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The Radio Society of Great Britain Members' Magazine

RadCom

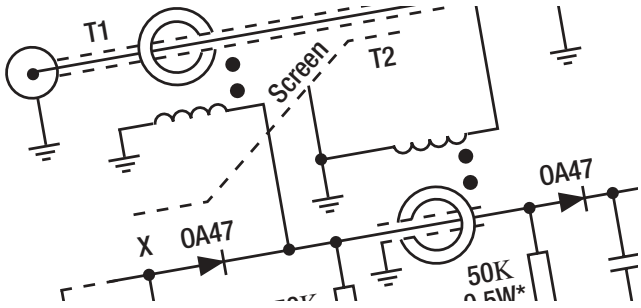
£3.95 Vol 80 No. 2 February 2004

IOTA contest

All the results of this, the RSGB's biggest HF Contest p79

Down to earth
Minimal systems for VHF/UHF DX p34

Antennas
Peter Dodd on making good PL-259 connectors p53



TT **Dynamic power control and more on small loop antennas and bright LEDs** p37

REPEATERS
GB3DX celebrates a year using *EchoLink* internet-linking software p73

INSIDE

MORSE
New column for everyone, from those who never touch a Morse key to those who don't know what a mic is!

COMPARISON OF SSB PHASING METHODS
New short series comparing the various ways of generating SSB signals

REVIEW
The SteppIR 3-element Yagi: adjusts its element lengths for resonance

NATIONAL SCIENCE WEEK
Why you should put on a public demonstration of amateur radio during Science Week–and how we can help you

EMC
How to deal with RF triggering intruder alarms

WIN A bhi NEDSP1061 digital noise reduction module p27

WATERS & STANTON

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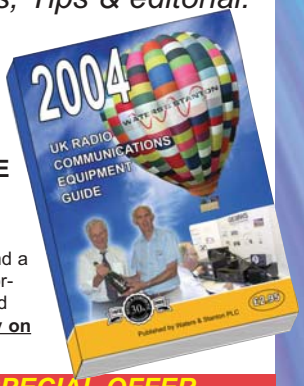

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Over 4000 products and a wealth of technical information, illustrations and tech info. **Order Today on your "card"**

ICOM IC-446S SPECIAL OFFER

RUGGED PMR446 HANDHELD
Don't confuse it with cheaper models, this one is rugged!. The IC-446S is ideal for a multitude of uses along with reliable operation. It is water resistant, and the antenna folds away when not in use.
**8 channels *Built-in CTCSS tone squelch *38 CTCSS codes per channel *Foldaway antenna *Large backlit display *Powered by 3xAA Alkaline batts *Water resistant*
(OFFER ONLY AVAILABLE WHILST STOCKS LAST)
SPECIAL OFFER was £99.95 now £59 B

GARMIN iQUE 3600 BRAND NEW

Its a GPS, PDA, and MP3 player - - - And it even talks to you!

£549.95 B

The New Garmin IQ3600 gives you a pocket full of power. The advanced 12-channel GPS receiver with flip-up antenna is coupled with Palm OS 5 software package that makes it a fully equipped PDA with all the associated capabilities. We give you a FREE Mapsource disc that goes down to street level for most of Europe! The navigator speaks to you as you drive - so eyes always on the road! A lovely bright crisp screen makes it perfect for car, bike or walking. Includes lithium cell, charger, and USB hod for PC synchronisation. Amazing value and a great companion.

HF TRANSCEIVERS

ICOM IC-756 PRO II SPECIAL OFFER £1899 C

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.**

3 Year Warranty on orders before 27th Feb.

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

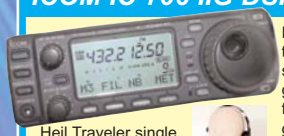
3 Year Warranty on orders before 27th Feb.

