are beginners when it comes to certain aspects of the hobby. For example, last month G3NUG and G3XTT encouraged newcomers to HF DXing - who might never have considered calling a DX station - to get on the air to work their 3B9C DXpedition. This month, Ian Poole, G3YWX, gives newcomers an easily-understood description of SSB: what it is, how SSB is generated, how it is resolved and why you might want to use SSB in preference to, say, AM or FM. I'd always be pleased to receive suggestions from newcomers for subjects they would like to see covered in 'Down to Earth'. Please write c/o RSGB HQ or e-mail: radcom@rsgb.org.uk"

Alexander Justin, G8DAI (see 'Justin Time').

The Carrickfergus October class, including young Emma (see 'News from Northern Ireland').

JUSTIN TIME!

Peter Justin, G4AZL, sent word that Alexander Justin obtained his full licence, at the age of 14, after passing the last City & Guilds RAE in December. He achieved this after just two months of part-time home study, having had no previous interest in amateur radio.

Alexander says that "This final opportunity to obtain a full licence by direct entry was not to be missed. My first week on the air was interesting and I had QSOs (contacts) on 2m FM and SSB. All the stations I worked were patient and helpful although one person said my callsign must have been a misprint and wanted to call me M3DAI. Keeping a QSO going was hard work and I had to use written notes to help me. Working a group of stations in a net was the hardest. I am now more confident and I am working on my operating skills and hope to go on HF soon."

Alexander's callsign, G8DAI, was resurrected having been held previously by a family member over 30 years ago. His shared station has facilities for all bands 160 - 10m, plus 2m and 70cm from an excellent location 400ft above sea level - so look out for him on the air. Well done Alexander! Keep us informed of your achievements with your new licence.

NEWS FROM NORTHERN IRELAND

The Carrickfergus Amateur Radio Group (CARG) reports more success from its Foundation courses at the Downshire School, Carrickfergus. In the October class was Emma, their youngest female Foundation licensee at just 10 years old. In addition to introducing a total of 47 new Foundation licensees to the hobby through four excellent courses run in 2003, the Carrickfergus group prepared 19 RAE candidates for the December exam.

Not content to sit on their laurels, members of CARG will be running all the Radio Communications Examination courses (Foundation, Intermediate and Advanced) during 2004. For further details the contacts are John Branagh, tel: 02893 367208 evenings, e-mail jbranagh@supanet.com or John Roberts, tel: 02890 459910, e-mail: john@gi0usx.freeserve.co.uk

Keep up the good work guys, and stay in touch.

INTERMEDIATE PRACTICE

Since the publication of the *Intermediate Licence* textbook I have received several requests for sample exam papers. To the best of my knowledge, there have been no 'official' practice papers produced for the Intermediate examination. To help my own students revise at the end of our course I produced a paper in the style of the official exam. Quite co-incidentally, so did Don Lamb, G0ACK, from the Radio Society of Harrow. Following some mutual editing, and with Don's agreement, I am now able to offer the two practice papers to tutors and students alike. An e-mail or stamped addressed envelope to the address at the top of the page is all that is necessary. I must stress that these are *not* RSGB / Ofcom papers and do not contain questions from the official question bank. However, both Don and I have some experience behind us and believe they are pitched at about the right level. ♦

WEB SEARCH	
International Marconi Day	www.gb4imd.co.uk

By Ian Poole, G3YWX

5 Meadway, Staines, Middx TW18 2PW.

E-mail: ian_poole@lineone.net

An introduction to single

If you are studying for the Foundation or Intermediate licence, or if you already have your M3 or 2E0 callsign, you will probably be familiar with SSB on the HF bands. But just what is SSB? Why can it sound like Donald Duck? Why is it more difficult to tune in than other modes and why, for that matter, would you want to use SSB anyway? Ian Poole answers these, and many other questions about single sideband.

Single sideband (SSB) is by far the most popular form of voice communications used on the HF bands today. Listen to any one of the HF amateur bands and it is possible to hear many different SSB signals from all corners of the world. The reason for this widespread use is that it offers significant advantages over alternative modes such as AM and FM that could also be used to carry voice communications on the HF bands.

Unfortunately there is a small penalty to be paid for the advantages of SSB. The way in which it is generated is more involved than either AM or FM, and as a result the transmitters or transceivers require more stages and are more complicated. However, with modern circuit technology this is not the issue it was years ago, and most transceivers these days are multi-mode.

Fig 1
When a carrier is modulated by an audio sine wave (in this case 1kHz), additional signals appear either side of the main carrier.

Fig 2
A typical audio signal spectrum produces sidebands extending out either side of the main carrier.

Fig 3
A single sideband signal.

WHY USE SSB?

The mode that was widely used for HF communications before the introduction of SSB was AM. This has a number of drawbacks that can be seen if a careful look is taken at its characteristics.

In the first instance it occupies a comparatively large amount of the spectrum. To see why this occurs it is necessary to look at what happens when a radio carrier is modulated. Take the example of a carrier at a frequency of 1MHz being modulated by a steady sine wave with a frequency of 1kHz. When the modulation is applied this has the same effect as mixing or multiplying two signals together. As a result, sum and difference frequencies are generated. These are known as the *sidebands* and in the example given they occur at points 1kHz either side of the main carrier, as shown in **Fig 1**.

If the sine wave modulation is replaced by a typical audio signal containing a variety of frequencies, the audio signal spectrum appears either side of the carrier as shown in **Fig 2**.

It can be seen that the AM signal occupies a bandwidth twice that of the audio signal, and in this respect an AM signal is very wasteful of valuable spectrum allocations.

The other problem that occurs is that an AM signal is not efficient in terms of its power usage. Under the condition where the maximum amount of modulation is applied, the signal as a whole rises to a level twice that of the mean, ie no modulation level and falls to zero. Under these conditions the sidebands each take a quarter of the power. For example a signal using a 100-watt carrier would have two sidebands, each of 25 watts. This means that it makes very inefficient use of the power, and this can be particularly important when it is necessary to make the best use of the available power to enable the signal to be read even under adverse conditions.

WHAT IS SSB?

To overcome the shortcomings of AM, it is possible to remove some of its constituents to leave only those that make an active contribution. In the first instance it is possible to remove the carrier. It only serves to provide a reference that is used during demodulation and it can easily be supplied in the receiver, thereby saving a large amount of power. It is also possible to remove one of the sidebands. As they are an exact mirror image of each other, there is no need to transmit both of them. By removing one there is an immediate 50% saving in spectrum as shown in **Fig 3**.

Technically there is no difference between either sideband, but from an operational viewpoint it is necessary to have a convention to which everyone adheres. Professional users have adopted the upper sideband (USB) in all cases, but radio amateurs use the upper sideband on bands above 10MHz, and lower sideband (LSB) on frequencies below this. Thus LSB is used in the 1.8, 3.5 and 7MHz bands, whereas USB is used on all other bands.

FIG 1 © RADCOM 129

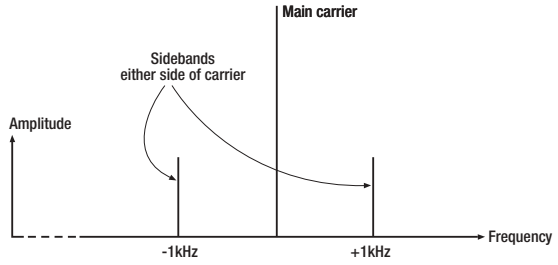


FIG 2 © RADCOM 130

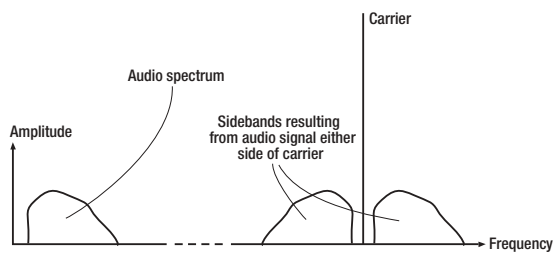
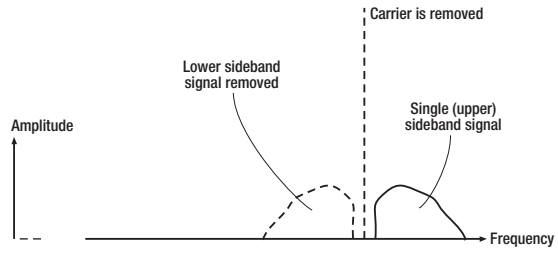


FIG 3 © RADCOM 131



ADVANTAGES OF SSB

The advantages of more efficient use of the available transmitted power and the better use of the spectrum have already been mentioned. These are not the only advantages, though, as there are also other improvements that can be gained by using SSB.

There is an overall improvement of 9dB when compared with an amplitude modulated signal. 6dB of this improvement comes from the fact that the transmitted signal does not contain the carrier, but only the sidebands that contain the information to be transmitted. A further 3dB comes from the fact that the receiver bandwidth can be halved. The 9dB gain corresponds to an eight-fold increase in power that would be required for an amplitude modulated signal to pack the same punch.

The fact that the SSB signal occupies half the bandwidth of an AM signal means that more people can use the same amount of spectrum. With ever-increasing numbers of signals on the bands this is a very important consideration.

RESOLVING SSB

In order to be able to regenerate the correct audio the receiver needs to be able to reinsert the carrier. To do this a circuit called a beat frequency oscilla-

sideband

tor (BFO) is needed. Sometimes this circuit also goes by the name of carrier insertion oscillator (CIO). Whatever it is called it is exactly the same circuit.

When receiving SSB the position of the BFO is quite critical. If its frequency is placed too close to the signal the audio will sound too low, and conversely if it is too far away then the signal will sound too high. A shift of 1kHz in the BFO frequency will change the pitch of the audio by 1kHz and make it unintelligible, so tuning an SSB signal has to be done fairly carefully.

When resolving SSB, the best performance is obtained when the SSB signal is tuned to the centre of the passband of the receiver as shown in Fig 3. Then the BFO is adjusted to one side or the other depending upon whether the signal is USB or LSB. This is normally done automatically within the radio by selecting either USB or LSB on the mode selector switch. This means that with the BFO fixed at the optimum position the receiver itself has to be tuned to give the correct pitch for the incoming signal. When the signal is heard at the correct audio pitch it means that the signal is correctly tuned in.

GENERATING SSB

There are several methods of generating an SSB signal. The most popular is the filter method in which a double sideband suppressed carrier signal is generated from which one of the sidebands is removed by filtering.

A typical sideband generator is shown in **Fig 4**. Here it can be seen that the audio and the fixed frequency carrier are applied to a balanced mixer. This is a form of mixer in which only the signals generated by the mixing action are present at the output, and not those entering. This means that the signal generated is a double sideband suppressed carrier signal consisting of only the two sidebands.

Once the double sideband signal has been generated, it is then passed through a narrow band filter. This allows through only the required sideband and rejects the other. As the carrier is on a fixed frequency, a high performance filter can be used to give the required level of sideband suppression. The filter will also provide some additional carrier suppression, as it is never possible to remove completely the carrier in the balanced mixer.

Once the SSB signal has been generated, it needs to be converted to the required frequency. This is accomplished using normal frequency conversion techniques. Typically these days a frequency synthesiser will be used to provide a stable variable frequency oscillator.

FIG 4 © RADCOM 132

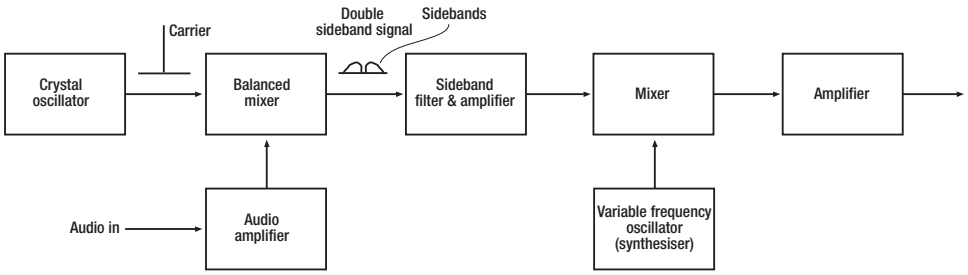


Fig 4
Generating single sideband using the filter method.

FIG 5 © RADCOM 133

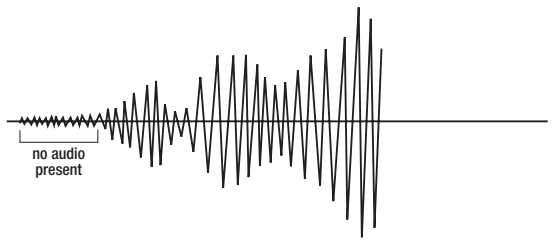


Fig 5
Envelope voltage waveform for an SSB transmission.

POWER MEASUREMENT

Power measurement for an SSB transmission is somewhat more difficult than it is for most other modes. Transmissions such as Morse or FM are essentially constant in their amplitude and their level can be measured using a simple power meter. This is not the case for SSB. Here the output level varies in line with the instantaneous audio input level. This means that a different approach is needed and what is termed the peak envelope power (PEP) is used.

The peak envelope power of a transmission is the *average power supplied to the antenna transmission line by a transmitter during one RF cycle* at the crest or peak of the modulating envelope.

Fig 5 shows a typical envelope voltage waveform for an SSB transmission. When a single sideband signal is viewed on an oscilloscope, the voltage envelope is seen as shown in Fig 5. When no audio is present there is virtually no output, and as audio is applied, the output rises. Using the peak envelope voltage it is possible to calculate the peak envelope power.

Power is normally calculated from the following:

Power = V x I = V^2 / R

Since the calculation of the peak envelope power needs the average over a cycle, the peak envelope voltage is multiplied by 0.707 to obtain the RMS (root mean squared) value. In this way the peak envelope power is obtained:

Peak envelope power = (Peak envelope voltage x 0.707)^2 / R

It is easier to measure the power in this way because measuring both voltage and current simultaneously is more difficult. By running the transmitter into a known load only one measurement is needed.

SPEECH PROCESSING

The output power of an SSB transmitter is obviously limited by the output capability of the transmitter. However, speech contains a very high level of peaks but the *average* power is comparatively low. Therefore the average power of an SSB signal would be low, and the utilisation of the capabilities of the mode would be poor.

To improve this situation it is necessary to ensure that the best use is made of the available power capability. This can be achieved by improving the average to peak ratio of the incoming audio, and by lowering the content of the audio that does not contribute to the intelligibility of the speech.

Various techniques such as compression (where the gain of an amplifier is reduced as the input level increases), clipping (where the transient peaks in the speech waveform are removed), and filtering and frequency tailoring (where out-of-band frequencies are removed and the intensity of in-band frequencies is altered to give the maximum intelligibility) are used. By adopting these techniques, gains of around 5 - 10dB can be achieved. As such, speech processing is employed in almost all modern transceivers.

SUMMARY

SSB is widely used on the HF bands where it is the most efficient mode in widespread use. It is likely to remain in its position of dominance for many years to come, although with the digital revolution it is likely that new digital forms of communications will start to become used more widely. ♦

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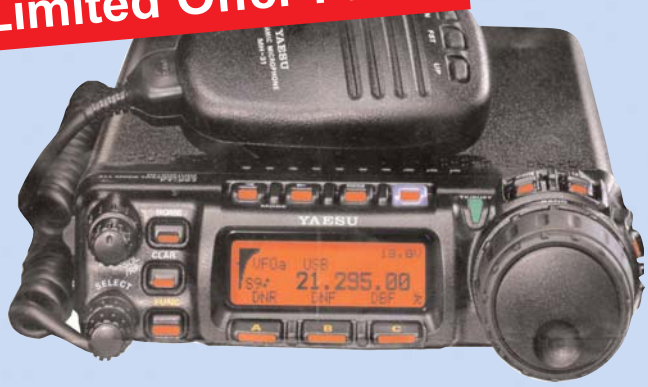

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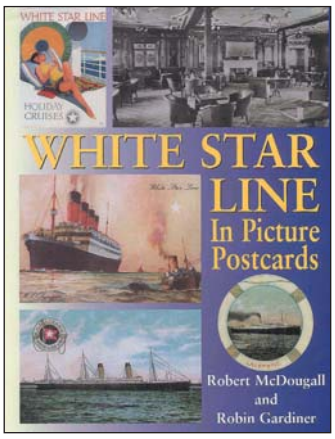
Book review

As a change from purely radio-related books, this month we feature a selection of three books connected by the theme of the Titanic. All three are available from RSGB Sales.



WHITE STAR LINE IN PICTURE POSTCARDS
by Robert McDougall and Robin Gardiner
Reviewed by RSGB Staff

White Star Line in Picture Postcards contains the images from over 200 postcards from the collection of Robert McDougall, supplemented by captions and text by Robin Gardiner, detailing the history of the White Star Line and its fleet.

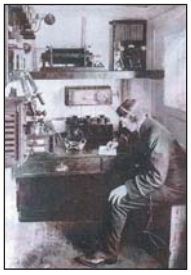
Although *Titanic* was undoubtedly White Star's best-known liner, she was but one of many vessels operated by the company. *Titanic*'s sister ships, the *Britannic* and the *Olympic*, were joined by several hundred other vessels which the company owned, chartered or loaded, ranging from the prestigious liners to tenders and tugs.

In its later years, the company adopted names ending in 'ic' for its vessels, making them instantly identifiable to all who knew the North Atlantic routes. The last wholly-new White Star Line vessel, the third to bear the name *Britannic*, entered service as late as 1930 and survived until 1960 as the last member of the line.

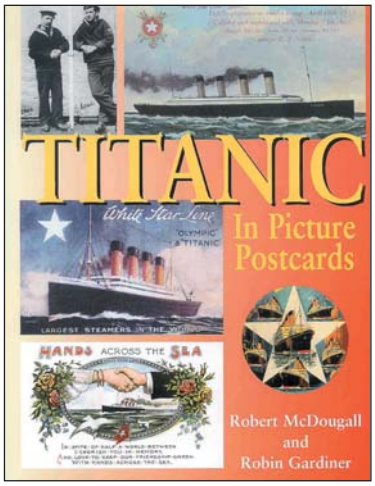
Dating far back into the 19th century, the White Star Line survived as a separate entity until its merger with Cunard in 1930.

It is fortunate for us that shipping companies, and White Star in particular, saw the potential of the picture postcard for marketing purposes, thus making the contents of this book both attractive and informative. Those even remotely interested in sea travel in the 19th and 20th centuries will find this book engrossing.

White Star Line in Picture Postcards
Ian Allan Publishing
Hard back 215 x 252mm, 128 pages
ISBN 0-7110-2986-5
Members' price £14.99 (non-members £19.99) plus p&p
Available from the RSGB Shop.



The wireless room of a 1912 liner.



TITANIC IN PICTURE POSTCARDS
by Robert McDougall and Robin Gardiner
Reviewed by RSGB Staff

A sister book to that reviewed above, this one concentrates on the *Titanic* alone, and her short, but eventful, life. Foundering during her maiden voyage, she was certainly not the only ship to sink during the last 100 years. She may be the most famous, however, her collision with the iceberg, her gradual sinking, the part played by the ship's orchestra and, from our point of view, the contribution of the ship's radio officer, Jack Phillips, continue to fuel speculation to this day. From the radio perspective, it is interesting to note that the book contains a photograph of Marconi, the caption saying that he "is erroneously credited with inventing wireless". The authors do not tell us who *did* invent it!

Before, during and after the loss of the *Titanic*, the liner was thrust into the public gaze by a massive production of photographs, both official and unofficial. Some really do portray the ship herself, but others show her sister ships, *Olympic* and *Britannic*, in disguise.

As the book's fly-leaf suggests, the book is "a remarkable testament to perhaps the most famous liner ever to sail the Atlantic".

Titanic in Picture Postcards
Ian Allan Publishing
Hard back 215 x 252mm, 128 pages
ISBN 0-7110-2896-6
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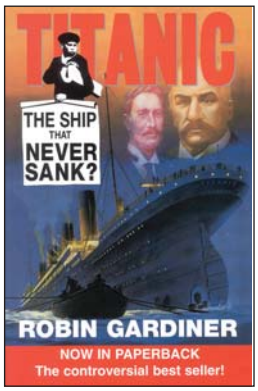

TITANIC - THE SHIP THAT NEVER SANK?
by Robin Gardiner
Reviewed by RSGB Staff

This is an unusual book which will certainly appeal to those who enjoy a good conspiracy theory! This particular theory goes as follows. While the *Titanic* was in the Harland and Wolff shipyard in Belfast nearing completion, her sister ship, the *Olympic*, was in collision with a Royal Navy vessel. The *Olympic* was taken to the same dockyard for repairs, but it quickly became apparent that she could not be repaired economically. The Royal Navy was exonerated for the collision and the owners of the *Olympic* faced an expensive loss. A decision was taken to swap identities with the *Titanic*, so that the *Titanic* could complete the *Olympic's* outstanding bookings.

Meanwhile, the original *Olympic*, now renamed the *Titanic*, was speedily patched up and it was this ship that so fatefully sailed on that day in 1912. However, that is by no means the end of the story. Knowing that the *Olympic* could never be satisfactorily restored, it is alleged that the owners planned an insurance scam. The *Olympic/Titanic* would be involved in a fake collision at sea, sunk in mid-ocean, and they would collect the insurance money. However, not wishing to murder over 1500 souls, two ships were to be standing by in order to rescue all the passengers before the *Olympic/Titanic* could sink. Unfortunately this bold plan went disastrously wrong when, steaming towards the rendezvous for the fake collision, the *Olympic/Titanic* was involved in a very real collision as it rammed one of the rescue ships (not an iceberg) - and the rest is history.

To find out precisely how all this happened, you will have to read *Titanic - the Ship that Never Sank?* Whether or not you believe this story, the well-written narrative provides a compelling argument and this book is never anything but a fascinating read.

Titanic - The Ship That Never Sank?
Ian Allan Publishing
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By Pat Hawker, G3VA

37 Dovercourt Road, London SE22 8SS.

TT

Pat describes the popular pastime of refurbishing old equipment, before returning to the subjects of surface-wave propagation, small transmitting loops and the venerable HRO.

REFUSE-BIN? REPAIR? RESTORE? REBUILD?

Most amateurs, even newcomers graduating from SWLs, soon 'trade-up' and discard their early equipment. Sometimes this is because it has developed a fault, does not cover the desired bands, or has long passed its 'sell-' and 'use-by' dates, or even from a yearning to have 'this year's model'.

All this engendered or enlarged a relatively new branch of the hobby - the desire to collect, display or use 'historic' equipment in re-created stations of yesteryear. This is a world-wide phenomenon: the January, 2004 *QST* has full-length articles on 'Restoring a Homebrew Transmitter' - subtitled 'Restore Your Faith in the Hardware of Amateur Radio's Rich Past' and 'The Incredible Saga of a DX-100 Restoration Run Amok', subtitled 'How W0DZ learned to Stop SSBing and Love AM phone'. The July 2003 issue in the regular column on 'Old Radio' featured the RS-6/RS-6A cold-war/Korean-war spy radio and, in the past few years, has included articles on Hallicrafters and Collins history and equipment.

Some collectors seek amateur or military equipment that appears unmodified, at least as far as outside appearance is concerned for display purposes only. Others seek to repair faulty receivers to put them in fair working order, if necessary using later components, but without changing their external appearance; others seek to restore equipment to its full specification; yet others are prepared to rebuild equipment to a new specification, including modifications to make it suitable for SSB etc. Finally, there are still others who seek to purchase 'surplus' high-cost, relatively modern, professional receivers, that originally bore price tags far beyond the usual amateur budget – despite warnings by John Wilson in *SWM* to think about the problems of repairing such receivers when the inevitable fault finally arises.

Old valve receivers and transmitters can often be repaired or restored by amateurs equipped only with a multimeter, a soldering iron, a few hand tools and a signal source (preferably, but not necessarily, a professional signal generator). Even a simple signal-injector probe can quickly locate a faulty stage. The dual-frequency signal injector shown in **Fig 1** provides AF or modulated RF harmonic signals up to about 100MHz. A hex-CMOS device uses three inverters to provide oscillation at about 300Hz and 700kHz, as described in *Electronics Australia* in 1980 and noted in 'TT' August 1980, together with full constructional details of a basically similar unit by G4BXK designed to fit into an aluminium cigar tube together with its power supply provided by four 1.5V hearing-aid cells housed in a section of plastic garden-hosepipe.

Documentation is usually available or obtainable. Circuit diagrams (usually a vital requirement) were almost invariably included in the maker's operating instruction manuals and in the reviews published in the amateur journals; details of much wartime military equipment are included, for example, in the books *Wireless for the Warrior*, compiled by Louis Meulstee (published by *Radio Bygones).* A forthcoming publication in this series will cover the majority of clandestine radios, including most of those used by MI6 and SOE.

Valve data, including base diagrams, for American types were included in the ARRL *Radio Amateur's Handbook*, at least up to the mid-1960s. European valve manufacturers issued pocket data books including 'equivalent' and 'suggested replacement' types. My own reasonably-extensive sources of valve data were augmented a few years ago by a gift from John Roscoe, G4QK, including the 1946 edition of *Radio Tube Vade-Mecum*, by P H Brans, together with RCA manuals etc.

'New Old Stock' valves for both receivers and transmitters are still available for most post-1940 equipment. Suitable components (including improved types) are usually available, although high-voltage and high-wattage types, wound components, including power and IF transformers can be a problem. Replacing defective rotary wave-change switches can require a skill beyond that of many of us without professional experience, and should not be tackled lightly. In some cases, it may be necessary to cannibalise two identical faulty sets to make one good unit.

COMMON FAULTS IN OLD COMPONENTS

What are the most common faults? With use, valve heaters gradually lose emission, resulting in change of characteristics and eventually in unsatisfactory or no performance. However, normally, valves do not deteriorate appreciably during storage over years of non-use. Sixty-year-old valves such as the once-popular metal octals can still give good service. But not all valve-manufacturers achieved the same degree of reliability. Generally, valves with two or more structures (triode-hexode, triode-pentode, twin-triode, etc) are more subject to failure than single structure valves. Internal short-circuits, including cathode-heater leakage can be a problem. Abuse of power valves (excessive anode voltage/current etc) can result in ionisation or inter-electrode shorts.

Valves are intended as replaceable plug-in devices – normally beneficial when re-activating an old set, but a second-hand 'bargain' can present

FIG 1 © RADCOM 126

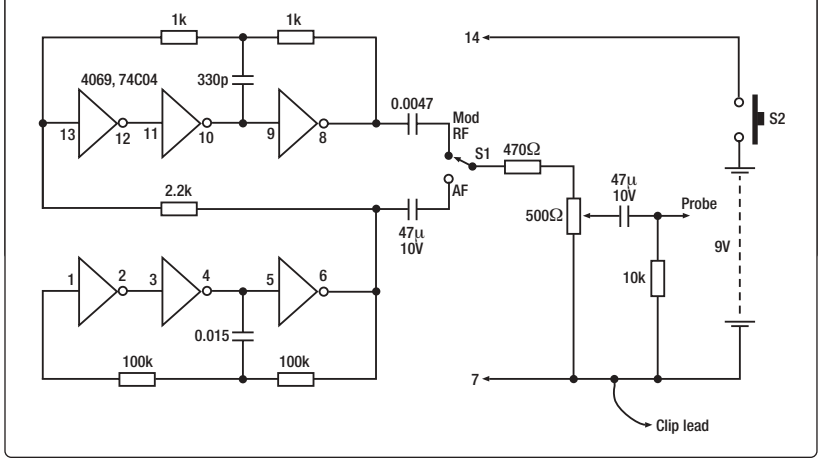


Fig 1
Dual-frequency signal injector providing AF or modulated RF harmonic signals up to about 100MHz.

the problem that the wrong types may have been inserted to cover up missing valves. Identification marks on old, used valves tend to disappear (sometimes readable by blowing gently on the valve envelope).

Old receivers often used rubber-insulated twin-flex to wire up heaters, dial-lamps etc. Rubber perishes, then crumbles away if touched or moved and replacement of all rubber-insulated wiring is often necessary. Insulation of old-style waxed paper fixed capacitors tends to degrade to a few hundred-thousand ohms and when used, for example, as screen-bypass capacitors can significantly lower the screen voltage. Composition resistors, particularly those subject to long-term direct-current, tend to increase resistance to a value that may greatly affect the performance of a receiver.

High-voltage electrolytic capacitors are among the most unreliable components. Unlike other capacitors they *always* pass leakage currents. For example, even a new 16µF capacitor at 450V can be expected to show a leakage current of at least 1mA, and this will increase significantly as the condition of the component worsens with age. It should be clearly recognised that electrolytics deteriorate fairly rapidly when not in use. After being out of use for a year or more (or less in tropical climates) they need to be 'reformed', otherwise they may fail completely when the rated high voltage is applied. To reform a capacitor, a reduced voltage should be initially applied and then gradually increased over a period of 30 minutes or so, by which time the leakage current should have reduced to a reasonable figure. If leakage remains high, the unit needs to be replaced; a high leakage current will heat up the capacitor to an extent where it will fail completely – possibly even explode. Experience tells me this can happen!

Joints, sockets and switches can all give problems (even on modern equipment) though often curable with cleaning fluids or chemical aids specifically designed both to clean and lubricate the contacts. Noisy potentiometer tracks can often be cured by forcing a suitable lubricant (eg Electrolube) through the gap in the C-clip or by means of the spindle, without dismantling the component. If a non-lubricating cleaning-fluid is used, a *little* Vaseline should afterwards be applied sparingly.

A fairly common fault is failure of the power transformer. This may have burnt-out due to short-circuiting of turns, etc. The purist may be able to get the original core rewound or (with difficulty) find a replacement that fits. A bodge is to remove the original transformer and feed the receiver from an external PSU – less elegant, but it will put an old receiver back into service! Be careful when replacing a dud rectifier valve with silicon diodes; this not only removes the warm-up period but instantly puts an extra 15V or so more across the electrolytics and the HT+ bus.

Formerly, wound components such as transformers and chokes, when operating at a positive potential with respect to the core or other windings, were vulnerable to moisture ingress that could result in electrolytic action. This could remove copper around any 'pin-holes' in the enamel insulation, resulting in corrosion and eventually an open-circuited winding, a phenomenon known as 'green spot' corrosion (from the green spot at the point of the break). Experience, however, suggests that short- rather than open-circuited windings are more common in power transformers – often leading to smoke pouring out of the transformer and, if not detected, possibly to fire.

Old-style compression trimmer capacitors can shift in time and partial re-alignment may be required. When dealing with receivers having readily accessible air-cored inductors, a useful checking aid is a 'tuning wand'. This may consist of an insulated rod some 6in long and 0.25in diameter, having a dust-iron or ferrite rod attached to one end and a piece of brass rod attached to the other end. Then inserting the iron-dust end into the inductor increases its inductance; inserting the brass end decreases the inductance. Alignment can thus be checked without touching the trimmers.

Peter Chadwick, G3RZP, whose rebuilt HRO has been mentioned in 'TT' (February 2002 & January 2004) writes: "One point applicable to more equipment than just old HROs is resistor drift. In 2002 I opened up a nice hermetically-sealed plastic pack containing a NATO stock-numbered 4700Ω 5%, 0.25W carbon resistors, packed in 1964. It had never been used, but it measured 17% high in resistance. Oddly enough, an ex-HRO resistor of 50kΩ 10% (the 0.25W type with longitudinal grooves) of much age and use, was only 15% high. I suspect the moral here is that many of the smaller carbon resistors in one's stock should probably be thrown out, and would also explain why quite a bit of older gear tends to be working 'not quite but nearly' to specification. I also noticed that some of the HRO moulded mica fixed padder capacitors were a problem – a supposed 930pF one varied between 500 and 930pF depending on how hard you squeezed the case! However, a 1nF moulded mica from the HRO BFO circuit measured as perfectly good and only about 20pF low, and apparently had not drifted much. So older equipment may well need more than just the electrolytic and paper capacitors changing if it is to be restored electrically to its former glory.

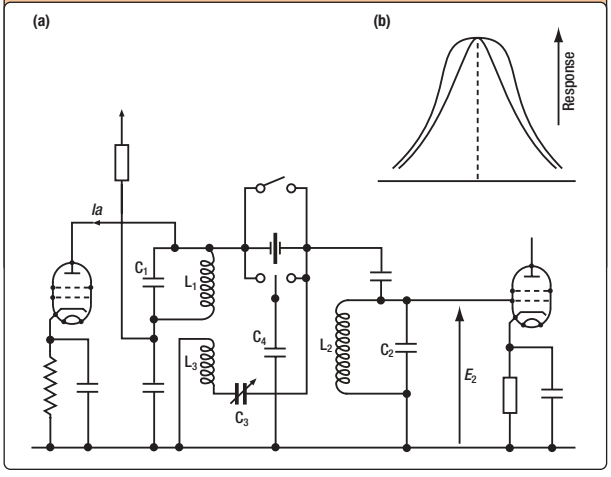
"Another year I got an Eddystone 888A receiver [1960s] that needed some restoration work. One interesting problem was very poor oscillator stability on 21MHz; this proved to be due to a dry joint from original manufacture that had eventually had dirt and corrosion build-up in sufficient quantities to cause trouble. Clearly, quality control and inspection during production is not always what one would hope for. However, having got the 888A working, I was quite impressed with its performance – a few leaky capacitors on the AGC line needed changing, and quite possibly some resistors might have benefited from replacing. An additional (semiconductor) diode in the crystal calibrator produced calibration pips up to 30MHz, an improvement on the original calibrator.

"I fitted a product detector in the HRO rebuild [see 'TT' January 2004]. Because the diode detectors used for AM need a lot of input volts to minimise distortion, it is quite easy to use a pentode as a product detector and BFO [see Fig 6 and text on page 46 of the January 2004 'TT']."

A rebuild for operational use rather than 'historical display' can incorporate extra facilities: regeneration applied to signal-frequency, IF or 2nd detector stages, addition of a crystal- or mechanical-filter, etc. It is often possible to add an extra winding to old-style IF transformers, and this may, for example, prove easier to implement than to find the centre-tapped IF transformer used in most single-crystal 455 or 465kHz IF filters. **Fig 2** shows a single-crystal filter that can be implemented without a centre-tapped IF transformer providing two bandwidths with minimum difference in signal attenuation. If C4 is made a part of the total tuning capacitance of one of the side circuits in the resonant condition, switching it over to the other tuned circuit detunes the side circuits above and below their resonant value by equal amounts. It was shown by the Marconi team in 1946 that, with C4=7.6pF, the original bandwidth of 1710Hz is reduced to 500Hz, although the gain changes only from 37dB to 36.5dB.

Fig 2
Single-crystal filter that can be implemented without a centre-tapped IF transformer, providing two bandwidths with minimum difference in signal attenuation.

FIG 2 © RADCOM 127



WASH AND BRUSH UP

Even when old equipment is required for display only, it is clearly desirable that its appearance should be made as presentable as possible. Many years ago, I noted in 'TT' and most editions of *Amateur Radio Techniques* (RSGB, out-of-print)) some advice by W1FSN that originally appeared in one of a series of National advertisements.

For cleaning smooth, grey [metal] cabinets, W1FSN recommended the use of a good wax polish, eg Johnson No 100 [Topps silicone furniture cream or antistatic non-abrasive instrument cleaners are also excellent] using soft cloths, free from grit and avoiding undue pressure on any aluminium speaker grilles. He pointed out that, although plastic dial windows were usually treated at the factory with anti-static compound, this wears off so that dust and lint tend to cling to the windows if these become electrically charged, for example from polishing. These particles can be removed by breathing on the window and wiping with a slightly dampened very soft cloth. Cleaning fluids and abrasives can permanently fog or scratch the plastic. Abrasive cleaners should not be used on etched nameplates and calibration charts, etc. All solvents such as paint thinner, lighter fluid and turpentine should be kept well away from receivers.

For models in wrinkled enamel cabinets (eg HRO) he suggested that cabinets should be removed and scrubbed with soap and warm water, using a fairly stiff brush. Then the cabinets should be rinsed thoroughly with clean hot water and dried behind a stove or in the sun. A coat of wax can then be added and rubbed up with a soft shoe-polishing brush. W1FSN advised against using rags on wrinkle surfaces, since these will be torn, leaving quantities of lint.

For dusting chassis and components, he recommended the use of a small paint brush, which can also be used for occasional dusting of a front panel and the control knobs. At the time, he recommended that, should dust fail to yield to dry brushing, the brush could be dipped in carbon tetrachloride (eg Thawpit), but that this should not be used until all loose dirt has been brushed off. Since W1FSN gave his advice, the toxic nature of carbon tetrachloride has been more fully recognised and this chemical is now banned in the UK – there are, however, less-toxic 'dry-cleaning fluids' available.

'TT' November 2003, in an item on the care and maintenance of linear amplifiers, suggested *inter alia* "use a vacuum cleaner to clean not only the amplifier, but also the surrounding areas." While this is sound enough advice when dealing with valve-type amplifiers and equipment, Colin Coker, G4FCN, writes: "In respect of vacuuming out the dust and rubbish, it should be borne in mind that a plastic vacuum cleaner nozzle can generate very high levels of static electricity due to the air flow over the plastic and can mean instant death to sensitive components (as I have found to my cost on a computer motherboard). Ensure that a properly-earthed conductive nozzle is used on the vacuum cleaner before going anywhere near equipment [containing solid-state devices]."

A common problem with old equipment brought out of a less-than-ideal store is corrosion of the steel chassis, etc. Rust can be removed by careful application of fine-grain sand- or emery-paper but, unless the chassis has been stripped of components, care should be taken to remove all the fine metallic particles that could otherwise cause faults.

SURFACE-WAVE/GROUND-WAVE PROPAGATION

The February 'TT' item 'HF Surface-Wave OTH radars?' reporting Dr R W P King's suggestion that 28MHz surface-wave radars would provide better detection of small low-flying aircraft and small boats carrying drugs into the USA across the Gulf of Mexico than the existing HF sky-wave OTH radars, has brought informed comment from Peter Martinez, G3PLX, and Alan Boswell, G3NOQ. Both emphasise that surface-wave propagation is the same mode as ground-wave propagation, as used for AM MF/LW broadcasting and by amateurs for local contacts on HF – and that HF surface-wave radar is now quite widely used at coastal sites in the UK. My own feeling is that the term 'surface-wave' is more appropriate where, as for sea-paths or UHF transmission lines, propagation is in a boundary between a good conductor and air; 'ground-wave', where the path is across land, where the earth conductivity at the frequency concerned may be relative low, and where the antenna's VRP at 0° will be limited.

G3PLX clearly feels that I misled readers. He writes: "Pat Hawker suggests that 'surface-wave propagation is seldom discussed in amateur radio and goes on to describe HF 'surface wave' radar as a new idea [I would deny that I called this type of coastal radar a 'new idea' – what was new was Dr King's suggestion of using it for a particular application in the Gulf of Mexico – *G3VA*]. We, as amateurs, have known this phenomenon for decades under another name. It is no more than what we know as 'ground wave' on the LF bands. This is the same propagation mode that results in long- and medium-wave broadcasts being audible beyond line-of-sight [in daylight] and is the same mode used for local and mobile working on the 1.8MHz band. The signal hugs the curvature of the earth as result of the wave-front being bent slightly downwards by its interaction with the surface losses. The effect diminishes as you go higher up in frequency, but it is much more pronounced over a sea path than over a land path. For example, a 100km sea path will give useful surface-wave propagation at frequencies up to 15 times higher than a 100km land path. We may not be aware of this mode on the lower HF bands because the sky wave is often present at the same time, but a radar system would be able to separate the two because of the range difference. One such system was tested a few years ago in the approaches to the Thames estuary. It operated on a single frequency in the low HF range with a bandwidth of 15kHz and a transmitter power of just 36 watts."

Alan Boswell, G3NOQ, writes: "I was interested to see your coverage of Dr King's review of HF surface-wave radar. The amazing Prof King is now 98 and I have found it difficult over the years to prepare any technical article for publication without one or more references to something he has published... As you say, HF radar is well established and examples of the surface-wave and sky wave varieties have been in operation for many years. The 'Woodpecker' of the 1980s gave HF radar a bad name, but there are many installations around the world which happily co-exist with other HF users. I enclose a copy of recent paper by David Emery of AMS, presented at the IEE HF Conference at Bath University, June 2003: 'The Choice of Operating Frequency in HF Surface-Wave Radar Designs' (IEE Conference Publication No 493). This gives more details of a typical HF surface-wave radar on a coastal site, operating over the sea. David assured me at the Conference that AMS's HF radars use properly-licensed channels, none of which are in the amateur bands, and that their spectral content is very well controlled. His presentation showed an antenna array based on tetrahedral wideband elements covered in 'TT' some time ago. ['Tetrahedral Dipole Antenna', 'TT' September 1997, see also *TT Scrapbook, 1995-99,* pp173/4 or *Antenna Topics,* pp346-348. This patented antenna was invented by Alan Boswell and Barry Peters of the then GEC-Marconi Research Centre – *G3VA*.]

"From the 2003 Conference paper, it is apparent that the propagation mechanism is simply the usual vertically-polarised ground wave as used in LW and MW broadcasting, and is very stable and predictable (ignoring night-time sky waves). Frequencies over 3MHz are usable over the sea's surface for ground-wave propagation because the sea has much higher conductivity than the land; it is called surface-wave just because it seems contradictory to talk about a ground wave over the sea's surface. At around 28MHz, the ground wave works pretty well between places like Clacton and Margate, provided the

antennas are both vertically polarised (as in CB radio)."

The paper notes that "Factors influencing the propagation loss [over a sea path] include sea-state, water temperature and salinity, and atmospheric refractive index. However, none of these determine the loss to the same degree as the operating frequency – for example, at a range of 250km, an increase of over 70dB is suffered when moving from 5MHz up to 20MHz... **Fig 3** shows the approximate total *two-way* propagation loss with range for 5, 10 and 20MHz." For communication purposes, the path losses shown can be halved.

IN BRIEF – SMALL TRANSMITTING LOOPS

Two topics continue to dominate my postbag: small transmitting loops and the performance of pre-war and wartime communications receivers with particular reference to the HRO. Space limitations oblige me to hold over much detailed discussion on small loops, interesting though it is.

However, I must report that, in the matter of loop efficiency and the Chu-Wheeler formulae, both G3LHZ and his professional critics hold firmly to their opposing views as outlined in the February 'TT'. G3LHZ remains determined to do his bit "to repair the unnecessarily-damaged reputation of small antennas" and, with his student Marc Harper, promises "a lot more results that, in due course, will be published. For example, we have performed measurements between a pair of identical loops; this removes any concerns that there may be over reciprocity or field sensor calibration."

Dave Gordon-Smith, G3UUR, joins the 'professionals' in believing that there are flaws in the methodology used by G3LHZ to 'measure' radiation efficiency. He notes that, in monitoring the 3.5MHz net (some 200km distant) in which G3LHZ participates (see 'TT' June 2003, p71), he finds G3LHZ's signals are almost always some 20-30dB lower than those of the other participants.

G0GSF refutes the suggestion that Chu-Wheeler is not supported by *measured* results.

HRO

G4BXD's curious choice of "better than HRO" WWII receivers ('Last Word', February, p97) is, I would suggest, a *reductio ad absurdum*. As far as I am aware, none of those he listed (with the possible exception of the German models) was available in 1939 at the start of WWII. By no stretch of imagination can the Armoured Vehicle WS sets, with their limited frequency coverage, be considered general coverage communications receivers in the same class as the HRO. The RAF R1155, American BC312/348 sets were reasonable enough designs but, *inter alia*, lacked crystal filters; the weighty Admiralty B40/41 was a post-war model. The only British or American models in his list that can be directly compared in performance to the HRO for weak-signal, CW reception in crowded bands by skilled intercept operators are the Marconi CR100 (developed during the war and quite widely used for signals-intelligence purposes) and the CR300 triple-conversion maritime receiver (developed late in the war and marketed post-war). If the German sets were so good, why did they (and Japan, Canada and Australia and probably Marconi in the UK) produce near replicas of the HRO?