ICOM IC-703 NEW £599 C

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.**

3 Year Warranty on orders before 27st Feb.

ICOM IC-706 IIG DSP £789 C



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**

3 Year Warranty on orders before 27th Feb.

ICOM IC-718 £499 C

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.

3 Year Warranty on orders before 27th Feb.

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**

3 Year Warranty on orders before 27th Feb.

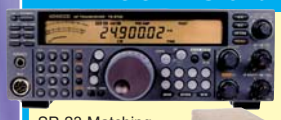
KENWOOD TS-870S DSP £1399 C

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**

3 Year Warranty on orders before 27th Feb.

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**

3 Year Warranty on orders before 27th Feb.

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**

3 Year Warranty on orders before 27th Feb.

Basic Model IC-910H £1129

HF TX / LINEAR AMPLIFIERS

YAESU FT-1000 MKV £2295 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.

3 Year Warranty on orders before 27th Feb.

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.

3 Year Warranty on orders before 27th Feb.

YAESU FT-920AF £1049 C

100W HFplus 6m transceiver. 100kHz - 30MHz, 48 - 56 MHz Gen coverage Rx, 100 memories, Internal ATU with 100 tuner memories, large backlight LCD, Built-in memory keyer, 13.5V DC. Now includes FM unit and 6kHz AM filter.

LAST FEW

YAESU FT-897 £989 C

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.

3 Year Warranty on orders before 27th Feb.

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.

3 Year Warranty on orders before 27th Feb.

YAESU FT-857 NEW £799 C

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.

3 Year Warranty on orders before 27th Feb.

YAESU FT-817 £539 C

bhi NE-DSP1061 Module available!

160m - 70cms. Up to 5W output all modes. ***Ours includes*** **battery and charger.**

Add £110 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

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THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

VHF / UHF TRANSCEIVERS

ICOM IC-E208 NEW £319 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 £349 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-8800R £269 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!

VHF/UHF HANDHELDS

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 £115 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 £259 B

WITH EXTRA WIDE RX COVERAGE

- 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 £109 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.

VHF / UHF ANTENNAS

MOBILE ANTENNAS

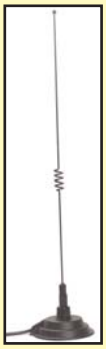
DIAMOND ANTENNA (PL-259 base type) **NEW**

CR-8900. Quad bander 6m/10m/2m/70cm. Length 1.26m, max pwr 60W with fold over base. **£72.95 B**

WATSON ANTENNAS (PL-259 base type)

W-2LE	2m quarter wave 2.1dBi 0.45m	**£9.95**	A
W-285S	2m 3.4dB 0.48m (fold over base)	**£14.95**	B
W-77LS	2m/70cm 0/2.5dB 0.42m	**£14.95**	B
W-770HB	2m/79cm 3/5.5dB 1.1m	**£24.95**	B
W-7900	2m/70cm 5.6/7.6dB	**£32.95**	B
W-627	6m/2m/70cm 2.15/4.8/7.2dB 1.6m	**£34.95**	B
WGM-270	2m/70cm On glass 3.7m coax 50W	**£29.95**	B

MFJ-1724B SPECIAL OFFER



Dualband Mobile Whip Antenna with Mag Mount

World's best selling dual band 2m/70cm magnetic mount antenna.

*2m/70cm *Quarter wave on 2m, 3dB gain 70cm *Black stainless steel *Low SWR handles full power *48cm (19in) long *Powerful 9cm (3 1/2in) magnetic base *Scratch resistant rubber guard to protect your car *4.5m (15ft) RG-58U cable fitted with PL-259 plug *SO-239-BNC adapter provided

WAS £21.95 **NOW £16**
plus £2.75 P&P

HIGH SIERRA SIDEKICK NEW £259 B

80m to 6m 200W Mobile Whip Motorised Tuning, Can Be 'Mag' Mounted*

The large diameter coil offers efficiency higher than any other similar antenna, in a very compact size. Band changing is a button press away!