There were British Army receivers (R206 and R201) with Bridged-T crystal filters, but not included in G4BXD's list. And some good wartime RAF models.

Alan Gibbs, VK6PG, reports that he is currently restoring an AMR100, the Australian copy of the HRO made by AWA about 1942: "A few months ago, I found a genuine Australian-made 'HRO' together with all the coils. It was lurking inside a garage under a bench, and full of dirt, oil, mouse droppings (including one dead mouse) and straw clippings! After a good clean up and some loving care, the receiver is now in good working order and worthy of restoration."

He adds, *inter alia*, "The AMR100 was built in Sydney by Amalgamated Wireless Australasia, circa 1942/3, for the US Forces in the South Pacific and designated *US Signal Corps SC-CD-136.43*". I understand they were also used by Royal Australian Signals units for interception at strategic locations in Australia and the South Pacific areas along with HROs, AR77s and AR88s." (See the photographs). There were six coil packs covering 0.5 to 24MHz, but these were not interchangeable with the HRO. It was housed in RAAF blue crackle. The main tuning knob was manufactured from pressed steel in Sydney, the four-gang tuning capacitor and worm drive being imported from National in the USA.

Gerald Stancey, G3MCK, draws attention to the excellent 1946 paper by the late Dr G L Grisdale, G5GZ, and R B Armstrong of the Marconi Company 'Tendencies in the Design of the Communication Type of Receiver' (*Journal of the IEE,* Vol 93, Part III, September 1946, pp365-378, with subsequent discussion and reply, pp378-384). This provides an excellent overview of the development of high-performance communications receivers up to the end of WWII. It includes detailed consideration of four British and American receivers designated A, B, C and D. From the details given, these can be clearly identified as – A: CR100; B: HRO; C: CR150, and D: CR300. The advantages and disadvantages of plug-in coil assemblies, turrets and units with ceramic iron-cored formers and rotary wafer switches are discussed. Similarly the use of 'logging scales' together with either calibration charts (HRO) or (approximate) direct calibration as in the CR series. The use of a single-crystal filter with panel control of neutralisation is described as "popular among skilled operators because, with considerable care, a high degree of rejection of a single unwanted interfering signal can be obtained... [but] is now considered inferior to an arrangement in which the crystal is left permanently neutralised and the effective passband of the circuit is altered in a series of finite and symmetrical values. Apart from being more satisfactory to unskilled operators, this arrangement does not call for readjustment as the frequency of the interfering signal changes." Like so many of the later post-war developments, the design aim seems to have been primarily to reduce the need for operating skill rather than to improve basic performance.

Whether or not you are a fan of the HRO or the CR-series, this professional paper by Grisdale and Armstrong is iconic. It is noteworthy that the Marconi team was led by German-born Dr (later Professor) Zepler, who came to the UK in the 1930s and was probably the only person, as pointed out by G3RZP, to have designed radio equipment used by both sides in WWII. ♦

FIG 3 © RADCOM 128

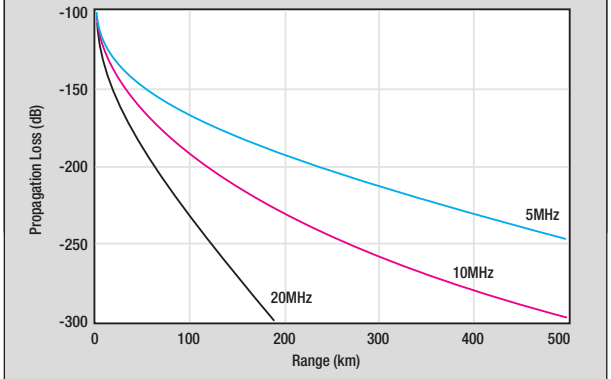
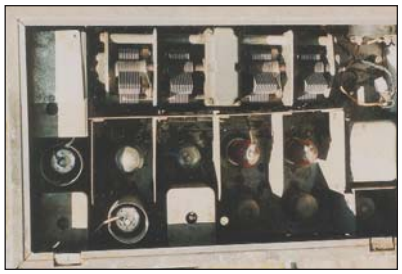


Fig 3 Approximate total two-way propagation loss over a sea-path at 5, 10 and 15MHz. For communication purposes, the losses can be halved.

The 1942-43 Australian AMR100 (US SC-CD-136.43), replicating the HRO, but using glass-octal valves (6U7G, 6J7G etc).



Underside view of the AMR100 currently being restored by VK6PG.

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By Peter Dodd, G3LDO

37 The Ridings, East Preston,
West Sussex BN16 2TW.

E-mail: g3ldo@ukonline.co.uk

Have you ever wondered about the calibration of your S-meter, or wondered how you could estimate the polar diagram of your antenna? G3LDO clarifies things for you.

Antennas

The normal way of checking out the new antenna that you have just bought or constructed is to just fire up the transceiver into it, having first determined that the VSWR is reasonably low. You then spend some time obtaining reports on both transmit and receive, where possible comparing it with some previous or existing antenna. Such methods are affected by fading, nevertheless, over a period of time, you can get quite a good statistical series of S-meter measurements. A more instant method of obtaining an idea of antenna performance is to use a Field Strength Meter (FSM) to make local field strength readings. A FSM can be used to:

- make comparative measurements of various antennas to assess relative gain;
- plot a polar diagram to record antenna directivity;
- enable a transmitter antenna to be tuned for maximum efficiency or gain;
- locate the source and measure the level of radio interference.

THE COMMUNICATIONS RECEIVER AS AN FSM

While it is possible to make or buy a FSM, every radio shack has one in the form of a receiver or transceiver. On the face of it, the modern transceiver should make a good field strength meter. Many are small and portable and convenient to use. In practice, a receiver requires the RF gain to be turned to maximum for the S-meter to function correctly. Under these circumstances, the receiver is very sensitive and a variable attenuator may be necessary for adjusting the signal strengths so that they fall in a useful region of the S-meter range.

Test setup with a signal generator and a calibrated switched attenuator. The IC-737A uses a conventional S-meter while the IC-706 uses the bargraph type. Normally the receivers would be tested separately.

So just what is a useful range? We should not expect different receivers to give the same S-meter reading of a given signal level on a given frequency unless by coincidence. This is because the gain distribution of each receiver stage is different for a specified design and the S-meter is normally activated from the AGC line. Some years ago at least one receiver manufacturer attempted to standardise S-meter readings so that S9 was equivalent to 50µV and the signal level between each S-unit was 6dB, with the scale above S9 calibrated in dB relative to S9. Icom has got quite close to this standard. On the IC-7400, S9 is equivalent to 50µV and the signal level between every S unit is 3dB [1].

None of the S-meter linearity tests that I have made on any of my transceivers, using a signal generator, met this original specification, see the photograph. In general, the signal level between each S-point was around 1.5dB at the low S-point readings increasing to 3dB at the higher readings. In most cases, the dB marks at signal levels over S9 represented a true indication of signal level change. Many transceivers and receivers have S-meters comprising a bargraph indicator, which results in some loss in resolution, particularly noticeable at the high end of the scale. A conventional S-meter is preferred because of the higher resolution when measuring a change in signal strength.

FIG 1 © RADCOM 132

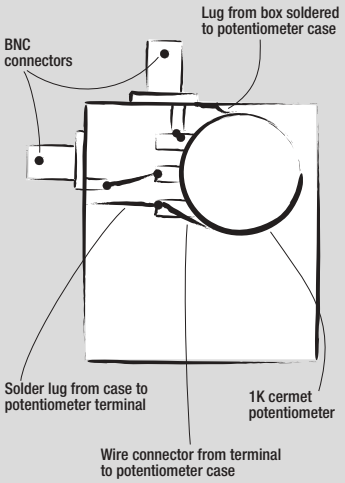


Fig 1
A simple variable attenuator using a 1k cermet potentiometer.

USING THE FSM

If you have installed a beam antenna, the most usual method checking out the beam pattern is to do some field strength tests with another local amateur who provides the test signal. The test is done by noting the S-meter reading when the beam is rotated, with the measurements being noted, with the beam stationary, every 10° or 20°. The transmitter power can be adjusted so that it fits into the most easily-read portion of the S-meter. Note that measurements made at the lower end of the S-meter scale may give an exaggerated idea of directivity for the reasons discussed above. If you do not have a friendly local amateur then the same test can be made using a mobile installation placed in the far field. I have found the test to be a particularly useful way of checking the relative performance of mobile antennas [2].

When performing these tests, you will probably find the receiver FSM is too sensitive with the RF gain at maximum. The answer is to use an attenuator. With a simple potentiometer variable attenuator, see **Fig 1,** you can adjust test transmission levels and FSM sensitivities appropriate to the measurements being performed. Note that the lower part of the S-meter scale is most sensitive to change in signal level. A calibrated step attenuator, shown in the photograph, is much more useful but lack of space precludes its description here. See [3] for full details of its use and many other aspects of antenna parameter measurements.

Note that if you use an attenuator with a transceiver, disconnect the microphone to prevent the attenuator being burned out by an accidental transmission. ♦

REFERENCES

[1] Icom IC-7400 HF/VHF transceiver, reviewed by Peter Hart, G3SJX, *RadCom* October 2002. Note S-meter calibration on page 69.
[2] 'Computer-Modelling the HF Mobile Antenna', Peter Dodd, G3LDO. *The ARRL Antenna Compendium,* Vol 7. (also describes measurements).
[3] *The Antenna Experimenter's Guide*, 2nd ed, Peter Dodd, G3LDO. Note - updates to this book can be found on web.ukonline.co.uk/g3ldo

By Steve White, G3ZVW

c/o RSGB HQ

Whatever next

The next generation of atomic clock is with us. The 'optical clock' is capable of further-increased accuracy ♦ More about photonic crystals, and their future application to computing.

I am grateful to Dick Biddulph, M0CGN, for sending me the January 2004 issue of *Chemistry World* which contains a fascinating feature on the increasing accuracy of atomic clocks.

In 1967, the atomic clock came into being. Based around atoms of caesium, it gives us the ability to measure time to 14 decimal places.

A conventional atomic clock contains a group of heated caesium atoms which, when bombarded by intense microwave radiation of a specific frequency, 'flip' their electron shells 9,192,631,770 times per second. A detector within the clock measures the quantity of caesium atoms that flip their state. When the transmitter is tuned to the correct frequency a peak is measured by the detector, so the system employs a feedback loop and is self-calibrating. All that then has to be done is to divide the frequency of the transmitter by 9,192,631,770 to measure a one second period. However, caesium clocks have inherent inaccuracies because the optimum possible accuracy of measuring the vibration of a single atom of caesium cannot be achieved. Similarly, hot atoms of caesium are flying about at differing angles and speeds, so their susceptibility to the critical frequency of the microwave transmitter is affected by Doppler shift.

Today, the science of horology is undergoing another revolution, the latest generation of atomic clocks being the so-called 'optical clocks'. These measure time by locking the oscillation of a laser beam to changes in the energy level of a single ion of mercury.

In an optical clock, a single ion of mercury (or ytterbium, strontium, indium or calcium) is trapped by a magnetic field and cooled almost to absolute zero (-273°C) by lasers (see **Fig 1**). Once the ion is in its super-chilled state, another laser is tuned to the frequency required to shift the ion's outer electron from one state to another. At this frequency, the ion goes what scientists call 'dark'. So long as the laser is tuned to the correct frequency it will stay dark, but if the frequency drifts off it will 'blink' back on. If this happens the laser is re-tuned to make it go dark again. What then has to be done is divide the laser frequency by a suitable number to give a super-accurate one second period. However, measuring oscillations at something like a quadrillion (10^{15}) Hertz is no mean feat. And then there are the problems that minute changes in gravity have on such a clock – moving it from one floor of a building to another will throw the clock out, as will the action of the tides. Clearly, the construction and setting-up of a laser clock is the stuff of nightmares.

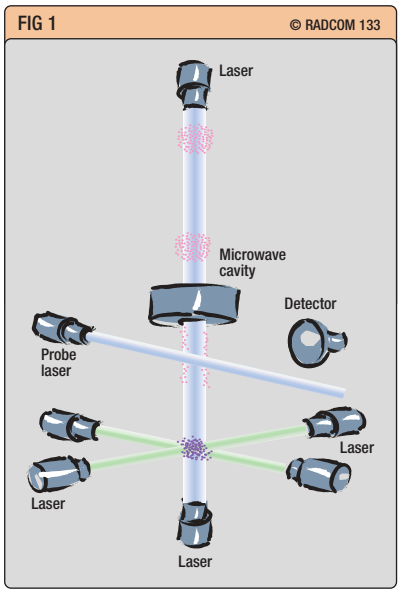


Fig 1
The laser clock works by trapping and super-cooling an ion of mercury, which sits at the point where the laser beams converge.

So what use does the world have for such an accurate clock? Well, many of us know that accurate time-keeping is the key to accurate navigation, so positioning systems are likely to be the first things to benefit. As an example, the *Chemistry World* feature says that employing optical clocks instead of caesium clocks would increase the accuracy of the GPS system from several metres to "a few centimetres at most".

To conclude, if there had been a laser clock on earth 65 million years ago – at the time the dinosaurs were wiped out – it would only be 2ms out today. Indeed, with an accuracy of one second in 30 billion years, if a laser clock had been set running at the dawn of the universe, it would still be well under one second out.

COMPUTING WITHOUT ELECTRONS

In the March column, I wrote about photonic crystals and how they are being used by Shawn Yu Lin, an electrical engineer at Sandia National Laboratories, to produce a different kind of incandescent lamp.

The work that Lin is undertaking is unlike the work that most scientists are conducting on photonic crystals, because before he discovered that they could be used as efficient light emitters they were better understood as steering devices or filters for light. Photonic crystals allow light of certain wavelengths to enter their structure but block others, the size of and spacing between lattice elements corresponding roughly to the wavelength of accepted radiation. Cavities or channels built into a photonic structure can permit the passage of radiation that wouldn't penetrate an unaltered crystal, so researchers can create devices that steer light through the crystal in a controlled manner. Not far off, say the technology's developers, are photonic microcircuits that will be able to process light beams in much the same way that today's microchips process electric currents. Among the many potential advantages of light-based circuits are that they should run faster and consume less power than their electronic counterparts. ♦

WEB SEARCH	
Photonic crystals & light computing	www.sciencenews.org/20031004/bob9.asp

RadCom

April 2004

photo: tomasz dobrowolski, stock.xchng.

INSIDE

By Peter Homer, G4KQU

E-mail: g4kqu@btinternet.com

Simple sound-card-to-radio

Have you ever wanted to try those digital modes that require connecting your computer sound card to your transceiver, but have been put off by the cost of commercial interfaces? Here are three solutions – a fully-isolated interface, a simpler interface without isolation, and an even simpler one for hand-held radios. Use them for RTTY, PSK31, SSTV, CW, MFSK, FeldHell, *EchoLink*, *eQSO*...

Digital communication modes represent one of the fastest-growing areas of interest in amateur radio, with the past decade having seen many developments. Over the past few years, new data modes like MFSK and PSK31 have become popular.

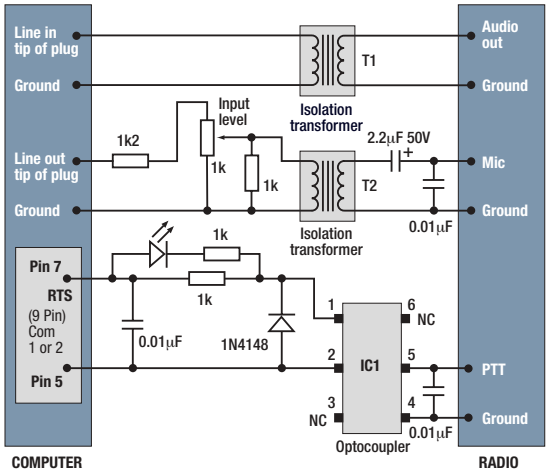
GOING DIGITAL?

For digital transmissions such as RTTY, PSK31, MFSK and others, you need to be able to connect your computer to your transceiver in an effective and consistent way, allowing signal levels between the two to be correctly set. [Much has been said recently about this subject [1, 2], and the reader is encouraged to consult both of these articles if the intention is to build any of these interfaces – *Ed.*]

An interface unit allows transmission and reception of these modes without the expense of purchasing a separate TNC or DSP device. A regular sound card, as found in most of today's computers, can easily handle DSP functions. The interface circuits given here are designed to operate without an external power supply.

Fig 1
The fully-isolated interface circuit.

FIG 1 © RADCOM 122



INTERFACE CIRCUITS

There are various circuits to enable you to build your own interface. I have included here some simple designs that I have built, tested and which work very well, considering their simplicity and economy. They will also perform well if you intend to run an Internet gateway using *eQSO* or *EchoLink* software. Software for these modes is freely available via the Internet, and on my own website (see 'Websearch').

Some PTT techniques make use of the transceiver's VOX circuits - but don't forget to disconnect it or the inevitable computer beep or late night MP3 might create a surprise or two! I have avoided requiring VOX switching here, but many new PCs have no RS-232 port, so I think we are soon going to have to find another way to switch our radios.

Digital modes can have a long transmitter duty cycle. Try to keep your output power to 10 - 20 % of the maximum rated power. Disable all the rig compressors, DSP noise reduction etc.

THE FULLY-ISOLATED INTERFACE

Fig 1 incorporates two 600Ω audio transformers (T1, T2) and an RS-232-driven optocoupler, IC1. Preferably, use an IC socket for IC1,

COMPONENTS FOR Fig 1
Resistors: 3 x 1kΩ
1 x 1.2kΩ 0.25W
1 x 1kΩ linear pot
Capacitors: 1 x 2.2µF 50V
3 x 0.01µF
Transformers: 2 x 600Ω, type 9000 (RS 208-822)
Integrated circuit: 1 x IC1 optocoupler 4N25 (RS 597-289)
Miscellaneous: 1 x red LED (high-sensitivity type)
1 x diode 1N4148
2 x 3.5mm stereo jack plugs
1 x 9-pin D-plug (for RS-232 port) & cover
Screened cable, project box

interface circuits

for possible quick replacement! All components can be obtained from Mode Components (see 'Websearch').

The purpose of the transformers and an optocoupler is to isolate the transceiver from the computer, keeping the interference from the PC to a minimum. Ensure that the screening on the radio and the screening on the PC are not connected together.

Stereo 3.5 mm plugs connect the line in and out on the computer soundcard. Use the tip and earth only because, in this application, the sleeve is not used.

To control the radio PTT, an isolated signal from the computer's RS-232 RTS line is used. If you have an available DB-9 connector on your computer, RTS is pin 7, and ground is pin 5. If you have a DB-25 connector, RTS is pin 4, and ground is pin 7. [Remember to configure your software to use the RTS pin for PTT – *Ed.*]

To control the audio going to the microphone input on the transceiver, a 1kΩ potentiometer varies the input to T2, and is adjusted for correct audio drive to the radio, converting line signals (0.5V) to microphone (10mV) levels. The value of the 1.2kΩ resistor (connected to 'line out') can be changed if you are troubled by the pot always being at the bottom or top of the range or, alternatively, by adjusting the computer's 'audio out' slider [1] until the correct level is achieved.

Operationally, audio levels are adjusted by the computer level controls or may be incorporated in the software you will be using.

The LED (high-sensitivity type) is used as an indicator when the interface is in the transmit mode.

It is suggested that the finished interface is put in a metal box and that the grounding is taken from the *radio* side of the circuit.

SIMPLE INTERFACE

This circuit (**Fig 2**) is very similar to Fig 1 except it does not use audio transformers or the optocoupler, but performs splendidly.

In this circuit the computer RTS drives an open-collector transistor for the PTT. You can use any general npn transistor instead of a BC108.

SIMPLE INTERFACE FOR HANDHELD RADIOS

A handheld's microphone and PTT are normally combined, hence the circuit of **Fig 3** was designed.

Audio levels can be adjusted only by the computer's level control. Stereo 3.5 mm plugs connect the 'line in' and 'line out' sockets on the computer sound card. Use the tip and earth only as, in this application, the sleeve is not used. ♦

Fig 2
Interface having the same electrical performance as Fig 1, but without isolating transformers and optocoupler.

Fig 3
Interface circuit for use with hand-held transceivers where the microphone and PTT connections are joined.

FIG 2 © RADCOM 123

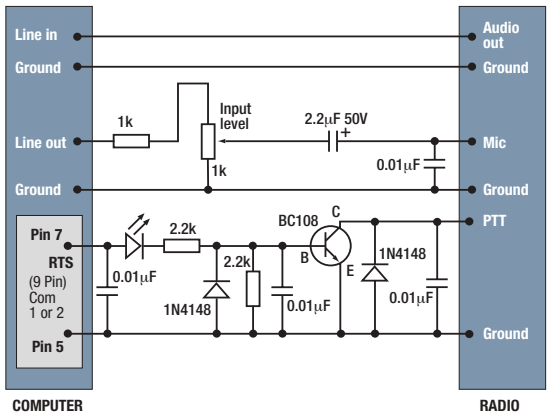
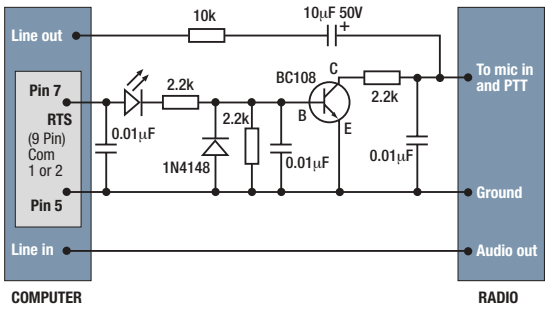


FIG 3 © RADCOM 124



WEB SEARCH

My website	http://www.g4kqu.co.uk
EchoLink	http://www.echolink.org
eQSO	http://www.eqso.org
Mode Components	http://www.modecomponents.co.uk

REFERENCES

[1] 'In Practice', *RadCom* January 2004, pp59/60.
[2] 'A Useful Audio Level Indicator', R G Dancy, G3JRD, *RadCom*, March 2004, p49.

COMPONENTS FOR Fig 2

Resistors: 1 x 1kΩ
2 x 2.2kΩ 0.25W
1 x 1kΩ linear pot
Capacitors: 1 x 2.2µF 50V
4 x 0.01µF
Miscellaneous: 1 x red LED (high-sensitivity type)
- 2 x diode 1N4148
2 x 3.5mm stereo jack plugs
1 x BC108 transistor
1 x 9-pin D-plug (for RS-232 port) & cover
Screened cable, project box

COMPONENTS FOR Fig 3

Resistors: 3 x 2.2k
1 x 10kΩ 0.25W
Capacitors:1 x 10µF 50V
3 x 0.01µF
Miscellaneous: 1 x red LED
1 x diode 1N4148
2 x 3.5mm stereo plugs
1 x BC108 transistor
1 x 9-pin D-plug (for RS-232 port) & cover
Screened cable - project box

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BAHF-4 FREQ:10-15-20-40 Mtrs LENGTH: 1.70m HEIGHT: 1.20m POWER: 300 Watts **£159.95**

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HF YAGI

HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts **£399.95**

ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM
FREQ:10-15-20 Mtrs GAIN:8 dBd
BOOM:4.42m LONGEST ELE:8.46m
POWER:2000 Watts **£329.95**

ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m
POWER:2000 Watts **£599.95**
40 Mtr RADIAL KIT FOR ABOVE **£99.00**

HF VERTICALS

VR3000 3 BAND VERTICAL
FREQ: 10-15-20 Mtrs
GAIN: 3.5dBi HEIGHT: 3.80m POWER: 2000 Watts (without radials)
POWER: 500 Watts (with optional radials) **£99.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**

VR5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 4.00m RADIAL LENGTH: 2.30m (included). POWER: 500 Watts **£189.95**

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN: 3.5dBi HEIGHT: 6.50m
POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials) **£119.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**
OPTIONAL 40mtr radial kit **£14.95**

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials) **£169.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**
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MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts **£44.95**
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(MTD-5 is a crossed di-pole with 4 legs)

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30mtr RG58 PL259 to PL259 lead **£14.95**

MILITARY SPECIFICATION LEADS
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10mtr RG58 Mil spec PL259 to PL259 lead **£10.95**
30mtr RG58 Mil spec PL259 to PL259 lead **£24.95**
1mtr RG213 Mil spec PL259 to PL259 lead **£4.95**
10mtr RG213 Mil spec PL259 to PL259 lead **£14.95**
30mtr RG213 Mil spec PL259 to PL259 lead **£29.95**
(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

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6mtrs through to 80mtrs.
Change band by using a simple fly lead and socket at the base coil and fine tune with the adjustable telescopic whip.
Standard 3/8 thread 1.65mtrs fully extended.

Reviewed by Chris Lorek, G4HCL

PO Box 400, Eastleigh SO53 4ZF.

E-mail: g4hcl@rsgb.org.uk

It has never been easier to operate datamodes by using your PC's soundcard. Chris Lorek looks at what he describes as "the absolute ultimate in versatility" when it comes to rig-to-PC interfaces.

RIGblaster Pro soundcard to PC interface

There is a tremendous number of PC programs for amateur radio communications using a PC and soundcard. As well as offering transmit and receive of almost any digital mode you care to name, other uses include digital audio processing of signals to improve readability, on both receive and transmit (yes, you can even use your PC as a speech processor!) Some programs, particularly those for contesting, also include an automatic voice keyer for pre-recorded CQ calls etc, or of course you can simply record your own 'wave' files and replay these from your PC with a mouse click.

The interface between your transceiver and PC can be relatively simple for many operating modes. It may just be an audio lead from your receiver to the 'line in' on your soundcard, another for transmit audio from the soundcard 'line out' to the transmitter mic input, with 'VOX' (voice-operated transmit, ie audio-switched transmitter keying) enabled on your rig for transmit / receive switching. This could be sufficient for many uses, although some programs offer direct transmit keying via the RS-232 DTR (Data Terminal Ready) line, as well as 'real' switched CW and FSK keying rather than using microphone audio for these. Transceiver control via the RS-232 connector and possibly an external hardware level-converter interface is also often a feature of 'all-singing all-dancing' programs. But you could end up doing *lots* of lead plugging and unplugging to switch between 'normal' manual operation of your transceiver and PC-controlled operation.

The US firm of West Mountain Radio has been manufacturing interfaces for this very purpose for several years now, with a 'Nomic' interface (purely for digital modes) plus audio / digital interfaces of the RIGblaster M8, RIGblaster Plus, and their 'top-of-the-range' RIGblaster Pro, which is the subject of this review.

If you just want to use your PC to decode various digital modes on receive only, or to act as a receive audio processor, the only thing you'll need is a single receive audio lead. However, if you want to switch around modes and uses, then you'd probably be better off with some form of switch box to make this easier for you. For example, if you operate on SSTV, where you'd alternately use SSB speech and SSTV transmit / receive throughout your contact, you're usually stuck with swapping over mic leads. Likewise if you're using a voice keyer. Of course, swapping leads in mid-contact isn't very practical, and most users would build up a suitable 'switch box' as well as various interfaces if needed.

This, effectively, is what the RIGblaster is - but with a difference! If you want the absolute ultimate in versatility, this unit will quite probably perform any form of rig-to-PC interfacing you could think of - and more besides. On receive, it lets you route the audio through it from where you can plug in your rig's external speaker, as well as using the PC speakers on receive. Likewise on transmit, your mic audio can be switched when required to be routed via the RIGblaster Pro through the soundcard as well for audio processing.

RIG CONTROL

As well as being a full-featured soundcard interface, it also has a built-in transceiver control interface, suitable for use with the Icom CI-V and Yaesu CAT systems, and compatible with Ten-Tec and Kenwood rigs. For radios which can use standard RS-232 for control, this can be 'looped through' the RIGblaster to handle PTT/CW/FSK keying, or you can use two serial ports, one for soundcard interfacing and the other for rig control. Some programs, *MixW* and *HamScope* for example, will handle soundcard operation and rig control simultaneously, so it's your choice, but with this interface you only need one serial port connection to your PC. In all, you've a choice of single, dual or 'pass through' serial connections for rig control, keying and soundcard operation.

CONNECTIONS

There's a front panel 8-pin round mic connector, with a rear panel RJ45 rectangular mic connector as well. A mic lead, terminated at one end with an 8-pin connector and the other end with an RJ45 is supplied, which allows you to connect either end to your transmitter's mic socket depending upon the type of socket used, the other end plugging into the 'opposite type' socket on the RIGblaster Pro. Your mic then simply plugs into the remaining mic socket on either the front or rear panel. If your rig's mic connector is a different type, four-pin screw-on adapter kits are also available as an option, as well as a Yaesu Modular 6-wire cable, or you could of course make up your own. There's also an auxiliary mic input on the

front panel, which lets you use, for example, a headset mic in place of your normal mic whenever you want to without having to first unplug your normal mic. Both 3.5mm and quarter-inch headphone sockets are also provided for headphone use.

On the rear panel are the majority of the connection sockets. Separate CW and FSK keying outputs are provided, each with a dedicated opto-isolator circuit to prevent ground loops. As well as the mic lead, no fewer than six screened audio / data leads each terminated with 3.5mm three-terminal jack plugs plus a 3.5mm to quarter-inch stereo adapter are provided for other connections, such as receive audio in, receive audio line out to soundcard, soundcard audio line out to RIGblaster, FSK keying, CW keying, and TX audio to soundcard. To save confusion, the manufacturers even supply handy suitably-worded and colour-coded label tags which you can attach to each end of these cables. Finally, a 9-way RS-232 lead is provided to link to your PC's serial connector, and a plug-in 12V DC lead to power the RIGblaster with.

IN USE

The first thing you'll need to do before you can use the RIGblaster Pro is to remove the top lid, and use the supplied plug-in wire jumper links to suit to your individual rig's mic pin-out. The user manual gives you plenty of information on this, with sample link configuration drawings for plenty of commonly-used radios. After this, it's a lead-plugging exercise, with various connections between your transceiver and the RIGblaster Pro, and from it to your PC's soundcard and RS-232 connections. Again, the user manual gives you plenty of help here, including drawings of typical connection arrangements.

Then it's a case of setting up the levels using your PC's 'sound control panel' to suit your transceiver, as you'd have to do in any case if you want to use any soundcard-based program with your rig. Once again, the manual gives step-by-step instructions here. If you need to vary levels between programs, a manually-adjustable rotary audio level control on the unit's front panel lets you do this without the need to go into the 'sound control panel' each time and adjust this using your PC's mouse.

If you can't wait to get on the air, there's a 'quick start' guide, which goes though the entire procedure step by step and gets you on air using the *DigiPan* PSK31 program. By following this, I managed to get up and running in around 20 minutes.

There are front panel LEDs to confirm that you're using the correct audio source and levels, as well as more LEDs to indicate TX PTT, CW and FSK status, power on, and 'Process'. The latter is for when you've chosen to route your mic through the soundcard rather than direct (note that you'll need full-duplex soundcard ability for this).

This review describes the RIGblaster Pro and not the features of the various programs you can use with it, although bundled with the unit is a CD containing a vast selection of shareware, freeware, public domain and demo soundcard programs for virtually any mode you could think of (PacTOR II and III being exceptions, which no-one has written a soundcard program for, because of software / firmware licensing restrictions). There are currently few, if any, amateur-written mic processing soundcard programs, but several professional versions are included on the CD. Each program has an 'easy install' facility from the menu, but as with everything you'll need to read and understand the various program 'help' files to use them effectively.

Some programs, like *WSJT* for VHF use, already have the facility for suitable transmit and receive delays to handle masthead preamp etc switching. But most don't, so if you use an external TX keying sequencer for this (as I do on VHF and UHF) you'll be pleased to know there are separate PTT in / out sockets on the unit's rear panel. These are normally connected with an internal jumper link, simply remove this and you can plug your sequencer in between them. About the only negative point I could possibly make is that if I wanted to connect a different transceiver, eg to change between HF and VHF / UHF operation, I'd need to go inside and re-link the mic connection jumpers.

As many transmitters already have switchable speech processing, you may think that soundcard-based transmitter audio processing, including audio tailoring, could just be a gimmick. I don't. Around 15 years ago I bought an Icom SM-10 desk mic with its built-in graphic equaliser after I had reviewed it and found during the review what a difference it made to my transmitted audio readability. If you already have a good communications microphone, all well and good: I thought I had, but a bit of 'tweaking' can sometimes make a lot of difference! A quick flick of the front-panel 'Process' switch on the RIGblaster Pro lets you instantly compare between settings.

The unit can key your transmitter using either 'hardware' PTT, or in VOX or Process modes. Either way, a PTT override function lets you stop the computer from transmitting so you can use your mic just by pressing your mic's PTT button, handy for voice keyer use as well as SSTV. Also, because the RIGblaster Pro has separate outputs for PTT, CW and FSK keying, I found there was no need any more to keep swapping leads between different programs.

To put it simply, after I'd set it up for my transceiver, the RIGblaster Pro made soundcard operation using a wide range of different programs very easy indeed. I'd consider the RIGblaster Pro to be currently the ultimate in soundcard interfaces.

The RIGblaster Pro sells for £209.95, and our thanks go to Waters and Stanton PLC for the loan of the review model. ♦

0% Interest

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What it gives you: Microphone equalisation, Rig Control (CAT, CU-V) PSK-31, WSJT, SSTV, CW, RTTY, MFSK, MT63, AMTOR, PACTOR, Hell, DVK, Packet/APRS, EchoLink, Internet Linking, Beacon Rcvr/Clock, QSO & DVK message recording.

Package includes: RigBlaster Pro control console, CD software for wide variety of modes as above, AC PSU, PC serial lead, terminated 8-pin mic lead, 6 pairs stereo 3.5mm leads, external 12V DC lead, Jumper leads to match rig mic connections, 36-page manual and connector lead sticky tabs.

Chris Lorek, G4HCL, says:

"the absolute ultimate in versatility"

RigBlaster Plus £119.95

Order Code: RB/PL/C

RigBlaster M8 £109.95

Order Code: RB/M8/C

RigBlaster Plus gives you the perfect interface between PC and radio. Enjoy CW, RTTY, PSK31, SSTV, Packet, AMTOR, DVKeyer, WSJT, Mic equalizer, Rig CTL and EchoLink - all from the supplied CD. With the RigBlaster Plus you get automatic mic straight thru and true rig CW keying which means you can use your rigs CW Rx filters (on the RigBlaster M8, "RJ," and NOMIC, for CW you key an audio tone whilst in the SSB mode). Fitted 8-pin mic plug and Supplied with software and all connecting leads ready to go. The 8-pin mic socket is configured to suit your radio via internal jumpers.

RigBlaster M8 gives you a budget interface between PC and radio. Enjoy CW, RTTY, PSK31, SSTV, Packet, AMTOR, DVKeyer, WSJT, Mic equalizer, Rig CTL and EchoLink - all from the supplied CD. This is a true item that gets you going an a whole range of exciting modes. And the great thng is that you get the software and all the connecting leads. Front panel has 8-pin mic socket that can be configured to any rig via internal jumpers.
RigBlaster RJ is fitted RJ mic socket. **Code: RB/RJ/C**

RigBlaster Nomic £59.95

Order Code: RB/NO/8C

RigBlaster Nomic If you want all the features of the RigBlaster M8, but are happy to unplug it to use your mic for SSB, then this has to be a really great buy. Supplied with leads and software with all the programmes

The Fun Begins - With these modules you open up a brand new world on amateur radio. Weak signal and QRP work become so much easier with many of the data modes. Get back into the pioneering spirit of ham radio and explore the waves and these new modes. You will have hours of fun and meet a lot of new friends and many old ones as well!

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By Tim Kirby, G4VXE

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A computer network at home? Perhaps even five years ago, this would have been unusual for the vast majority of people. But now, many homes have several computers in them and it makes sense to share resources (a printer, scanner, Internet connection - or amateur radio transceiver) between them. This article explains how to go about creating such a network and what it can do for you.

Computer networking and amateur radio

The first thing you need is at least two computers! We're going to assume that you have Windows-based computers. Your task will be easier if you have Windows 95, 98, ME, 2000 or XP (it can be done with Windows 3.1 but it takes a bit more effort).

Next, you need some network cards. Ethernet cards which operate at 10 or 100MB are very cheap, for both desktop machines or laptops, which use PCMCIA cards. You can pick them up very cheaply at rallies or through computer suppliers: don't expect to pay much more than £25 for such a card.

The simplest method to connect two computers together is to use a crossover cable. This means you connect the transmit line of one network card to the receive of the other. You can buy crossover cables, or an adapter to convert a standard CAT-5 network cable into a crossover cable. Or, armed with a cable, plugs and a crimping tool, you can make your own (see 'Websearch').

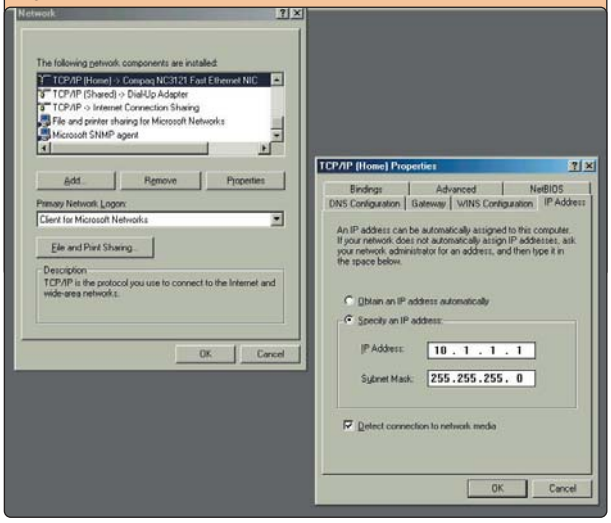
BASIC NETWORKING

Installing network cards in the machines will prompt you with a few questions about how you want to set up your network. You'll need to supply a name for each machine. Something like 'SHACK' or 'TIM' will do fine.

You will need to install a Network Protocol that your network card will use to talk to other machines. You will need to install TCP/IP if you ever want to use the Internet or pretty much anything else on your machine.

You may be prompted about a TCP/IP address. What's this? Well, each computer that uses an Internet connection, or talks to another computer will almost certainly have one. Think of it like a phone number for computers. Assuming that you are setting up a network which won't, for the moment, talk to the outside world, you should use a range of private IP addresses. I'd recommend being logical about it. For example, the first computer could have an IP address of 10.1.1.1 and the second should be

FIG 1



10.1.1.2 and so on. You'll also be asked to provide a network mask. This is a bit beyond the scope of this article, but it affects what other computers your machine can talk to. When in doubt on a small network at home, type 255.255.255.0 If you mess up these settings, right click your mouse on Network Neighborhood and select Properties. This will show you a dialog box such as the one in **Fig 1**. Click where it says TCP/IP and hit Properties. You'll soon discover that any adjustment of these settings on most Windows operating systems requires a reboot.

Once you've installed network cards and TCP/IP on each of your machines, and put the crossover cable between the machine, they should be ready to talk to each other. Make sure any security programs / firewalls are disabled for now (but do remember to re-enable them when your machines are talking and before you connect to the Internet!).

So the machines are talking to each other? That's excellent! With a couple of simple steps, you'll soon be ready to share files and printers on your two machines. On each machine, go back into the network settings (right mouse click from Network Neighborhood and select properties). This time, hit Add, then select client and from the list, choose Client for Microsoft Networks (**Fig 2**). Finally, hit add, select Service from the list and choose File and Printer Sharing for Microsoft Networks.

Do this on both of your machines and then reboot. You should notice that when the machines start up you are prompted for a user name and password. Assuming that you are at home - accept the default and have a blank password. However, you should *never* do this on a real network or even if you are at home with children where there may be network resources such as the Internet that you do not want them to use without supervision. If you connect to the Internet, you should also use a Firewall program, such as Zone Alarm or Norton Internet Security to prevent hackers trying to access files on your machine. Do not think that this is a remote risk: if you don't have a firewall *it will happen*, it's as simple as that.

Then, on one of the machines (let's say it's called 'SHACK'), start up Windows Explorer. Select a directory that you want to be accessible from the other machine (this could be C:\). Right click it with the mouse and select sharing. It will show a dialog box such as **Fig 3**, where you enter the name of the share, in other words the name that your directory will be known as.

Then on the other machine, type Start/Run and then in the box that appears \\SHACK\ESPROP (in this case). All being well, you should see all the files in that directory.

You may find that where you are using computers running a variety of Windows versions that it is easier and advantageous to install a protocol called NETBEUI. This makes Windows networking very simple over a small network. NETBEUI is not immediately available under Windows XP, however, you may install it - to do so, follow the instructions on the Internet (see 'Websearch' below). Note that you should install TCP/IP if you want to share an Internet connection

on your PC.

Next, you should be able to share your printer. On the machine that it's connected to, you can go into Control Panel and Printers and select the option to share the printer. Depending on the operating system that you are using, you may automatically have access to the printer from the other machine, or you may need to install the printer driver. Either way, you will soon be able to print across the network.

Congratulations: your basic network is in place.

SHARING THE INTERNET CONNECTION

Having got the basics in place, one of the next things to do is to share the Internet connection, so that it is accessible by all computers on your network. Assuming that the computer that the Internet connection comes into is using Windows 98 or later, you can run 'Internet Connection Sharing'. Simply install this - it will guide you through a series of questions - nothing complex. At the end of this, you will be prompted to create a disk which you need to apply to the other workstation(s) on your network. I have found this unnecessary and the following method to be simpler.

On the PC(s) where you wish to access the Internet, which do not have a direct connection to the Internet and will access it through the PC that you've just set up, do the following:

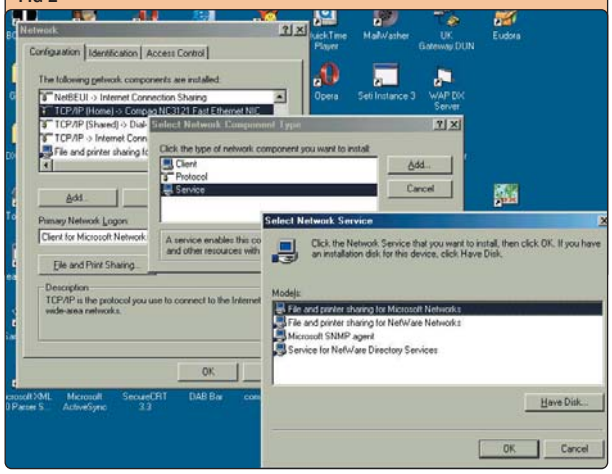
Right mouse click on Network Neighborhood, select TCP/IP and hit Properties. You will have, previously, typed in a TCP/IP address for this. Change this to 'Obtain a TCP/IP address automatically'. The PC which shares the Internet Connection acts as a Dynamic Host Configuration Protocol (DHCP) server and issues these addresses.

Reboot this PC, connect to the Internet on your other PC, and you should find that you can access the Internet from both workstations. Again, if you have a firewall, you may find that some adjustment is necessary as it may not automatically permit communications to the outside world. If you are having problems, make sure that your 'client' PC has obtained a TCP/IP address (use WINIPCFG /ALL as before) and if not, temporarily disable the firewall and try again. It usually works fairly easily.

WIRELESS NETWORKING

You'll may want to extend your network beyond two PCs. Until recently, the usual way to do this was to install a network hub. The hub has a number of ports and you plug a standard network cable (not a crossover cable) into each port from the network card

FIG 2



on your PC. Network hubs or even switches are very cheap and you should be able to get one for £30 or so. Better still, if you have a good relationship with a network manager of an IT department is to see if they have any redundant hubs or switches. They are frequently upgraded, so small workgroup hubs or switches may often be lying in a box unused and thus available for the cost of a polite enquiry!

Instead of network hubs, over the last year or so wireless networking has become very affordable for the home user. Sometimes known as Wi-Fi (Wireless-Fidelity), there are several standards available for use. These standards are defined by the IEEE. Standard 802.11b operates in the 2.4GHz band and provides data transfer to a maximum of 11Mb per second. 802.11g provides data transfer up to 54Mb per second. Equipment conforming to the 802.11g standard is compatible with the earlier 802.11b specification.