- 3.5 - 60MHz
- 200 Watts
- 15 in base unit
- High Q Coil
- 3ft whip
- 12V motor
- Control box
- DC cables
- 3/8" stud mount
- Made in USA

* Needs our 3-way magnetic mount

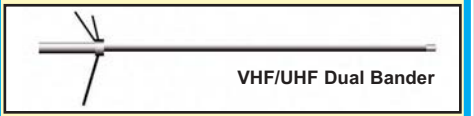
WATSON MOBILE BASES

WM-14B.
Large diameter 14cm magnetic mount SO-239, c/w 5m RG-58 & PL-259

W-3HM	Adjustable hatch mount	**£14.95**	A
WM-08B	8cm mag mount, 5m cable PL-259	**£9.95**	A
WM-14B	14cm hvy duty mag mount+cable	**£12.95**	A
WSM-88V	BNC mag mount plus 3m cable	**£14.95**	A
W-3CK	5m 5D-FB cable assembly+pigtail	**£18.95**	A
W-ECH	5m standard cable kit assembly	**£12.95**	A
W-300T	3/8in" Triple Mag Mount	**£39.95**	A
W-300S	S0-239 Triple Mag Mount	**£39.95**	A

BASE STATION ANTENNAS

DIAMOND



VHF/UHF Dual Bander

X-200 N	2m/70cm colinear 6/8dB 2.5m 'N'	**£84.95**	C
X-300	2m/70cm colinear 6.5/9dB 3.1m	**£99.95**	C
V-2000	6m/2m/70cm 2.15/6.2/8.4dB 2.5m	**£89.95**	C

WATSON

W-300.
Very popular dualband base antenna. Supplied with u-bolts for mast fixing.

W-30	2m/70cm colinear 3/6dB 1.15m long	**£39.95**	C
W-50	2m/70cm colinear 4.5/7.2dB 1.8m long	**£49.95**	C
W-300	2m/70cm colinear 6.5/9dB 3.1m long	**£64.95**	C
W-2000	6m/2m/70cm 2.15/6.2/8.4dBi 2.5m	**£69.95**	C

WATERS & STANTON

PRICE MATCH

THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

HF ANTENNAS

VERTICAL ANTENNAS

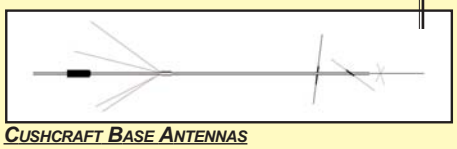
Hustler Mobiles

Get top performance when on the move. Purchase the **MO-3 base** (137cm) for **£26.95** 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



CUSHCRAFT BASE ANTENNAS

MA6V *NEW*	20-17-15-12-10-6m 250W PEP	**£289.95**	C
MA5V	20-17-14-12-10m 250W PEP	**£249.95**	C
R8	40-30-20-17-15-12-10-6m 1.5kW	**£499.95**	C
R6000	20-17-15-12-10-6m 1.5kW PEP	**£349.95**	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

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

X-7	20/15/10m 7 el. Yagi 2kW	**£699.95**	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	**£389.95**	C
A4-S	10-15 & 20m 4 el. Yagi 2kW	**£599.95**	D
A3-WS	12 & 17m 3 el. Yagi 2kW	**£399.95**	D
D-3	10-15-20m dipole element 2kW	**£259.95**	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	**£259.95**	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	**£799.95**	C

RADIO WORKS

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

CW-160	160-10m 76.8m long	**£139.95**	C
CWS-160	160-10m 40.5m long	**£134.95**	C
CW-80	80-10m 40.5m long	**£99.95**	C
CWS-80	80-10m 20.1m long	**£119.95**	C
CW-40	40-10m 20.1m long	**£94.95**	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	**£64.95**	B

HF ANTENNAS

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

ANTENNA TUNER UNITS

MFJ Compact Portable Tuners

MFJ-971
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RSGB matters

New RSGB Board members

Colin Thomas, G3PSM, and Angus Annan, MM1CCR, have been co-opted to the RSGB Board with effect from 1 January 2004.