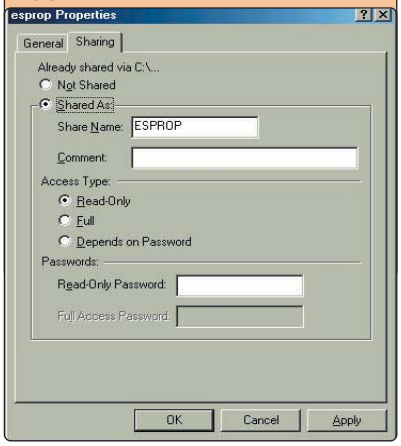
To use wireless networking technology, you'll need an access point, which can be plugged into your network card or hub and configured and one or more PCs with a Wireless LAN card. The access point is the most expensive piece of gear we've discussed so far, but if you go for the lower 802.11b standard, can be obtained for around £50.

Configuration is very straightforward and generally achieved through a web interface. Remember to set some security on your Wireless network (you will be guided through how to do this) otherwise you may find others using your network!

You are able to select which channels the Wireless LAN uses and if you are an Oscar 40 user, you may wish to experiment with the choice of channel as the higher ones avoid interference with satellite operation.

Having configured your Wireless LAN, you will find that the network is suddenly so much more flexible than you've known before. Armed with your laptop and a wireless LAN card, you can look at the *DXCluster*, or web pages, from the comfort of the sofa or your garden!

FIG 3



SOME USEFUL PROGRAMS

You can look at the *DXCluster* easily on any Internet PC. Simply go to the command prompt and type 'telnet gb7djk.dxcluster.net 7300' and press enter. You will soon be logged on to the Cluster. The telnet program provided with Windows is a little unfriendly for amateur radio purposes, though adequate, so you might want to look at DX Telnet (see 'Websearch'). In addition to GB7DJK, there are many other Internet connected *DXClusters* which you can connect to.

If you are a datamodes enthusiast, you might like to try remote controlling your datamodes program. I found a very useful package (free) called VNC (Virtual Network Computing). You install this package on to a PC, and you can then connect to it across the network and see the screen it is displaying and type commands as if you were at the keyboard. It's great! Using this, I was able to make PSK and RTTY QSOs from the comfort of my sofa, when the PC and rig were in the shack!

FINALLY

Having a network at home is so useful - you can share printers, access your MP3 files from any machine on the network, check your e-mail and so on. Having Internet access on the shack PC is invaluable too, particularly for *DXCluster* access, leaving the VHF bands free to be used for VHF DXing.

I hope this article has stimulated some thought on how you could go about setting up a network at home, if you've not already done so and the benefits and fun that will result if you do. Good luck and have fun! ♦

WEB SEARCH

Making a crossover cable	www.makeitsimple.com/how-to/dyi_crossover.htm
Installing NETBEUI	http://support.microsoft.com/default.aspx?scid=kb;en-us;301041
DX Telnet	www.qsl.net/wd4ngb/telnet.htm
Virtual Network Computing (VNC)	www.realvnc.com

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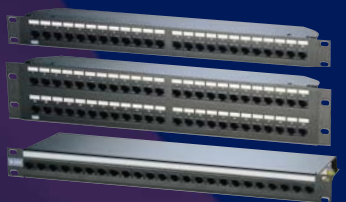

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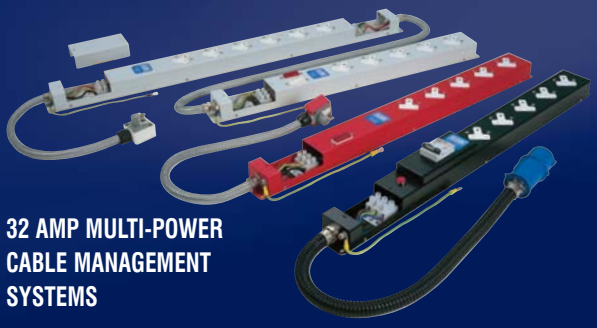

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By Jeremy Boot, G4NJH

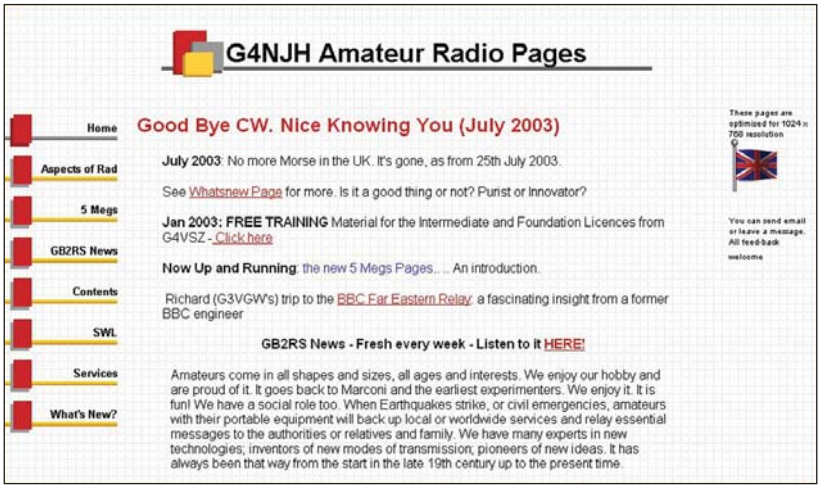
E-mail: g4njh2@ntlworld.com

The weekly GB2RS news has been broadcast on the amateur bands for nearly 50 years. More recently, the script has been posted on the RSGB's website every week. But did you know you could also *listen to it* on the Internet? The service is provided by Jeremy Boot, G4NJH, and we asked him to tell us all about it.

GB2RS news broadcasts on the Internet

It was perhaps 15 or more years ago that I became quite sure in my own mind that I would one day be reading the RSGB news at some point. Some things you just know. Precisely why remains a mystery to this day. No doubt something in the recesses of my psyche accounted for it.

However, this daydream was quickly dismissed and there seemed no opportunity to volunteer nor, indeed, was there a local need. There was a service at the time coming from Birmingham on 2m and the GB3CF repeater also relayed the news. I thought no more of it until about four years ago.



INTERNET & THE HAM IMAGE

Some years before that, I had been one of the 'early adopters' of the Internet for the promotion of amateur radio. I felt that one of the most serious reasons for our hobby going into decline was our then perceived image as Tony Hancock caricatures or irrational oddities. Joe Public knew practically nothing about us other than that our signals came through his hi-fi occasionally and that we cluttered our gardens with wires and antennas. The seemingly unwelcome onset of CB in the 1980s had been largely an opportunity for us to close ranks, through fear of association. Although there had certainly been hard working and earnest amateurs who did preach the word to the world outside, most of us did not. The Internet presented a real chance to put things right.

I had devised some web pages for beginners, and then, later, more comprehensive ones, although they were quite crude by modern standards. Other good amateur sites were springing up: the Internet was expanding. I had literally hundreds of e-mails from amateurs, many lapsed, whose interest had been re-kindled, or from people expressing real interest in something they had never, until then, had the least idea about.

SPOKEN WORD: REAL AUDIO

The written word was all very well, but how much better to use the improving technology to use short recordings, for example, in streaming *Real Audio* of a QSO or Morse? If that, then why not GB2RS news itself? I told the RSGB what I was doing, both out of courtesy and to be able to demonstrate it to them. They accepted it, but the idea of mixing the Internet and amateur radio was not received universally within the hobby with overwhelming enthusiasm: it was nothing whatever to do with the hobby, some maintained, just another distraction from the real stuff.

This attitude - which proved temporary, and seems minor compared with the other recent revolutions, eg new licensing - was not entirely unexpected. Talking to clubs and meetings around the country about that time, I found that the idea of using a new medium to forward the hobby (and not replace or challenge it) was understood by the young as you would expect, and also, less expected, by the 'old timers', who saw it, quite properly, for what it was. The ones in the middle age group were the most dubious on the whole. They probably still are!

A BIG NEW WWW AUDIENCE FOR GB2RS

The Internet could do three things for amateur radio: it could spread the word more widely; give the news at any time of the listener's choosing (rather than just live on a Sunday morning), and provide a service, including to those, such as the partially-sighted, who had no other access or to whom text on a website was a problem. I was pleased about this latter idea, which was a happy spin-off.

Once the concept of using GB2RS on the Internet was agreed formally, I became an official RSGB newsreader. By this time, foreign services who had for some time been compiling audio news bulletins for amateurs, were taking voice clips from our new service for inclusion in theirs. Of these most notable must be the WIA's *Q-News* from Queensland, whose professionalism and sheer liveliness of presentation continues to make us seem very staid by comparison. The US services, especially *Amateur Radio Newsline*, did the same, and, occasionally we have turned up on HCJB, the Voice of the Andes, from Quito, Ecuador, as an audio clip in their DX programme - and on others for all I know. All of these spread the service much wider than before. Sometimes I am asked to read an article for another service to provide the English accent for some item or simply to provide contrast or variety to their own services. It all makes for good international relationships. Another useful spin-off.

In Australia the whole of the GB2RS main bulletin is relayed quite widely by various means, and retransmitted over local repeaters from Western Australia, through

continues on page 53

By Don Field, G3XTT

105 Shiplake Bottom,
Peppard Common,
Henley on Thames RG9 5HJ.

E-mail: hf.radcom@rsgb.org.uk

Logbook of The World

Do you chase the popular DXCC series of awards, but find the cost of collecting QSL cards prohibitive? Or maybe you love to collect QSL cards so much that you don't want to risk mailing them to the USA, or even to your local checkpoint, in case they go astray. If either of these applies Logbook of The World (LoTW) may well be for you. Yet another reason to have a computer in the shack! Read on, and find out more...

Driven primarily by the two considerations above, the ARRL has come under some pressure in recent years to introduce some sort of 'paperless' system for DXCC. With more and more stations and, more relevant in this case, more and more DXpeditions, using computer logging, it was clear that the possibility existed of building a huge database of station logs, and being able to cross-check QSO data to validate contacts. After all, many contests have operated this way for years, with an ever-increasing proportion of logs arriving in electronic form, and computers doing most of the cross-checking. Accuracy is improved compared with manual systems, while the workload is considerably reduced.

AUTHENTICATION

With over one million cards being checked by hand at ARRL HQ each year, it was quite clear that the staff who administer DXCC would welcome anything which would automate the process. The big stumbling block was authentication. Some have queried why this should be a major issue, given that paper QSLs can be 'modified' by someone sufficiently determined to do so. But, of course, if a QSL card has been tampered with, that only affects one DXCC credit (or maybe three or four, at most), whereas if an electronic log cannot be validated, or is at risk of being tampered with by third parties, then some tens of thousands of QSO records could be open to corruption. My own log is probably fairly typical of many active amateurs, with nearly 100,000 QSO records, from over 30 years on the air, all, incidentally, in electronic form.

GETTING STARTED

LoTW was launched late last year, following extensive beta testing, based around the concept of using public key encryption, which is well-proven technology used in many applications where security is an issue. The concept is straightforward. The first step for anyone wishing to submit a log is to register online at the ARRL website and download the *TrustedQSL* software. You then e-mail ARRL with a request for a Digital Certificate. This is your encryption key, which will allow every individual QSO you upload to be 'signed' electronically. This has two effects. Firstly, to prove that the QSO record actually came from you. Secondly, to prevent it being tampered with.

But, how does the ARRL know you are who you say you are? In the case of US amateurs, they use the FCC database, but for amateurs elsewhere, they require a copy of your licence, plus proof of identity (typically a copy of the main page of your passport, plus something with your name and address on it, such as your driving licence). Photocopies are acceptable, but good, old-fashioned mail has to be used as, again, e-mail isn't considered sufficiently secure without digital signatures (Catch 22!).

The end of DXpedition QSLs? Absolutely not!

The good news is that you should only have to do that once, at which point your Digital Certificate will be e-mailed to you and you will be in a position to start uploading your log. Logs for uploading need to be in ADIF or Cabrillo format. ADIF (Amateur Data Interchange Format) is widely accepted nowadays as a standard format for exchanging data between different logging programs, and is supported by all the popular programs. Similarly, Cabrillo is widely supported, in its case as the most common format for contest log submission.

Having generated an ADIF or Cabrillo log, you then use the *TrustedQSL* software, with your Digital Certificate, to 'sign' all the QSOs before uploading to the DXCC database. The upload can be through the LoTW web page or by sending the file as an e-mail attachment. This should be straightforward, though large logs may generate attachments which are larger than your ISP will accept. The answer to this is easy, as it isn't necessary to send your entire log in one go. You can send it in stages and, of course, send further files as time goes on and you make more QSOs. Many contesters now upload their logs a day or so after each contest as a matter of routine. Just to give you an idea, I uploaded my own log in several separate files, each with 10,000 QSOs. Each of these files was close to 1.5MB in size (fortunately I had just swapped to a broadband connection, so the upload time wasn't too bad).

AND THEN?

Once your log is uploaded, you can visit the LoTW web page to view your data. There are several facilities available to you, including letting you see what confirmations you have. In other words, contacts in your log which match contacts in the relevant logs already in the database. Of course, at the moment the percentage of your contacts confirmed in this way will be relatively low, but this will grow as time goes by and more stations upload their logs. Of 96,000 QSOs which I have uploaded, just over 3000 currently match others in the database but, not surprisingly, most of these are with US and Western European stations. And, of course, most are for fairly recent contacts; of the first 10,000 QSOs in my log, there were just nine matches!

More importantly, from the point of view of your DXCC awards, we will see more and more DXpeditions

continues on page 53

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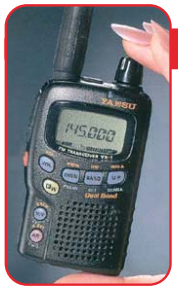

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Model Number	Power	Freq. Range	Display	Price Each
SX100	3KW	1.6 - 60 MHz	30W / 300W / 3KW	£109.95
SX200	200W	1.8 - 200 MHz	5W / 20W / 200W	£79.95
SX400	200W	140 - 525 MHz	5W / 20W / 200W	£89.95
SX600	200W	1.0 - 160 MHz + 140 - 525 MHz	5W / 20W / 200W	£139.95
SX1000	200W	1.8 - 160 MHz + 430 - 1300 MHz	5W / 20W / 200W	£189.95

SX20C

Diamond SX20C and SX40C Watt meters. The Diamond SX20C and SX40C are compact Watt meters featuring cross needle meter for measuring power and SWR simultaneously.

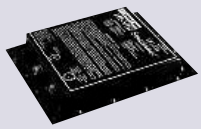
Model Number	Power Settings	Freq. Range	Size	Price Ea.
SX20C	30w & 300w	3.5 - 150 MHz 3.5-30 / 50-54 / 130-150 MHz	3 5/16' W x 3 5/16' H x 3 3/4' D	£74.95
SX40C	15w & 150w	144 - 470 MHz	3 5/16" W x 3 5/16" H x 3 3/4"	£69.95

SG-230 Smartuner Only £359.95

Weather proofed Auto ATU sold in the thousands to hams and professional users. Designed primarily to tune end-fed wires/vertical whips.

- Frequency range: 1.6-30 MHz
- RF Sensed, no data cable required
- Minimum 2.4m to infinity for tuning
- Power rating: 3-200 watts PEP maximum: 12VDC.
- VSWR (Typical): 2:1
- Tune power: 3 watts nominal
- Weight: 8 Lbs.
- Dimensions: 16Dx12Wx3H
- Supplied with 9 ft. cable for coaxial and DC power

SG-231 Smartuner Only £359.95



Best Selling 1MHz-60MHz Auto Tuner. Ideal for HF rigs with Six Metres fitted. Note max power100W

- Frequency range: 1.0- 60MHz
- Power rating: 100W PEP maximum or CW 60W HF and 100W VHF
- SWR: Less than 1.3 to 1
- Tune power: 3 watts minimum- 100 watts maximum
- Weight: 3 Lbs.
- Dimensions: 11.5Dx9.5Wx1.7H
- Supplied with 9 ft. cable DC power.
- Light black anodized aluminum case with mounting plate and ABS cover
- Waterproof of immersion of two feet, half hour

SG-239 Smartuner Only £189.95

The new SG-239 fits the coupler requirement of the many low cost HF transceivers on the market, including among others, the Yaesu FT-817, FT-897, Kenwood TS-50 and Icom IC-706.

Performance features of the SG-239 are far ahead of its low price. The unit will work with silent receiver tuning or within the range of 1.5 to 200 watts with a high power transceiver. It has 170 memory bins, with fast, accurate tuning via independent sensors, including VSWR, phase, magnitude, low impedance, and forward sensing. Other couplers only sense the VSWR for a proper match - the SG-239 does it all and does it fast. And, if you recall the tuning setting from memory, tuning is even faster.

SG-237 Smartuner Only £299.95

WOW! This is tiny! If size and weight are important to you then check out the SG-237 from SGC. This product is designed with high density surface mount components on a 4 layer PCB, providing high efficiency, reliability and performance. The unit is fully waterproof (under 2 ft of water over 24 hour period). The PCB is mounted on a sturdy chassis plate which provides an excellent electrical and RF ground system. The case is waterproof and protects the complete unit.

Specification:

HF Frequency Range:	1.8 to 60 MHz
Power Input Range:	3 to 100 watts (PEP) o" 40 watts max. on CW
Input Impedance Range:	45 to 55 ohms
VSWR: (Typical)	Typically less than 1.4:1
DC Input Requirement:	+13.8 VDC (nominal)
DC Operating Range:	+10.5 to 18 VDC
Input Current: Average:	300 milli amps
Random set time:	Typical: less than 2 seconds
Recurrent set time:	Typical: less than 10 milliseconds
Memory Capacity:	170 locations
Antenna Length:	Minimum length of 7 ft. - 3.5 to 60 MHz Minimum length of 23 ft. - 1.8 to 60 MHz
Installation:	Any position
Operating Temperature:	-35° to +70°C
Size:	9L x 7W x 1.85H inches (22.9L x 17.8W x 4.7H cm) PCB 6L x 5.5W x 1.2H inches (14L x 15.24W x 3.05H cm)
Weight:	2 pounds (PCB 1.25 pounds)
Case Construction:	ABS plastic cover on an anodized aluminum base
Control Cable:	Shielded 4 conductor RG-58 coax with PL-259 connector
Control Cable Length:	9 feet in length

SGC

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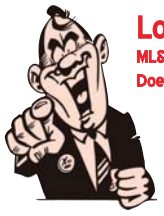

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GB2RS news broadcasts on the Internet

continued from page 48

Adelaide and of course Queensland. Some parts of Canada and the USA take it too, some stations in South Africa and the Netherlands in the same way. To what extent it is heard within the UK we have no reliable means of assessing. It used to be possible here to relay the recordings in *Real Audio* via our repeaters and Internet Gateway frequencies for which permission had been given, but the minutiae of the WT Act got in the way at some point when challenged, so it cannot now be done, alas.

HOW IT WORKS

The equipment needed for these recordings is disappointingly uncomplicated and simple! For *Real Audio* I used to use *Real Producer* from Real Audio. Now it is *Helix Producer Basic*. Both are free. They allow either the conversion of other sound formats (eg .WAV files) or 'live' recordings to the .rm files. You cannot edit with these free editions (I am sure you can if you pay for the professional editions).

RM AND *MP3*

I use a desk mic such as can be found anywhere in PC shops and the computer sound card does the rest. At present I use only a Sony *Vaio* laptop for all this. More recently I have been recording in *MP3*, which produces much larger files. File size was a big issue before broadband came along. The overseas re-broadcasters prefer *MP3* because of its superior quality. At present I use *X_Audio Tools ADRecorder* and convert *MP3* to *Real Audio* then post both on the G4NJH webpage.

Generally I divide the bulletins into its component parts: Main, DX, Propagation and Local (but, given that most listeners are abroad, I read only the Midlands version of this). I get more feedback from aboard too, but I am grateful to the UK listeners who point out errors, omissions etc. The whole process takes about two hours a week.

I read the script straight off the RSGB members-only website pages from where it is available from each Wednesday afternoon. Once files are converted to *MP3* and *Real Audio*, they are FTPd to the server via cable link. Occasionally, if I am away on business, the whole process has to be done from an hotel room (although not the FTP with hotel telephone rates!), so there is then a delay of a day or so until the news is posted.

COMPLEMENTARY

I am glad to have provided a slightly new and different service for the hobby. It complements the hard work done by the 'traditional' newsreaders and certainly doesn't detract from their excellent service. The Internet was never meant to *rival* amateur radio. It is quite strong enough to stand on its own, but all innovative hobbies absorb and use new ideas. Ours is no exception. Long may it be the case. ♦

WEB SEARCH

GB2RS news in Real Audio and MP3	www.innotts.co.uk/asperges/rsgb.html www.listen.to/gb2rs
Amateur Radio Newsline	www.arnewsline.org
QNews	www.wiaq.com/qnews/upload/qnews.htm
HCJB	www.hcjb.org
Real Audio	www.real.com
Helix Real Producer	www.realnetworks.com
X_Audio Tools ADRecorder	www.xaudiotools.com
RSGB	www.rsgb.org

Logbook of The World

continued from page 49

uploading their logs to LoTW. For example, this month's UK-led 3B9C DXpedition [see March *RadCom* pp28 / 29 - *Ed*] is committed to upload its entire log to LoTW at the earliest opportunity. What then happens is that you can claim new counters for your DXCC awards from the QSOs which match up. This is done on line, with a small charge being made for each contact claimed (the charge will be lower than that for the checking of traditional QSLs). At the time of writing, there are 36 million QSO records in LoTW, from 6300 different users and 8229 certificates (some users have more than one certificate, for additional callsigns they have held).

DEATH KNELL FOR THE QSL?

You might well be wondering whether LoTW signals the end of traditional QSLs and the answer is, of course, absolutely not. Many people will continue to enjoy collecting paper QSLs, and displaying them on the shack wall as mementoes of those rare contacts. LoTW is not an electronic QSLing system, and doesn't pretend to be. You cannot print a QSL card from the matching records, though I suppose at some stage this service could be offered as some sort of add-on. And, of course, for claiming contacts with stations who don't use LoTW, you will still be able to send your traditional QSLs to ARRL for checking (ARRL has confirmed that they will *always* continue to accept paper QSLs).

But the question obviously arises as to whether, as the LoTW database grows and becomes more comprehensive, it can be used as the basis for claiming other awards around the world. The answer appears to be a qualified "yes", but clearly the ARRL's priority is to get the whole thing working seamlessly for DXCC first. However, as an example, the RSGB's IOTA awards programme is already talking to the ARRL about having access to the database for electronic verification of IOTA contacts. This is by no means as straightforward as it may sound. For example, the ARRL will know the DXCC entity of contacts appearing on LoTW, but it is not always possible to determine the island group simply from the callsign (the current system allows you to enter your Grid Square, ITU and *CQ* Zones and IOTA reference, but this information isn't mandatory). So it is clear that any developments in respect of other awards won't take place overnight.

Incidentally, the ARRL is quite clear that it will not take on the role of QSL manager. In other words, as an example, if you thought you had worked a particular DX station and there is no match in the database, the ARRL cannot help. You need to check with the other station, or his QSL manager, as appropriate. If it turns out there was a problem in his log (for example, he realises that at one stage he was logging the wrong band), he can make corrections and upload a corrected log to LoTW. At that stage your missing match should appear.

THE TECHNICAL STUFF

The LoTW software will run on most Windows-based PCs and you will, of course, need an Internet connection, with your own e-mail address. Linux and Macintosh versions of the software are also available. You will also need to be able to turn your log into ADIF or Cabrillo format (the ARRL has made interface specifications available to logging software authors to make the whole process as seamless as possible, including being able to back-feed so that your local log can show confirmations held in LoTW).

And that's it. Even if you don't chase ARRL awards, you are encouraged to upload your log (it doesn't cost anything) as others may be looking for credit for contacts with you. ♦

FURTHER READING

'Introducing… Logbook of the World', *QST*, October 2003, pp46 / 47.

WEB SEARCH

LoTW web page	www.arrl.org/lotw

By Mark Marsden, G4AXX

38 Lambert Cross,
Saffron Walden,
Essex CB10 2DP.

E-mail: g4axx@ntlworld.com

One of the most common uses for a computer in the ham shack is that of logging contacts. Most serious DXers and contest operators, and many 'casual' ones, would no longer consider logging in a paper log book. Most logging programs are DOS-based but in the last few years a couple of *Windows* logging programs have become available. Mark Marsden gives us an overview of the most popular of these - *WriteLog for Windows*.

WriteLog for Windows contest logging software - an overview

Contest logging programs have developed steadily over the last few years, from the early DOS-based programs through to the latest programs for Microsoft *Windows*. *WriteLog* was first released in 1997 and is a highly competent logger for CW, SSB, RTTY, and PSK31. It currently runs under *Windows* 95, 98, NT, 2000, and XP. Over the last 10 years of regular contesting I have used *CT, TR, SD* and *NA*, but in 2002 the Granta Contest Group made the jump from DOS to *Windows* and started using *WriteLog*.

We did this mainly because we wanted to write our own contest templates and were interested in remote spotting using Internet and *PacketCluster* links.

WriteLog makes good use of Ethernet networking, and using the sound card for modulation and demodulation. Under *Windows* other programs can be run at the same time such as RTTY, PSK31, *DXCluster* terminals, or propagation prediction programs. A big change is having a mouse on the table during a contest, it takes a little getting used to and it doesn't come naturally to some operators.

One of the biggest changes we experienced was a big increase in functionality with a very comprehensive array of configurable parameters. One nice feature is being able to make *WriteLog* compatible with *CT* which means an operator experienced in using *CT* can use the familiar *CT* keyboard commands.

In 2003 GB5HQ was activated in the IARU HF Championship with 10 stations around the UK using *WriteLog's* Internet logging features. All the stations linked to a central server through the Internet and QSOs logged by the stations were seen by all stations on the network. Although this was the first entry by the UK into the IARU headquarter-station 'big league', it was very successful and demonstrated the power of *WriteLog's* Internet logging.

MAIN FEATURES

There are so many features of *WriteLog* that in a short overview such as this it is possible only to list the main ones:

- Partial call checking (using Master and Country data files).
- Two radio support (control signals on LPT port).
- Automatic switching of voice or RTTY output from sound card.
- Color coded band map.
- Separate band map for each radio.
- Rate window (shows rate for last 10 and last 100 QSOs).
- Automatic calculation and display of 'off times'.
- Beam heading (great circle bearings, short and long path, and distance).
- Check call window (shows possible matching callsigns and on which bands it would be a new multiplier).
- Band summary window (shows score breakdown by band and total score).
- 'Search & Pounce' memories (stores up to four callsign and frequency pairs).
- Choice of output formats (export to standard database, spreadsheet, ASCII and ADIF files).

STARTING A NEW CONTEST

When starting *WriteLog* there is an opportunity to start a new contest or continue with a saved log. A new contest can be started by selecting a

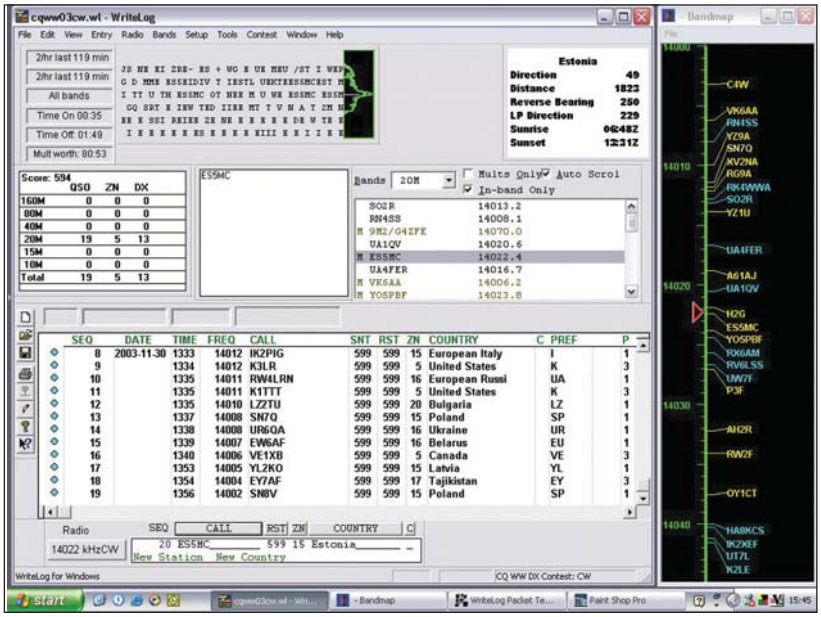
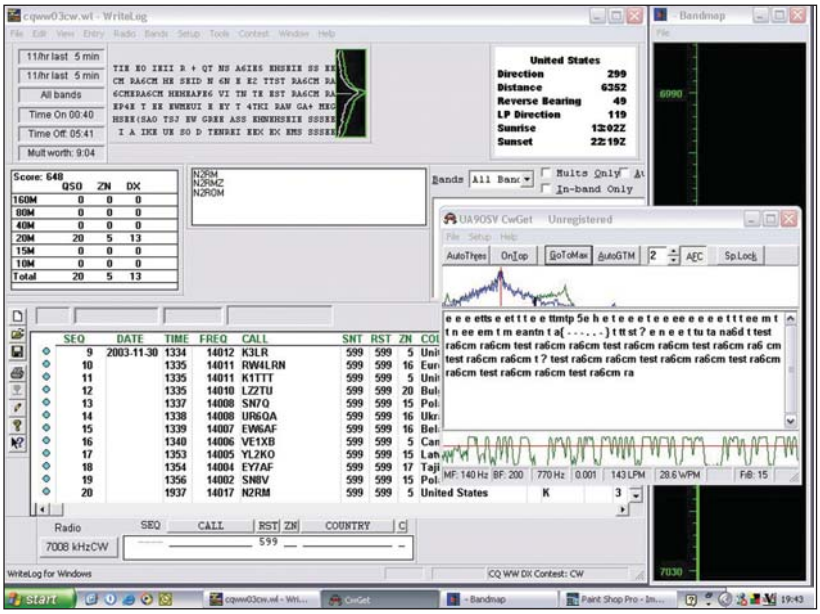
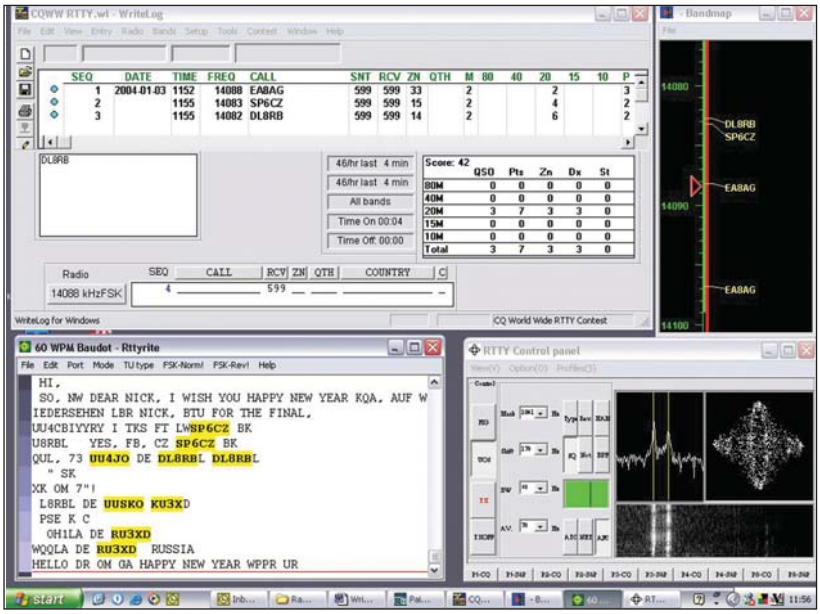
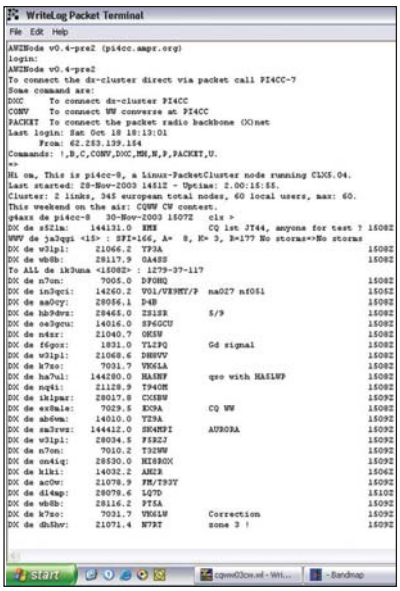


Fig 1
WriteLog being used in the CQWW CW contest (see text)







(From top)
Fig 2
WriteLog, again in the CQWW CW contest, but also using the CwGet CW decoder.

Fig 3
WriteLog using MMTTY as an RTTY terminal.

Fig 4
WriteLog can be used with DXCluster; the PacketCluster window during the CQWW CW contest.

contest from a list. The latest software comes with 29 contest templates for the most popular events. Many more contest templates have been written for other national and club contests and are available from third-party download links on the *WriteLog* website (see 'Websearch' below).

WriteLog also has general-purpose logging modes for general DXCC logging and DXpedition mode. Radio control is provided for a wide range of transceivers including Kenwood, Yaesu, Icom, Ten-Tec and JRC.

CW GENERATION

WriteLog, like any other program running in a multi-tasking environment, is affected by timing jitter. We have often used *WriteLog* on 400MHz P2 computers under *Windows 98* and *XP* and have seen no CW timing problems. However, it is understood that some network drivers, CD writers, etc multi-task poorly enough to affect *WriteLog's* CW generation. This has led to products becoming available for CW generation that are independent of the PC's processor, such as Winkey and the MK-1100 Multi-Keyer (see 'Websearch').

VOICE KEYERS

WriteLog uses the PC's sound card to record and play .WAV files to the radio to relieve operator fatigue in contests. Three voice keyer interfaces for use with *WriteLog*, two for the FT-1000MP and one for Icom transceivers, are described on the Granta Contest Group website (see 'Websearch'). These voice keyers have been used to great effect in many contests and are considered invaluable.

CQWW CW CONTEST

Fig 1 shows a screen shot of *WriteLog* running in the CQWW CW contest. In this example, ES5MC has come into the *PacketCluster* window, has been selected, the rig has been put on the announced frequency, the call has been put in the bandmap and the signal is being decoded in the CW decoder window.

Fig 2 shows a similar situation but with a comparison between the *WriteLog* and *CwGet* CW decoders. They are both copying RA6CM calling CQ at 28.6WPM. For more information on *CwGet* see 'Websearch'.

RTTY CONTESTING

Fig 3 shows a screen shot of *WriteLog* using *MMTTY* as an RTTY terminal demodulating RU3XD in QSO with OH1LA. *WriteLog* can be configured for AFSK or FSK RTTY depending on the modulation capabilities of the transceiver.

PACKET INTERFACE AND SPOTTING SUPPORT

WriteLog can be used with *DXCluster* for spotting and making a DX announcement. Filters can be set up for single and multi-operator stations and notifications made of new QSOs / multipliers. **Fig 4** shows the *PacketCluster* window during the CQWW CW contest.

WriteLog is written by Wayne Wright, W5XD. It costs $75 and is distributed by Ron Stailey, K5DJ. For further details see the *WriteLog* website. ♦

WEB SEARCH

WriteLog	www.WriteLog.com
Winkey	k1el.tripod.com/wkinfo.html
MK-1100 Multi-Keyer	www.WriteLog.com/SO2R/w5xd_multikeyer.htm
Third party downloads	www.WriteLog.com/ThirdPartyDownloads.htm
Voice keyers	www.granta.digital-crocus.com/equipment.php3
CwGet	www.dxsoft.com/en/products/cwget

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Z200A 2M/70cm fibreglass (2.15db/3.8db/L0.62m)	£24-95
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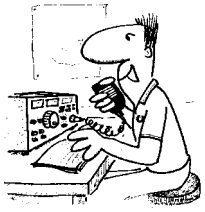

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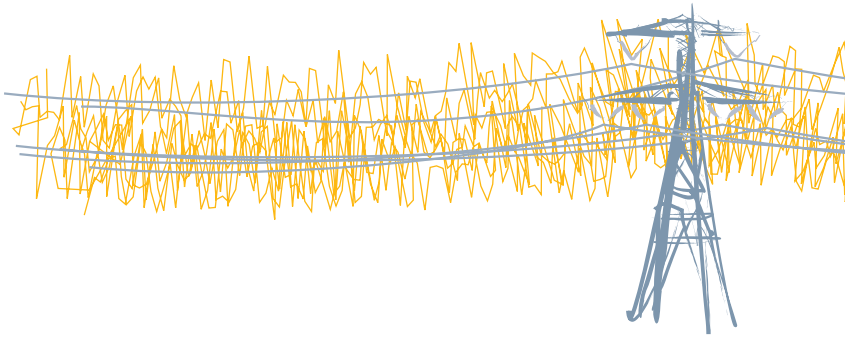
By Jeff Smith, MI0AEX

RSGB President, c/o RSGB HQ.



So why all the fuss about broadband

In this special feature, RSGB President Jeff Smith, MI0AEX, explains in simple terms why PLT is an inappropriate technology for bringing broadband Internet access to the United Kingdom.

The RSGB, through publications and public statements, has consistently expressed its support for 'Broadband Britain', providing it comes with the 'right' technology. Without the right technology the delivery of broadband may create problems that could undermine, in the eyes of many users, the whole concept. Several excellent articles concentrating on the scientific or technical aspects of the arguments have been presented for discussion and consideration but still some members remain confused. I want to remove some of that confusion.

In recent months much has been said about the supposed threat posed by Power Line Transmissions (PLT), Power Line Communications (PLC) or Broadband over Power Lines (BPL) to the HF spectrum. In order to understand if there really is a threat - or if all you have heard is simply empty rhetoric designed to scare the amateur radio community - it is necessary to reduce the arguments to simple, easily-understood words, free as far as is practicable from too much jargon, business-speak or technicalities. In this article I intend to present a simple view of this problem so that you can decide for yourself the merits or otherwise of PLT, free from jargon and emotion.

Is it important that we have broadband? Yes, very important.

SO, JUST WHAT *IS* BROADBAND?

Information from the Internet can reach your home either as a narrow band (a 'small stream' or 'trickling brook') only able to deliver information at a slow speed of less than 100 thousand bits of information a second, or it can pour in like a 'gushing torrent' on a *Broadband* of delivery of many million bits of information a second. That delivery can reach your home in a variety of ways, nearly all of which are appropriate to the method of delivery, subsequent use and effect on others. However, one method of delivery has a potentially damaging effect on many people not concerned with its use and this is PLT, PLC or BPL (they all mean the same thing so I will use the term PLT throughout this article). However, such a bald claim cannot stand alone and accordingly I will now explain my claim.

Before considering any of the merits about PLT, for or against, I believe it would be helpful to describe some of the systems that are available to deliver information from the Internet to your home.

In an ideal world, every home would have a dedicated mechanical connection - probably a piece of wire - maintaining access to an Internet system, but as that would have had to be installed at the time the home was built this is unrealistic. What needs to be done is to examine how your home is connected to the outside world, via utility services, and make use of such connections, if they are appropriate.

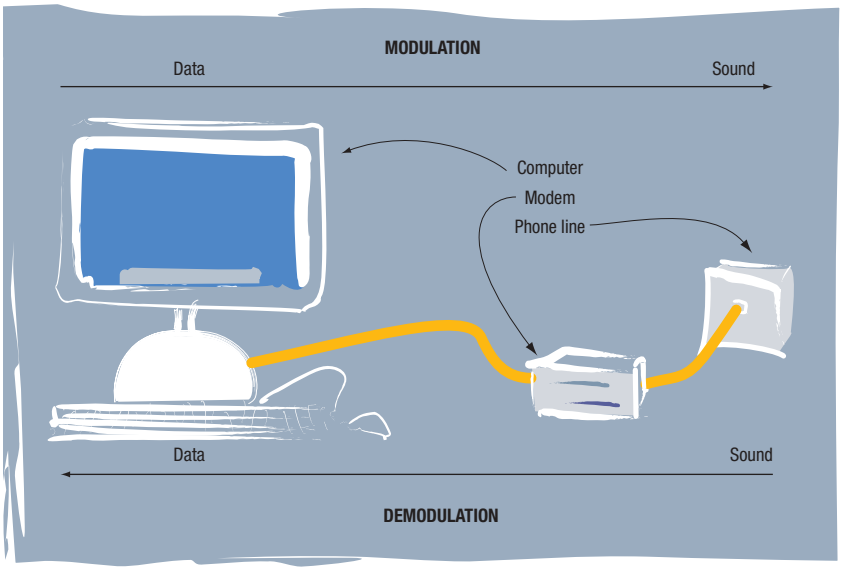
OTHER METHODS OF DELIVERY

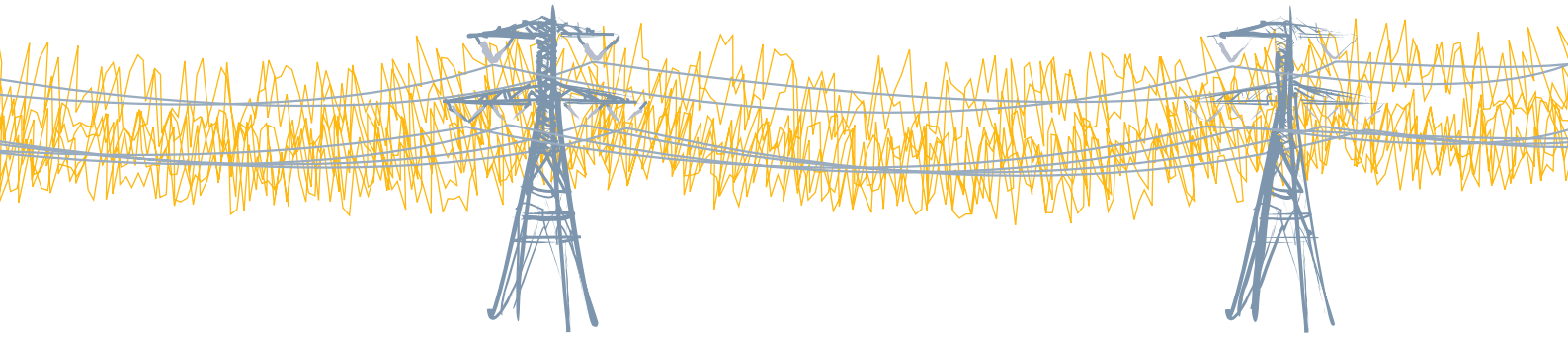
The average home has four fixed connections to utility services: water, gas, electricity and either a telephone line or a CCTV cable. Water and gas mains are too likely to lose signals to the ground so they can be disregarded. Electricity lines are designed to carry electrical power at 50Hz and may need special technical developments to make them useable for information transmission, whilst telephone lines or TV cables are designed right from the start to carry information.

Better than 90% of homes have an electricity connection, about 82% can access a fixed telephone system, between 45% and 50% have cable out in the street, some 92% are in range of a mobile telephone mast, whilst 100% of UK homes are in the footprint of a communications satellite.

The standard telephone line, once referred to as the 'twisted pair', has been used for digital phone connections for over a decade. It is sometimes called Integrated Services Digital Network (ISDN) and has expanded to allow data to be transmitted simultaneously over great distances using end-to-end digital connectivity. In this manner voice and data can be carried by bearer channels at data rates of 56Kbps or 64Kbps. In the home you are more likely to hear reference to a Digital Subscriber Line (DSL) which allows balanced use of the line when carrying voice communications. As a carrier of data, to and from the Internet, it represents a small stream or gentle trickle.

Developments have led to the Asymmetric Digital Subscriber Line





and PLT? ...or PLT made simple.

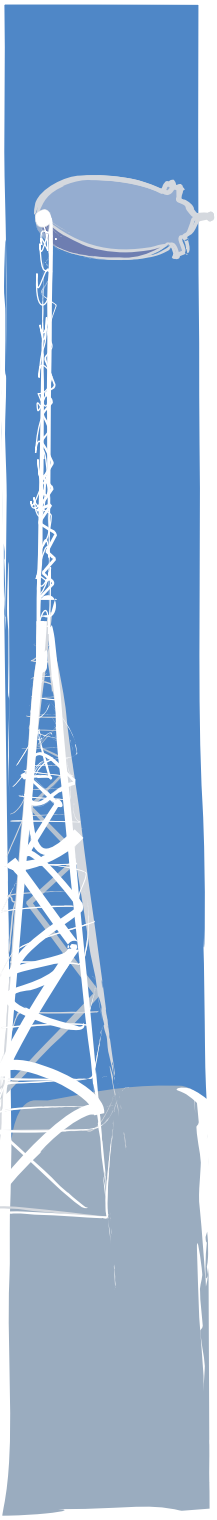
(ADSL) system which is designed so that much more data is delivered to the home than is sent from the home (asymmetry). Its bandwidth is broader and so it can deliver up to 512Kbps. Current research and development is leading to ADSL2 and ADSL+ by which your humble phone line will eventually try to reach about 1000Kbps whilst in a few high density locations it may become a torrent and deliver millions of bits of information a second (Mbps).

However, the telephone line has one big drawback, in that any customer living more than 18,000 feet from a telephone exchange (about 3.5 miles or 5.5km) will necessitate the need for expensive repeater devices. If the line is in ADSL configuration this distance may be reduced further. This means that city and urban dwellers will always be well within the 18,000ft limit, but rural customers will probably lose out. Gavin Young, director of technology at Bulldog Communications, has been quoted as saying, "Maybe you'll get in the range of 12 - 16Mbps with some of these ADSL enhancements, but having said that, those high speeds will only be available over loops that are short enough, so that these very high rates may not reach a very high percentage of customers". (*Internet Magazine*, issue 109, autumn 2003). Not therefore an option for rural or isolated communities.

CCTV cable, as previously mentioned, reaches about 45 - 50% of UK homes and excellent rates of information delivery to and from the Internet can be achieved. Such rates are comparable with, or often exceed, ADSL.

Whatever the speed of delivery using ISDN, ADSL or cable, none of these systems encroach upon the use or enjoyment or other forms of delivering entertainment or communication such as radio, TV etc. They can be said to be achieving the purpose for which they are intended and are therefore *appropriate* technologies.

If you do not want to use a fixed link, you can get access to the Internet using radio. This would probably involve a satellite, a tethered balloon, fixed wireless or the local mobile phone network. Tethered balloons or



aerostats are still in development and will involve a balloon located some 1500 metres above a fixed mast. The tether or umbilical chord attached to the balloon will also contain a fibre optic cable connected to a ground station which will deliver data to the balloon. An array of antennas on the surface of the balloon will radiate to a fixed area of between 2000 and 5000 square kilometres (depending on the claimed radius of the radiation). The frequencies used are expected to be in the GHz range. However, the existence of a large balloon may not appeal to pilots of either military or commercial aircraft, who are not used to avoiding man-made obstacles. They and other aviation experts may well consider this aspect of the technology as inappropriate.

Satellites orbit at 22,000 miles and cover 100% of UK homes. Signals to and from them, called upstream and downstream rates, are received on dedicated dishes attached to the home or a nearby central point. This point could be the local village hall or community centre. Transmissions are also in the microwave band and do not interfere with other users of the radio spectrum.

Fixed Wireless, as the term implies, involves the radiation of a wireless signal most often in one of three bands: the WiFi 2.4GHz frequency, 3GHz or 13 GHz bands. The signal will be radiated from a high building or antenna tower and customers must enjoy line of sight to the antenna, probably within 3.5km, to receive this service. Uplink and downlink speeds will vary from provider to provider. Mobile phone masts are offering Internet connections either through a dedicated laptop wireless card or to a PC with a suitable adaptor. This service is available to more than 90% of the surface area of the UK.

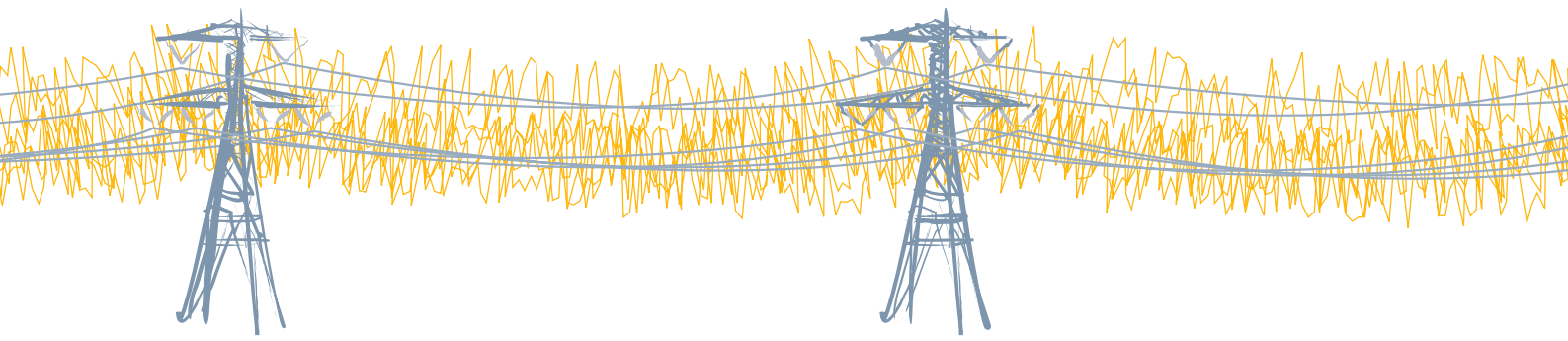
APPROPRIATE AND INAPPROPRIATE TECHNOLOGIES

Other than the reservation previously mentioned from a pilot's viewpoint, all the radio systems currently available also achieve the purpose for which they are designed and do not interfere with other users of the radio spectrum. They do not cause any degradation of the enjoyment of the general public, nor create problems for specialist groups. They too are a form of appropriate technology. It is one of the important principles of radio spectrum planning that new users or uses should not degrade the existing use of spectrum.

I have mentioned data being received as a 'trickle' or as a 'torrent'. This torrent is often referred to as broadband. Well, why is it called 'broadband'? The name refers to the *bandwidth* required to send or receive all that information. However, as time passes it is also being recognised by non-technical people as a word used to describe *any* movement of information to and from the Internet.

Is it important that we have broadband? Yes, very important. Broadband can help business be more efficient. Education is an essential part of everybody's life. Broadband can deliver a whole range of information services from teaching materials, travel information, news, shopping and of course entertainment. In short broadband is a very important part of any country's development. It is so important that the prime minister, government ministers, industrialists and educationalists have all said how important broadband will be in delivering information to those who need it. They have also used the expression 'Broadband Britain' whilst emphasising this importance.

Considering its importance, is everything about broadband good? Unfortunately the simple answer is *no*, and that brings us to the heart of the problem radio amateurs are talking about. Broadband is an enormous technological development with huge potential but, and it's a very big *but*, technological developments *must* be appropriate, otherwise they may well damage or destroy the parts they affect, whether in the short term or over a long period of time. Most systems driving the broadband revolution are appropriate to what they are trying to do, but it is the belief of many users of the radio spectrum that one particular system, PLT, is most definitely *inappropriate*. Earlier I made reference to the many forms of receiving information that I think are



appropriate.

It must be said again that the RSGB believes in, and fully supports, the concept of 'Broadband Britain', provided that the technology to deliver it is appropriate. We are very concerned that PLT technology is *not* appropriate and that is why we are trying to resist the delivery of broadband along power lines.

PLT, in our view, must pass two very important tests before it can be seen to be appropriate. Those are that is does not pollute or damage the environment to the disadvantage of others, and that it will be a resounding financial success for those who are prepared to invest in this particular area of the technology. I am not a qualified specialist in stocks and shares and so later in this article I will share with you some of the concerns which experts in that field have noted.

ARGUMENTS FOR... AND AGAINST

On the other hand the proponents of PLT are equally convinced that their means of communicating will be financially successful and that it is both an enormous technological development and a superbly appropriate way of delivering information to their customers. They are also confident that we radio amateurs represent a relatively small interest group unable properly to grasp the benefits they will deliver and that we are at odds with the greater majority of our fellow citizens. We are just a collection of little fish in a big pond who do not see the big picture. We do not support their view and feel we must voice our concerns now before it is too late.

The basis of PLT is to insert information from the Internet into electricity cables and send that information to a customer. Responses and demands from the customer, via his or her computer are relayed back to the point at which the electricity engineers inserted the signal. The technology to achieve the insertions is quite impressive, but it has knock-on side effects some of which are unwelcome. Indeed, according to Kim Gilmour, "Powerline communications were once considered an obvious and revolutionary strategy for getting the UK online but a powerline trial by Scottish electricity provider Norweb faded quietly away in 1997" (*Internet Magazine*, autumn 2003, issue 109). Les Godall, senior analyst with Forrester, was quoted in the same article as saying, "Persistent delays, quality problems and absent vendor backing will relegate it to pet-project status at cash flush utilities like RWE and nothing more."

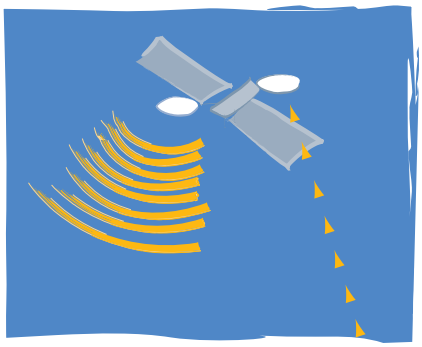
Problems have consistently been present in this technology to such extent that a number of countries, including Japan, have scrapped all forms of PLT and concentrated on tried and tested forms of Internet delivery. Barry Fox in the magazine *New Scientist*, 6 December 2003 p26, noted that ". . . five years ago the utility Nortel abandoned a project in the UK to use power cables to carry telecoms signals, after this was found to cause street lamps to radiate signals that interfered with radio reception".

These actions and pieces of information seem to cry out that the technology is not appropriate.

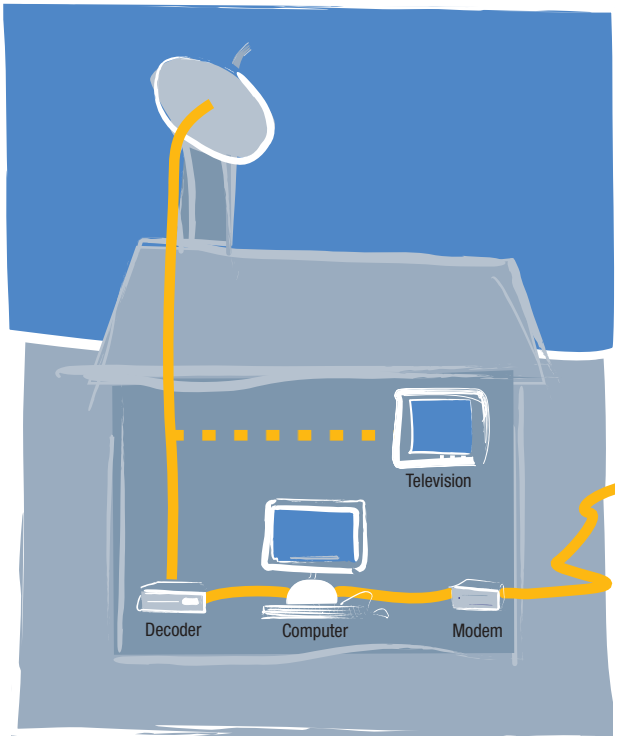
Despite this, trials are being conducted in Campeltown, Crieff, and Stonehaven in Scotland and Winchester, England. One industry specialist has made the claim that within a 400m radius of the insertion the results are superior to other forms of data delivery. However, "BBC engineers who measured the interference created by the service were horrified by its effect on short-wave radio reception in homes" (*New Scientist*, 6 December 2003, p26).

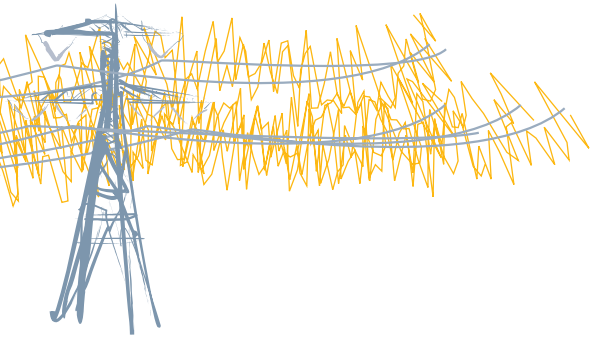
UNSUITABLE FOR ISOLATED COMMUNITIES

The belief that best results will be within 400m of the insertion, irrespective of any tests conducted by others, raises another question mark over its suitability. I and many other citizens live many miles from expected 'insertion points' (in my case 15 miles). The route to rural dwellers involves many points at which transformers, providing power to isolated farms, will have to be bridged with expensive equipment before they can receive any benefit from this process. I cannot find any examples of risk capitalists ready to finance the cost of delivery to such isolated communities or individuals. Even if they do produce the necessary finance there is too obvious a likelihood that actual or potential customers will turn to cheaper technology providers, particularly those with ADSL, who arrive in that neighbourhood somewhere downstream. This realisation must further tend to dissuade financial risk takers.



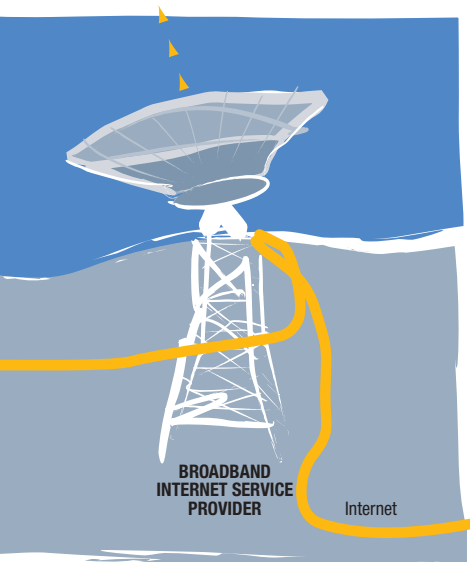
The transmission of Internet data along the powerline also has the effect of making each section of the cable perform like an antenna and radiate the data signals. In support of what the BBC's engineers found, tests carried out by many amateurs, including representatives of the RSGB, suggest that the effect of these transmissions could be to raise the noise floor by many decibels. Some results gave as much as a 30dB rise.





You will remember that if the initial signal, in this case the background noise (white noise, hiss or whatever) is increased, every 3dB increase doubles the noise. 30dB would increase the background noise by a factor of 500 times. This would decimate most of the HF bands and could adversely affect amateurs, the military, broadcasters like the BBC, astronomers listening to radio signals, pilots of transatlantic jets and emergency communications. To degrade the spectrum in this way is considered by us to be totally unacceptable and is pollution of the worst kind. I have no doubt that this alone indicates that the technology is inappropriate.

David Sumner, K1ZZ, noted in a recent article for the ARRL that the US National Telecommunications and Information Administration observed that "As a result of non-linear elements in the electrical power distribution system, BPL systems may radiate emissions at frequencies substantially higher than the frequencies actually used intentionally within the BPL system". David further commented, "That makes BPL a concern to anyone who watches television, listens to FM radio, rides in an airplane, train or boat, cares about weather forecasting or astronomy, or relies upon police or fire departments or any other services that use land mobile radio" (*QST* November 2003). Concerns and doubts about the appropriateness of this technology spread far and wide.



ANOTHER INAPPROPRIATE TECHNOLOGY: A *CRI DE COUER*

I have pointed to appropriate technologies because they do not adversely affect others and do not pollute. It may well be helpful if I now give an example of other forms of inappropriate technologies which have nothing to do with radio, the development of which were resisted by a tiny minority who were initially ignored until it almost became too late to prevent a huge ecological disaster and who were seen as narrow-minded and at odds with the greater majority.

Our forefathers used to go down to the sea shore armed only with a pointed stick in order to catch fish to feed their families. Fish is a superb food source and it was easy to recognise the value of developing better and better technologies to catch this food. A plentiful supply of fish would bring great good to the feeding of the country and many generations sought to improve the catch. By the 1800s these improvements had led to the explosive harpoon gun to catch whales and enormous trawl or drift nets to catch other types of fish. Some nets had large mesh through which small or young fish could escape and be able to develop naturally, but the nets with small mesh caught everything, young and adult, all of which died. The harpoon gun was, in its way, just as efficiently deadly as the small mesh nets, ensuring that all whales were caught and killed.

As soon as these 'technological developments' appeared, a small number of concerned voices said that they were not appropriate and would lead down the road to disaster. These voices continued to be ignored almost until it was too late. Eventually the world needed a moratorium on the killing of whales, despite some continuing to say that the objectors did not understand the benefits that could be delivered. More recently the European Community has been forced seriously to re-examine the whole question of fishing and begin to devise ways to put right the damage done. The wide mesh nets could be seen as appropriate technology but the small mesh nets and the harpoon guns were not.

It is the belief of many users of the radio spectrum that… PLT, is most definitely inappropriate

Maybe if we had only allowed wide mesh nets the present problems would not have arisen. We want broadband delivered by appropriate technology, analogous to the wide mesh nets. PLT too closely resembles the narrow mesh nets. We are not a small fish ready to be killed off just to allow an unfettered technological disaster. We do not want to see spectrum pollution destroy the enjoyments and benefits of others.

WHERE DO WE GO FROM HERE?

The proponents of PLT also claim that they are interested in serving rural areas, yet their trials are being conducted in urban areas including the city of Winchester, hardly a rural area. Many developing nations are seeking ways to boost the effective distance over which Wireless Local Area Networks (WLANs) can operate and thereby service their rural inhabitants. PLT does not seem to figure in their development plans. I have not attempted to look too deeply into the world of stocks and shares but I cannot easily find any articles in financial magazines urging their readers to invest in PLT. People with spare cash, venture capitalists, are needed to finance the huge investment needed to get PLT to every isolated home or farm. Venture capital appears not to have been won over. Associated Press carried a quote from Larry Carmichael, a project manager with the Electric Research Institute: "I think they're a long ways from proving it, let's leave it there. The tests to date have been so small as far as looking at the financial and technical viability. It's still at the very early stage of development".

If PLT is, in our view, inappropriate then what is appropriate? The delivery of high-speed information to your home, your school or your place of work can be achieved in a number of ways. I have described some of those ways - ADSL, cable, satellite, WiFi etc - all of which are appropriate and how they work can all be explained in a simple fashion. Do not be fooled into supporting PLT if it comes to your locality. We have no doubt it is inappropriate. We hope you will say so too if you are asked or have an opportunity to tell others. ♦

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Practical aspects of datamodes

News about using QRSS on HF ♦ More information about RTTY, AmTOR and AmTOR-ARQ ♦ Be careful about what you connect to the telephone line ♦ BARTG soul-searching ♦ A new transceiver interface for digital modes ♦ A digital voice interface

Richard Newstead, G3CWI, sent in this about using slow CW (now usually referred to as QRSS) on the HF bands: "There is a lively bunch of experimenters using QRSS on the HF bands [see also p 85 - *Ed.*] - there is even a 'contest' of sorts. I have been encouraging them to think a bit more about the best way to send this slow-speed data. My thoughts are that the dispersive nature of the HF channel means that simple QRSS is not the best way forward. HF QRSS gives one plenty of time to think while those traces appear! I wonder if there is a niche in the array of datamodes used by amateurs for a very slow and robust mode that works with weak signals on HF channels?

"I am thinking that a simple EME-style QSO could be achieved in under an hour and that, for optimum performance, the mode should not be connectionless (ie it needs to have an ARQ element for best performance). Such a mode would require good frequency stability and accuracy - we know lots about the dispersive characteristics of HF channels so it should not be too hard to devise something. Personally, I would like something that could be left running, doing periodic soundings to make contact on the long-path. It would be sort of fun if it retained some link with CW, so that it could be manually decoded, even if the actual QSO was automatically done. All the excellent development work on digital modes seems to have gone into connectionless conversational modes - this would be a whole new area to explore. I think that QRSS, while fun, is not really going anywhere on HF (great for LF though)."

In the last column, I mentioned that support for the older RTTY and AmTOR modems is not very widespread now. E J Hatch, G3ISD, replied: "I suggest you look at the websites of G3VFP and WM2U, where there is much useful information and software which, when combined with the book *Digital Modes for All Occasions* (available from the RSGB Shop), by Murray Greenman, ZL1BPU, gives a comprehensive overview. I might add that, as far as I know, AmTOR-ARQ is not covered by any of the sound card programs. Admittedly, it is not much heard these days, but I and others continue to use it for its superior error-free characteristics. The G4BMK (DOS) software is excellent."

Peter Simpson, G3GGK, commented on my suggestions of using the Data Access Arrangement hardware from modems. He writes; "As you quite rightly point out, only approved apparatus may be coupled to telephone lines in the UK. [This may also be true elsewhere.] My understanding is that the 'complete' modem unit is given approval and that modifications will invalidate that approval. Removal of a section of the circuitry would almost certainly be classed as modification and would leave the main unit and the removed portion without approval." He is, of course, correct but, for a home-built unit, such a module could form a good start. Just be aware...

BARTG CHANGE OF DIRECTION

BARTG appears be questioning its *raison d'être* these days. Because of the ease with which anyone can now start using data modes with just a sound card, there is no need for anyone to ask a group such as BARTG for help. Gone are the days when BARTG and its kits were needed to help people get going with their Creed teleprinters and then the TNC; this is why the organisation changed to an Awards and Contest Group a couple of years ago. Although this move was welcomed by many, some said that, as the group was no longer going to produce 'technical articles', they would cease to be members. As there was an increasing problem getting anyone to write technical articles, these just could not appear, so the BARTG magazine, *Datacom*, is now geared primarily to contests and operational matters.

MixW USB TRANSCEIVER INTERFACE

A new transceiver interface, the MixW RigExpert, has appeared, to make connecting between computer and rig simpler and neater. It uses the Universal Serial Bus (USB) port with a separate module that performs both as audio interface and serial port substitute - so it can handle all the connections to a PC without the need for separate audio attenuators and isolation transformers, plus serial interfaces for Tx/Rx switching. Software drivers need to be loaded onto the PC and, after that, software such as *DigiPan* can then use the MixW interface rather than the sound card. Interfaces to the remote control of many rigs are included, such as CAT and CIV, a facility that is usually difficult to arrange when the normal serial port is being used for Tx/Rx control. A picture of the MixW interface is shown, and full details are available from the web address given at the end.

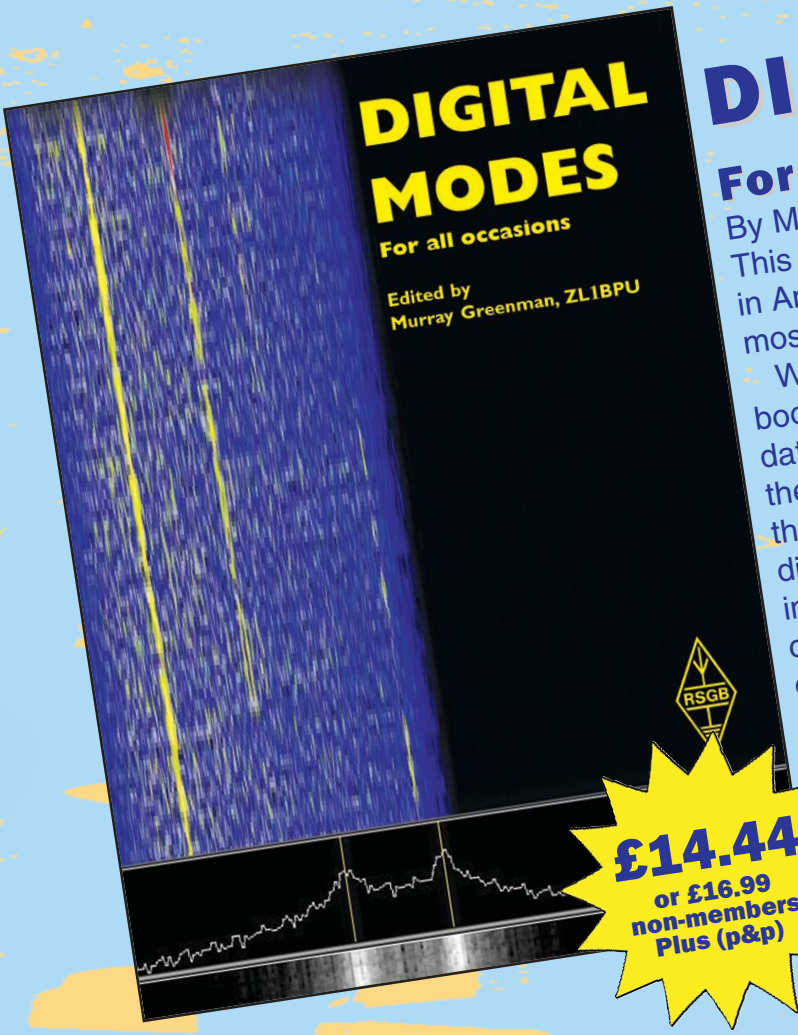
DIGITAL VOICE

AOR-UK has been given CE approval for its digital voice interface, and apparently it has been informed by OFCOM that its use on the amateur bands will be permitted here. One issue that needs to be resolved is finding suitable frequencies for digital voice and digital slow-scan television. There are quite a few people using ARD-9800 digital voice/data/SSTV units and they are having a hard time finding a frequency to use. In the US, these modes are considered as voice, so should not be in the data sub-bands, and the US licence reflects this. In most other parts of the world there is a free-for-all, with bandplans being purely voluntary, so bandplanning issues need to be addressed before bedlam ensues. ♦

The RigExpert USB transceiver interface, manufactured by MixW (pen not included!).

WEB SEARCH

QRSS on the HF bands	www.cnts.be/knights_qrss
MixW Interface	www.mixw.net
G3VFP	www.g3vfp.org
W2MU	www.qsl.net/wm2u



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In practice

'GOOD-ENOUGH' CONNECTORS

Q What's the right way to put DIN and 'D' connectors onto multi-core cables?

A In this age of compact ready-made equipment, assembling small connectors onto small multi-core cables has become one of the most-needed skills in amateur radio. This is not a traditional skill, because everything now is so much smaller than when Marconi were a lad. I don't know if there even *is* a 'right' way to do it using hand tools; but I do know some 'good-enough' ways. They don't always look pretty, but they *are* reliable connections that won't short or come loose.

The key skills are:

- Accurate, repeatable wire-stripping
- Clean, *quick* soldering
- Getting every step *right first time*.

Good tools are vital - this isn't an easy job, so you want your tools to work *for* you, not against you. Central to the whole operation, and central in the photograph, is a table vice with a tilting ball mount. It holds the work at about the right height above the bench-top, and can easily be adjusted to give just the right orientation for soldering for each separate step. There are various alternatives costing around £10-15 [1]. The Draper vice shown costs more than that, but is a good investment. I use mine a lot, for all kinds of assembly and repair work, and over the years have certainly got my money's-worth. The vacuum base doesn't work on real-life work surfaces, but the Draper vice is so heavy that it doesn't matter. I strongly prefer it over a vice that clamps on the edge of the bench, because the base raises the work to a more comfortable height, and dropped parts don't fall on the floor. Well, *fewer* dropped parts, anyway...

Anticlockwise around the vice are the necessary hand tools:

- A *semi-sharp* penknife - sharp enough to cut through the soft plastic outer jacket of a small cable, but not sharp enough to nick the fine strands of any screening underneath (if you're careful). For this particular job, an ordinary penknife is much better than a Stanley knife or a scalpel.
- A sharp-pointed scriber or similar tool for combing apart the strands of braided screening.
- A pair of sharp-pointed nail scissors, for trimming back braid and cutting very thin insulated wires. I do have a very good pair of small wire-cutters, but for this particular job the scissors are more versatile.
- A pair of adjustable wire-strippers. Good wire-strippers are crucial, because you *must* be 100% confident that you can strip every one of the thin wires in a small multi-way cable to exactly the same length, cleanly and without nicking the strands. Don't try to use ordinary wire-cutters - you might manage to strip the first few wires, but before they're all done you'll probably snip one right off... and then you'll have to start all over again.

The strippers shown are about the minimum quality that will do the job well. This particular tool comes in two versions, that have different ways of adjusting how far the jaws close. It's worth spending a little more on the version that has a multi-sided rotatable cam on the left handle (see the inset in the photograph).

- A pair of fine-nosed forceps, for holding the wires while soldering. I find that forceps with finger-loops are easier than pliers to manoeuvre into odd orientations. Use non-locking forceps, because you always need to hold the wires *gently*.
- A soldering iron with a sharp-pointed conical tip. This is small work, and definitely not a job for your vintage Henley Solon! As an absolute minimum, buy a small low-cost iron for this kind of job - you're going to need it more and more in future.

I have already sung the praises of irons such as the Weller TCP that have a range of temperatures and interchangeable tips of different sizes [2]. Several people who have followed that recommendation have told me, "Thank you - I only wish I'd done it years ago!"

- Thin solder (22SWG) so that you can apply just as *little* as you need.
- A very good light - for this kind of work, your eyes need as much help as they can get.

Armed with these tools, and with a little practice, you should be able to make a very good job of fitting small connectors to small cables.

Typical of the cables you'll be using are thin 9-core screened (Maplin XR27E), screened two-core (Maplin XS23A) and figure-of-eight twin individually screened (Maplin XR21X). Unlike most suppliers, Maplin sell these cables by the metre [1]. The 9-core has a braided screen, and enough cores for most applications, so it's a good type to standardise on and keep a few spare metres to hand. I'm particularly fond of the twin individually screened (XR21X) because that can be peeled apart into separate single-core screened cables. Although these small, low-cost cables have only a single-layer lapped (helical) screen, as opposed to the braided screen you find in the 9-core or in RF coaxial cables, I've found them suitable for normal uses.

On to the connectors, and let's start with the DIN series. The key to working with DIN connectors is to follow the pin numbering that is moulded into every single plug or socket. Follow those numbers, and the connectors will mate correctly. **Fig 1** shows the numbering for the common DIN connectors with 3, 4, 5, 7 and 8 pins. Five connectors in only two diagrams? Yes, because all except the 4-pin connector share the same layout and numbering system. A 3-pin connector has only pins 1, 2 and 3; the 5-pin adds two more, but doesn't re-number the existing pins; and so on. Note that the numbering will appear mirror-imaged in certain views, which is why you should *always* follow the pin numbering on the item itself.

The shared layout between DIN connectors with different numbers of pins leads to a few useful tricks. If you don't need to connect every pin,

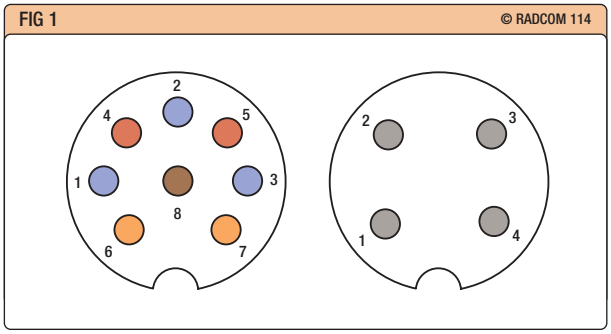


Fig 1
DIN connectors with 3, 5, 7 and 8 pins all share the same numbering system; the 4-pin numbering is different. Layouts may be mirror-imaged. Follow the numbering on the item itself.

Tools for working with small connectors.

you can sometimes use a plug with fewer pins than the socket has. If the reverse applies, and all the plugs in your component drawer have too many pins, you can remove the unwanted ones with a pair of strong wire-cutters. But just when we thought we could trust those clever people from DIN, they played a dirty trick on us: the 8-pin connector comes in two patterns, which look almost identical but will *not* mate. Connectors with up to 7 pins are based on a circular layout, and in the most common pattern the 8th pin is simply placed in the centre of the circle. Icom rigs use these 7- and 8-pin connectors. But, in the other pattern, pins 6, 7 and 8 are all offset downwards. Yaesu HF transceivers use this less common 'offset' or 'horseshoe' variant for the 'Band Data' connector [3].

The second photograph shows a simple screened cable connection to a 4-pin DIN plug. The diagram in the transceiver manual showed the signal input to pin 1, ground to pin 4, so that's what I did. I also decided to connect the grounded pin to the connector shell. Here's the procedure, including those little details that make all the difference.

1. Dismantle the plug, removing the cable clip, and grip just the plastic pin header in the swivel vice. Alternatively, plug the pin header into a matching socket, which holds the pins in position if the plastic softens.
2. Slip the connector body onto the cable *now*! Even if the other end of the cable is free, this is still a very good habit to develop.
3. Strip back about 20-25mm of the jacket of the screened cable. Your wire-stripper probably cannot cut cleanly though the jacket without damaging the fine wires of the screen underneath. It's best to run the penknife blade around the jacket first, cutting through most of the thickness - again without nicking the wires underneath - and then just ease the jacket off gently.
4. Use the sharp-pointed scriber to unravel the screen gently, and twist the wires to form a pigtail as shown. Don't twist it too tightly around the centre wire, which has very thin, soft insulation.
5. Strip back the insulation from the centre wire to leave about 7-9mm, and quickly tin the bare strands to hold them together. The soft PVC insulation will shrink back with the heat, so this step needs some experience and judgment. Then snip off the excess bare wire so the end will go nicely into the hollow end of the correct pin (pin 1 in this example - Every time, check the number moulded into the header).
6. Here's the tricky bit. You really need one hand to hold the cable, another to hold the soldering iron, and a third hand to apply solder. Two-handed people have to tin the hollow-ended pin, put down the solder and then feed the tinned end of the centre wire into the pin while heating the pin. Make absolutely certain there are no stray strands of wire sticking out, that could short to some other pin or to the shell.

For this step, it really does help to steady your elbow or forearm against the bench. This is where you'll appreciate the tilting vice, to hold the work at just the right angle. It also helps to support most of the weight of the cable, either over your shoulder or from an overhead bench lamp, so it's not trying to pull out of the pin.

Hold the wire gently in your forceps or pliers, or else you'll squeeze right through the insulation when it softens. Try to feed the wire in straight, because the softened insulation will peel off at a sharp bend.

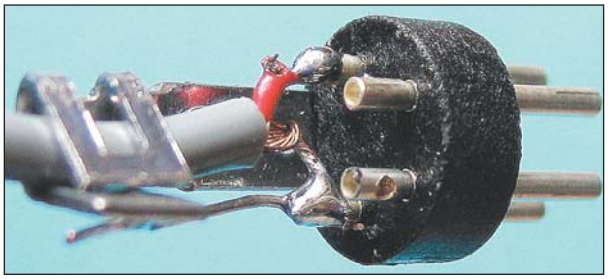
Be quick when soldering, to avoid melting the plastic. While the solder is molten, twist the cable so that the grounding pigtail is lying over the pin to which it's about to be connected. At this stage you only need to tack-solder the centre wire into place, because this is *not* going to be your final electrical connection.

If you are assembling a multi-way connector, repeat this step for the other wires. We'll look at that in more detail next month.

7. Insert a piece of solid tinned copper wire into the pin that is to be grounded (pin 4 in this example - again, check the number moulded into the header). Tilt the vice head so that the wire stays inside the hollow end of the pin. Solder both the pigtail and the wire to this grounded pin. Don't over-heat it, or else solder may flow back up the pigtail and melt through the insulation of the centre wire. Cut off the excess length of the pigtail.
8. Now that the cable is more firmly attached to the plug, re-flow the solder joint on the centre wire to make a reliable electrical connection. Add a little more solder - really to add more flux - but then carry all excess solder away on the tip of the iron. Aim for a small, neat bead as shown, that won't short to the shell or to any other pin. (You'll notice that the hot soldering iron tip touched the insulation when I did this. Well, that's better than overheating the pin and allowing it to move in the header.)
9. Assemble the cable grip to the pin header, and hold both parts together in the vice. The type of DIN plug illustrated has a metal body, and a slim cable grip that allows good all-round access. The cheaper plastic-bodied plugs have a two-part metal shell that covers half the rear of the header, so these are more difficult to work with.

Solder the cable grip to the grounding wire as shown in the photograph, taking care not to unsolder the wire from the plug. In other words, apply the soldering iron to the cable grip, not the wire.

10. Use pliers to clench the cable grip onto the cable. Make sure: there is some slack in the centre wire, so it won't snap if the cable is pulled.
11. Make an all-round visual check for stray strands of wire - snip them off with the sharp-pointed scissors - or excessive blobs of solder that might short to an adjacent pin or the connector body. Assemble the connector into its body, and then test for open-circuits between adjacent pins. ♦



A simple screened cable connection to a 4-pin DIN plug. Note the added grounding wire to the connector shell, via the cable grip.

NEXT MONTH we'll apply those skills to the assembly of multi-way DIN connectors and 'D' connectors for PC ports. I'll also talk more about testing cables. And a final reminder: if you don't already have a suitable small soldering iron, do think very seriously about getting one. All the other tool requirements are negotiable; but not that one.

NOTES AND REFERENCES

[1] Follow the links from the 'In Practice' website (URL above). I am continuing to research a 'best value' option for a tilting vice, and will post the results as available.

[2] 'In Practice', March 2002 - but re-check all part numbers before ordering.

[3] Yaesu users: do *not* try to force the wrong type of 8-pin plug into the 'Band Data' socket! There is a severe risk of breaking the special switched socket - and that means *big* trouble. Unfortunately, an essential control line is routed through the offset pin 7, so you don't have the option to use a more common DIN plug with fewer pins. You can buy the correct 8-pin offset/horseshoe plug either from Yaesu dealers or from Maplin (FG40T).

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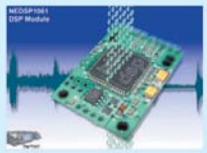

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By Lawrence D Woolf, BA (Hons), BSc, Dip Math (Open), GJ3RAX

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Comparison of SSB phasing methods

Part 3

This month the focus is on polyphase networks designed by Gingell, KN4BS, Martinez, G3PLX, Rogers, G3TFL, and Green, VK6KRG.

The polyphase circuit (**Fig 12**) uses a different approach to generation of the audio phase shifts. It was devised by Michael J Gingell, KN4BS, while he was employed by ITT at STL, Standard Communications Labs, between 1965 to 1975. In 1968, he filed patents for ITT on this, now long expired. In 1974 he completed an external PhD from London University on the subject of *The Synthesis and Application of Polyphase Networks with Sequence Asymmetric Properties*, [7].

There is a rather pleasing symmetry to the polyphase network. However, this version uses 48 components compared with the eight or 12 components of the bridge-type phase-shift networks. The repetitive layout of the circuit implies that it could easily be extended or reduced if required. The values shown are those used in the implementation by Peter Martinez, G3PLX, [8].

In order to use this circuit in a transmitter, the input Vi1 is joined to Vi2 and then Vi3 is joined to Vi4. The two resulting inputs are fed in antiphase. Some versions use a transformer for this function and others use a pair of operational amplifiers that have been set for unity gain. One amplifier is configured to be non-inverting and the other is inverting.

The polyphase network outputs present us with four signals, nominally identical in level, but phase-shifted incrementally by 90°. We could just take any adjacent pair of outputs to give the required phase difference or feed the alternate pairs into differential amplifiers. Another option is to feed the four audio signals into a four-phase mixer in which the RF carrier signals are also incrementally phase shifted by 90°.

FIG 13 © RADCOM 116

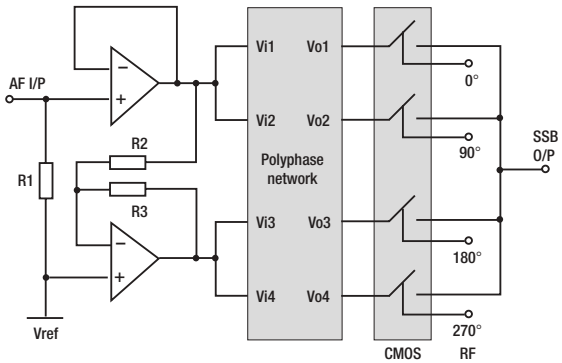


Fig 12
The G3PLX version of the Gingell polyphase network with six sections.

Fig 13
The polyphase exciter.

Fig 14
The local oscillator phase diagram.

The simplified circuit in **Fig 13** shows a practical method for generating an SSB signal using a polyphase network. The upper operational amplifier is configured as a non-inverting unity-gain stage. The lower one is also unity gain when R2 = R3, but provides an inverted output to feed the other inputs of the network. The four outputs have been shown driving a CMOS switch as a modulator. The four control inputs must be fed with square waves, each with a 90° (or 25%) duty cycle, and phase-shifted by 90° with respect to each other.

The four outputs of the local oscillator are shown in **Fig 14**. This shows two complete cycles and how they drive the CMOS switches in sequence so that only one is in the ON state at any one time.

In **Fig 15** we can see that the G3PLX version of the polyphase network gives much better opposite-sideband suppression than the older designs. In theory, over 60dB is achievable over a 550Hz to 4.5kHz audio bandwidth. Changing the resistor values from 5.6kΩ to about 10kΩ lowers the frequency range to around 300Hz to 3kHz, offering somewhat more useful performance for speech.

There have been several other circuits published using the polyphase network. In most cases, the resistors have been the same value throughout and the sets of capacitors are of different values. (A 'set' is, for example, the resistors R11, R12, R13 and R14, together with capacitors C11, C12, C13 and C14, in Fig 12.) Within each set, the four resistors must be matched as closely as possible, likewise the capacitors. With a modern digital test meter selecting matched sets is relatively straightforward.

For each of the sets it is possible to calculate the frequency at which the phase error is close to zero:

$f = 1/(2\pi RC)$ **Equation 10**

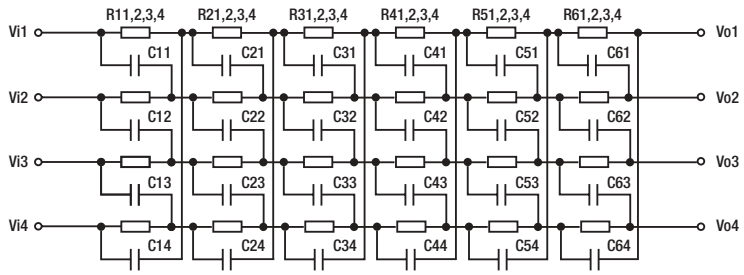
The useful frequency range of the polyphase network is slightly greater than indicated by the highest and lowest frequencies calculated using Equation 10, demonstrated by taking those values from the G3PLX version. The resistors are all 5.6kΩ. The highest capacitor values are 47nF which give a calculated frequency of 605Hz. The lowest capacitor values are 6.8nF which give a calculated frequency of 4180Hz. The graph shown in Fig 14 shows that the blue curve, the phase error, crosses the zero error axis at about these frequencies. The intermediate zero error frequencies may also be calculated in the same way. The actual useful range is greater because it extends to the frequencies where the phase error, and therefore the opposite-sideband suppression, is still considered acceptable. In Fig 15, for example, the frequency range, for better than 60dB opposite-sideband suppression, is 550Hz to 4.5kHz, with the magnitude of the phase errors at these frequencies being approximately 0.1°.

Some of the published information suggests that the component tolerances are not very critical. The exact 90°-frequencies for each section may be altered by several percent without much noticeable change in the performance. However, the values within each section should be carefully selected. Each set of four resistors and four capacitors should be as closely matched as possible.