Fred Handscombe, G4BWP, has stepped down from the Board due to pressure of other work commitments.

New board member Colin Thomas, G3PSM.

CHANGES TO RSGB COMMITTEES

With effect from 1 January, the HF, VHF and Microwave Committees have been amalgamated into the new Spectrum Forum, which is being chaired by Colin Thomas, G3PSM. The Morse Test Steering Committee has been disbanded and the Technical and Publications Advisory Committee, TAPAC, has been renamed the Technical Committee.

RCF WEBSITE

The Radio Communications Foundation (RCF) [see pages 15 - 17 of the January 2004 *RadCom*] now has its own website at www.commsfoundation.org

AROS NEWS

The RSGB Amateur Radio Observation Service coordinator, Barry Scarisbrick, G4ACK, is giving a talk on the work of AROS at the Reading & DARC on 12 February. For further details please contact Pete, G8FRC, on 01189 695697.

Barry Scarisbrick says that he has lost touch with several AROS Observers as they have changed e-mail addresses or moved house without informing him of their new contact details. He would be grateful if all registered AROS Observers could contact him to confirm their ability to continue and to provide him with current contact details. Please e-mail: aros@rsgb.org.uk or write to PO Box 113, Potters Bar, Herts EN6 3ZY.

E-MAIL CORRECTION

The e-mail address of Gareth Price, GW3MPP (see 'New DRRMs in South Wales', page 6, January *RadCom*) should read: gcpricegw3mpp@btopenworld.com (with no hyphen).

LICENSING: SUDDENLY IT'S SIMPLE!

Eighteen months ago, I explained how the UK's system of amateur radio licences was changing (see *RadCom* September 2002, page 48). At that time, things were in flux: there were complications connected with the transition from one system to another. Now everything has become much simpler. Let's find out how.

HOW MANY TYPES OF UK LICENCE ARE THERE?

There are now three: the Radio Communications Examination (RCE) Foundation, Intermediate and Advanced. The term Radio Amateurs Examination (RAE) is no longer used. Intermediate licences are what we used to call Novice. Advanced is the new name for the Full licence. There has been no distinction between ▶

RSGB MICROWAVE CONTESTS 2004

Gremlins crept into the Microwave Contest Calendar on page 86 of the January *RadCom* and unfortunately the errors were not noticed until the item was published. The date of the January All Band Activity Day should be **Sunday 25 January** and the date of the July 3rd 5.7GHz and 3rd 10GHz Cumulative contest should be **Sunday 25 July**. Also, please note that the 5 September events (4th 24GHz and 4th 47GHz Cumulative) are not in the correct chronological sequence.

'A' and 'B' licences since July 2003. Everything has become more straightforward, and can truly be said to be integrated.

WHAT DOES AN 'INTEGRATED SYSTEM' MEAN?
Everyone entering the hobby from the beginning of this year must go through each stage before progressing to the next. So it is no longer possible to become a radio amateur by passing a purely theoretical examination - there are practical tests at Foundation and Intermediate level.

THAT MEANS EVEN A BSC IN ELECTRONICS HAS TO GO THROUGH ALL THE STAGES?
Yes, there are no exceptions. Everyone must be able to demonstrate suitable skills in licence conditions, safety, EMC and use of equipment. It's comparable to requiring an aeroplane pilot to have flying experience - OK, a transmitter is not quite the same, but 400W in the wrong place can cause havoc. In practice, a well-qualified person would be expected to race through the system at high speed. No course is required at any level, although many candidates will want to be taught by an experienced amateur.