AN OPTIMISED POLYPHASE NETWORK

Looking at the components chosen by G3PLX, we can see that the ratio of the adjacent capacitor values is about 1.5:1, or slightly less, in each case. The phase errors are somewhat greater for the outer values than for

FIG 12 © RADCOM 115

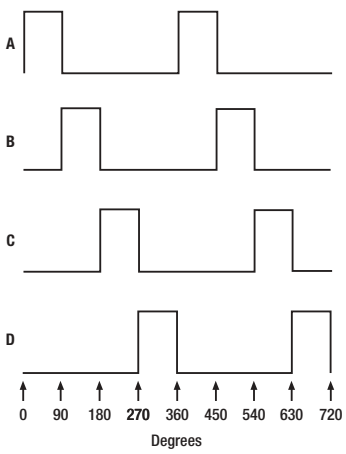


Values

All resistors 5.6kΩ

C11, 12, 13, 14 47nF
C21, 22, 23, 24 33nF
C31, 32, 33, 34 22nF
C42, 42, 43, 44 15nF
C51, 52, 53, 54 10nF
C61, 62, 63, 64 6.8nF

FIG 14 © RADCOM 117



the intermediate ones, but are still acceptable. These ratios for the outer capacitor values could be reduced, to narrow the range slightly, or the intermediate values could be wider spaced, which would allow a wider frequency range. In order to achieve a predicted opposite-sideband suppression of greater than 50dB over a particular frequency range, the adjacent-section frequency ratios should not exceed 2:1. This gives a useful basis for choosing suitable values.

Using this technique, it was found that, choosing outer ratios of 1.6:1, with 2:1 for the intermediate sections, an opposite-sideband suppression of 50dB could be achieved over a frequency range of 20:1. This assumes perfectly-matched components and that all the required values can actually be used. The values used for the calculations were resistors of 10kΩ with capacitors of 3.9nF, 6.25nF, 12.5nF, 25nF, 50nF and 80nF. The useful frequency range is 180Hz to 3.6kHz.

The results of this optimised version are shown in **Fig 16**. This is not necessarily the best that can be achieved, but appears to offer a better compromise than the originally-proposed design. In order to get the exact capacitor values required, we would probably have to use series or parallel pairs in some cases, which would also increase the cost. The analysis of the G3PLX version predicted better opposite-sideband suppression but, in practice, this would be degraded by component tolerances. Other factors, including the amplitude and phase errors in the RF signals to the mixers, would also compromise the results that could be achieved in practice.

THE G3TFL POLYPHASE NETWORK

Another interesting variation was proposed by G3TFL [9]. In this, he suggested using equal value capacitors, all 47nF, and changing the resistor values for each section. He also chose to use eight sections instead of six. These resistors were 680Ω, 1kΩ, 1.5kΩ, 2.7kΩ, 4.7kΩ, 8.2kΩ, 15kΩ and 18kΩ.

The results shown in **Fig 17** are similar to those presented in 'Technical Topics', which did not, however, show the phase-error curve. We can see that the opposite-sideband suppression is potentially better than 60dB from 170Hz to 5.4kHz. This demonstrates quite clearly that increasing the number of sections, and thereby using more components, can increase both the frequency range and the opposite-sideband suppression.

THE VK6KRG POLYPHASE NETWORK

Another polyphase network was published by Rodney Green, VK6KRG [10], as part of a more complex receiver design that introduced some other interesting features. His polyphase network was even larger than that of G3TFL, as it had nine sections. It also had equal capacitor values.

The capacitors were all 10nF. The resistor values shown were 3.3kΩ, 4.7kΩ, 6.8kΩ, 10kΩ, 15kΩ, 22kΩ, 33kΩ, 47kΩ and 68kΩ. The response shows an opposite-sideband suppression of 50dB or better from 180Hz to 6kHz. It is also possible to reduce the end phase-ripple peaks by changing the resistor values of 3.3kΩ to 3.9kΩ and the 68kΩ to 56kΩ, respectively. The real difference to the performance would probably be hard to detect.

The article by VK6KRG also used a two-section polyphase network to provide the RF phase shift to drive the mixers.

CONCLUSIONS ON THE POLYPHASE NETWORKS

The use of the polyphase network has been shown to be capable of offering much better results than the earlier bridge-type networks. By using more filter sections and many more components, this version can produce more points where the phase error is zero, with much less ripple between these zero phase points. It has been shown that, by following a few simple rules, a circuit can be designed that will give results to meet a wide variety of needs. Simpler versions could be used for the narrower-bandwidth modes such as CW or data. As with the bridge-type circuits, careful attention must be paid to restricting the signal bandwidth to the useful operating range of the phasing network to avoid transmitting or receiving any unwanted signals. ♦

NEXT MONTH

In the final part, GJ3RAX looks at the all-pass filter as a phasing device.

REFERENCES

[7] Michael J Gingell's website, http://users.vnet.net/gingell/polyphas/polyphas.html
[8] 'G3PLX Polyphase SSB Generator' in 'Technical Topics', *Radio Communication* May 1975, pp379-81.
[9] 'Technical Topics', *RadCom* July 2001, p63.
[10] 'The Bedford Receiver: A New Approach', *QEX* Sept/Oct 1999, pp9-23.

Fig 15: The phase error and opposite-sideband suppression for the G3PLX design.

Fig 16: The optimised phase error and opposite-sideband suppression.

Fig 17: The phase error and opposite-sideband suppression of the G3TFL design.

Fig 18: The phase error and opposite-sideband suppression of the VK6KRG design.

FIG 15 © RADCOM 118

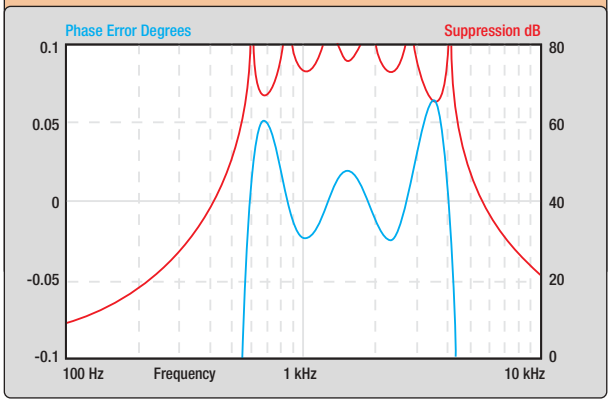


FIG 16 © RADCOM 119

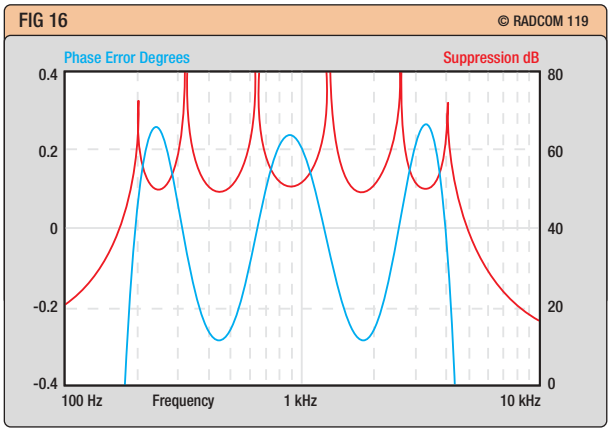


FIG 17 © RADCOM 120

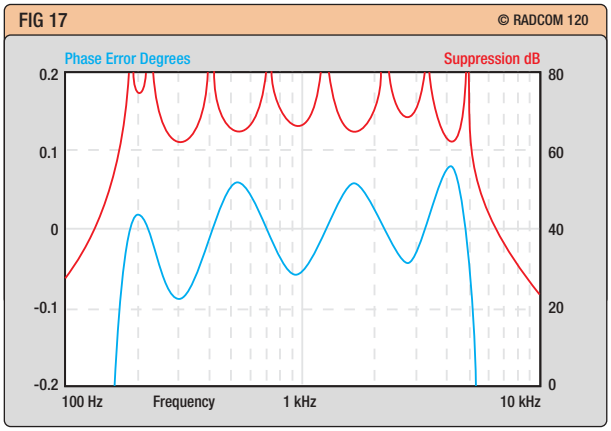
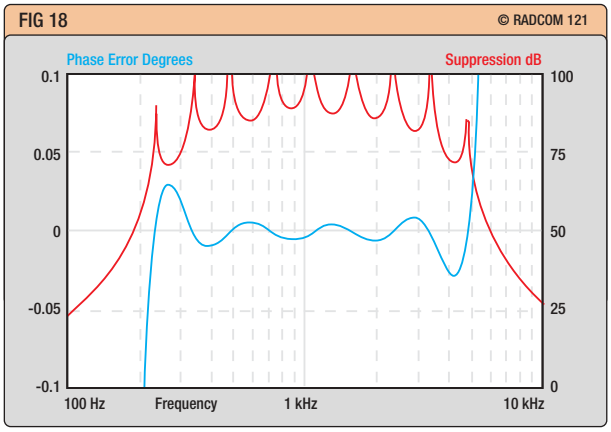


FIG 18 © RADCOM 121



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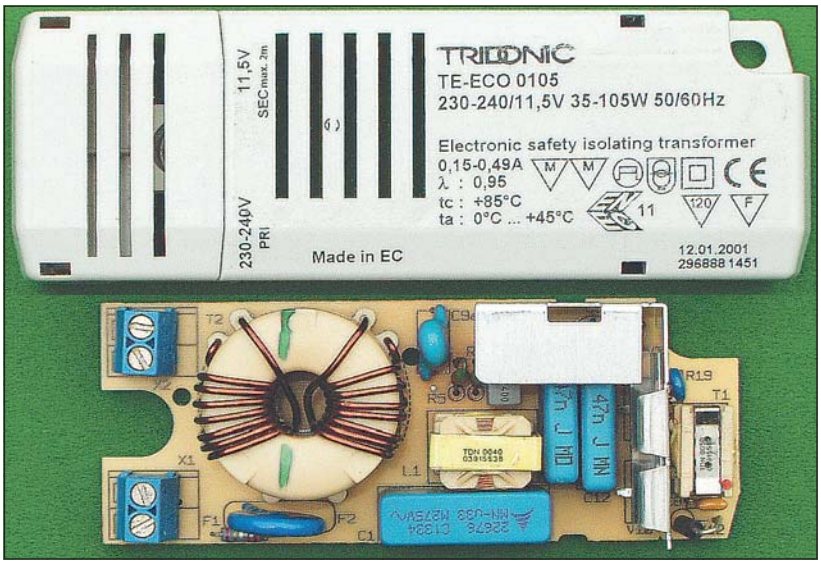
EMC

The ever-increasing use of switch-mode power supplies (SMPSs) is generating growing levels of radio-frequency interference on amateur bands. This month's 'EMC' column includes an example of this. Tyre static is also a cause of interference to automobile LW/MW reception, and engine management systems can be the sources of other interference.

Don, G3HVA, has written to comment on the item in February 'EMC' about locating RF interference sources. He emphasises the importance of searching on the highest frequency on which the RFI is audible and of going to a higher frequency as you get closer to the source. This is an important point which is explained in the EMC Committee's six page information sheet, EMC04, *Interference to Amateur Radio Reception* (see 'Web Search'). Don has also provided an interesting account of his own experience in locating a source of interference a few years ago.



A Tridonic TE-ECO 0105 electronic transformer for low-voltage lighting.

INTERFERENCE LOCATION IN PRACTICE

Don, G3HVA, was suffering from a source of broad-band interference that was ruining communications on the 3.5MHz and 7MHz amateur bands. Over a three-month period, he spent many evenings searching for the source. He searched around the village on foot with a portable short-wave receiver, but locating the strongest signal proved difficult as most of the peaks were false due to vertical runs from overhead power distribution cables, street lighting, sub-stations, etc. He also tried driving around in a car with the receiver connected to the car aerial, but found that this provided little advantage apart from protection from the weather.

Don then constructed a light-weight tuned loop aerial for 3.5MHz and took directional bearings from his garden and from the garden of another radio amateur in another part of the village. Plotting the two bearings on a map gave an approximate location where the lines crossed at a point to the north of Don's home. He searched in that direction, but still ran into the same problem of many false peaks. He then referred to the *Interference Handbook* by William Orr, W6SAI, which states that when looking for a noise source, the search criterion is not the *level* of the noise but the *highest frequency* at which it can be heard. The first time Don heard the noise on 20MHz in a back alley, he knew he was getting closer, and when he heard it on 28MHz, he was within about 30m of the source. He finally pinpointed it by receiving on 40MHz.

Don approached the owner of the bungalow near where the source appeared to be and also contacted the Radiocommunications Agency and the Area Manager for Southern Electricity. The RA and Southern Electricity both promised action and the noise disappeared within the next day or two. Don never found out what it was, but it was probably an arcing power cable or faulty insulator.

LOW-VOLTAGE LIGHTING

Low-voltage halogen spotlights are sometimes installed in fitted kitchens. These require transformers, which may be the conventional iron-cored 50Hz type or high-frequency 'electronic transformers'. From time to time, the EMC Committee has received reports of RF interference from such electronic transformers, both to amateur radio reception and to LF/MF broadcast reception. Until recently, we never had the chance to test an actual electronic transformer from an installation that was reported to cause RFI.

Don, G3HVA, has a neighbour who had a new kitchen fitted. This included 10 low-voltage spotlights, each 20W, powered by three electronic transformers supplied by ScrewFix. When the neighbour's kitchen lights were on, Don noticed interference from 1.8 - 30MHz and above, but particularly on the 14MHz and 18MHz bands. Don uses an inverted-V wire aerial for 3.5MHz and 7MHz and a quad aerial on a tower for 14 - 28MHz. When pointing towards North America, the quad points towards the neighbour's house and, although the electronic transformers are CE marked to show compliance with the relevant EMC standards, these standards are not strict enough to protect reception of weak signals on amateur bands. Don was able to cancel most of the interference using an MFJ Noise Canceller, but he found the residual noise irritating, especially when receiving weak signals.

Don agreed to pay £33 for the electronic transformers to be replaced by conventional iron-cored 50Hz transformers. This completely cured the problem. Don then sent one of the electronic transformers to the EMC Committee for evaluation. It was a Tridonic model TE-ECO 0105, rated at 105VA.

These electronic transformers drive the lamps with an 11.5V, 35kHz square-wave AC output, at up to 9A. The output cable is not screened, so there are some potential EMC issues here. In the Tridonic Atco 2003/2004 catalogue (see 'Web Search'), the introduction page for the TM family of ordinary 50Hz non-electronic safety isolating transformers for low-voltage lamps states that the maximum length of secondary wiring must not be exceeded, to avoid excessive voltage drop, but the introduction page for the TE

family of electronic transformers makes no mention of maximum cable length on the secondary side. The wiring diagrams show a maximum secondary wire length of 2m for the TE-ECO series and for most other types of TE electronic transformer (apart from the TE-DC), but do not explain *why* the 2m maximum length should not be exceeded. The reason appears to be EMC compliance, because the longer the output cable, the greater the level of RFI emissions.

ELECTRONIC TRANSFORMER ON TEST

First, I set up the electronic transformer in my kitchen with a 12V 60W car headlamp bulb as a load connected via a 2m length of cable. Using an inverted-V wire dipole over the roof, the interference was most noticeable on the 14MHz and 18MHz bands where the background noise level on quiet portions of the band increased from about S1 to S3 - 4 on a Kenwood TS-850, and this was with only one transformer rather than three in Don's case. I then tested the electronic transformer on an HP8591EM spectrum analyser with an EMCO Line Impedance Stabilising Network (LISN). The standard EMC test below 30MHz tests 'conducted emissions' of RF interference into the mains supply. It did comply with the applicable EMC standard, EN55015. Like most SMPSs, the conducted emissions fall steadily from 150kHz up to about 2MHz and then fall more steeply above 2MHz. Unlike most SMPSs however, the conducted emissions come up again at higher frequencies with a broad peak at around 12 - 21MHz. This is similar to the emissions from some models of noisy TV set.

On the TE-ECO 0105 model tested, the secondary output is marked, '11.5V SEC max 2m' so I checked to see what happens if this length is increased from 2m to 5m. It certainly made a difference and the conducted emissions from 0.5MHz to 1.5MHz increased by about 20dB. One thing the catalogue doesn't state is that the secondary wiring to the lamps should be run as a closely spaced pair to minimise the area of the radiating loop and that neither side of the secondary output should be earthed. Although it would be unusual to earth one side, if this is done it has a severe effect on the EMC performance, with conducted emissions at around 1MHz increasing by about 30dB.

I then traced out the circuit of the TE-ECO 0105 electronic transformer. Part of the circuit diagram is shown in **Fig 1** and it makes an interesting EMC case study. The incoming mains supply is rectified by a bridge rectifier to power the drive circuitry that uses two power transistors to drive transformer T2 at 35kHz. L1 and C1 reduce the levels of RFI fed back into the mains supply. One side of the 11.5V AC output is connected to the negative side of the bridge rectifier

FIG 1 © RADCOM 134

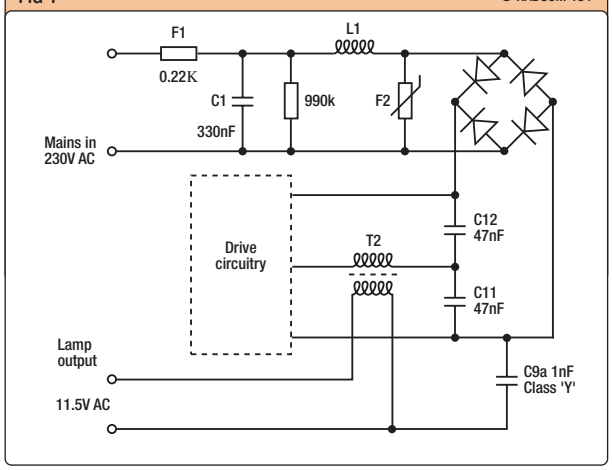


Fig 1
Part of the circuit diagram for a Tridonic TE-ECO 0105 electronic transformer for low-voltage lighting.

output via C9a. This capacitor has a high impedance at 50Hz but provides a relatively low impedance path at RF. This bypasses the mains RFI filter L1-C1 and allows RFI from the switching transistors to get out via the output wiring, which explains why the length of the output wiring needs to be limited.

There seems to be an anomaly in the EMC standards here. Since 1 August 2003, household appliances must meet the 2000 edition of EN55014. The latest edition not only tests conducted emissions from the mains *input* terminals but in the case of regulating controls incorporating semiconductor devices, there is a new test with a voltage probe that also measures the level of RF interference emitted by the *output* terminals of such devices. This output terminal test is applicable to devices such as the fridge 'Savaplug' (see 'EMC' October 2002 and February 2003). In the case of lighting equipment, however, the applicable EMC standard is EN55015. This only tests conducted emissions from mains *input* terminals, with no requirement to test emissions from the *output* terminals in the case of electronic transformers.

EN55015 has already been tightened to allow for the combined effect of using more than one electronic transformer in a particular lighting installation. There appears to be a need to introduce a new test for emissions from the output terminals of electronic transformers, rather than relying on the installer to connect not more than 2m of cable to the output terminals.

To conclude, if you have any problems with RFI from electronic transformers for low-voltage lighting, the first thing to check (if possible) is that the length of cable connected to the lamps does not exceed the maximum specified for the electronic transformers and that neither side of the output is earthed or unbalanced in any way. If you are having low-voltage lighting installed in your own house, you may wish to go for conventional transformers rather than the electronic type.

AUTOMOTIVE EMC

Don, G3HVA, also reports that he bought a new Nissan Micra in 2002 and the car radio suffered interference on reception of weak LW and MW signals such as BBC World Service (648-kHz). This transmission is not intended to serve Hampshire where he lives, but he had no problem receiving this station on the radio in his previous car, a Ford Fiesta. The crackling noise was worst in dry weather and disappeared when there was any water on the road. This is characteristic of tyre static, but it was not cured by fitting a static discharge strap that drags on the ground nor by painting conductive stripes on the sidewalls of the tyres. After two years, the car needed two new front tyres and Don had the original Bridgestone brand tyres replaced with Firestone tyres. This cured the RFI problem caused by tyre static.

The rubber compound used in many car tyres is slightly conductive but some tyres use non-conductive rubber and can generate RFI due to tyre static on dry roads. This is a point to bear in mind if you have new tyres fitted to a car that you use for operating HF mobile or if you listen to LW/MW broadcast DX reception on the car radio. Tyre dealers may not have any information on tyre conductivity and it may be necessary to contact the tyre manufacturer.

With many modern cars, however, tyre static is the least of the problems for mobile radio amateurs and shortwave listeners. Some electronic engine management systems radiate RFI on the MF/HF bands and it is not normally possible to suppress this interference. Try tuning the car radio to a quiet frequency around 550kHz and you'll be amazed at the amount of QRM in some cars.

Brian, G3KJX, has a Saab 93 and reports that he and his wife take long drives to Portugal. Brian's wife has a major hearing problem and wears a hearing aid. So that they can communicate, Brian has fitted an audio frequency induction loop system in the car. By switching the hearing aid to the 'T' setting, they can communicate very well. Unfortunately, even without the loop connected the hearing aid user hears a constant whine from the engine management system whenever the ignition is switched on, even if the engine is not running. Brian has plenty of experience in this area, but cannot get any help from the garage nor from the manufacturers. He has found that other Saabs cause the same effect. Although this is an audio-frequency rather than radio-frequency EMC problem, it illustrates the potential of electronic systems in modern cars to emit interference. ♦

WEB SEARCH

RSGB EMC Committee website www.qsl.net/rsgb_emc/
(Includes EMC information sheet EMC04, *Interference to Amateur Radio Reception*)
Tridonic Atco, transformers for low-voltage lighting www.tridonicatco.com

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This month Don Field examines the laws of physics and comes to the conclusion that we can be grateful that world-wide propagation is most easily achieved on a range of frequencies centred around 14MHz - and not, for example, 14kHz!

HF

The remark was made to me recently that HF amateur radio is very well served by the laws of physics. It's certainly true that the radio spectrum covers many octaves, from the very-low frequencies through to the high microwaves. And yet world-wide, ionospheric propagation takes place over a range of wavelengths which conveniently lend themselves to most suburban locations. While setting up an ELF (Extremely Low Frequency) installation for submarine communications takes huge real estate and vast amounts of power, world-wide propagation is most reliable and most easily achieved on a range of frequencies centred around 14MHz, or a wavelength of 20m. A half-wave dipole, a very efficient antenna with almost 100% radiation efficiency if properly constructed, is just over 30ft long, a length which most of us can manage to find space for without too much trouble. At sunspot peak (sadly, just behind us) the 10m band also offers world-wide propagation, and even gain antennas (for example a 2-element quad, which can be made easily and cheaply with garden canes) take up very little space.

So for those of you coming to HF for the first time, welcome and enjoy. The laws of physics suggest that you should be able to engage in long-distance communications with very little difficulty. Indeed, the usual path for newcomers to HF is to set out on one of the middle bands, say 20 or 17m, start to see the scores growing, and eventually begin to look for new challenges. A typical progression is to move to 40, 80 and finally 160m, the difficulties increasing at each stage, both as a result of propagation itself but also because antenna size (and height required for the same take-off angle) doubles each time. For those who are fortunate to live on farms or in similar locations this may not be an issue. For those of us on typical suburban plots, the challenge really does increase exponentially!

Of course, there are other ways of extending your HF interests, without having to take on the laws of physics in this way. You can stay on 20, 17 or 15m and try out other modes of transmission (RTTY, PSK31, SSTV, for example), or find specific awards programmes to chase (IOTA being an excellent example, with most activity taking place around 14260 and 21260kHz).

If you really are space-challenged you may be less sanguine about my arguments above. I dare say you would much rather that world-wide propagation peaked at a wavelength of 2m, for example. That's actually an interesting thought, because our hobby might be very different if this were so, with far greater numbers of amateurs on the world-wide bands, most using very high gain antennas (on 2m a Yagi with 10dBd gain is quite manageable for most households). Those CQWW contests could have had quite a different flavour! But, wishful thinking aside, my own rule of thumb has always been that, without making special engineering efforts (silver plated wire, air-spaced coils, etc) antenna efficiency usually holds up reasonably well down to about two-thirds of full size. So you should be able to manage something reasonably effective for 20m if you can get up at least 7m of wire, about 22ft (preferably close to 30ft above ground, of course). Or it could be a loaded loop, 44ft in circumference, supported from a tree, fishing pole, etc. Or an elevated ground plane - a loaded vertical on the chimney, just 11ft or so in length, with radials trailing across the house roof. Your neighbours need never even know you are an amateur.

Dave Robinson, G4FRE (now WW2R), on a temporary visit to Hong Kong, where he took the opportunity of meeting up with old colleague Dave Turkington, VR2GI / GI4SRK, and do a spot of guest operating.

DX NEWS

Band conditions during February were somewhat variable, but the week leading up the ARRL CW contest was especially productive, with good conditions and lots of activity by expedition stations warming up for the contest, particularly from the Caribbean. At least one UK station, chasing the Chiltern DX Club's Kenwood Challenge (see February *RadCom* p10), worked over 190 DXCC entities in the course of the month. So conditions certainly can't have been *too* bad!

I see from the *PacketCluster* system that there has been quite a lot of interesting activity on 5MHz, with Caribbean and US stations being worked on a regular basis. Listening one evening, I was astonished at the signal strengths of some of the trans-Atlantic stations. Do please let me have some reports, if you are active on the 5MHz allocations.

Francois, F8DVD, will once again be active from **Svalbard** between 4 and 10 April, JW/F8DVD. Activity will be on all bands between 80 and 10m. QSL via the French bureau or direct to his home call.

Jean-Marc, F5SGI, will be active, hopefully as TM6ILE, from **Groix Island** (EU-048, DIFM AT-012) on 11 to 18 April. This will be a 10 - 80m CW-only operation. QSL via home call (but contacts will be confirmed automatically via the bureau).

Mark, G4AXX; Dick, GU4CHY; Steve, G4EDG; Steve, G4JVG, and Rich, M5RIC, will operate from **Malawi** between 18 April and 1 May. The full 7Q7 callsign will be announced shortly before the start of the operation. A website has been set

COUNTRIES WORKED, 2004
(First 2004 table, sorted by SSB totals)

CALL	CW	SSB	DATA	MIXED
W1JR	149	126	71	195
G4WXZ	78	68	0	115
MM1APX	0	57	62	73
M0CNP	2	48	48	66
G0GFQ	0	43	12	45
MU0FAL	73	41	0	80
G4FVK	16	38	0	44
G7CLY	0	38	0	38
VK4BUI	60	31	0	78
G3XTT	144	24	74	168
G3YVH	98	21	0	111
GM8OEG	24	21	58	61
M5AEF (1W)	9	20	0	25
G4FVK	6	15	0	19
G3LHJ	87	12	62	114
G4DDL	37	5	10	38
M0BVE	143	0	0	143
G3SXW	111	0	0	111
G4KFT	110	0	0	110
G3YMC (QRP)	64	0	0	64
G3TXF	64	0	0	64
G4IRN	56	0	0	56

up (see 'Websearch' for details) and will include a log-search facility updated regularly. Activity will be on all bands 10 - 160m on CW, SSB, RTTY and PSK using three stations with amplifiers and beam antennas. Kenwood (UK) has kindly agreed to sponsor the DXpedition and will be providing transceivers. QSL cards should be sent via G3LQP direct or via the bureau.

Jack, F6BUM, has permission to go to an island off **Cameroon**, TJ. It will be a new activation for IOTA. He plans to be active from 9 to 11 April.

Jim, W4PRO, has received his A52PRO licence for **Bhutan**. He expects to be on the air 22 March to 14 April including the *CQ* WPX SSB weekend. From 10 to 14 April he hopes to be active from Kathmandu, Nepal, callsign as yet unknown.

Ian, 9M2/G3TMA, and two other operators are planning a trip to two rare **Borneo** IOTA destinations in late March / early April 2004. The two island groups are OC-165 (Pulau Satang Besar, 9M8) and OC-184 (Pulau Muara Besar, V8). Ian has already carried out a survey on Pulau Satang Besar, and the available antenna space on the beach does not look particularly good for some of the more populated amateur areas of the world. However, operation will be on SSB and CW, including WARC bands.

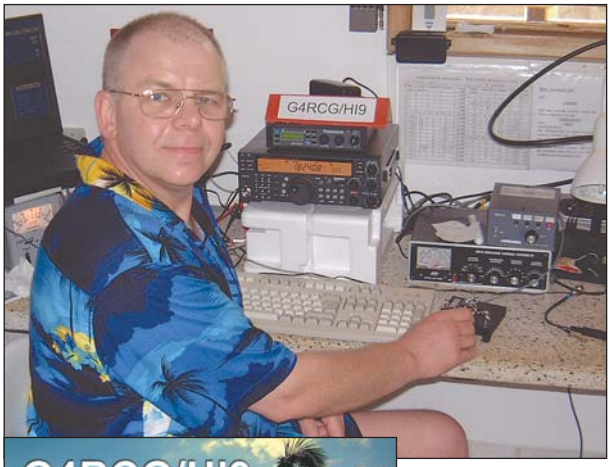
The DXpedition to **Clipperton Island** that was set for March has been rescheduled for April. The team has arranged transportation on another boat leaving on or about 10 April providing they can get more operators. They are looking for additional operators to join the original seven operators to make 12 to 14. The licence and landing permission is in hand. Plans are to have five full-time stations running so there will be plenty of operation time for all. The team will place special emphasis for Europe and the low bands. Fingers crossed.

Frank, DL2SWW, and Ric, DL2VFR, will be active as OX/homecalls from Maniitsoq (Sukkertoppen) Island (NA-220), **Greenland**, from around 1800 on 23 April to around 1800 on 5 May. They will operate CW and SSB on as many bands as possible depending on propagation. QSL via home calls, bureau or direct. Further information is available on their web page.

The Radio Club de **Martinique** hosts this year's Caribbean Hamboree and special event station TO7HAM will be active on all bands and modes on 3 to 18 April. QSL via FM5AN.

The **Peter 1st Island** (3Y0) DXpedition originally scheduled to take place in January 2004 and now scheduled to take place in January 2005 now has its web page up and running.

Roger, G0SWC, will be returning to the **Falkland Islands** in mid April until mid June signing VP8DBR. He will be active on SSB on the HF bands, and will also try some PSK31, using his laptop PC.



John, G4RCG, on the air as G4RCG/HI9 from the Dominican Republic.

Dominican Republic QSL card.

The 3B9C **Rodrigues Island** DXpedition will be active as this appears, closing down around 13 April. Towards the end of the expedition, expect more datamodes activity, or maybe you might want to call again for a QRP contact. The QSL address has now been announced: FSDXA, PO Box 73, Church Stretton SY6 6WF, UK. Bureau cards go via the RSGB bureau and can also be requested via the 3B9C web page.

EUCW / FISTS QRS PARTY

While I don't cover contests any more, this one falls into a slightly different category. This is really an operating event, aimed at encouraging CW activity, and runs for one week from 0000 on 25 April to 2359 on 1 May. CW QSOs, on any band, with a maximum speed of 14WPM. Call CQ QRS/EUCW. Members of EUCW-affiliated clubs send RST, QTH, Name, Club, Membership Number. Others send the first three items. One point for QSOs with own country, 3 points for QSOs with other European countries. Logs go to M5AGL. That's a brief summary of two pages of information, which I'll try to add to my web page.

AWARDS

The Galapagos Islands diploma is awarded to Amateur Radio Operators and Short Wave Listeners for confirming contacts with (SWL reception of) a minimum of three different HC8 or HD8 stations in the Galapagos Islands. This award has been developed to recognise past amateur radio activities from the Galapagos Islands as well as to promote future DX operations from the two different HC8 and HD8 prefixes. A special endorsement is available for those confirming QSOs with (reception of) eight different Galapagos Islands callsigns, one of which must be an HD8 callsign. All contacts or SWL reports must be made after 20 November 1945. Contacts may be made using different personal callsigns, but they must be made from within the same DXCC country. Endorsements are available by Band, Mode or QRP <5W. The basic diploma is US$5.00 (or equivalent - foreign currency accepted at current exchange rate) or 10 IRCs (valid *only* if properly stamped). The '8' Stations upgrade endorsement at a later date is US$2 or 4 IRCs. Send a log extract (QSLs are not required) to Dr Rick Dorsch, NE8Z/HC1MD, PO Box 616, Hamburg, MI 48139-0616, USA. Rich has also sent details of the Republic of Ecuador-HC/HD DX Award "Equatorial Line Diploma". I will put details on my website. Another one I have posted there recently is the MBEDX (Multi Band Emission DX) Award, sponsored by the FEDXP (Far East DX-ploiters), to encourage those who have completed awards such 5-Band DXCC and 5-Band WAZ to expand their activities on to other bands and modes.

MOST WANTED

Yet again, *The DX Magazine* has published its annual 'Most Wanted' survey. The full results are broken down by world-wide, Europe only, world-wide (No Europe or USA), overall USA, USA/NA Eastern Time Zone, USA/NA Central Time Zone, USA/NA Mountain Time Zone and US/NA Pacific Time Zone, and are published in the January / February issue of the magazine. The Top 100 world-wide listing also appears on the magazine's website. Here are the top 10 Most Wanted: 1) Scarborough Reef (BS7); 2) Andaman & Nicobar Islands (VU4); 3) North Korea (P5); 4) Lakshadweep Islands (VU7); 5) Peter I Island (3Y); 6) Yemen (7O); 7) Juan de Nova & Europa (FR/J & FR/E); 8) Navassa Island (KP1); 9) Desecheo Island (KP5); 10) Aves Island (YV0). No surprises there and, with the sole exception of Peter 1 Island, the rare ones are rare not because they are particularly hard to reach, but for political reasons (no permissions forthcoming).

CORRESPONDENCE AND TABLES

Les, VK4BUI (M0BUI), is our first table entry from 'down under'. His list of stations worked with 200 watts and a G5RV would fill most UK DXers with envy though, of course, many of them are actually local (relatively speaking!) to his neck of the woods. For example, he had no trouble with ZK3SB (Tokelau) on both modes, whereas that's one that proved well-nigh impossible from G.

Colin, MU0FAL, takes issue with those who add "/QRP" to their callsigns in CW pile-ups. He feels that if they were half as enthusiastic about sending their callsign as they are about the /QRP, most would get into the log much more quickly. I sympathise Colin, as this is a bugbear of mine, too. And, of course, /QRP is not

in any way an official adjunct to the call in the way that, say, /M or /MM would be.

Andy, GM8OEG, has become an RTTY enthusiast, and has also been giving CW a serious go. His RTTY efforts, mainly in the BARTG, XE and WPX RTTY contests, brought in DX such as YV (Venezuela) and 8P (Barbados)on 40, 20 and 15m. Andy says he has been using G4FON's excellent Koch CW trainer to get his CW speed up to scratch, and had a dabble in the RSGB 1.8MHz contest.

David, M0CNP, is another data-modes enthusiast. This must be getting catching! His RTTY activities bagged him 4V200YH (Haiti), 8P2K (Barbdos), P40G (Aruba), ZF2NT (Cayman Islands), 9M2/G4ZFE (Malaysia) and A61AR (Dubai) among others. David was due to be in Bermuda in March, but will be back in blighty by the time this appears.

John, G4RCG, reports back on his recent trip to the Dominican Republic. He and Bruce, KI7VR (ex-G3NDG), were active with a TS-570DG running 100 watts. On 160m they used an inverted-L antenna, just 50ft in the vertical section, but obviously from a good location because they had great success on the band, with John making over 1000 QSOs (including your columnist). Their total, all bands, was over 7000 QSOs, so they rate the trip a great success. They are interested in ideas of where in the Caribbean they might head on their next trip, particularly from a low-band point of view.

Dave, G3YMC, continues to be surprised what his QRP efforts bring, a recent example being FS/N7DD (St Martin) on 40m, worked after just two or three calls.

Robin, M5AEF, continues with his very low power (usually less than one watt) efforts, and his log includes SSB contacts with TA1/PA4WM (Turkey, 15m) and CW with EA8/ON5UM (Canaries, 30m) among others. Later this year he is planning what he calls 'QRP holidays' to the Peloponnese in the Messenian Gulf as SV3/M5AEF/P (last week of May), mostly CW on 20, 17, 15, 10m, and OZ/M1DUD/P from Central Jutland (first two weeks of August), mostly 10m.

Mark, MM1APX, is a first-time participant in the tables. He starts with some good stuff, and is another to have taken to the data modes, in his case PSK31 on which he worked EK7DX (Armenia) and 3DA0DX (Swaziland) among others.

John, 4F3/GM4DKO, has been in correspondence with me about Logbook of the World (LoTW). He is concerned that DXpeditions may use the advent of LoTW as an excuse to stop issuing traditional QSL cards and, if so, whether other award sponsors will have access to the LoTW database. John is also worried that the LoTW may be open to hackers. Well, John, hopefully the article on LoTW elsewhere in this issue (on page 49) will answer some of your questions and help to put your mind at rest.

Neil, G0JHC, returns to a question I posed some time ago, which is whether there is any interest in adding 6m to the quarterly 9-band table. With many newcomers to HF who already have respectable scores on 6m, he thinks this might be appealing. Your views are welcome, as ever.

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 **17 April**. ♦

WEB SEARCH

UK 7Q7 DXpedition	www.malawi.digital-crocus.com
Caribbean Hamboree	www.caribbeanhamboree.org
Most Wanted	www.dxpub.com
OX by DLs	www.iota-expedition.com
Peter 1 Island	www.peterone.com
3B9C Rodrigues Island	www.fsdxa.com/3b9c

HF F-Layer, Propagation Predictions for April 2004

	3.5MHz	7.0MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** EUROPE							
Moscow	6.....557	76.....14767	..54444464..	...678887...	.....	.....	.....
*** ASIA							
Yakutsk	.....	.....	..5434563 2..	...3562.....	....22.....	.....	.....
Tokyo	.....	.....14..	.....111..	.....1.....	.....	.....	.....
Singapore	.....	.....11.	.....232..	.....134...	.....122...	.....1....	.....
Hyderabad	.....	1	13421	..11.13675..	..1222564...	...23356....	.....
Tel Aviv	62.....1233	66.....4666	..353245737.	...1..112...	.....	.....	.....
*** OCEANIA							
Wellington	.....	.....4...	....12224...	.....	.....	.....	.....
Well (NZ) (LP)	..3.....	289.....2..	7793.....887	..83.....775	.....	.....	.....
Perth	.....	.....11.	.....	.....	.....	...11.....	....1.....
Sydney	.....	.....22..	.....121..	.....1133...	.....1.....	....2.....	.....
Melbourne (LP)	.....	..65.....	1.482.....1	...6.....1.	.....	.....	.....
Honolulu	.....	.....	...11.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.1.....26...	1.2...137311	..22112.741.	...223..73..	...223..6...
W. Samoa	.....	.....	...1111.....	....111.....	.....	.....	.....
*** AFRICA							
Rodrigues 3B9C	.....	7.....5777	72....199987	..211269986.	..33347886..	..3345687...	...234676...
Malawi DXped	.....	66.....1455	883....38988	..752137987.	..66556898..	...567788....	....45677...
Johannesburg	35.....22	78.....4888	18873	..1....2751.	...1..1372..	...445678....	...335567...
Ibadan	.....	12.....111	..72...14631	..88655678..	...8677784..	...8..667....	.....
Nairobi	.....	.....	43.....123	..2....12341	..42..1245..	..1432356....	...124563...
Canary Isles	231.....532	665.....1656	2.722112 4672	...7666778..	...5777778..	.....2226....	.....2...
*** S. AMERICA							
Buenos Aires	..1.....	567.....25	..1.....11.	....1...162.	....11.125..	.....11123..	.....1.11...
Rio de Janeiro	.....	112.....11	..1.....2..	....1...283.	....211147..	....111245..	.....11132..
Lima	.....	1.1.....	.....	...3.....11.	.....1..12..	.....1..11..	.....1...
Caracas	.....	.....	...1.....1.	....1....1..	.....1...1..	.....11122..	.....
*** N. AMERICA							
Guatemala	.....	.....	.....	.....	.....	.....	.....
New Orleans	.....	.....	.....	.....233341.	.....4554..	.....2....	.....
Washington	.....	21.....2	....1....141	.....433451.	.....12556..	.....1....	.....
Quebec	55.....5	664.....57	....1..112..	.....12354..	.....	.....	.....
Anchorage	.....	.....	.....11..	.....	.....	.....	.....
Vancouver	.....	.....	.....	.....1..	.....	.....	.....
San Francisco	.....	.....	.....	.....1..	.....	.....	.....
San Fran (LP)	.....	.....	.....2....	.....531..	..11...641..	.....55....	.....44...

Key: Each number in the table represents the expected circuit reliability, e.g. '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 http://members.aol.com/g4fkhgwyn. The page is updated monthly. The provisional mean sunspot number for February 2004 issued by the Sunspot Data Centre, Brussels, was 46.0. The daily maximum / minimum numbers were 67 on 27 February, and 18 on 17 February respectively. The predicted smoothed sunspot numbers for April, May and June are respectively: (SIDC classical method - Waldmeier's standard) 48, 46, 45 (combined method) 54, 53, 52. Longpath predictions are shown with (LP) following the path name. Higher input power and superior aerials have been used for these predictions; less well-equipped stations may find the longpath predictions somewhat inaccurate.

Radio Fairs

WEST LONDON RADIO & ELECTRONICS FAIR

Sunday 18th April 2004

Bigger than ever, the best amateur radio show in London is back on Sunday 18th April. More stands than ever before and now with free interesting lectures.

Kempton Park Racecourse in Sunbury opens its doors once again to The Radio & Electronics Fair on Sunday the 18th of April. Following the success of last year's shows, the organisers have expanded the event to two floors of the well lit, easy to access exhibition centre in the main grandstand. The venue is smart and clean with excellent facilities for the disabled. It benefits from excellent catering, is easy to reach by road and public transport and there is ample free parking too. A newly installed ATM ensures no shortage of funds for those irresistible bargains! Talk-in is to be provided, courtesy of the Whitton Amateur Radio Group, who will be putting out a big signal on 145.550MHz.

Present at the show will be the three main manufacturers of amateur radio equipment; Icom, Kenwood and Yaesu, exhibiting alongside UK dealers such as Martin Lynch & Sons, Waters & Stanton, Sandpiper, Sycom, Greenweld, bhi and Moonraker amongst many others. There will also be club and charity stands loaded with second hand goodies and bits and pieces for homebrewers. The Coulsdon Amateur Transmitting Society will be hosting a large bring-and-buy stall where you can sell your old gear to finance the new! The RSGB will, of course, be in attendance with their large collection of RSGB publications and will be hosting the popular Meet-and-Greet area where you can get to meet officers of the Society who will be happy to provide information and helpful advice to visitors. People will be on hand to give advice about learning the code, and demonstrating Morse software. Morse proficiency tests will range from 5wpm to 25wpm. A certificate will be mailed to those successfully completeing the test.

HF Demonstration Station

Have you ever wanted to try out the latest and best equipment with some decent aerials but never had the time, space or funds? Well you'll have the opportunity to do just that at the show. Yaesu, Kenwood and Icom will be installing their top-of-the-line transceivers and ancillaries for you to use in the GB5KRF demonstration station in conjunction with the Whitton Amateur Radio Group and the 3B9C Rodrigues Island DXpedition. This is no 'ordinary' demonstration station where you get to see the back of someone else's head whilst they have all the fun! No, visitors to the show will be positively encouraged to have a go at working the DX themselves. All the experts froml the suppliers will be close at hand to answer any queries you have about the gear.

"This event is growing and will be the biggest and best yet, be sure not to miss it...."
Paul Berkley, M0CJX
Chairman, Radio Fairs

All This & Music Too

The evergreen Ken Mackintosh and his Big Band will be in attendance and plenty of seating will be available for enjoying the music and taking a rest between rushing from one stall to another.

FREE KENWOOD GOODY BAGS FOR THE FIRST 500 HUNDRED VISITORS!

LECTURES

RadioFairs, the show's promoters, have always had as one of their main objectives the promotion and advancement of the art of amateur radio and to that end have organised a series of "byte-sized" lectures to be held at the event. These will be short, easily digestible talks aimed at beginners and 'improvers' dispensing useful, hard-earned information and advice to those interested in doing more than pressing the PTT button. The RSGB is sponsoring the talks, which will be free to attend.