THE MORSE TEST HAS GONE FOR EVER?
Yes, the test is no longer required for radio amateurs in the UK. The Morse Assessment of the Foundation Licence is being retained - interestingly, many Foundation Licensees have decided to learn Morse. It is possible that some countries will require a Morse qualification for operation with a reciprocal licence or under CEPT, and the RSGB will operate a scheme for certification if necessary.

WHAT ARE THE CALLSIGNS ALLOCATED TO EACH LICENCE CATEGORY?
This is an easy question to answer now.

- All calls beginning with 'G', 'M0' and 'M1' are Advanced.
- All calls beginning with '2' are Intermediate.
- All calls beginning with 'M3' are Foundation.

Add the 'regional locator' as necessary, to make 'GW', '2D1', 'MM3' and so on (and note that there are exceptions, for example, Short Contest Calls).

At the moment, callsigns in the series M0xxx, 2E0xxx and M3 are being issued, and the next series for Foundation licensees will begin with 'M4'.

LET'S HAVE A SUMMARY OF THE MAIN DISTINCTIONS BETWEEN THE THREE LICENCES
Foundation licensees are restricted to 10W with commercially-made equipment, and can use the bands 160m - 70cm (except 10m). They are limited in other ways, for example, they may not supervise other operators. Intermediate licensees have access to virtually all amateur bands with a power limit of 50W. They can make and modify their equipment, can use satellites and work with User Services. Advanced licensees can use 400W and have all the bands available. This includes the possibility of operating maritime mobile and abroad.

WHAT WAS THAT ABOUT OPERATING ABROAD?
Please note: only Advanced Licensees may operate abroad. This includes operation under CEPT (for Europe and the USA among other places), and also in getting a reciprocal licence. Foundation and Intermediate licensees who go on the air from the Republic of Ireland or France (for example) are operating illegally - they jeopardise their UK licence as well as risking prosecution abroad. Of course, it is legal to access a repeater which happens to be in a foreign country, as long as you remain in the UK.

WHAT ARE THE EXAMS AND ASSESSMENTS AT THE THREE LEVELS, IN SUMMARY?
Foundation amateurs must show their ability to operate correctly within the amateur bands, and to deal with safety and EMC issues. They must know how to put up efficient antennas, and have enough theory to cope with the QRP level allowed. They have to pass an examination in licence conditions and radio basics.

At Intermediate level, an amateur must have a good knowledge of radio theory, as well as learning much more material relating to EMC, safety and licence conditions. This is commensurate with a licence which permits amateurs to make and use their own rigs. One of the practical assessments is that a candidate has to build a small piece of equipment, and get it working to the satisfaction of the assessor. By the time candidates get their Intermediate licences, they will have undergone around a dozen tests of their practical abilities.

The Advanced licence requires a fairly detailed understanding of radio theory, and involves a serious examination. The questions relating to licence conditions are 'open book'. The knowledge that amateurs need to reach the 'top of the tree' is similar to before, in the days of the RAE. The practical tests at the lower levels involve additional work. Most amateurs don't find these tests onerous, because they simply reinforce projects and ideas they have already worked on.

HOW IS THE TRAINING AND EXAMINATION SYSTEM BEING ADMINISTERED NOW?
City & Guilds, which had run the RAE since 1946, has withdrawn from examination of radio amateurs. The RSGB is now carrying out registration and examination of candidates at all levels. In summary, Foundation assessments and examinations are available at 'short notice'. Intermediate assessments and examinations are held every month, and it is hoped that this can be increased to 'short notice' soon. Advanced examinations are held every two months (see below left).

As far as training is concerned, candidates are advised to check that their instructor has the knowledge and experience required. The RSGB has a "Train the Trainers' scheme, which helps instructors to become more skilled in technical and educational techniques - details from RSGB HQ.