11.00am UK 6m Group Lecture

The UK Six Metre Group will, in their own words, "be covering a little of the history of operation at 5/6metres and a canter through the practicalities of operating on six today including propagation, bandplan, aerials and equipment and a section on digital modes. It will be aimed at the beginner on 6m and those who are wondering whether to invest in the time to try out the 6m position on the new rigs band switch". They will also be holding their AGM at the show to which everybody is welcome.

11.45am Software DX Aids
By John Butcher, G3LAS

This lecture will be illustrating a survey of the many ways in which computers are being used in amateur radio to aid finding and making contact with that elusive DX station. Examples will be given of programmes dealing with propagation, cluster spotting, data mode reception and transmission, logging, award tracking, etc. An explanation will be given of the concept of integrated station management in which transmitters and receivers are linked by software to give an ergonomic and efficient communications centre.

12.30pm Internet Linking
By Terry Giles, G4CDY

Terry will explain the mysteries of, and differences between, the various amateur radio internet linking methods and demonstrate how to speak to the world from a handheld.

1.15pm HF Antennas
By Bob Burns, G3OOU

Bob will talk about his experiences with a range of wire aerials for the HF (and VHF) bands including a clothes-line helical, aerials for small gardens, the famous G5RV and a number of derivatives that have significantly improved performance on 80m and Top Band. He will also discuss open wire feeders and an ATU based on the classic Z-Match that covers 1.8 - 146MHz.

2.00pm ATV Antennas
By Paul Prior, G8IXC

The Chairman of the Kent Television Group (KTG), will give a talk on VHF/UHF aerials, "An evolution from Isotropic to Yagi and more complex aerials". It will be an illustrated talk on how some of these antennas work. There's no complex maths, the entire talk being given with pictures and examples.

How to get there

Admission is £3.50 and under 16's get in free

Running Order

Tickets on sale	9.30am
Show opens	10.00am
UKSMG (6m)	11.00am
Software DX Aids	11.45am
Internet Linking	12.30pm
HF Antennas	1.15pm
ATV Antennas	2.00pm
Ken Mackintosh	12.30pm - 3.00pm
Show closes	4.30pm

RSGB
"Meet and Greet"

Your Chance to 'Rag Chew' with the RSGB President and officers of the Radio Society with FREE tea and coffee as well.

UKSMG

The UKSMG group will be holding their AGM at Kempton at 10.15am to which everybody is welcome.

www.radiofairs.co.uk or e-mail info@radiofairs.co.uk
For Bookings Tel: 01737 279108

By Tim Kirby, G4VXE

Willowside, Bow Bank, Longworth, Abingdon, Oxfordshire OX13 5ER.

E-mail: tim@g4vxe.com

Contest

The first results of the new 80m Club Championships, which started in January, are already on the RSGB HF Contests Committee website. This month, Tim Kirby looks at the popular CW RoPoCo event, and there are plenty of results to be published.

At the time of writing, we're into the second full month of the new 80m Club Championships. One or two of the sessions have been bedevilled with poor conditions, but activity has been great and it's good to see a number of new entrants taking part in these events. The data events have persuaded one or two people on to the air for the first time in an RSGB contest which is also great to see.

Because of the policy of accepting entries only by e-mail and some very hard work on behalf of the adjudicators, adjudication of the contests has been extremely efficient: see the RSGB HF Contests Committee website, www.rsgbhfcc.org for the results.

CONTESTS THIS MONTH

The first of the RoPoCo contests for 2004 takes place on 4 April. This is a great event for the more experienced CW operator. In the first contact, you send your own postcode and then in the subsequent contacts, you send *the postcode that you received from the previous contact*. And the key phrase is 'that you received', rather than what you thought you *should* have received! Great fun, particularly if you don't mind getting up in the morning. On 10 April, the European Spring SSB Sprint takes place, which again, is a great contest for the slightly more experienced operator, with the corresponding CW event on 17 April.

At VHF, there's the 1st 70MHz contest on 11 April and then the 50MHz contest on 25 April, both of which are interesting events with the hope of some Es, particularly towards the end of the month. Certainly, S5 has been worked via meteor scatter in early April as well, so it's well worth taking a look on the bands during these sessions. ♦

CONTEST CALENDAR

HF Contests

Date	Time	Contest	Mode	Bands	Exchange
3/4 Apr	1500-1500	SP DX Contest	CW/SSB	1.8-28	RST+SN
4 Apr	0700-0900	RoPoCo 1	CW	3.5	RST+Postcode received
5 Apr	2000-2130	RSGB 80m Club Championship	CW	3.5	RST+SN
10 Apr	1500-1859	EU Spring Sprint	SSB	3.5/7/14	Both calls +SN + Name
10/11 Apr	1900-1900	CIS DX Contest	SSB	3.5-28	RS+SN
12 Apr	1400-2000	Low Power Spring Sprint	CW	1.8-28	RST+Grid+ Pwr category
14 Apr	2000-2130	RSGB 80m Club Championship	SSB	3.5	RST+SN
17 Apr	1500-1859	EU Spring Sprint	CW	3.5/7/14	Both calls +SN + Name
22 Apr	2000-2130	RSGB 80m Club Championship	DATA	3.5	RST+SN

VHF Contests

Date	Time	Contest	Mode	Bands	Exchange
6 Apr	2000-2230 *	RSGB 144MHz Activity/ Club Championship	ALL	144	RST+SN+ Locator
11 Apr	0900-1300	RSGB 1st 70MHz	ALL	70	RST+SN+Locator+Location
13 Apr	2000-2230 *	RSGB 432MHz activity	ALL	432	RST+SN+Locator
20 Apr	2000-2230 *	RSGB 1.3GHz/ 2.3GHz activity	ALL	1.3G/ 2.3G	RST+SN+Locator
25 Apr	0900-1300	RSGB 50MHz	ALL	50	RST+SN+Locator+Postcode
27 Apr	2000-2230 *	RSGB 50MHz activity	ALL	50	RST+SN+Locator

* Local time

ROPOCO 1, 2003

Fraser Robertson, G4BJM, maintains his grip on the RoPoCo silverware, by once again winning the Verulam Silver Jubilee trophy. Fraser's checked score was top of the pile, and he also submitted a perfect log, ensuring victory. In fact, four other competitors either outscored or equalled Fraser's raw QSO total, but logging accuracy once again proved the decisive factor. ***Clive Whelan, GW3NJW***

Pos	Callsign	Checked score
1	G4BJM*	630
2	G3RSD	620
3	G4RCG	610
4	G4OGB	610
5	G3BJ	600
6	G3XTT	590
7	G3WUX	590
8	G3KHZ	590
9	G3LIK*	580
10	G3ZRJ	560
11	G4BUO*	560
12	GM3POI*	550
13	G3LET	540
14	G0MTN	530
15	G4PIQ/P	520
16	G4CZB	520
17	G2HLU	510
18	G3OLB	500
19	G3JJG*	500
20	G2AFV	490
21	G3HZL	490
22	G3GLL	480
23	M0AJT	480
24	G4BLI	470
25	G3JJZ	450
26	G0WBC	450
27	G2FSR	450
28	G0DHZ	450
29	G3HEJ	440
30	G4EBK	430
31	G3LHJ*	420
32	GW3SB	410
33	G4RLS/P	410
34	G3MA	400
35	G4XPE	400
36	G4BVY	400
37	G4PTE	400
38	G3SET	390
39	G0RDO	380
40	G3VDF	360
41	G3GMM	340
42	G4ARI	280
43	G3WRR	270
44	GW0KZW	250
45	G3VQO	230
46	G3CQR	230

* Perfect log.
Check logs gratefully acknowledged from GM3UM and G4KNO.

2nd 144MHz BACKPACKERS CONTEST, 2003

The second session of this popular series of contests produced an entry of 30 stations. The competitors in both this and the parallel *Practical Wireless* contest enjoyed good band conditions and fine weather - a first for a Backpackers contest? Even the high operating standards were remarked on by more than one entrant. One station 'discovered' that ballpoint pens don't write on paper coated in sun tan lotion! The unusually high level of activity produced some dynamic range problems for the stations configured for maximum sensitivity (as normally required). At least one station remarked that when they remove their receiver preamps, their QSO rate increased.

Congratulations to the following winners and runners-up: 3W Single Operator Winner M0AFC/P, Runner-up GW8ZRE/P; 10W Single Operator Winner M0BAO/P, Runner-up: G4EDR/P; 3W Multi-operator Winner GW7LQD/P, Runner-up MM0FVC/P; 10W Multi-operator Winner GW5NF/P, Runner-up G8NWM/P. M3NSZ/P wins the leading Foundation Station certificate. Thanks to G3MEH, G3YJR, M3KGC and G6ZME/P for their invaluable checklogs. ***Ian Pawson, G0FCT***

3W Single Op

Pos	Call	Loc	QSOs	Mults	Total	Best DX	km
1*	M0AFC/P	IO84SA	179	37	1532170	DC6IA	711
2*	GW8ZRE/P	IO83JA	141	34	863430	PA0PVW	619
3	GW0PZO/P	IO83ID	129	32	640096	PA0PVW	626
4	G1WKS/P	JO01ED	74	26	324740	MM0FVC/P	510
5	G4HLX/P	IO91FN	70	25	308150	GM4ZUK/P	601
6	GM4IGS/P	IO74WV	41	22	211046	G0JVR/P	539
7	G1WAC/P	IO82LB	65	20	199360	GM4ZUK/P	543
8	G1ATZ/P	IO82KV	51	16	106048	G0NFA/P	324
9	G6GVI/P	IO81PH	38	17	97223	G7ANV/P	443
10	G0BVW/P	IO70GE	23	19	92891	GM4IGS/P	531
11	G4BXT/P	JO01RI	22	18	90504	DF2VJ	449
12	G8XQS/P	IO95AF	32	17	89981	G0NFA/P	502
13*	M3NSZ/P	IO81XT	40	14	68698	GI6ATZ	388
14	G0NFO/P	IO82RJ	36	14	49868	F8KFV/P	430
15	G0LJD/P	JO01DK	25	14	48846	PA0PVW	384
16	M0BHE/P	IO80MU	24	13	42770	G3XNO/P	349
17	G7ARW/P	IO83SO	22	8	18032	G0NFA/P	354

10W Multi-op

Pos	Call	Loc	QSOs	Mults	Total	Best DX	km
1*	GW5NF/P	IO81KR	150	32	961856	DK3BU	721
2*	G8NWM/P	IO92TR	101	35	898590	DC6HQ/P	758
3	M1BAR/P	IO83XH	78	25	243750	F8KFV/P	535
4	M1LOL/P	IO93AF	43	14	63434	GI4OWA/P	359

10W Single Op

Pos	Call	Loc	QSOs	Mults	Total	Best DX	km
1*	M0BAO/P	IO81FD	54	20	191080	ON1AEN	513
2*	G4EDR/P	IO94RD	30	16	86592	G8NJA/P	440

3W Multi-op

Pos	Call	Loc	QSOs	Mults	Total	Best DX	km
1*	GW7LQD/P	IO82KW	144	29	687213	PA0PVW	612
2*	MM0FVC/P	IO85WL	104	26	540124	F6FLB	567
3	G3BPK/P	IO83PN	76	28	276556	GM0HTT	617
4	G0RMX/P	IO82TA	90	23	265052	ON1AEN	444
5	M0BPQ/P	IO91XH	102	21	251391	MX0TRG/P	408
6	G3LRS/P	IO92MO	57	21	160629	F8KFV/P	479
7	G4VRC/P	IO90NX	41	22	156288	G7ANV/P	483

Checklogs: G3MEH,G3YJR,M3KGC,G6ZME/P.

1st 50MHz BACKPACKERS CONTEST, 2003

Entrants experienced good band conditions with almost continuous Sporadic E propagation to southern Europe and beyond during the co-ordinated section of this contest. Unfortunately, thunderstorms were also around towards the end of the session

resulting in a rapid exit from site for more than one contestant. The last hour of the Backpackers contest was very quiet for most stations once the stations in the co-ordinated contest had ceased operating.

Congratulations to Malvern Hills B, G4IDF/P, for winning the 3W multi-operator section and to M0AFC/P for winning the 10W multi-operator section. In the Single Operator sections, congratulations go to GI7JYK/P for winning the 3W section and to GW8ZRE/P for winning the 10W section. All section winners and runners-up will receive certificates.

Ian Pawson, G0FCT

3W Single Op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	GI7JYK/P	IO74BS	36	44	2022856	YT0A	2172
2*	G1WKS/P	JO01ED	47	43	1702972	LZ1A	2044
3	G4BXT/P	JO01RI	21	28	786884	9H6M	2002
4	G0FUW/P	IO90JO	16	16	158064	IR8M	1901
5	M1GRY/P	IO81WG	14	15	107295	T99C	1737
6	G0OIW/P	IO91IH	11	12	51552	II0W	1445
7	G1WAC/P	IO82QJ	12	7	4928	M0DDT	122

3W Multi-op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	G4IDF/P	IO82TC	28	29	699045	YO6RBT	2097
2*	GW0PZO/P	IO83ID	48	31	583916	9H6M	2361

10W Single Op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	GW8ZRE/P	IO83JA	83	60	3943980	9H6M	2347
2*	M0BAO/P	IO81FD	13	13	101738	9H6M	2216

10W Multi-op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	M0AFC/P	IO84SA	71	62	3940286	9H6M	2398

3rd 144 MHz BACKPACKERS CONTEST, 2003

Good weather and above average conditions were the theme of the third 144MHz Backpackers contest. Several callsigns new to Backpackers' contests appeared in this session - welcome to this popular series of events. There was some DX available to those who could break through the QRM from the VHF NFD stations. The majority of the entrants managed to break the 500km barrier.

The standard of logging continues to be extremely variable. This time, three stations managed not to lose a single point during adjudication - well done. On the other hand, five stations had the misfortune to lose over 15% of their claimed score. The average loss of points was 8%.

Congratulations to the following stations for winning their respective sections: M0AFC/P (10W Single Operator); GW0PZO/P (3W Single Operator); G8NWM/P (10W Multi Operator); GW5NF/P (3W Multi Operator). All winners and runners-up will receive certificates. Thank you to G0NFO/P for a very useful checklog.

Ian Pawson, G0FCT

3W Multi-Op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	GW5NF/P	IO81KR	76	29	419746	DL0NS	676
2*	G6ZME/P	IO82NN	41	20	121040	GM4ZUK/P	487

3W Single Op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	GW0PZO/P	IO83ID	107	30	548880	F6HPP/P	629
2*	G4HUN/P	IO92XA	72	34	481950	GM4ZUK/P	570
3	G1WKS/P	JO01ED	61	32	393792	GM4ZUK/P	671
4	G8XQS/P	IO94AO	52	24	326040	ON6NB/P	585
5	GI7JYK/P	IO74BS	51	21	249648	G6BUT/P	523
6	G0HDV/P	IO93UK	57	23	245548	GM4ZUK/P	415
7	G0BVW/P	IO92RA	54	27	228906	MM0CPS/P	446
8	G3JKV/P	IO91TE	42	25	225400	GM4ZUK/P	655
9	G4BXT/P	JO01RI	27	22	161590	DK0BN	472
10	G7ARW/P	IO83RP	37	15	77445	GM4ZUK/P	-
11*	M3CGC/P	IO81XT	24	15	60300	GM4ZUK/P	-

10W Multi-Op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	G8NWM/P	IO92TR	81	31	487444	DK0BN	644
2*	G3BPK/P	IO83PN	80	25	318600	EI5CRC/P	426
3	M1LOL/P	IO83WE	51	24	220368	F6KFM/P	613

10W Single Op

Pos	Call	Loc	QSOs	Mult	Total	Best DX	km
1*	M0AFC/P	IO84SA	131	35	1015420	F4CQY/P	829
2*	G4PIQ/P	JO02PF	80	40	849480	DF0CI	622
3	GW8ZRE/P	IO83JA	130	32	747456	F6HPP/P	616
4	G4RQI/P	IO94JF	74	30	509910	DK5DQ	659
5	G0PQF/P	JO01AX	67	35	478205	GM4ZUK/P	576
6	M0BAO/P	IO81FD	62	23	283866	GM4ZUK/P	647
7	G3YDY/P	IO84IE	45	19	184813	G5LK/P	458
8	GI0OUM/P	IO74CN	16	12	61164	G3TCR/P	481

Checklog: G0NFO/P.

CLUB CALLS CONTEST 2003

Many former Class B, Intermediate and new M3 operators obtained contacts throughout the UK. Helped by good propagation conditions, their presence, welcomed by all, made the contest lively for the whole period. One third of logs submitted were on paper, reflecting some clubs' encouragement to members to have a go from home, perhaps for the first time, to support the club and join in the fun. Members should be asked, though, to try to make a few contacts and thereby ensure they become valid by appearing in more than one submitted log. Club names with some initials recorded, like Cambridge UWS, were accepted from all logs, whilst remembering that the rules require the full name to be *sent*, without initials.

Congratulations to the leading club, Cambridge University Wireless Society, GX6UW, for winning the Ariel Trophy and certificate of merit. Certificates of merit are also awarded to the leading individual club member, Thomas Cannon, G0VQR, from Reading and District ARC and the leading non-club member Russell Baker, G4ZRZ. The David Hill, G4IQM, Memorial Trophy is awarded to the Hadley Wood Contest Group.

Mike Thayne, G3GMS

Pos	Callsign	Club name	Status	QSOs	CS	M	NC	Score
1#+	GX6UW	Cambridge UWS	CS	134	35	79	20	1672
2	GX4STV	Hadley Wood CG	CS	140	33	83	24	1660
3	G0RGH/P	Harwich ARG	CS	146	30	92	25	1651
4	G3WAS	Lichfield ARS	CS	126	36	69	21	1623
5	M5ARC/P	Wisbech ARAEC	CS	138	29	88	22	1582
6	G5XV/P	Newbury ADARS	CS	128	31	82	15	1569
7	G0RAF	RAF Waddington ARC	CS	121	30	70	21	1463
8	G0SWI/P	Sudbury ADRA	CS	120	29	72	19	1445
9	GC4CC	Swansea ARS	CS	117	27	73	17	1391
10	GX3RAL	Loughborough ADARC	CS	90	35	48	7	1385
11+	G0VQR	Reading ADARC	M	94	34	50	10	1382
12	G5RR	Hucknall Rolls Royce ARC	CS	120	26	73	21	1375
13	G3WOR/P	Worthing ADARC	CS	112	27	72	13	1371
14	G4AHG/P	Shirehampton ARC	CS	114	28	65	21	1367
15	GX7EAR/P	Echelford ARS	CS	103	29	61	13	1339
16	G0IDA	Hadley Wood CG	M	112	26	70	16	1336
17	G3RWL	Hadley Wood CG	M	87	32	50	5	1311
18	GX3TRF/P	Maidstone A ARS	CS	102	27	64	11	1301
19	G4FIN	Northampton RC	M	86	31	48	7	1273
20	G3GWB/P	Northampton RC	CS	87	30	52	5	1271
21	G8FMJ	Worthing ADARC	M	84	31	47	6	1262
22	G3SAD/P	Stevenage ADARS	CS	85	29	48	8	1220
23	G3YEC	Colchester RA	M	71	33	32	6	1198
24	G4EZT	Stratford-upon-Avon DRS	M	75	30	38	7	1165
25	G4MEM/P	Cheltenham ARA	M	77	28	42	7	1141
26	G3SNU	Torbay ARS	M	90	23	58	9	1135
27	GX4NOK	North Wakefield RC	CS	96	21	60	15	1113
28	G3SWC	Horsham ARC	M	72	28	37	7	1101
29	G3ZBU	Horsham ARC	M	63	30	29	4	1084
30	GS4RIV/P	Wigtownshire ARC	CS	103	17	68	18	1074
31	G3NPF	Horsham ARC	M	73	26	40	7	1069
32	G4FBS	Horndean ADARC	CS	71	26	41	4	1068
33	M5BXB	Hadley Wood CG	M	79	24	45	10	1062
34	G3YAJ	Colchester RA	M	55	31	23	1	1055
35*	G3NEO	Bolsover ARS	M	56	31	20	5	1043
36	G4AYM	Gloucester ARAES	CS	67	26	37	4	1036
37	M0DDT	Newbury ADARS	M	56	30	23	3	1033
38	G4ADV	Newquay ADARS	CS	76	23	41	12	1008
39	G3OGP	Horsham ARC	M	50	29	20	1	975
40	GX4FRS	Farnborough ADARS	CS	67	23	38	6	966
41	G0VYR	Farnborough ADARS	M	46	28	17	1	923
42	G7TWC	Hadley Wood CG	M	53	25	27	1	919
43+	G4ZRZ	None	NC	46	27	18	1	903
44	M0COP	Wythall ARC	M	43	28	14	1	899
45	G0VDZ	Echelford ARS	M	71	18	47	6	898
46	G4FQR	Horsham ARC	M	41	27	14	-	868
47	G3CO/P	Colchester RA	CS	49	24	24	1	867
48	GX3ASR	Edgware ADRS	CS	52	23	24	5	851
49	GW4JUN	G QRP Club	M	39	26	12	1	827
50	G4KZD	Hadley Wood CG	M	46	22	19	5	783
51	G3VER	Verulam ARC	CS	37	24	13	-	776
52	G4AGE	Bolsover ARS	M	40	23	16	1	775
53	G0ICJ	Wythall ARC	M	36	24	11	1	763
54	G0CXJ	Stratford-upon-Avon DRS	M	36	23	12	1	743
55	G0SHC	King's Lynn ARC	M	33	24	8	1	739
56	G4KIT	Worthing ADARC	M	37	22	15	-	736
57	G3EUE	Worthing ADARC	M	36	22	13	1	723
58	M5KZI	Horndean ADARC	M	34	22	12	-	712
59	G4HRS/P	Horsham ARC	CS	34	20	14	-	672
60	G3NDJ/P	Worthing ADARC	M	37	18	18	1	651
61	G4VSS	Warrington ADARS	M	30	19	10	1	615
62	G0OUR	Open University ARC	CS	29	19	10	-	612
63	G2HS	Echelford ARS	M	32	18	13	1	611
64	G3JIR	Warrington ADARS	M	27	19	8	-	596
65	G0WRS	Warrington ADARS	CS	30	18	11	1	595
66	GX3YSC	Maidstone B ARS	CS	30	17	13	-	580
67	G4MRH	Worthing ADARC	M	35	15	19	1	575
68	G4VTO	Torbay ARS	M	25	18	6	1	555
69	G8XIT	Worthing ADARC	M	30	15	14	1	535
70	M0BOX	Hadley Wood CG	M	27	16	10	1	531
71	G3PYC	Horsham ARC	M	28	14	13	1	499
72	G4TWK	Worthing ADARC	M	27	14	13	-	496
73	G4KTI	Colchester RA	M	21	16	5	-	488
74	M0AJF	Stevenage ADARS	M	22	15	7	-	476
75	G8MYK	Wythall ARC	M	20	15	5	-	460
76	G0LNX	Maidstone A ARS	M	19	15	4	-	452
77	G6PMT	Echelford ARS	M	19	12	6	1	387
78	M0DTB	Worthing ADARC	M	20	11	9	-	380
79	G8BUR	Stevenage ADARS	M	19	11	7	1	367
80*	G8LED/P	Northampton RC	CS	18	11	7	-	364
81	G3KND	Farnborough ADARS	M	14	12	2	-	352
82	M1ECY	Stevenage ADARS	M	14	10	4	-	312
83	G4DDX	Stevenage ADARS	M	13	9	4	-	284
84	G0ECW/P	Worthing ADARC	M	14	8	6	-	272
85	GX4RSB/P	Bolsover ARS	CS	11	9	2	-	268
86*	M5ACR	Reading ADARC	M	15	7	7	1	255
87	G6OKU	Bolsover ARS	M	10	8	2	-	243
88	G0JSH	Echelford ARS	M	10	8	2	-	240
89=	M0ADY	Worthing ADARC	M	15	5	10	-	220
89=	G4SLE	Worthing ADARC	M	15	5	10	-	220
90=	G0RXT	Bolsover ARS	M	9	7	2	-	212
90=*	G0WMG	Worthing ADARC	M	14	5	9	-	212
91	G0SMY	Worthing ADARC	M	12	5	7	-	196
92	G3ZHE	Warrington ADARS	M	8	6	2	-	184
93	G8RZA	Hadley Wood CG	M	8	5	3	-	164
94	G4SOB	Colchester RA	M	6	4	2	-	128
95*	M3MGC	Northampton RC	M	5	4	1	-	120
96*	G3OFA	Farnborough ADARS	M	4	4	-	-	112
97	2E1OKT	Bolsover ARS	M	4	3	1	-	92
98*	G1OCL	Worthing ADARC	M	5	1	4	-	60
99*	G3HBZ	Echelford ARS	M	3	2	1	-	59

Check log: GW4BLE. # Ariel Trophy. +Certificate. *Error free log.
CS = Club Station. M = Club member. NC = No club.

Top 5 Clubs

Pos	Club Name	Score
1##	Hadley Wood CG	5411
2	Horsham ARC	5097
3	Worthing ADARC	3947
4	Bolsover ARS	2365
5	Echelford ARS	2195

David Hill, G4IQM, Memorial Trophy

The VooDoo Contest Group entered Niger by road from Burkina Faso on their way to enter the *CQ* WW CW contest as 5U5Z in November 2003. Left to right: Vince, K5VT; Mike, KC7V; Lee, G0MTN; Lee, KY7M; Fred, G4BWP; Don, G3XTT (not pictured Andy, G4PIQ). The sign reads: "Welcome to Niger. National Route No 6. Remember: keep to the right. Maximum Speed 100km/hour. Parking permitted only in designated areas". It seems that the team decided to ignore that rule in order to bring us this exciting photo!

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by Robin Page Jones, G3JWI

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2nd Edn (formerly entitled "The Radio Amateurs Guide to EMC"), 1998, RSGB, paperback, 244 mm x 172 mm portrait, 208 pages, ISBN: 1-872309-48-8

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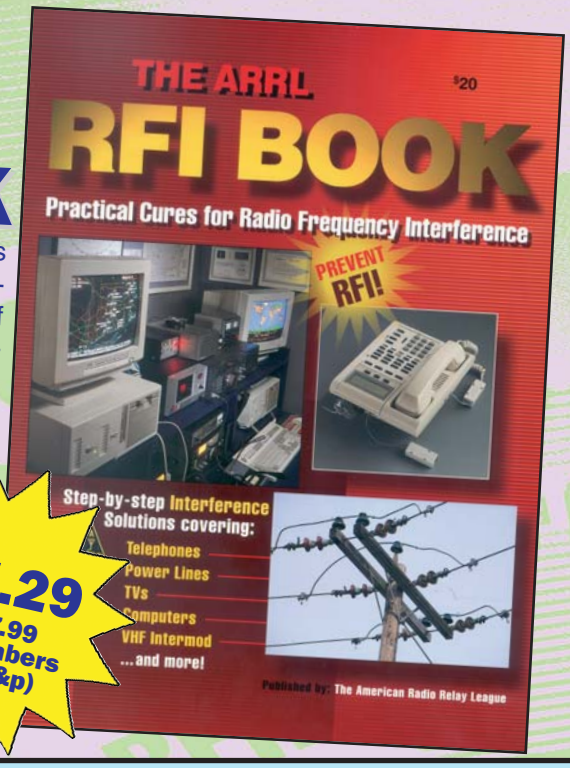

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VHF/UHF

These days the Internet plays an essential role in the compilation of the 'VHF/UHF' column. Norman Fitch describes the sources he uses to bring us the latest VHF/UHF news every month.

The Internet plays an essential part in the compilation of 'VHF/UHF' each month and long gone are the days when almost all the contributions came by the post or 'snail mail' as we now call it. So, as there are few activity reports this month, I thought it appropriate to review some of the data that are available on the Internet.

There are four main sources of information. 1) Your e-mails. 2) The official websites of organisations like the NASA, the RSGB, the ARRL and so on. 3) Your personal websites and 4) The websites of the thousands of special interest groups such as contest operators, satellite, repeater users and researchers.

Your e-mails are the main source of news for 'VHF/UHF' and without them, there would be little to report, so keep them coming. It would be appreciated if you would always include your surname and callsign - yes, sometimes people forget that! - and your locator. I prefer reports in plain text so that they can be edited into a word processor document. Photographs of operators and stations are always welcome but please write some details to go with them. If it is more convenient JPEG images can be attached to e-mails.

Solar and geomagnetic data are obtained from the excellent Space Weather website the opening page of which gives the current conditions, a 'What's Up in Space' section for the day and assorted astronomical news. Scrolling down the page we come to the 'Essential Web Links' section which has over 20 references. These include: a) The NOAA Space Environment Center, the official US government bureau for real-time monitoring of solar and geophysical events, research in solar-terrestrial physics and forecasting solar and geophysical disturbances. It links to a mine of information including the 30-day records of solar and geomagnetic activity always mentioned in 'VHF/UHF'. b) Images from the Solar and Heliospheric Observatory (SOHO) spacecraft. c) Real-time solar wind data and d) Aurora forecasts.

The RSGB and ARRL websites are very comprehensive and have links to many other relevant sites. One of the best of the amateur websites for VHF operators, to which I often refer, is that run by Volker Grassmann, DF5AI. One link is to the Beam Finder site concerned with radio propagation analysis software, which can be downloaded from it. To quote from the welcome page, "It provides a 2500 x 1800 pixel screen map of the world which displays calculated results from sophisticated models, DX data and other sources of information. The program deals with quantities the radio amateur is already familiar with, ie grid squares, geographical co-ordinates, distances, antenna headings and frequencies." The Beam Finder and DF5AI sites are complementary, the latter dealing with application aspects.

For those interested in tropospheric ducting propagation the website run by William Hepburn is essential viewing. His maps cover all areas of the globe and attempt to forecast paths that could be open for the coming few days. Those keen to explore the possibility of trans-Atlantic propagation on 2m keep an eye on this one. There are many other websites that are worthy of mention but I hope that the above recommendations will be of interest.

Peter Rackman, G3IRQ, adjusting his dish antenna. His is a new station operating on 23cm EME. (Photo from the February *432 and Above EME News*).

PROPAGATION STUDIES

DF5AI writes, "Amateur radio propagation studies is no technocratic discipline; not at all. There is a community behind it, ie radio amateurs around the world sharing identical interests, amazement and fun in long-distance propagation on very high frequencies." In an attempt to encourage young people and newcomers to the hobby he continues, "Therefore I would like to implement a new section to the Amateur Radio Propagation Studies website, ie the 'DXers' profiles' presenting and demonstrating the ham community behind VHF DXing. Please consider placing your personal profile on http://www.df5ai.net/Home/guestbook.html and you may freely decide which information is most relevant."

This is an experiment with no strict rules in the hope that it may contribute to a fascinating aspect of amateur radio, ie propagation studies. Pictures and images would be much appreciated. This seems like an excellent idea, as it will reveal who is doing what on the VHFs with the numerous modes now available.

SOLAR AND GEOMAGNETIC DATA

In the 30 days to 10 February there were no significant solar events. The 10.7cm solar flux peaked at 135 units on 19 January and the minimum value was 87 on the 29th, the average being 110.3, about 10% down on last month's value. The Sun was spotless on 27 and 28 January and only 16 new regions were observed, one of which, 554, had a beta-gamma-delta magnetic field, the kind that might have resulted in a powerful X-class flare.

The geomagnetic activity was modest with the mid-latitude A-index at Fredericksburg in double figures on 18 days. The maximum value was 35 on 22 January, when the estimated planetary A-index was 62, and on 2 February it was 28.

BEACON NOTES

The Wessex beacon, GB3WSX on 4m was due to be activated (QRV) in February following its final testing. Weather permitting it was hoped to install the antenna on the 7th. It is located at Yeovil in Somerset (IO80QW) and is on 70.007MHz in mode F1A sending its callsign and locator on a 1min cycle. The authorised power is 22dBW ERP but until a suitable PA is acquired it will be running 10-12dBW. The antenna is a 7-ele wide-spaced Yagi at 105m ASL bearing at 070°. This is a project of the Wessex Repeater Group, which has a website - see the list. Thanks to group

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50 MHz	70 MHz	144 MHz	430 MHz	1296 MHz	Total
G3IMV	846	20	619	125	53	1663
G4YTL	11	56	560	141	14	782
G0FYD	717	9	294	48	17	1067
M3CLY	262	-	285	20	-	567
G4ZHI	107	17	280	33	-	437
G3XDY	-	34	261	179	130	604
GW7SMV	675	-	250	-	-	925
G3FPK	30	-	246	-	-	276
G1SWH	448	42	242	81	30	843
G8VHI	-	-	217	76	40	333
G8HGN	346	-	200	73	-	619
G4DEZ	665	30	196	87	41	1019
M5BXB	423	15	177	57	-	672
GM4VVX	357	22	170	2	-	551
G8TOK	419	39	145	57	29	689
G6TTL	405	-	140	94	28	667
G3FIJ	278	29	108	51	23	489
EA7IT	67	-	108	-	-	175
G8RWG	-	-	108	-	-	108
G0ISW	231	6	100	22	-	359
G4OBK	469	25	79	10	-	583
M5MUF	155	23	70	-	6	254
G4APJ	184	-	61	29	-	274
M1DUD	272	1	50	9	-	332
G0JHC	1040	26	48	4	-	1118
MU0FAL	503	-	28	9	3	543
G4FUJ	111	20	28	6	5	170
G7KHF	510	-	18	-	-	528
MM1FEO	50	-	13	1	-	64
GW3EJR	313	-	-	-	-	313

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Band of the month 144MHz. Next deadline is 13 April.

Chairman Dave Boniface, G3ZXX, for this news.

Commenting on the item in the March 'VHF/UHF' about the VO1ZA trans-Atlantic 2m beacon, Davey, G3AGA, advises that "GB3SSS is still firing away at Poldhu. The only reports from the west so far were in last autumn when G0KZG/MM heard it in mid-Atlantic."

MOONBOUNCE

Howard Ling, G4CCH (IO93), still had problems with the elevation inclinometer on his dish antenna system into the start of the year but can work around it until he has the time to check out the system. On 23cm in January he completed with F1ANH* on the 3rd, GW3XYW* and K5GW* on the 4th, G3IRQ O/OR and 339 - see the picture of Peter's dish - for initial 187 and G3LQR* on the 6th and G3LTF, UR5LX*, DL4MUP and IK2MMB on the 9th. On the 10th, in the activity weekend (AW), he completed with SK0UX*, UR5LX*, GW3XYW* and OZ6OL* (NB * denotes a CW contact).

The following information is extracted from the February *432 and Above EME News* edited by Al Katz, K2UYH, who reports that January activity seemed spread out around the official activity weekend of 10/11 which saw excellent conditions. On a sad note the death of W6PO is reported. Bob Sutherland was a member of the Eimac Radio Club, W6HB, which made the first amateur radio moonbounce contact on 23cm in July 1960. He was the editor of *The Moon Bounce Notes* published by Eimac, the main source of EME information in the 1970s, and was the author of numerous QRO VHF amplifier articles. He was a leading EMEer on 144 and 220MHz.

Operation is planned from Rodrigues Island in the 20 March to 13 April period and will include 70cm EME operation with the callsign 3B9C [see *RadCom* March 2004 pp28/29 - *Ed*]. David Bowman, G0MRF, reports that the group had shipped four 19-ele Yagis, three ATF54143 preamps and a solid state 100W amplifier. Linear Amp UK had agreed to supply a GS31B PA capable of 700W, which they would have to take on the plane with them. There is a website - see the list.

Hamad Mannai, A71AW (LL55SG), is QRV on 70cm from Qatar using a 3m 0.38 f/d TVRO dish with a 100W 'brick' amplifier at the end of 100ft of LDF-40 cable. He is also interested in 23cm and plans to use an MKU-13100 100W PA and MKU-131AH 0.4dB noise figure HEMT preamp. He is willing to try JT44 and JT65 modes. His e-mail address is a71aw@hotmail.com and QSLs should go only via W3HNK. Hamad has a website - see the list.

Peter Blair, G3LTF (IO91), enjoyed the good conditions in the first part of January but not the high winds which severely limited his operating times. On 23cm on 31 December he worked G3IRQ (M/O) for initial 203. In January he completed with G4CCH and GW3XYW on the 9th and on the 11th. VE7BBG was #204 followed by VE6TA. On the 9th on 70cm he worked YO4FRJ #378 with an excellent signal and on the 10th OK2BDO. Peter's e-mail address is 100633.1656@compuserve.com

Stuart Jones, GW3XYW (IO81), has had no success with JT44 random operation on 23cm. He uses 1296.044MHz and calls CQ in the first period listening for his own echoes on that QRG (frequency). He asks if there are any recommendations yet on a separate QRG for JT65 random operation. So far he had only made one JT44 random QSO when he was on 1296.030MHz expecting a sked station that didn't show. He has heard random activity on 432.044MHz, though. He points out that where to set your receiver offset for random operation on 23cm is a real problem as the difference from your local echo offset can approach 3kHz. The mutual Doppler offset QRG calculated by JT44 is quite accurate and you can also use the JT44 big waterfall spectral display to look for someone calling way off frequency. Stuart's e-mail address is gw3xyw@thersgb.net

Plans for this year's EME Conference at the College of New Jersey in the Ewing Township over the 6-8 August period are now well advanced. The registration fee has been set at $80 or 70 euros for Europeans, who can pre-register with Dominique Faessler, HB9BBD, at dfaessler@bluewin.ch to simplify funds transfer issues. The speaker programme is starting to come together with a number of interesting papers submitted. There is a comprehensive website with all the latest information - see the list.

METEOR SCATTER

April sees the major Lyrids shower. The OH5IY *MSS0FT* program suggests that the maximum should be around 2250 on the 21st with a ZHR of 15. Reflections should be above half the maximum, which is rather broad, for about half a day. The radiant is above the horizon of mid-UK stations for about 20 hours from 1830. At the peak time the best directions are north/south and northwest/southeast.

Commenting on the 'Leonids Feedback' section in the February 'VHF/UHF', William Ivison, M3IVI (IO94), writes that he was fortunate to see many Leonids trails on 21 November while driving on the B6318, which runs alongside Hadrian's Wall, heading west towards Greenhead between 2200 and 2250. He counted 12 trails while driving and a further 36 when parked for a 20min break at an isolated, dark spot on a cold and clear night. He was only licensed last August so let's hope it encourages him to try meteor scatter in due course. Thanks for the map William.

BAND REPORTS

50MHz

Bryn Llewellyn, G4DEZ (JO03), reports a few Es openings to Portugal and Italy, the last being on 22 January when he worked a couple of CT1s and heard the CN8 beacon for over half an hour at up to S7. He worked into Scandinavia but the propagation mode was uncertain as it didn't sound like either Es or aurora-E, with no tone A at all.

Ted Collins's, G4UPS (IO81), report makes grim reading. From 1723 on 17 January he heard a very weak EA7 on SSB and CW and the CT0SIX beacon came up to S7 by 1725. SSB QSOs with CT1ANO (IN51), CT1FMX (IM59) and CT1EEB (IN50) followed but all signals had faded by 1800. From 1855 CN8KD was audible on 50.110MHz for 6min but not the beacon.

Clive O'Hennessy, GM4VVX (IO87), heard no Es or tropo scatter but the Lerwick beacon is audible in every aurora. On 15 January he worked MM5DWW and on the 22nd GM3XOQ with LA and SM stations heard during auroras. In a late submission David Whitaker, BRS25429 (IO94), reports hearing his first aurora of the year on 12 February. It lasted from 1630 till 1806 in which time he heard stations in 17 grids and eight countries, G, GM, EI, SM, LA, OZ, ES and DL. Furthest station was ES5AM (KO38) at 1794km but only two Gs were heard.

70MHz

Colin Redwood, G6MXL, was QRV for the last 40min in the Cumulative contest on 25 January operating /P from the Purbeck Hills in Dorset. Conditions didn't seem all that favourable but he managed to work

GD4GNH at 424km. He used an FT-290 as a 2m IF running 500mW to a transverter and amplifier giving out 35W into a long run of UR67 cable to a 5-ele Yagi about 8ft AGL.

GM4VVX reports that the Buxton beacon is audible very often at S9A in auroras. Clive says that he "...screams down the mic for hours, but silence is the stern reply!" In the aurora on 23 January he worked GM3UAG (IO87) and GM6VXB (IO97). In the first leg of the Cumulatives he only heard meteor pings and in the second GI4KSO was the sole QSO. He is looking for a Pye A200 amplifier to up his 10W power; any help? His e-mail address is cohennessy@madasafish.com

144MHz

There is very little to report about 2m activity but Philip Lancaster, G0ISW (IO84), has been busy working DX via MS using FSK441 and WSJT software. Running only 50W from an FT-847 and a 9-ele Yagi he has worked EA2KP (IN83), DD3SP (JO72), LA5KO (JO59), DH8IAT (JN49), DJ3LE (JO44), DL3LST (JO61), IK2DDR (JN35), HB9DFG (JN58), OK1MZM (JN69) and EB2AYV (IN83). ODX so far is ES6RQ (KO28) at 1796km. He wishes to stress that high power is not necessary with this mode, that you don't need to be situated on top of a mountain and that you don't have to wait for a major shower as there are plenty of random meteors.

GM4VVX's activity has all been via auroral propagation, which Clive found on 15 days in January but only on five was there any activity. The only station worked in three hours on the 6th was DL9MS. On the 15th he made SSB QSOs with GMs in the far north and on the 23rd he completed CW contacts with stations in G, GW, GM, DK, OH, SM and LA and with GM on SSB. Next day brought CW QSOs with G, GM and DK stations and with GMs, Gs and EIs on SSB. On the 25th he got nowhere for two hours but then made CW QSOs with G, GM, GW, SM, LA, OH and PA stations and SSB contacts with GMs, Gs, PAs and GWs.

VALE G3FZL

As was reported in the March *RadCom*, Geoff Stone, G3FZL, is a silent key. He was a member of the VHF Committee for many years and its Chairman in the 1970s. He was a key figure in organising the annual VHF Conventions in the London area. Geoff continued to be a dedicated member of this Committee, attending our Saturday meetings at London House in Bloomsbury, even when his health was deteriorating. He was also the Society's VHF Manager and Chairman of the Scientific Studies Committee in the 1970s. For many years Geoff read the GB2RS news broadcasts on Sundays and was always called by many listeners in the London area and beyond. On behalf of readers to this column I would like to extend deepest sympathies to his widow Ceri. RSGB General Manager Peter Kirby, G0TWW, and several other radio amateurs attended his funeral at the Benchley Crematorium in South London on 11 February.

SIGN OFF

Thanks to Neil Clarke, G0CAS, for the December copy of *SunMag* and to the editors of *The Six and Ten Report* downloaded from the website - see the list. The deadline for the June issue is **13 April** and for July it's **11 May**. My CompuServe ID is G3FPK and the telephone answering and fax machine is on 020 8763 9457. ♦

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The Six and Ten Report	www.explore.plus.com/6and10

HELPLINES

IMPORTANT NOTICE
Respondents to items in the 'Helplines' column are advised not to send original documents, but to copy them and send the copies. This is to protect your (often valuable) property in those very few instances where the originals are not returned.

- David, VK2AYD, is a member of a club which has tabled for 2004 the production of a number of simple DF receivers that can be used by schoolchildren on field days, school picnics and amateur radio demonstrations. Rather than re-invent the wheel, David wonders if any other club or individual has developed a simple receiver that could be constructed for, say, around £20, and used for such purposes? Any help would be appreciated, as the club needs to encourage the young. VK2AYD, e-mail: davpil@midcoast.com.au

- Graham, G3YJR, needs a user and/or service manual for an Alinco DJ-S1E 2m hand-held. All expenses will be paid. G3YJR, QTHR. E-mail: hmyjr2@hotmail.com

- Harry, G3DAM, would like to obtain a replacement lamp for a Canon P8 Cinestar projector, type Haimex (or similar), silver-coated 8V 50W. Expenses will be refunded. G3DAM, tel: 01386 41951.

- Mr W J L Stuart, M0LOG, needs any information on the Wayne Kerr B421 bridge. M0LOG, QTHR. Tel: 01925 659 946, or e-mail: joyce.logan@ntlworld.com

- Ted, G4EGB, requires an ISD1110P sound chip, which is a 28-pin dual-in-line type for his custom-made PCB. The ISD1110P was superseded by a more comprehensive one several years ago. Ted has tried RS, Maplin and Farnell, so all ideas will be considered. G4EGB, QTHR. Tel: 01723 362 537 or e-mail: g4egb@yahoo.com

- Dennis, G3EAY, requires the handbooks or driving instructions (originals or photocopies) for two fax machines, the Brother Personal Fax-510 and the Sanyo Facsimile SFX-33. He will repay all expenses. G3EAY, QTHR. Tel: 01255 435 581.

- Dennis, 2E0AFI, needs an instruction book (not the data manuals) for an AVO MkIV valve characteristic meter (valve tester). A photocopy would be fine. 2E0AFI, QTHR. Tel: 01773 863 355.

- Peter, M3PRF, is looking for user instructions and a circuit diagram for the Datong FL-1 audio filter. He will refund all costs. M3PRF, tel: 01707 263 269, or e-mail: sandpet@ntlworld.com

- Colin, GM3WKZ, is seeking the handbook, circuit diagram, and any other information and advice regarding the 23cm, 100W cavity PA, with 2C39A valve, manufactured by L Wave. All costs will be fully reimbursed. GM3WKZ, QTHR. Tel: 01847 804 600 (OH), 01847 811 244 (home).

- John, G3OOK, is looking for a circuit diagram or service manual for a Marconi Instruments Vacuum Tube Voltmeter type TF1300. Expenses will be reimbursed. G3OOK, QTHR. E-mail: g3ook@aol.com

- Graham, GM7KYX, is looking for any help (operating manual or circuit diagram) regarding an American wire recorder - Webster, Chicago, model 228-1. All costs refunded. GM7KYX, QTHR. Tel: 01542 870 322.

- Iain, GM0KDP, is searching for a Motorola MC3340P chip to complete a two-tone oscillator circuit from the RSGB Radio Communication Handbook. GM0KDP, QTHR. E-mail: iaindunbar@aol.com

- Peter, G3GYE, urgently needs the circuit of the 50-ohm attenuator used for the TLC in the Redifon GA485 1kW HF. He would like to purchase or borrow the handbook, or just have a print of the attenuator circuit. All expenses paid. G3GYE, QTHR. E-mail: ninapitts@sagainternet.co.uk

By Dave Pick, G3YXM

178 Alcester Road South, Kings Heath,
Birmingham B14 6DE.

E-mail: lf.radcom@rsgb.org.uk

LF

New Zealand signals heard in eastern USA and Alaska, while PA0SE is heard across the Atlantic ♦ A simple QRSS interface circuit ♦ LF news from the USA ♦ Sound card software for LF ♦ Operation from large commercial masts

During the ZL6QH tests of 26 – 28 December, signals from Quartz Hill near Wellington were received on the east coast of the USA by W4DEX and in Alaska by KL1X. No reports were received from Europe.

Unfortunately, an attempt at an SSB contact with VK7 didn't succeed, but another attempt will be made.

PA0SE GOES TRANS-ATLANTIC

Although Dick Rollema, PA0SE, has been on LF from the start and has designed many projects, including an accurate field-strength measuring set, one thing he had not tried was QRSS.

When he was loaned a 300W transmitter, by Harry, PA0LQ, he decided that he had the power and reliability to try a trans-Atlantic test. This transmitter uses four PL519 TV line-output valves in the final stage, and had a VFO at 2.72MHz which was very good for CW, but not stable enough for QRSS. At Dick's request, he modified it to accept an external oscillator, in this case a Wandel and Golterman SP-12 signal generator, which is referenced from Dick's SPM-12 selective level meter. Quite a complex setup!

In the early hours of 30 January, the 140mW ERP signal was copied by Joe, VO1NA. Joe's signal is generally pretty good, so it looks as though a PA/VO contact may be possible.

Joe had already made a 2-way contact with G3LDO a few days before.

QRSS INTERFACE

Those wishing to try QRSS will need a way of connecting the serial port of the PC to the transmit and key lines of the transmitter. It is useful to have some isolation between the PC and the RF equipment to minimise noise and pickup. Whilst transformers can be used in the audio circuits, the best solution for the switching lines is an opto-coupler.

I have used the simple circuit shown in **Fig 1** for some years without any problems. The red and green LEDs are useful indicators when setting up the software before connecting up the transmitter. The opto-coupler specified is a Darlington type [shown with ordinary transistors for simplicity – *Ed.*] without a 'Vcc' pin. It depends upon the current your transmitter requires to switch, but these Darlington types give more sensitivity than the basic types. They are quite hard to find, the 8-pin DIL TIL198 that I use is available from Dial Electronics, but there's a better choice of SMD devices if you have good eyesight!

US NEWS

Laurence, GM4DMA (recently KL1X), has now left Alaska bound for a new site in Oklahoma. His beacon, WD2XDW, closed down in early January, but he hopes to obtain another 'Part 5' experimental licence from his W5 location in a few months.

OM2TW's problems were caused by these chokes at the base of the tower (see "Big Signal' Weekend'.

Just before the mast came down he copied signals from G3LDO and from DF6NM at almost 7600km.

As if moving thousands of miles wasn't enough, Laurence is planning a trip to Fiji in late June and will take his trusty 136kHz listening gear.

As one station closes another opens.

Warren, K2ORS, has just received his 'Part 5' call, WD2XGJ. WD2XGJ is authorised to radiate 10W ERP in the 136kHz band, and Warren's application included two-way communication with other 'Part 5' stations and foreign amateur stations. His location is not too far inland from Boston, Massachusetts. so with any luck he should get a signal to Europe!

SOFTWARE RECEIVERS FOR VLF

Many VLF enthusiasts are using their PC sound-cards as receivers for frequencies below 22kHz, but now a new generation of sound-cards has become available which can resolve higher frequencies. These cards have 96kHz or even 192kHz sampling frequencies.

Alex Deligiannis reports that he is now using an Audigy 2 ZS 24bit/96kHz sound card, which has a response of 10Hz to 48kHz and he is very pleased with the results.

If you want to try VLF reception on your PC, Alberto di Bene has just released version 0.93 of his *Software Defined Radio* program. This version has an FM demodulator (thanks to Barry Dieser) and various other improvements.

It is available free from the SD Radio website.

'BIG SIGNAL' WEEKEND

Ed, RU6LA, and Rich, OM2TW, both set up portable stations at large commercial masts on the same weekend in January. Ed radiated a good signal from Machta and was received at about 3700km by CT1DRP and EA1PX, but Rich had problems.

He was trying to tune a 135m medium-wave broadcast tower on 136kHz, but could not arrange a matching network that would work.

It seems that the tower was grounded by a set of chokes which allowed power for the warning lamps to pass through. These chokes were of insufficient inductance to operate on 136kHz.

If he gets another opportunity to use this site, he will try resonating the chokes with a large capacitor. It shows that you have to be prepared for all eventualities when visiting such sites!

Look out for Rich and other Slovakian stations using the call OM100TS in appreciation of the achievements Joseph Murgas in early radio. In 1904 he patented a 'tone signalling' system, later taken up by Marconi, which is not too dissimilar to the modes we use on LF today. ♦

FIG 1 © RADCOM 123

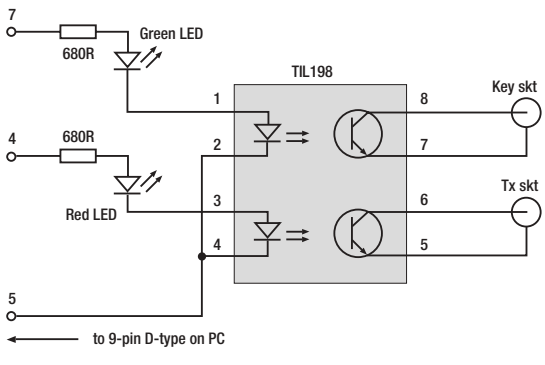


Fig 1 Circuit of the QRSS interface.

WEB SEARCH

SD Radio	www.sdradio.org (Download the *SD Radio* program)
Dial Electronics (suppliers of the TIL198)	www.dialelec.com

By Rev George Dobbs, G3RJV

St Aidan's Vicarage, 498 Manchester Road, Rochdale, Lancs OL11 3HE.

E-mail: g3rjv@gqrp.co.uk

QRP

One of the encouraging things about writing this column is that I get to know about the achievements of other radio amateurs using low power and simple antennas, so I have devoted this issue to sharing some of that information with readers - a few stories of people having fun and achieving results with QRP.

On Saturday 13 December, Tony Billington, MD3DCI, made contact with Philip, K4QH, from Tennessee, USA on the 15m band. Tony made the contact from inside the radio shack at Scarlett Point on the Isle of Man using a Yaesu FT-817 with a maximum of 5W to a tiny Miracle Whip antenna. I contacted Tony about the QSO and he added, "This was the first contact I made with the Yaesu FT-817 on HF working portable. After listening around the 40m band and finding it very noisy, I then switched to 15m and listened around 21.240MHz. I was receiving strong American stations, so I thought I would put out a couple of CQ calls and then the call came back from K4QH. As you might imagine, the people with me just could not believe it, but there is a video clip on the Scarlett Point website. This shows Phil giving me a signal report of RS 35. A good QSO with the Miracle Whip MkII and the very potent Yaesu FT-817 operated at 5W from *inside* the former coastguard station. This just goes to show what you can do with QRP, and the video is there for all to see."

More information about the radio shack at the former coastguard station at Scarlett Point, Castletown, on the Isle of Man can be found on its website.

QRP SSB RESULTS FROM THE USA

Jake, N0LX, mentions his QRP SSB results in unusual portable conditions. "I use an FT-817 mounted either on a backpack or on the back seat of a 2.5m rowboat here in the state of Colorado. My current antenna of choice for both is a homebrew shortened end-fed half-wave wire, supported by a 6m fibreglass fishing pole. I have made some nice DX contacts on 17 and 20m recently.

"On 2 December, I was in the boat on a small lake near Denver. It was 6.30pm local time, dark and cold. My last stateside contact had been 15 minutes ago, and I suspected the band had closed, so I started rowing back to shore. I stopped occasionally to tune across the band when I heard T32WW on Christmas Island way out in the Pacific. Got him on the third try and we talked for a couple of minutes, only to find his home QTH was Colorado!

"On 12 December, I was 'pedestrian mobile', with the FT-817. I had just finished a QSO into Washington State when I heard JH1OCC in Japan calling me! I received his QSL card yesterday.

"Then, for 'the one that got away', this month I was out with the pack again, climbing up a mountain near the house. On 20m I heard a ZS6 in South Africa. He heard me and almost had my complete call. After two repeats, he just disappeared, and I didn't even hear anyone calling him."

MICROWATT SIGNALS

A few weeks ago, I received the news that, over the Christmas period, Richard Newstead, G3CWI, carried out tests on the 10MHz band with a transmitter running around 3µW. This small signal was positively identified by two stations in Germany, one in Holland and one in Belgium. I asked Richard for more information and he said, "The tests were done using powers between 3µW and 10µW - not mW! I used an FT-1000MP as the signal source; due to the long integration times needed to receive the signals (30-second dot lengths), high stability was required! The signals consisted of my callsign and a five letter test word – 'BEER?' (question mark included). These five characters plus my callsign took one hour to send. The object of the test was to see if the ionosphere was stable enough for long integration time signals at HF. It is much more stable at LF where this technique is commonly used. In all, five people in three countries detected the signals. Some were getting the whole codeword correct as well! The photograph shows the question mark as seen by Peter, PA1SDB – the signals are rather weak! The red lines are put on by Peter to show where the signal is. Clearly the ionosphere is stable enough at local midday for this sort of thing.

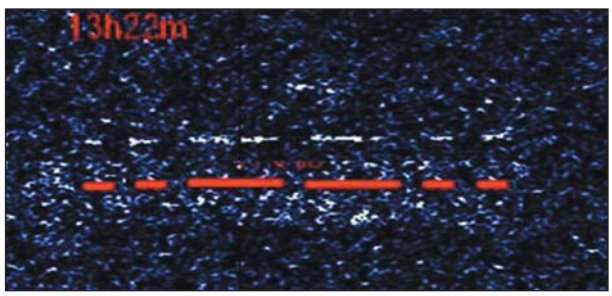
"There is a very active little group of experimenters called the QRSS Knights (don't ask!). The bias is very much on having fun and sometimes learning something new too!

"The other week I was receiving VP8FI very nicely on 10MHz – he was running 300mW. There was a certain irony that, at the same time as I was doing my tests, Jodrell Bank, just down the road from me, was straining to hear *Beagle 2*. If you do the sums, my tests got more miles per watt than *Beagle 2* was trying for!"

NEW CW 4 FUN DIPLOMA

The German magazine, *Funkamateur*, has launched a new attractive diploma to encourage those who are new to Morse, to promote skills and Morse proficiency. Applicants need to have 10 Morse contacts with German Class-II licensees (eg DB, DC, DD, and DG). The diploma is free with a small postal fee of 1.44 Euro. An application form can be found as a pdf file on the *Funkamateur* website. The last time I checked this site, it was in German only, but an English version is promised soon. ♦

N0LX operating SSB QRP portable from a half-frozen lake on New Year's Day.



The G3CWI signal as seen by Peter, PA1SDB.

WEB SEARCH

Scarlett Point	www.scarlettpoint.com
QRSS Knights	www.cnts.be/knights_qrss/
Funkamateur	www.funkamateur.de

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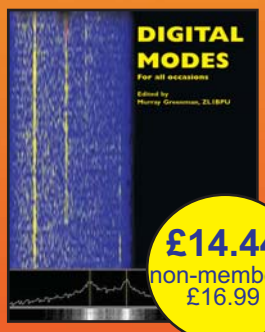

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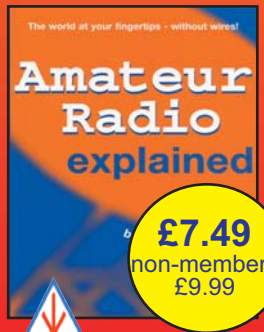

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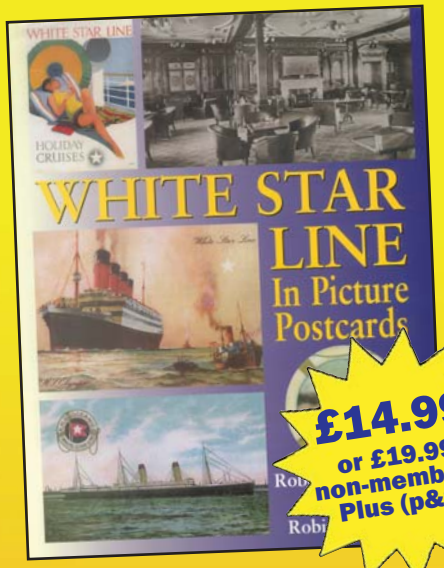

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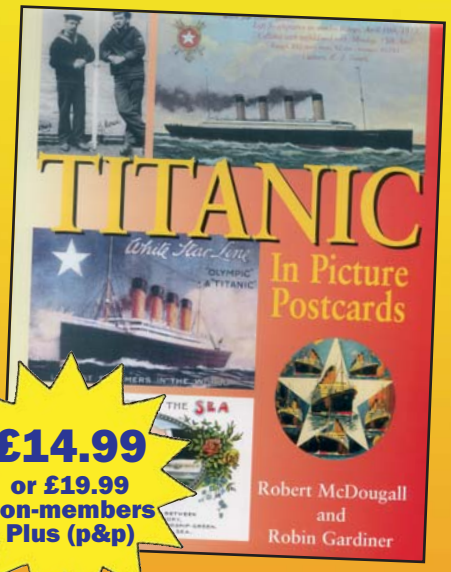
Size 215 x 252, 128 pages , ISBN: 0-7110-2986-5



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By Bruce Fleming, KI7VR (ex-G3NDG)

E-mail: radio599@pacifier.com

The two-element Pentagon

The Loop, the Delta, the Quad – now KI7VR introduces us to the Pentagon, a five-sided design that combines modest vertical height with good performance.

Quads are fine antennas and, on the higher frequencies, are easy and cheap to build. The problem with quads for 40 and 80m is *size* - they are physically huge, but I have found that by making two design changes and one compromise, a 40m 'loop' antenna can be built without too much heavy engineering.

The compromise is in regard to rotation: *don't try to turn it!* The fixed 'loop' is much simpler to build. Obviously a non–rotating, two-element 'loop' should be aligned for the most important DX direction, but it can also be readily switched 180° by changing the parasitic element from a reflector to a director.

The first design change needed to simplify a big fixed Quad is to hang the loops from one corner – this method needs only a single spreader per loop, which in my case, is a vertical bamboo pole. I will refer to a Quad loop hanging from one corner (**Fig 1(a)**) as a 'Diamond Quad'. TI5KD has constructed a single-element Diamond Quad for 80m on a 110ft (35m) tower. The diagonal corner-to-corner distance of this single-loop Quad is 95ft (30.7m) for resonance at 3.525MHz, hence the need for a high tower! The loop corners are pulled out with nylon cord attached near ground level to open up the loop. The resulting loop antenna beams north into the USA/Europe and also beams south to South America. The same tower carries a two-element 40m Diamond Quad which beams north. The signals from these Quads are very impressive, but major engineering is involved. After coming home from operating at TI5KD's shack in Costa Rica, I badly wanted a two-element 40m Quad, but I had neither the cash nor the stomach for heavy engineering. So I sought a way to reduce the height requirement of the Diamond Quad while retaining the single-spreader construction.

Fig 1
A comparison of three types of 'loop' antenna.

PENTAGON DEVELOPMENT

In free space, the ideal loop antenna comprises a circular conductor with a circumference equal to one wavelength [1], or multiples thereof. Circular loops are indeed used on the VHF bands, but on the HF bands, a circular shape is hard to achieve and loop antennas have tended to become triangular (Delta Loops), or square (Quads).

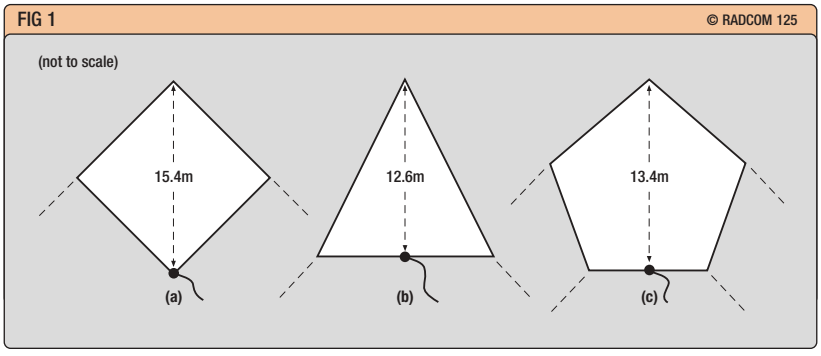
The conventional square Quad needs support at two high points per loop – normally achieved with long spreader poles mounted at 45° to the horizontal using a special bracket on the boom (lots of torque where the spreader pole attaches to the bracket) – this is difficult to engineer for 40m and 80m. The fixed Diamond Quad is simpler and more robust, with its single vertical spreader per loop – but there is a drawback - the Diamond Quad needs 1.4 times more vertical height than the square Quad. The Delta Loop (**Fig 1(b)**), with its flat base, needs less vertical height than the Diamond Quad; however this 'less open' type of loop may not be as efficient as the square loops. John Devoldere, ON4UN, calls the Delta Loop a "Poor man's Quad" [2].

This article describes a Pentagon Loop, which is more 'open' and requires less height than a Diamond Quad, but still hangs from one corner.

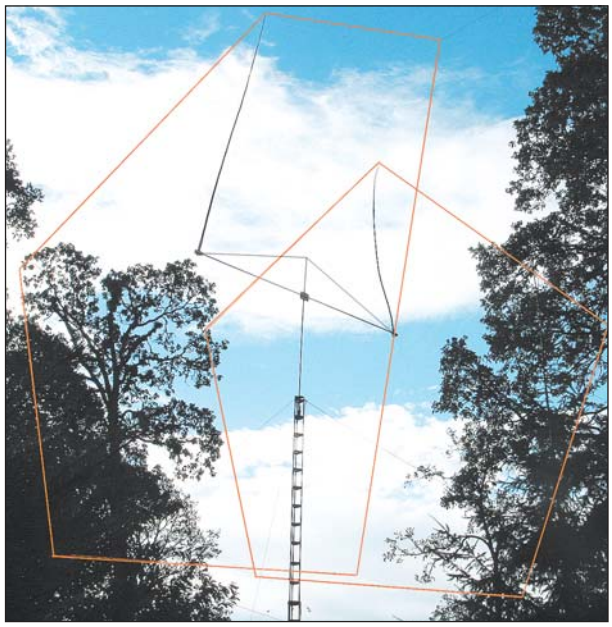
The 40m Diamond Quad (Fig 1(a)) has sides 10.87m long and a total circumference of 43.5m. When suspended from a corner, it occupies a vertical height of 15.4m. The corresponding Delta Loop (Fig 1(b)) has sides 14.5m long and a height of 12.6m. The Pentagon Loop (**Fig 1(c)**) has sides 8.7m long and a height of 13.4m. The Pentagon requires only 87% of the vertical height needed by the Diamond Quad shown in (a).

The Pentagon Loop requires but a single vertical support at the apex. The two upper corners are pulled out

FIG 1 © RADCOM 125



for 40m



The two-element Pentagon for 40m at KI7VR. The wires have been re-touched to make them visible.

with nylon cords to open up the loop.

The bottom is made flat, as with a Delta loop, to minimise the vertical height requirement. It is apparent that the Pentagon Loop is more 'open' than either a triangular or square loop and thus might be expected to radiate and receive somewhat better. A Pentagon has a 10% greater capture area than a square antenna made with the same wire. Tensioning the cords at the lower corners raises the bottom wire a few feet. I am not sure whether the bottom ropes are really necessary – without them, the wire droops in a catenary curve - although the wire hangs closer to the ground, the loop opens up even more.

MY INSTALLATION FOR 40m

An old 30ft crank-up tower was given to me by a friend: I constructed the tower base on the edge of my property where the ground drops sharply to the south. I used a 10ft stub mast made of steel fence railing (1.375in diameter) – cheap, but maybe too flimsy (we'll see). To the stub mast (8ft above tower top), I attached a 20ft boom made of two bits of the same fence railing, the ends of the boom being pulled up to a short centre support pole using Dacron cord, thus preventing sag and strengthening the assembly, a technique used in the past with aircraft wings. Each end of the boom carries a vertical piece of 3in OD aluminium tube (18in long) into which a varnished bamboo pole (homegrown, 20ft long) [3] is bolted. The height at the top of the bamboo is 58ft. The antenna wire (copper-clad steel, multi-strand 14-gauge) is attached to the top of each bamboo pole. A small loop is soldered into each wire at the four remaining corners and Dacron cord attached to each corner point.

How you pull out those top corners depends on your property. If you have lots of space (eg a field) then you can extend the Dacron cords far out until they approach ground level and then attach them to ground stakes. On my half-acre lot, I had to climb nearby trees and put my Dacron cords through smooth plastic rings fixed to convenient upper branches.

After final adjustment of the cords, the bottom wire hangs 19ft above the ground. I had calculated 17.5ft, so I guess it means I haven't quite got my tree branches in the right spots and I don't have perfect pentagons, but I will leave the trees where they are for now. By loosening the ropes, it is possible to drop the bottoms of the loops low enough so that, using stepladders, the coax connection can be modified, or the length of the parasitic element changed.

DIMENSIONS OF THE 40m PENTAGON

Driven element design resonance: 7050kHz.
Side lengths: five equal sides of 8.7m.
Total length: 43.5m.
Reflector length: 103.5% of driven element - four sides of 8.7m, bottom side: 10.2m.
Total length: 45.0m.

Note 1: the resonance shifts a bit with soil moisture content; I needed to shorten the loops as the soil dried out during summer.
Note 2: if the parasitic element is to be a *director*, its length needs to be 97% of the driven element, ie 42.2m. I used four sides of 8.7m and a bottom side of 7.4m.

MATCHING

The two-element Pentagon described above has an input impedance of about 100Ω when fed in the centre of the lower side (see [4] for a discussion about feeding loops at other points). For matching, I used a quarter-wave transformer of 23ft of RG-6/U coax (75Ω) attached at the bottom centre of the driven loop. This connects to RG-58/U (50Ω) running to the shack. The VSWR at the shack is 1.2:1 at resonance and I have run 500W on CW into this setup with no problems. RG-8/U would be better than RG-58/U, but I do things on the cheap!

COST

My total cost was $214 – of which $75 was for concrete mix; steel tube for boom and stub, $21; three heavy-gauge aluminium boom-to-mast coupling plates, $56; Dacron cord and antenna wire, $62. The tower, bamboo and coax were already available.

PERFORMANCE

You may wonder about an antenna that is so close to the ground on 40m. Well, I have a secret - the ground at my QTH falls away steeply to the south, so steeply that I am practically living on a cliff edge. With the antenna pointed at ZL, the boom has an effective height at the boom of 175ft. With 400W into the antenna on 7002kHz, the reports from ZL and VK are that "it sounds like a local" when the band was open (summer 2003). Received signals are up by about two S-points over a dipole and the noise is the same or lower. This antenna gives me good 'ears'. Long-path results to Europe have been excellent with the antenna pointed at New Zealand - eg 599 from OH4RH in October 2003.

Not everyone has a QTH like mine, but the Pentagon Loop is a way to get a low band 'quad' in the air for a reasonable price with a rather small tower. If you can manage to place said tower on a hill or a cliff - so much the better! ♦

REFERENCES

[1] *Low Band DXing*, by J Devoldere, ON4UN, ARRL 1999, p10-1.
[2] *Low Band DXing*, by J Devoldere, ON4UN, ARRL 1999, p10-5.
[3] MFJ Enterprises Inc produces a 33ft fibreglass telescoping mast (MFJ-1910) which, in lieu of bamboo, would probably do the trick. Available in the UK from Waters & Stanton PLC.
[4] *Low Band DXing*, by J Devoldere, ON4UN, ARRL 1999, p10-4.

Members' Ads

FOR SALE

7ft x 8in square white painted tower, sections bolt together, believed similar used as gantries for pop concerts etc. Occasional very slight surface-only rust spots, ideal for lightweight base tower and field days. Eight only left, £7 per section. Buyers collect. Genuine bargain. G3FEV, 01706 211 339 (Rawtenstall, Lancs).

ALINCO dual-band 605, £175. Narda mini power meter RF model 8441 microwave, £200 (cost £475). Harlow 420 513 (Harlow).

ALL following items, one non-smoker owner and under two years old: IC-756PRO mint with man, mic, boxes etc, £950. MFJ-986 3.5kW Versa Tuner £130. Nissei 30A PSU, £70. Manson 25/30A PSU, £50. Bencher deluxe paddle, £65. Vibroplex deluxe Bug Key, never used, under half price, £95. Kenwood headphones, £20. Several winches 900lb/1300lb, £20/£25 each. Heavy duty 20ft alloy poles. Lots of peripherals. 01446 413 379 (Barry, S Wales). E-mail: gw3cba@ntlworld.com

AMPLIFIER 2m Henry 2002A boxed, man, £650. MS-DTR, £100. ETM9C mem key, £80. Yaesu 211RH FM, £60. PacComm Tiny-2 MkII, £50. Ele rot KR-500, £60. Altron mast 33ft, £100. GP needed. Help to dismantle. Mike, G0KAS, 01372 810 612 (Epsom).

BNOS 432-1-50 linear with built in pre-amp, £70. BNOS 432-10-50 linear with built in pre-amp, £50. Pye MX-296, 16ch VHF mobile working on 70cm, £45. Realistic PRO-38 scanner 66-520MHz, £25. Pye M-293 low-band AM mobile, 6ch, £25. Mike, M0CIE, 01823 259 425 (Taunton).

CAPACITOR plates for making variable capacitors for high power/voltage linears. Homemade, drilled and only require studding and mounting Bakelite back plates. Five fixed and five movable at 4mm spacing = 30pF at 2000V. I have 26 movable and 19 fixed left. 50p per plate. V McClure, 01297 23421 (Devon). E-mail: poisonpen@poisonpen.freeserve.co.uk

CODAR AT5, late model, (ventilated case) 250/s, PSU, nice cond, gwo, man (copy), £60. G3WCE, QTHR, 01692 538 794 (North Walsham).

COMPLETE station – HF VHF UHF Yaesu FT-817 c/w battery pack, charger, battery holder, antenna, mic, soft case, boxed, £400. Tokyo HL-50B HF + 6m amp, £180. LDG-211 auto tuner, £90. HST-817 Heil Traveller headset, £60. Mizuho walkabout ATX WBN whip for FT-817, £50. Miracle antenna, £80. LDG-211 auto remote, £30. Alinco DJ-596 dual bander, 2m + 70cm – never used, £145. Create RC5-3 rotator, brand new, never used, £300, c/w 25m 8-core cable. All items less than 15 months old. FT-817, amp, tuner, headset and antennas used twice only! All in pristine cond with mans etc. Buyer collects or postage at cost. Ron, G4YYH, QTHR, 01209 718 021 (Cambridge). E-mail: g4yyh@tiscali.co.uk

CUSHCRAFT 203-CD monoband beam, new and boxed, £200. GW0SLM, 01407 832 841 (Anglesey).

EDDYSTONE S-640 rcvr, £100 or best offer. Buyer collects. G8BFS, QTHR, 01799 550 313 (Saffron Walden). E-mail: john@dudeney.co.uk

ELECTRONIC components, unused, mostly sorted, in several cardboard filing boxes which were left over when I retired recently and wound up the business. These include resistors, capacitors, ICs (linear and digital), relays, meters, etc, as well as some hardware. I ask only for a donation of at least £25 to the Children's Charity. First come, first served! Cannot split. I live in south Leicestershire. E-mail: atlanticelec@onetel.net.uk

GOULD OS-1100A 2-beam scope, £50. PSU 13.8VDC 50A stabilised, protected, metered, £100. PSU 0-450VDC stab, 700VDC unstab, 2x6.3VAC metered, £10. PSU 5VDC 75A switch-mode, £5. AVO RF sig gen 100kHz-240MHz, int/ext modulation, £25. Advance AF sig gen 15Hz-50kHz sine/square, £10. Racal Airmec electronic multimeter, all probes £10. Other items cheap/free. All gwo. G4OEE, QTHR, 0115 972 8064 (Nottingham).

ICOM 751 HF tcvr + gen cov rcvr guaranteed perfect cond, man, mic, pwr cord, £295 + p&p. GW3YVC, 029 2075 5190 (Cardiff). E-mail: owen@fulmar.freeserve.co.uk

ICOM IC-703 HF/6m 10W QRP new boxed, £535. IC-737A HF, ATU, boxed, £490. Kenwood TS-751E 2m multimode, as new, boxed, £285. Standard C-5900 FM 2/6/70cm, vgc. Rcvr 44-100MHz. 225-1020MHz FM/AM, vgc, boxed, £285. Drake MS-4 spkr, £20. Kenwood DFC-230 digital VFO, £40. G4AFY, 01562 747 480 (Kidderminster).

ICOM IC-756 HF/6m. Little use, £650. 01691 659 615 (Oswestry, Shropshire).

K2 with SSB, built in ATU, noise blanker, mic, exc working order, £440. G3GTJ, 01963 240 319 (Castle Cary).

KENWOOD / Trio TR-751 2m multimode. Boxed with man, £200. Tonna 9-ele 2m, £25. 2m colinear antenna, £15. Altai audio gen, £15. Thandar 2MHz function generator, £20. Buyer collects or carriage extra. G1ZBM, 01761 413 151 (nr Bath).

KENWOOD TS-850 SAT, 500Hz CW filter, operator man, vgc, £500. MFJ magnetic loop model 1786, control box, only used indoors vgc, £150. Kenwood TH-D7 2m tcvr, man, boxed, vgc, £150. Nigel, G4EJW, QTHR, 01278 784 734 (Burnham on Sea). E-mail: nigel@g4ejw.freeserve.co.uk

KENWOOD TS-870S, vgc plus EP-925 30A PSU, £750. G3MMK, QTHR, 01274 672 796 (Halifax). E-mail: bazhub@btinternet.com

KENWOOD TS-950SD digital c/w Kenwood standing wave meter. Extra filters for CW. Non-smoker. Buyer collects and tests and pays, £850 cash. G0ABK, 020 7435 8633.

LATTICE tower, 40ft, 2-section, tilt-over, post mounted, galvanised, 2 winches 3-band 3-ele HF beam, rotator, all £375. G3WBA, QTHR, 01275 873 691 (Clevedon). E-mail: ivan@g3wba.co.uk

LIST of equipment, antennas, cables, wire, video, photographic, instruments. Buyers collect, Dorset or Parcel Force. Detailed list e-mail. G3AAG (Dorset). E-mail: g3aag@aol.com

MICROPHONES Grampian dynamic DP4L, £10. Reslo ribbon, £15. Selmer RL1 RSA, £15. Spacemark RTTY terminal unit SRD1, £15. Yaesu FT-480R 2m all modes T/R, £180. Yaesu FT-680R 6m all modes T/R, £180. Low-pass filters (52ohms), Yaesu FF-501DX, £20. Minimitter (Labgear?), £15. See also Jan and Feb ads, p&p extra. QTH one mile from junction 29, M6. 01772 337 815 (Preston). E-mail: g3azi@btinternet.com

MILITARY radio type GRC9 c/w LV80 amplifier. Choice of two. One has a vehicle mounting kit. Priced from £195. 01775 766 398 after 7pm (Spalding).

POWER supply regulated 13.8V 3A free for cost of p&p, £5. G0GPO, QTHR, 01227 711 261 (Canterbury).

PRODUCTION run overflow PA Boards. They are 2in by 3in in size, tinned pads type and will accommodate up to 100W PA transistor and full pre-amp. Only six boards available. £10 each or £20 the lot. V McClure, 01297 23421(Seaton). E-mail: poisonpen@poisonpen.freeserve.co.uk

SELLING up. Icom 746 mint, boxed, man, £750. Yaesu FT-50R dual band h/h, mint, boxed, mic, £100. Kenwood TH-79E, d/band h/h, boxed, man, extra batteries, 2 mics, telescopic aerial, £125. MJJ-941E ATU like new, £50. Daiwa SWR/power meters CN103LN, £25 & CN10IL, £25. CobWebb space-saving antenna 20-10m, £90. Cushcraft 15-ele 2m beam, £20. Diamond V-2000 tri-band vert VHF/UHF antenna, £40. Carolina Windom 80 special (4 months old), £50. G7VDY, QTHR, 01226 716 073 (Barnsley). E-mail: martin.williamson11@btopenworld.com

SILENT Key (G4UAC) Sensible offers please for any of the following items. Alinco DR-590 2m/70cm tcvr. Yaesu FT-290 2m mobile tcvr, inc YM-47 mic. Yaesu MD-1 desk mic. Yaesu MMB-38 mobile mount bracket. Kenwood MC-85 desk mic. Kantronics KAM-Plus all-mode data controller. CX-401 4-way antenna switch. Revex duplexer D-24 2m/70cm. Altai KDM6 transistor dip-meter. MFJ-451 Morse keyboard controller. MFJ-1315X AC adaptor. MFJ-1272BYH mic/TNC switch, MFJ-784B tunable DSP filter. G3HEE, 01780 755 001 (Stamford). E-mail: p.fancourt@btinternet.com

SILENT Key (M0BTT). Icom 820H 2m/70cm base tcvr, £425. Tonna 5-ele 6m Yagi, £45. MFJ multimode controller, £195. All prices ono. 01780 755 001 (Stamford). E-mail: p.fancourt@btinternet.com

SILENT key sale - G0TTZ. AR88D, £80. Trio TS-515S, £80. KW2000A + AC and DC PSUs, £80. TR-2500, £50. IC-202, £50. IC-255, £50. FT-208RH, £30., Realistic DX394 £100. Pro2032 scanner, £60. Welz SP-350 power meter, £20. Belcom Liner 10, £50. Kenwood AT-230, £50. Quantek 2.4GHz counter, £30. MM and Mirage 30W 2m linears, £35 each. RN 2m to 6m tvtr, £25. Siemens Klangmeister FM/AM broad-

SILENT KEYS

We regret to record the passing of the following radio amateurs:

G0IBU	Mr Howdon	
G3IDG	Mr F Herridge	
G3JMB	Mr J Brooker	12/02/04
G3OYI	Mr M T Littlewood	03
G4IWG	Mr D Midgaff	10/02/04
G4JJW	Mr A Sambrook	02/03
G4PTU	Mr C Charlesworth	06/02/04
G4RJK	Capt J A Kay	26/01/04
G6EBZ	Mr A J Brake	26/12/03
G6GN	Mr H Gratton	
G6IQT	Mr R McConnell	11/2003
G7DLT	Ms E Ward	19/11/2003
GI1VLZ	Mrs K Caldwell	22/09/03
GI3PQW	Mr L Campbell	22/10/03
GI3SXG	Mr H E McNally	01/12/03
M0CWK	Mr R J Dewhurst	13/02/04
M1DZQ	Mr M Fowlds	05/02/04

CONGRATULATIONS

to the following, whom our records show as having reached 50 or 60 years' continuous RSGB membership this month:

60 years

G3BVU	Mr C J Beanland
G3HKT	Mr A R Partner
G4KID	Mr B C Partridge

50 years

G3AHD	Liverpool AR & ES
G3JHC	Mr B Jenkinson
G3MPB	Mr A R Smith
G8BFL	Mr B J Jayne

Our apologies for two omissions from the Old Timers' Honour Roll, published in February. They were Mr M Palmer, G8BOP, and Mr D Wood, G3HKO, both of whom joined the Society in 1951.

cast rcvr, £25. SWR bridges, coax switches etc. SAE/e-mail for complete list. Offers considered. Proceeds to St Dunstan's. 01273 463 447 (eve). E-mail: ggma@talk21.com (Shoreham Sx.).

SILENT key sale – GM3BCL. Car number plate registration RS59. Offers over £9,000 to John, GM4NHI, 01330 860 602 (Aberdeen).

SM-220 monitor scope B8 pan adapter, immac, £145. Datong FL3 mint, £50. Global 2000 SWL tuner, £45. MK-704 twin paddle key, brass base, £20. 12V 3A PSU, £10. G3RHM, QTHR, 01404 850 461 (Nr Exeter).

TEN-TEC Hercules 500W linear and matching 13.8V 100A PSU. Realistic offers. G3NSY, QTHR, 01743 790 457 (Shrewsbury).

TGM Communications 3-ele Hybrid Quad Beam antenna model no MQ36SR, covers 20-6m, as new, boxed with mans, £300. Carolina Windom 160 Special wire antenna. New, never opened, 160-10m, £100. Gap Challenger DX VI vertical, 80-2m, as new, all literature included, £80. Buyer collects or pays p&p. Bob, M0MJA, 01392 276 050 or 07949 537 081 (Exeter). E-mail: m0mja@aol.com

WW2 nostalgia. Ancient items dials, microphones, instruments, valves, coils, formers, books, tuning units, capacitors, rotary transformers. SAE list. G3HGM, QTHR, 01582 733 436 (Luton). E-mail: jaewen@bigfoot.com

YAESU 736 tri-band – 25W with 2-70-6 modules, £550. Yaesu 817 all-band portable with charger and VHF-UHF rubber duck ant, £400. SGC Smartuner 230 antenna tuner, £250. Doug, 0121 360 5062 (Birmingham).

YAESU FT-10000MP dual VFO tcvr. Boxed, man, vgc. Bargain, £1000 plus carriage or collect. No offers. Chris, 01326 377 233 (Falmouth). E-mail: g3nhl@tiscali.co.uk

YAESU FT-102, £120 and MFJ-949E deluxe aerial tuner, £80. Patrick, G0NZS, 01462 742 015 (Hinxworth). E-mail: patrickforbes@waitrose.com

YAESU FT-107 complete with PSU/spkr and desk mic. Man available, gwo. Buyer collects, £250 ono. G4IZI, QTHR, 01788 575 758 (Rugby). E-mail: daveg4izi@yahoo.co.uk

YAESU FT-767GX, with all modules, hence £650. FT-726R, rare HF module + 2m + 70cm modules, £450. Both exc cond, must collect. FT-480R, serviced, £165. Two FT-227R, £90 each. YH-2 VOX headset, hardly used, £25. Tvtrs: MM 70cm, original style, £60, later style, £85; RN Electronics, 6m, 25W, hardly used, £120. PMR: Dymar & Norgas 2m, Pye Europa 70cm, £30 each. Icom IC-551 rare 6m m/mode, £195. Other items. Lots of junk, no list, e-mail me what you are looking for. Keith, G0OZK, 07974 953 018 after 6pm (Stockport). E-mail: keith-g0ozk@yahoo.co.uk

YAESU FT-920AF HF+6m transceiver, CW filter fitted, with power cable, hand mic, man, in original box. Exc cond, around £725. G3RFH, 01253 823 957 (Blackpool).

WANTED

ACCESSORIES wanted for FT-101ZD MkII, must be vgc, FC-901 or 902 ATU. FV-101DM ex-VFO, SP-901 speaker, FTV-901R 2m, 6m, 70cm tvtr, YO-901/P monitor scope, FL-2100Z or ZA linear amp, YD-148 base mic. QTR world clock. Also non-working FT-101Z or ZD. Fox Tango newsletters and related paraphernalia. 01702 528 288 (Southend-on-Sea). Email: smithclamp@aol.com

ALL Racal or Watkins Johnson items wanted by enthusiast and collector in any condition. Any receivers, accessories, spares or manuals. What have you? Especially looking for RA1772, RA1778 or RA6790, also RA17 LF converter and SSB adapter, Cubic 3030, Collins HF-2050, and tall 19inch equipment racks to house my radios. Can arrange collection from anywhere. G8WKA, QTHR, 01252 795234 (Surrey). E-mail: richardreich@aol.com

BIRD dummy load, min 500W, model no please? Bird element 100H 2-30MHz 100W, good cond essential. G3GYE, QTHR (Penzance). E-mail: ninapitts@sagainternet.com.uk

BIRD Thru-Line insert, 'H' series 2 - 30MHz 100-250W or similar power. G8DPW, QTHR, 01795 580 930 (day). E-mail: swalemarin@aol.com

EDDYSTONE EC-10 WANTED. MkI or MkII. Dead or alive. Chris, 01737 244 471 (Reigate). E-mail: g4.byz@virgin.net

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 (Leeds). E-mail: g4uzn@qsl.net

UP to £60 offered for 2m multimode, FDK, Trio Yaesu etc. Scruffy is OK, but gwo please. Jim, 2E1BUR, 07973 409 631 (Hailsham). E-mail: jizzard@aol.com

VINTAGE ham radio gear: Codar, Collins, Drake, Eddystone, KW, AM/CW transmitters LG300, Panda, etc. Also looking for KW-201, KW-4B VFO, KW-160, KW Vanguard, Valiant, Victor Eddystone spkr, S-meter, Heathkit SB-610. Please let me know what you can help with. Paul, G4CCZ, 01932 342 927 (Woodham, Surrey). E-mail: g4ccz@6metres.com

WEYRAD printed circuit board PCA1 with or without parts on board and any P50 series IFs or osc or full radio 'Super 6' by Gladstone Radio in the 60s. Dave, G4WCD, 01482 507 244 (Hull).

WORKING or non-working Collins 30S1, KWS1, any pre 1970 amateur valve equipment ie Collins, Drake, Codar, Eddystone, Hallicrafters Hammarlund, Heathkit, Labgear, Lafayette, Mosley, Minimitter, Sommerkamp, Swan, HRO, 19 set, etc, or any other considered also matching speaker for FRDX400. G3ZIG, 01362 688 430 (Norwich). E-mail: g3zig@freenet.co.uk

YAESU FL-110 amp, Racal TA-944. G3GTJ, 01963 240 319 (Castle Cary).

YAESU FT-101ZD radio + FC-902 antenna tuner, YO-901 multiscope, SP-901P spkr, FV-101DM external VFO and FV-901 DM external VFO. G1GCS, 01264 393 290 (Andover). E-mail: william.brown980@ntlworld.com

RALLIES

3 APRIL 2004

GMDX 7th Annual Convention & Dinner – King Robert Hotel, Whins of Milton, Stirling. Bar lunches from 11.30am, start 12.30pm, £7, dinner £17. LEC, C, accommodation. Pre-book with Sheree Ferguson, 19 Leighton Avenue, Perthshire FK15 0EB.

VINTAGE & MILITARY ARS Southern Event – Field Place Conference & Sports Centre, The Boulevard, Strand, Goring, Worthing, signposted from the A27. OT 10am. Please note that this not a 'radio and computer' event. Demonstrations, displays, B&B, TS. HF & VHF stations (weather permitting). Mike, G0JXX, 01903 260 291, chairman@vmarsmanuals.co.uk

4 APRIL 2004

Northern Mobile Rally (Harrogate) – Harrogate Ladies' College, Duchey Road, Harrogate. OT 10.30am, admission by programme, £2.50. Gerald, G0UFI, 07734 478 080. [www.harrogaterally.co.uk]

18 APRIL 2004

West London Radio & Electronics Rally – Kempton Park racecourse, Sunbury-on-Thames, Middx. £3.50, under-16s free. TS, CP for 2000, DF, C, LB, TI on 144.550MHz, B&B, external seating & picnic areas. Paul, M0CJX, 01737 279 108, m0cjx@ntlworld.com [www.kemptonrally.co.uk]

YEOVIL & DARC 20th QRP Convention – Digby Hall, Hound Street, Sherborne. OT 10am. LEC, TS, B&B, C, CP free, TI on 144.550MHz via GB2LOW. Derek, M0WOB, 01935 414 452, or m0wob@tiscali.co.uk

23 – 25 APRIL 2004

CORNISH RAC 2004 International Marconi Day – [www.gb4imd.co.uk]

25 APRIL 2004

ALDRIDGE & BARR BEACON ARC 5th Annual Radio & Electrical Equipment Sale – Aldridge Community Centre, Anchor Meadow, Middlemore Lane, Aldridge. OT 10am, £1 inc free raffle. CP, C, RSGB book stand. Doug, G4LQY, 01543 571 269, or Charles, G0NOL, on 01922 636 162.

ANDOVER RAC Spring Boot Sale – Tangley Village Hall playing field, Wildhern, on A343 N of Wildhern. OT 10am, £1. C, TI via G0ARC on 145.550MHz. Terry, G8ALR, 01980 629 346, g8alr@ukgateway.net

LOUGH ERNE ARC 23rd Enniskillen Amateur Radio Show – Killyhevlin Hotel, Enniskillen. OT 12 noon, £3. CP, C, LB, free B&B, radio, electronics, computers, TS. Herbie, GI6JPO, 028 6638 7761, hng@ntlworld.com

3 MAY 2004

DARTMOOR RC Radio Rally – * New Venue ***** – Tavistock College, Tavistock, Devon. OT 10.15/10.30am. CP, DF, TS B&B, C, TI on 145.550MHz, picnic facilities. Ron, G7LLG, 01822 852 586.

MID-CHESHIRE ARS Rally – Civic Hall, Winsford. OT 09.45/10am. CP, C. David, G4XUV, 01606 77787.
9 MAY 2004

CRAG Magnum Rally – Magnum Leisure Centre, Irvine, Ayrshire. OT 10.30am, £3, accompanied under-14s free. TS, LEC, MA, B&B, C. Helen, MM0HLN, 07776 385 247, mm0hln@hotmail.com [www.magnumrally.freeserve.co.uk]

9 / 10 MAY 2004

DENBY DALE & DARS National Mills Weekend – Brian, G0BFJ, g0bfj@ntlworld.com [www.qsl.net/g4cdd and www.spab.org.uk/mills]

14 – 16 MAY 2004

DAYTON HAMVENTION – [www.hamvention.org]

16 MAY 2004

MIDLAND ARS Drayton Manor Radio & Computer Rally – Drayton Manor Park, Fazeley, Tamworth, Staffs, on A4091 near jn 9 & 10 of M42. OT 10am. TS in two marquees, FM, SIG, CBS, clubs. Norman, G8BHE, 0121 422 9787 or 07808 078 003, nlgutteridge@aol.com [www.midamradio.co.uk]

QSL COMMUNICATIONS Open Day – Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare. Yaesu, Kenwood, Icom attending. Jayne, 01934 512 757, jayne@qslcomms.f9.co.uk

1 – 12 JUNE 2004

ROYAL NAVAL AMATEUR RADIO SOCIETY, GB3RN, D-Day Commemoration. The RNARS HQ station will be celebrating D-Day with a special commemorative QSL card. Contacts made during this period will qualify. Modes: SSB on weekdays with CW on Thursday evenings and weekends. QSL to GB3RN or direct to G0VIX. Dave, G4ZMP, g4zmp@butler95.freeserve.co.uk

6 JUNE 2004

ANGLO-SCOTTISH REPEATER GROUP Radio Junk Rally – Cumwhinton Village Hall, 1 mile E of jn 44 of M6 on B6263. TI, C, DF. Mick, M0AOH, 01228 526 436, mickbarber@zetnet.co.uk

SPALDING & DARS Annual Rally – Sir John Gleed Technical School, Halmer Gardens, Spalding. OT 10am, £2. CP, TI on 145.550MHz, TS, CBS. John, G4NBR, 07946 302 815, or Alan, 2E0HGV, 07767 797 296. [www.sdars.org.uk]

WEST MANCHESTER RC 8th Red Rose QRP Festival – Formby Hall, Alder Street (off High Street), Atherton, Manchester. OT 11am, £1.50. TS, Clubs, RSGB, G QRP low-cost B&B, MA, CP free, DF, C, LB, TI on 145.550MHz. Les, G4HZJ, 01942 870 634, or g4hzj@ntlworld.com

13 JUNE 2004

East Suffolk Wireless Revival – Suffolk Showground, Felixstowe Road, Ipswich. OT 9.30am. CBS, B&B, bookstall, MA, HF station, club stalls, C. John, G3XDY, 01473 717 830, or Steve, M1ACB, 07720 412 648. [www.btinternet.com/~thomassg/eswr.htm]

NUNSFIELD HOUSE ARG 35th Elvaston Castle National Radio Rally – Elvaston Castle Country Park, Elvaston, Derby, on the B5010 between the A6 and A52, 5

miles SW of Derby. OT 8am, £5 per car, £12 per coach. Radio, computers & electronics, FM, B&B, crafts, FAM, C, etc. Les, G4CWD, 01332 559 965, les@g4cwd.demon.co.uk

19 JUNE 2004
Reddish Rally – St Mary's Parish Hall, South Reddish, Stockport, at the jn of Reddish Road and Broadstone Hall Road South. OT 11am, £1. TI on 145.550MHz. John, G4ILA, 0161 477 6702, john@mckae.freeserve.co.uk

20 JUNE 2004
NEWBURY & DARS Car Boot Sale – Cold Ash, nr Newbury. [www.nadars.org.uk]

25 – 27 JUNE 2004
HAM RADIO 2004 – New exhibition grounds, Friedrichshafen, Germany. OT 9am. [www.messe-friedrichshafen.de]

27 JUNE 2004
SEVERNSIDE TV GROUP West of England Radio Rally – *Cheese & Grain*, Market Yard, Frome, Somerset, four miles from site of former Longleat Rally. CP free, LB, C, DF. Shaun, G8VPG, 01225 873 003 (OH), 01225 873 098. [www.westrally.org.uk]

SWINDON & DARC Car Boot Sale – Mike, M5CBS, 01793 826 465.

4 JULY 2004
NORFOLK ARC Barford Radio Rally – David, G7URP, 01953 457 322 or 01953 458 844, or radio@dcpmicro.com [www.norfolkamateurradio.org]

YORK RC Rally – Arthur, G8IMZ, 01904 787 799 (OH). [www.yorkradioclub.net]

10 JULY 2004
CORNISH RAC Radio Amateur and Computer Rally – John, g4ljy@dsl.pipex.com, or Ken, ken@jtarry.freeserve.co.uk

11 JULY 2004
SWINDON & DARC Steam & Radio Fun Day – Ian, 2E0ZVG, ibrowne2@ntlword.com [www.swindonradioclub.org.uk]

18 JULY 2004
McMichael Amateur Radio Rally & Car Boot Sale – Dave, G4XDU, 01628 625 720, g4xdu@amsat.org

25 JULY 2004
COLCHESTER RAC Rally 2004 – James, M0ZZO, 01255 242 746, james@mcginty.net, or Gary, M0JJH, 01621 818 620, gary@garycavie.com

30 JULY – 1 AUGUST, 2004
AMSAT-UK Space Symposium – Jim, G3WGM, 01258 453 959, or g3wgm@amsat.org [www.uk.amsat.org]

7 AUGUST 2004
RUGBY ATS Rally – Tony, G0OLS, 01455 552 519, thumph3426@aol.com

8 AUGUST 2004
FLIGHT REFUELLING ARS Hamfest – Mike, M0MJS, 01202 883 479, or hamfest@frars.org.uk [www.frars.org.uk]

13 AUGUST 2004
COCKENZIE & PORT SETON ARC 11th Annual Junk Night – Bob, GM4UYZ, 01875 811 723, gm4uyz@btinternet.com

30 AUGUST 2004
TORBAY ARS Communications Fair – Anna, M3LMG, 01803 812 117, rally@tars.org.uk

5 SEPTEMBER 2004
Telford Rally – Bob, M0RJS, bob@somrob.u-net.com

19 SEPTEMBER 2004
LINCOLN SWC Hamfest – [www.hamfest2004.secretbunker.org.uk]

1 / 2 OCTOBER 2004
LEICESTER Amateur Radio Show – Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or g4afj@argonet.co.uk

1 – 3 OCTOBER 2004
WACRAL 2004 Conference – Geoff & Jan Grundy, 01323 721 352, g4yjw@wacral.org

3 OCTOBER 2004
GREAT LUMLEY AR & ES Rally – Nancy, 0191 477 0036 or 07990 760 920, nancybone2001@yahoo.co.uk

22 - 24 OCTOBER 2004
RSGB International HF & IOTA Convention (HFC2004) – John, G3WKL, HFC2004.Chairman@rsgb.org.uk

24 OCTOBER 2004
GALASHIELS & DARS Annual Rally – Jim, GM7LUN, 01896 850 245.

6 / 7 NOVEMBER 2004
18th North Wales Radio, Electronics & Electronics Show – [www.nwrrcw.org.uk]

5 DECEMBER 2004
BISHOP AUCKLAND RAC Rally – Mark, G0GFG, 01388 745 353, or Brian, G7OCK, 01388 762 678.

21 - 23 JANUARY 2005
CONTEST CLUB FINLAND 10th Anniversary – Sokos Hotel Vantaa, Vantaa, nr Helsinki. Proceedings in English. [www.qsl.net/ccf/]

GB CALLS

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. Please send operational details of your special event station to the RadCom office at least five weeks before publication. The only QSL Bureau sub-manager for special event station callsigns is as follows: GBxAAA-MZZ – Mike Evans, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR, e-mail mw0cna@ntlworld.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-manager?

2 Apr	GB0BTC: Belfast Titanic City. Belfast. LHV2 (GI0VAB)
8 Apr	GB4YOU: Youlbury Scout & Guide Radio. Oxford. TLH27P (G0RJX)
	GB4YOU: Youlbury Scout & Guide Radio. Oxford. TLH27P (G0REL)
9 Apr	GB2WOK: Work The World on a Wok. Kent. TLH27 (G3TAJ)
10 Apr	GB4SCL: Settle Carlisle Line. N Yorkshire, Ingleton. LH (G0FQN)
18 Apr	GB2LOW: Low Power. Dorset. 2 (G3ICO)
23 Apr	GB4SGD: Saint Georges Day. Oldbury, West Midlands. L27 (G0KNM)
24 Apr	GB0IMD: International Marconi Day. Alum Bay, Isle of Wight. TLHV27 (M0OPV)
	GB0MD: Marconi Day. Rochester, Kent. TLH (G3NZR)
	GB2MDI: Marconi Day International. Wiltshire. TLHV27 (M0CLI)
	GB4MBP: Marconi Bass Point. Cornwall. LH (G3MRT)
	GB5TOV: Transit of Venus. Chorley, Lancs. LH2 (G3UCA)
29 Apr	GB2SG: Sheffield Guides. Sheffield. LH27 (G4FAL)
30 Apr	GB0GEO: Group for Earth Observation. Leicester. 27P (G7CND)
1 May	GB4CUB: Bradford South Cubs & Scouts. Wilsden, Bradford. TLHV27 (G1IEP)

RSGB MEMBERS' ADVERTISEMENTS

RSGB Members wishing to place an advertisement in this section should use the official form printed in *RadCom* each month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged *pro rata*. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsigns and QTHR, provided their addresses in the current edition of the RSGB Yearbook are correct. RS members will have to provide their names and addresses or telephone numbers. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition. Please do not send members' advertisements to Manning Publishing Ltd (advertising agents). The closing date for copy is the first day of the month prior to publication, eg the deadline for the May issue is 1 April.

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 cash paid. Members' Ads also appear on the members-only website: www.rsgb.org/membersonly/membersads***

The Member's Ads order form is published below. If members do not wish to cut the form out of the magazine, photocopies will be accepted, as will recent copies of the form from previous months, or recent copies of the carrier sheet. As a last resort, members may also send in their advertisements on seperate sheets of paper, but if you choose to do this, you must supply an accurate word count–and, of course the correct fee in the normal manner.

RSGB MEMBERS' ADS ORDER FORM

Application form for one For Sale, Exchange or Wanted advertisement. Do not mix classifications on this form; seperate applications must be made.

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Copy to: David Thompson, Manning Publishing Ltd, The Irwin Centre, Scotland Road, Dry Drayton, Cambridge CB3 8AR
Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, Lambda House, Cranbourne Road, Potters Bar, Herts, EN6 3EP

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MISCELLANEOUS

G3LLL- PARTS Old Yaesu, also repairs for callers (Morecambe). Details g3lll@onetel.net.uk

KINGS PATENT AGENCY LTD Patents - Trade Marks - Designs. Literatures and fees on request. Tel: 020 7404 7788 www.kingspatent.co.uk

CALL IN ON THE 'GOOD NEWS' CHRISTIAN NETS! Every Sunday at 8am on 3747kHz and around 7047kHz and 144.205 at 3pm sharing Christian fellowship over the air. Info from WACRAL, 51 Alma Road, Brixham, South Devon, TQ5 8QR Tel: 01803 854504

Business Cards

The last word

"Ask not what the RSGB can do for you..."

From: E Arnold Matthews, G3FZW

As a comparative newcomer to our excellent hobby, Stewart Revell, G3PMJ ('The last word', March 2004), demonstrates that he still has much to learn when he asks, "What is the RSGB doing for the 'old brigade'?" The question he should be asking is "What is the old brigade doing for the RSGB?" Our Society could not exist without input from members. Amateurs with over three decades standing surely have much experience of value in helping its work. He will find great satisfaction in putting back into the hobby the pleasure he has enjoyed since he was licensed by helping newcomers. I am sure his Regional Manager will welcome him if he offers his services as a member of the Regional team.

But why should he want his licence free? He has privileges granted to comparatively few for which he annually pays a paltry sum and yet he argues that it is too much on the specious ground that others pay the same for "far superior benefits" - a statement which is far from true. He reminds me of our children who, when young, used to cry "It's not fair!" To which we replied, "Life isn't fair'!

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 to not 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. Some letters not published in RadCom may be published on the RSGB members-only website at rsgb.org/membersonly/lastword

COST - AND SIZE - OF NEW RIGS

From: Anthony B Plant, G3NXC

Further to the editor's comments following G3NRQ's letter ('The last word', March 2004), I have found a website (http://eh.net/hmit/ppowerbp) which allows prices in any year from 1264 onwards to be converted into the equivalent 2002 values. I used this to look at some of the prices of radio equipment from days gone by, with interesting results. The figures in brackets are the 2002 equivalents. In 1957 I paid £25 (£363.97) for a well used ex-WD HRO Senior because, as a student, I couldn't justify spending £30 (£436.76) for an equally well-used ex-WD CR100. It would be possible to buy very good all-band 100W transceivers for such prices these days if prepared to buy second-hand. It would not need very much to be added to buy a new IC-718.

If I had been particularly flush in my early days as a licensee I could have bought an Eddystone 888 receiver for 110gns (£1636.08) and a KW Vanguard kit for 54gns (£803.16). This would have yielded a 50W AM / CW set-up for a total equivalent cost in 2002 of £2439.24 - well into the new FT-1000MP price range.

An even more exotic set-up in 1960 would have been the Hammarlund HQ170E receiver for £188 (£2615.92) together with a Hallicrafters HT32a SSB transmitter for £307 (£4271.74). A total 2002 equivalent price of £6887.66.

I've not found a UK advertisement for the Collins KWM2 SSB transceiver, but factoring from figures in *CQ* magazine indicates that the 2002 equivalent price would be around £8400 - not including the PSU. Even a simple 160m set up in 1961 - a CR100 receiver plus a KW 160 transmitter - would have cost a total of £712.62 in 2002 terms.

It is worth mentioning that there was no purchase tax (the forerunner of VAT) on a range of goods, including amateur radio equipment, in those days so perhaps 17.5% should be added to the effective 2002 figures! I think these figures show why it was normal in earlier times to buy ex-WD receivers and lash a transmitter together out of surplus components. Perhaps the difference between now and then is that of expectation. We were quite happy to codge a station together out of whatever we could lay our hands on, whereas now it seems that some licensees look at the prices of new top-of-the-range commercial rigs, and complain about how expensive it is to get going. I can't help but feel that we derived greater enjoyment from the hobby.

From: Ray J Howes, G4OWY

...Yes, transceivers are getting smaller and it seems that as our 'toys' have become progressively matchbox size as the years slip by, the buttons and knobs controlling them have seemingly multiplied exponentially. But, whether G3NRQ's hypothesis of transceiver manufacturers being in competition with one another to see who can fit the most buttons and knobs to the front panels of their rigs has some merit, it does have a ring of truth in it. However, it probably has more to do with marketing hype than actual functionality in many cases.

Anyway, if G3NRQ cares to look West instead of East for an HF transceiver, the Ten-Tec Jupiter might well fit the bill [see the review in the January *RadCom* - *Ed*]. It is reasonably large, has far fewer buttons and knobs to confuse and twiddle and, more importantly, allows those with arthritic fingers to navigate easily between each control.

One *caveat*, though, as far as the Jupiter is concerned. Do not, repeat not, be tempted under any circumstances to remove the covers. Because, in doing so, you'll be shocked to discover there is virtually nothing inside it! In fact, there is so much room not only is there space for the internal ATU, one could also fit an internal PSU, an internal kilowatt linear amplifier, a satellite global positioning system and maybe even an FT-817 at a push. Seriously though, from an operating point of view, it's a breath of fresh air.

BEACONS SHINE OVER NORTH-WEST

From: Steve Ferrie, M3GIM (soon to be 2E0SAR)

Over the last 12 months, I have had the privilege and pleasure of undertaking the Foundation and Intermediate training courses at 'The Beacons' in Cheshire. Both courses have been lead by Dave Wilson, M0OBW, assisted by some excellent local amateurs. The Beacons is a 1950s nuclear protected bunker, now used as a standby emergency control centre for Cheshire County Council. Both courses take place in the main lecture theatre and make use of *PowerPoint* animated presentation material and hands-on teaching aids. As a frequent presenter / trainer in my professional life, I can vouch for the quality and obvious effort which goes into preparation for this training. Dave and his co-presenters deliver the training in a very professional and effective manner. I also never cease to be amazed by the standard of catering / support services provided by other amateur volunteers for course attendees. I think the RSGB should recognise Dave, the quality of his training, the hard work of local volunteers and the uniqueness of this venue as something quite special in the world

of amateur radio. If ever something qualified as a 'centre of excellence' surely this must be it.

REISSUED CALLS - THE LAST WORD

From: Margaret A Newnham, G6NZ (formerly G8ODO and G4HSV)

In reply to Dave Goodwin, VO1AU ('The last word', March 2004), to a dedicated radio amateur his callsign is very personal. My late husband, who was licensed in 1921, wished me to keep his callsign on the air after his demise. His friends still refer to him as "6NZ" and, Dave may smile, but "Leon Newnham, G6NZ"is inscribed on his headstone!

[This letter neatly now ends this line of correspondence - *Ed.*]

80M CLUB CHAMPIONSHIP CONTESTS

From: Richard Newstead, G3CWI

I write to congratulate the RSGB HF Contests Committee on the success of their new series of contests, the 80m Club Championships. The number of stations active in the second leg of the SSB section was a tribute to the attractiveness of this format of contest. By cleverly combining SSB, data and CW in short weekday contests and making it a team event, it really does mean that everyone can make a contribution. A couple of weeks ago in an e-mail titled 'QRV for data with 12 minutes to spare' one member [of G3CWI's club - *Ed*] wrote "It is a long time since I did anything completely new in amateur radio and it was tremendous fun last night. Without the peer pressure to come on the air and contribute to the club contest entry, I doubt if I would have made the effort. I am glad I did though." That pretty much says it all!

Q807 OM

From: Bruce Fleming, KI7VR, ex-G3NDG. QZZ

Morse code is rich in abbreviations and Q-signals. Some of them have entered every day vocabulary, for example, the abbreviation 'Xmas' was spawned by telegraphers weary of repeatedly sending 'Christmas'. But Morse characters and abbreviations are not fossilised in the past: they move with the times. Indeed, we have recently seen the introduction of the new Morse character for "@" (G4DMP, 'The last word', February 2004). Other abbreviations have popped up in the last 40 years are: TU for thank you, HNY for Happy New Year and 5NN for 599. Thus, the Morse language *is* amenable to change.

I have been re-examining the Q-signals lists. It seems to me that about 26 Q-signals are currently in general use: QRA, QRS, QRG, QRK, QRM, QRN, QRO, QRP, QRS, QRT, QRU, QRV, QRX, QSA, QSB, QSK QSL, QSO, QSP, QST, QSX, QSY, QTC, QTH and QTR. Many other Q-signals are being forgotten because nowadays they are not used enough to be perpetuated: eg QRI? (How is the tone of my signal?) and QSV? (Shall I send a row of 'V's?)

However, in reviewing the old lists I found a number of old Q-signals that could bear re-introduction, eg QRJ (Your signals are weak); QRH (Your frequency changes); QOH (There is interference from . . .); QAV? (Are you calling me?); QCM (Your transmitter has a defect); QSD (You are sending my callsign wrongly). These six came from a German list of Q-signals. They seem to be useful and I don't know why they became rare. Perhaps they need to be re-introduced?

In addition to the forgotten Q-signals, I would like to propose some new ones: QRE? (What is your e-mail address? / My e-mail address is . . .); QSE (Send me an e-mail message); QKI (The planetary K index is . . .); QSFI (The solar flux index is . . .); QSSN (The sunspot number is . . .); and lastly QRC? (What is your callsign?) I cannot believe we don't have this last one, but nothing like it appears in any of my lists. One hears people sending "pse ur call agn ": why not just "QRC?"

And now for a few humorous ones: QZZ (It is time for bed here); QRTT (Closing down to have tea - especially in VK, ZL and G); Q807 (Please wait while I get me a beer - if you don't get this, ask a G2 or a G3); QPIS (Please wait two minutes); QAOS . . . (There is a frantic pile-up on . . . kHz); QLF (Your sending is poor - derivation: you must be keying with your left foot.

Readers will probably have better Q-lists than I do. Please let me know what you think of these suggestions.

ANOTHER HAPPY CUSTOMER!

From: Nico van der Bijl, PA0MIR

It is with great pleasure I received your package including the excellent 'members handbook'. I really must compliment you on this, now that I renewed my membership which had expired last June due to an oversight of mine (after some 30 years). I sure hope to be able to profit from your services and excellent publications for another 30 years at least. Wish you all well and keep up the good work.

POOR BUSINESS POLICY

From: Ron Hacker G1DER

I recently retired and like most senior citizens I have to watch my pennies. Consequently I tend to use the Internet for enquiries, eg to obtain prices for items I wish to purchase. Late January I e-mailed three companies who regularly advertise in *RadCom* (the largest I e-mailed three times). None of the suppliers had the decency to reply. Is my order of around £100 too small for them or do they advertise just for fun? They should remember that today's order may lead to tomorrow's 'big one'. When I decide to purchase all my HF rigs etc I will take my custom elsewhere.

When I was in business I was taught always to reply no matter how small the order was. How things have changed.

REACTIONARY AND DEGENERATE

From: Ray Edginton, G3AGF

So, it has finally happened. That insidious term "politically correct" has at last penetrated the pages of our journal (Bill Abrahams, ON9CGB / G0MEU, 'The last word', March 2004). I trust that it will be applied with great zeal and at every opportunity by our talented editorial staff. Infiltrate the 'IOTA' column, vet the 'HF' pages - and 'Technical Topics' beware! Mr Abrahams should be assured that Britain always has been, is, and always will be great. Perhaps he has spent too long in Brussels?

Somewhere in the history of our hobby there exists a reference to and / or understanding of amateur radio being non-political. One assumes that this is still the case. Perhaps an occasional reminder would do no harm.

Finally, this reactionary, degenerate old G3 plus three has for some 70 plus years been and still is quite content with GMT and will continue to use same.

Yours Politically Correctly,

DX ON A BROOMSTICK

From: Des H Vance, GI3XZM

Hearty congratulations on the introduction of the 'Morse' column (*RadCom* February 2004). Like many, I regarded the Morse test as simply an obstacle between one's self and the HF licence. Then the chap who was teaching me Morse suggested I try to read the callsigns on the HF bands. Imagine my surprise and delight upon hearing lots of DX on CW when there was nothing exciting on phone. Through the 'Morse' column some who saw it otherwise may realise the value of Morse, for the reasons mentioned by Dave Lawley. It is the magic way, the witch's broomstick of ham radio.

While the G QRP Club, thank goodness, promotes CW and simple equipment it fails to reach those who feel they need a bigger signal and who often don't seem to realise that they can have one with simple gear. Let me suggest that the Society, through the 'Morse' column or elsewhere, promotes the use of simple equipment along the lines suggested by the G QRP Club etc, but possibly with a little more power.

I think my initial opposition to the dropping of the Morse requirement was shortsighted. Perhaps CW will now achieve proper status on its own merits. ♦

WATERS & STANTON

GENERAL ENQUIRIES: 01702 206835/204965
FREEPHONE ORDERLINE: 08000 73 73 88

AUDIO

HEIL USA- QUALITY AUDIO PRICES DOWN!

HEIL PROSET HEADPHONES & BOOM MICS

New Even Lower Prices!

Top quality headphones with boom microphones. Choice of mic. elements, HC-5 ideal for "rag chewing" or HC-4 for DX communications. Icom models fitted with IC element. Choice of AD-1 (£16.95) interface leads for most makes of rigs.

PRO-SET-PLUS	Large H/phones with HC-4 & HC-5	**£155.95**	B
PRO-SET-PLUS-IC	Large H/phones with IC & HC-4	**£169.95**	B
PRO-SET-4	Large H/phones with HC-4 element	**£109.95**	B
PRO-SET-5	Large H/phones with HC-5 element	**£109.95**	B
PRO-SET-IC	Large H/phones with ICOM element	**£124.95**	B

HEIL HERITAGE MIC £129.95 B

New Low Price!

The Heil **HERITAGE** cardioid microphone with chrome plated steel finish, in the style of the 'Elvis' microphone of the Fifties. PROLINE commercial balanced line broadcast element. Frequency response 40Hz to 18,000Hz, 600 Ohms. Desk stand not included.

PL-2 BALANCED STUDIO MIC

£59.95 B

The PL-2 balanced studio microphone boom is compatible with all Heil stick microphones inc the new Classic series. Desk mount will clamp to almost any surface & supports the 45" arm. Standard 5/8" - 27 thread.

SM-1 SHOCK MOUNT

£44.95 B

This shock mount decouples the microphone from the boom and prevents vibration noises. The mic is suspended in an 8-point nylon band and comes with the standard 5/8in - 17mm fitting.

HEIL GOLDLINE HAND MICS

PRICES DOWN

Goldline professional quality dynamic microphone. Three versions available, GM-4 with Studio & HC-4 elements, GM-5 with Studio & HC-4 elements and GM-V Vintage Goldline with Vintage Studio high impedance element, for older valve rigs such as Drake & Collins. Includes stand threaded holder. Requires CC-1 adaptor £29.95.

GM-4	Goldline HC-4 hand mic	**£109.95**	B
GM-5	Goldline HC-5 hand mic	**£109.95**	B
GM-V	Goldline Vintage Hi-z hand mic	**£129.95**	B

TB-1 MATCHING DESK STAND

£23.95 A

This smart desk stand perfectly matches the HM stick series of microphones. Base diameter is approx 120mm and total height of stand is approx 110mm.

HEIL CLASSIC DESK MICS

PRICES DOWN

The Heil Classic studio quality microphone, exact replica of the 1930's RCA 74B type of broadcast microphone. Inside it has the benefit of modern technology. Two inserts are provided, one for broadcast studio quality and a choice of one other Heil insert. Includes base stand, soft-touch PTT back panel switch and cover for microphone. Requires CC1 adaptor.

HCL5	Classic retro-look HC-5 desk mic	**£199.95**	B
HCL4	Classic retro-look HC-4 desk mic	**£199.95**	B
HCLic	Classic retro-look IC desk mic	**£199.95**	B

CB-1(H) MATCHING DESK STAND

This desk stand has been designed specifically for the Heil Classic & Heritage microphones.

PRICE DOWN £49.95 A

FS-2 PTT FOOT SWITCH

£39.95 B

Ergonomically designed to require less effort to operate. The hinge is under your heel instead of away from your foot. It can control two devices from a single operation.

SECONDHAND LIST

Glenrothes (Tel: 01592 756962)

TS-2000 HF/6m/2m/70cms ***as new***	£1345.00
FT-1000MP-MK5 HF transceiver	£1849.00
FT-920 all mode HF/6M transceiver	£820.00
TS-2000 HF/GC/6M/2M/70CMS	£1150.00
IC-703 hf/6m all mode transceiver ***as new***	£499.00
FT-920 all mode HF transceiver	£875.00
TS-850SAT +CW filter & voice recorder	£695.00
IC-R8500 .05-2000MHz all mode ***as new***	£850.00
IC-R75 all mode G.C. receiver ***as new***	£440.00
LOWE HF-225 Europa G.C. receiver	£299.00
IC-72 all mode receiver	£385.00
IC-R71E all mode receiver	£375.00
WIN 1550i Computer receiver	£275.00
LOWE HF-225 G.C.receiver	£150.00
TARGET HF-3 receiver	£79.00
FT-736 6M/2M/70CM all mode transceiver	£599.00
IC-T8E 6M/2M/70CM handheld	£199.00
TRIO TS-711E 2M base multimode	£375.00
IC-T3H 2M Handheld transceiver	£110.00
TR-2300 2M portable	£60.00
IC-R10 all band all mode handheld scanner	£175.00
MVT-7300 scanner full coverage all mode	£170.00
MVT-9000MK2 all mode scanner	£265.00
ROBERTS-RC-828 sw receiver + cassette	£145.00

Matlock (Tel: 01629 832375)

FRG-100 Yaesu HF receiver	£295
IC-R75 HF receiver	£450
TS-2000 HF/6m/2m/70cms	£995
TS-850SAT HF transceiver	£600
IC-706MkII VHF transceiver	£395
VX-1R Handheld	£75
VT-225 Yupiteru Scanner	£139

Hockley (Tel: 01702 204965)

IC-2100H 2m Mobile	£169.00
TM-451E 70cm FM mobile	£249.00
TM-V7e Dual band mobile	£279.00
TR-751E 2m Multimode	£329.00
DJ-G5 Dual band handy	£169.00
FT-11R + DTMF 2m handy	£119.00
IC-R71E HF receiver	£329.00
Lowe HF-150 receiver	£199.00
Lowe HF-225 receiver	£249.00
Lowe HF-250 receiver	£329.00
Sony ICF-SW55 receiver	£179.00
Sony ICF-SW100E	£115.00
IC-R7000 Wideband receiver	£449.00
WR-1550e PC receiver	£329.00
AR-8200 Scanner	£249.00
AR-8200II Scanner	£299.00
IC-R2 Scanner	£99.00
VR-500 Receiver	£150.00

bhi NES10-2 DSP SPEAKER £99.95 B

Combined speaker and programmable DSP unit. Offers dramatic noise reduction, even reduces annoying hetrodynes. 8 Ohms, 8 filter settings, 3.5mm plug, 12-24V DC

bhi NES-5 DSP SPEAKER £79.95 B

Combined speaker and fixed setting DSP unit. Offers same dramatic noise and hetrodyne reduction. (Formally NESCB) 8 Ohms, 3.5mm jack plug, 12-24V DC 500mA

WATSON HP-100 HEADPHONES £19.95 B

Excellent lightweight communication headphones with tailored response ideal for the modern tranceiver or receiver.
**8 Ohms 200-9,000Hz *Adjustable headband *3.5mm stereo plug *1/4" stereo adaptor.*

WATSON HP-200 HEADPHONES £22.95 B

Superb headphones with tailored response for radio comms. Excellent sound proofing, can pull in the weak DX.
**Mono 8 Ohm 200-10,000Hz *Padded Ear pieces *3.5mm stereo plug *1/4" stereo adaptor.*

SGC SPECIAL OFFER

Buy an SG-2020 or SG-2020ADSP transceiver with any SGC Coupler (except SG-239) and receive a *FREE* SGC Multimeter (worth £19.99) *PLUS* £30 (inc Vat) *OFF* the price of the pair.

SG-2020 £499.95
1.8-30 MHz 1W-20W

SG-2020ADSP £589.95
1.8-30 MHz 1W-20W + DSP

PRICES DOWN!

SG-237 Auto ATU

1.8 - 60MHz. 3 - 100W pep (40W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 300mA.

£299.95 c

SG-231 Auto ATU

1 - 60MHz. 3 - 100W pep (50W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 900mA.

£349.95 c

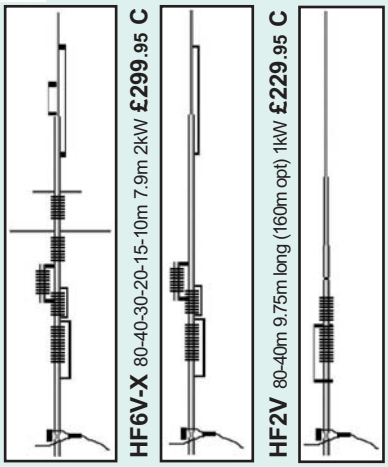
SG-230 Auto ATU

1.6 - 60MHz. 3 - 200W pep (80W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 500mA.

£339.95 c

Butternut Antennas from Bencher inc, USA

PRICES DOWN!



HF9V-X 80-6m 7.9m long 1kW PEP **£349.95 C**

HF6V-X 80-40-30-20-15-10m 7.9m 2kW **£299.95 C**

HF2V 80-40m 9.75m long (160m opt) 1kW **£229.95 C**

CPK Counterpoise Kit Acts as missing half of dipole, allows HF6V & HF9V to operate more efficiently. Bolts onto base, each side 2.5m. **£129 C**

STR-II Resonant Radial Kit 4 radials for 40, 20, 15 & 10m. Each radial is 9.5m long **£109.95 C**

RMK-II Roof Mount Kit Includes tripod/STR-II/hardware **£149.95 C**

TBR-160S 160m Resonator Kit **£114.95 C**

A17-12 17 & 12m adaptor for HF6V-X **£49.95 C**

A-6 6m Resonator for HF6V-X **£14.95 B**

30-MRK 30m Resonator for HF2V **£89.95 C**

TLK Top Loading Kit Increased band width on 80 & 160m, 4x7.62m wires + fixing bolts. For HF2V **£39.95 B**

WEB ORDERING
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PRICE MATCH

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

WATSON W-25XM PSU NEW £99.95 B

A compact sized switch mode power supply that will run your base HF station with ease. **Output voltage 10-18V *Output current 22A/25A peak *Over current protected *Switchable dual Voltage input*

WATSON W-25SM PSU £79.95 B

Very popular budget switch mode power supply. **Output voltage 13.8V DC *Output current of 22A (25A peak) *Front panel output terminals *Over current & voltage protection *Quiet operation*

WATSON W-25AM PSU £89.95 C

DC power supply for the shack & esp. for use with 100W transceivers. Separate voltage and current meters. **Output voltage 0-15V DC *Output current of 25A (30A peak). *3 sets of output terminals *10A cigar socket. *Over current protection*

WATSON W-5A PSU £29.95 B

DC power supply for the shack and low power QRP transceivers. **Output voltage 13.8V DC *Output current of 5A (7A peak) *Front panel output terminals *Over current protection*

MANSON EP-925 PSU £99.95 C

A general purpose 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

AVAIR VSWR Meters PRICEMATCH

AV-200 £49.95 B

Ideal for HF and VHF operation. It features high power handling up to 400W * 1.8-180MHz * 5W, 20W, 200W, 400W * Av or PEP

AV-400 £49.95 B

Ideal for VHF and UHF operation. It features high power handling up to 400W * 140-525MHz * 5W, 20W, 200W, 400W * Av or PEP

AV-600 £69.95 B

Two sensors used for HF and VHF/UHF operation. * 1.8-160MHz, 140-525MHz * 5W, 20W, 200W, 400W * Av or PEP

NEW SGC Master Antenna Controller

MAC-200 £339.95 C

* Automatic ATU
* 1.8-60MHz
* 5-Way Selector
* Coax or Balanced
* Long Wire

The MAC-200 will work with any HF transceiver up to 200W output. It has 3 outputs for coax and one each for wire and balanced - all switch selected. 168 revolving memory bins lets it remember for quick QSY. With an impedance range from 2 - 5000 Ohms, and built-in VSWR and power metering, it is all you are ever likely to need! Requires 12V DC.

WEST MOUNTAIN RIGBLASTERS

RIGblaster pro	Data interface 8-pin/mod, Cd & cables	**£229.95**	B
RIGblaster Plus	Data interface 8-pin/mod, Cd & cables	**£139.95**	B
RIGblaster M8	Data interface 8-pin, software & cables	**£109.95**	B
4T8-KIT *NEW*	Conversion Kit from M8 or Plus to 4pin	**£19.95**	A
RIGblaster nomic8P	Data interface 8-pin, software & cables	**£59.95**	B
RIGblaster nomicRJ	Data interface RJ, software & cables	**£59.95**	B
FT100-CBL	Adapts all units to FT100 input	**£12.95**	A
RB-CD	Standard RIGblaster program CD	**£9.95**	A

FREQUENCY COUNTERS

WATSON

The **FC-130** is an ideal frequency counter for the shack, mobile or portable use. Supplied complete with Ni-Cads, charger and telescopic whip.

Super Searcher	RF finder & freq. cnter 10MHz-3GHz	**£99.95**	B
Super Hunter	Frequency counter 10Hz-3GHz	**£149.95**	B
Hunter	Frequency counter 10MHz-3GHz	**£49.95**	B
FC-130	Frequency counter 1MHz-3GHz	**£59.95**	B

OPTOELECTRONICS

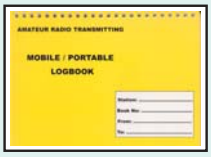
Top-of-the-range product from Optoelectronics, the **X-Sweeper** is a fully featured nearfield receiver that displays frequencies analogue signals in spectrum format on a 64x128 graphical display. It has 20 memory banks storing 100 freqs in each.

X-Sweeper *NEW*	Nearfield Receiver 30MHz-3GHz	**£1699.95**	C
Xplorer	Freq. cnter / CTCSS/DTMF decode	**£685.95**	B
Digital-Scout	Digital Freq. counter 60MHz-2.6GHz	**£459.95**	C
Scout	Freq. finder 10MHz-1.4GHz	**£349.95**	B
M1	Freq. cntr 50Hz - 40MHz	**£239.95**	B
M1-TCX0	M1 + temp controlled crystal oscillator	**£289.95**	B
Cub	Mini counter 1-2.8GHz	**£134.95**	B

TRANSMITTING LOGBOOK £4.99 A

Traditional Logbook for Radio Amateurs, A4 spiral bound for ease of use plus updated Prefix List and room for extra notes. A logbook is a legal requirement for any radio station.

MOBILE LOGBOOK £4.99 A



You've asked for one so here it is - the Radio Amateurs Mobile/Portable Logbook. A5 size, it also contains relevant repeater information. A mobile logbook is not a legal requirement.

Coax Switches

CS-600 2-way coax switch rated over 1kw (HF) and up to 600MHz @100W. Fitted SO-239 sockets. **£12.95 A**

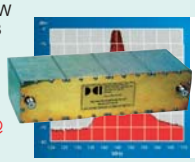
MFJ-1704 4-way coax switch rated over 1kw (HF) and up to 600MHz @100W. Fitted SO-239 sockets. **£69.95 A**

DCI High Performance Bandpass Filters

Razor sharp VHF & UHF filters

Simply place in antenna feed and clear up reception problems related to strong out of band signals. These are commercial grade filters with up to 68dB rejection.

DCI-145 2M Band Pass Filter. 200W handling. -68dB @ 136MHz, -55dB @ 155MHz. SO-239 **£99.95**
DCI-145-2HN "N" sockets **£109.95**



DCI-435 70cm Band Pass Filter. 200W. -47dB @ 415MHz, -50dB @ 455MHz. "N" sockets. **£119.95**

MFJ MFJ-974H True Balanced Line ATU

£179.95

It's been about forty years since a true balanced line tuner was offered on the amateur market. Balanced line has no rivals on HF when it comes to low losses. If you want to operate the G5RV as Louis Varney intended it, then throw away your coax feeder and realise its full potential by feeding it with ladder line or open wire feeder. The difference will amaze you. Indeed you can turn any dipole into an all-band dipole by tossing away the balun and feeding it directly with 450 Ohm ladder line The ATU covers 1.8 - 30MHz up to 300W and will also handle end fed wires and coax cable. Includes built-in VSWR and Watt meter with switching for peak or average power **MFJ-974** is identical but covers 3.5 - 60MHz. **£159.95**

MFJ-993 Advanced Automatic ATU £249.95

With Built-in Frequency Counter!
1.8 - 30MHz 2000 Memories!
Coax - Wire - balanced Line

From the masters of ATU manufacturing comes the most advanced automatic ATU ever produced. Other models like LDG from USA have no memories, no digital data display and are not able to handle long wires or balanced feeder. The MFJ-973 handles wire, coax and balanced feeder, provides digital display of VSWR data and frequency, has an RS-232 rig interface (not needed for normal rig - atu operation) and and audible signal to aid adjustment. Unlike its competitors, it takes into account impedance when finding the best L/C ratio. And with optional leads you can operate this ATU remotely as well. Finally the 2000 memories make it up to ten-times as fast to tune as units like LDG that use.

BUILT BY US

FT-8900R

FM Quad Band Full Duplex Mobile
29/50/144/430MHz
50W HF,VHF/ 35W UHF
Cross Band Repeat Capabilty
Wide Receiver Coverage

FT-7800E

FM Dual Band Mobile
144/430MHz
50W VHF/ 40W UHF
One-Touch Operation
Wide Receiver Coverage

FT-2800M

Heavy Duty VHF Mobile
65W VHF FM
Extensive Memory System
Alpha Numeric Display
Versatile Scanning

FT-8800E

FM Dual Band Full Duplex Mobile
144/430MHz
50W VHF/ 35W UHF
Cross Band Repeat Capability
Wide Receiver Coverage

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