QUESTIONS?
Contact Ed Taylor, c/o RSGB HQ, or e-mail: Ed@g3sqx.net

Ed Taylor, G3SQX, RSGB Board member

EXAM DATES

The following dates have been set for the examinations: **Intermediate** Monday 23 February; Wednesday 24 March; Tuesday 20 April; Monday 26 April; Tuesday 18 May; Wednesday 26 May; Monday 21 June; Tuesday 29 June; Tuesday 27 July. **Advanced** Tuesday 24 February; Monday 26 April; Monday 21 June. For further details please contact the Amateur Radio Department at RSGB HQ, e-mail: ar.dept@rsgb.org.uk

VHF AWARD NEWS

A successful claim was received from Colin Bayliss, GM3WKZ (KW), in Caithness for 225 squares on the 'Magic Band', 6m.

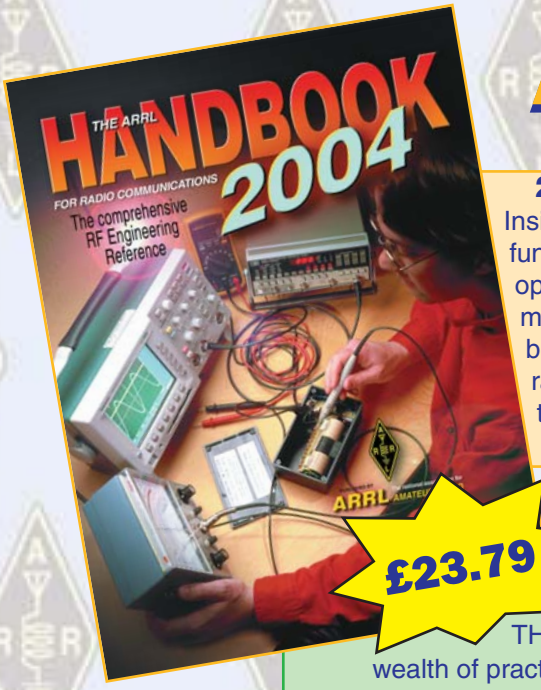
Very few claims are received for 70MHz, due to the small number of countries that have an allocation at 4m, so claims are all the more welcome (perhaps with new allocations in Europe this situation may change). This month Malcolm Franks, G4MKF (RG), submitted four cards to bring his tally up to 55 squares / 10 countries, only the third station to attain this level.

It's not often claims are received containing contacts more than a few years old, but this month one appeared from Neil Whiteside, G4HUN (CB), for the base level award on 144MHz. All of the contacts were from the late 1970s or early 80s and really show what can be done with minimal power, as Neil was using no more than 10W from an FT-221R and a small antenna (seeing all those old QRAs was quite nostalgic!)

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

SUMMARY OF AWARD RECIPIENTS
50MHz: 225 Squares: GM3WKZ.
70MHz: 55 Squares / 10Countries: G4MKF.
144MHz: 40 Squares / 10 Countries: G4HUN.

ARRL BEST OF 2003



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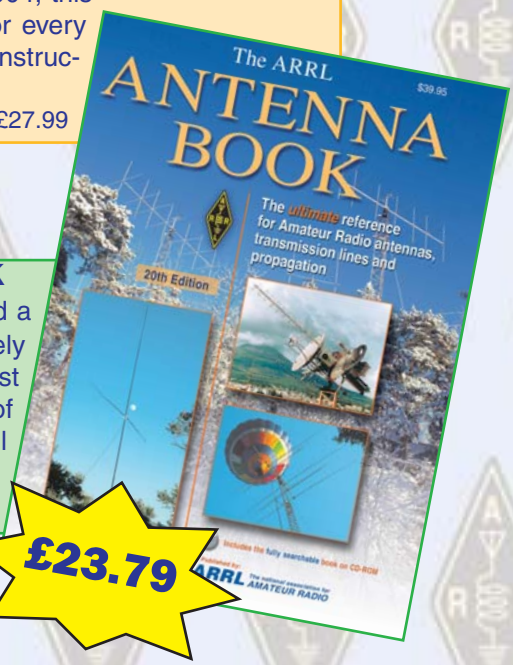

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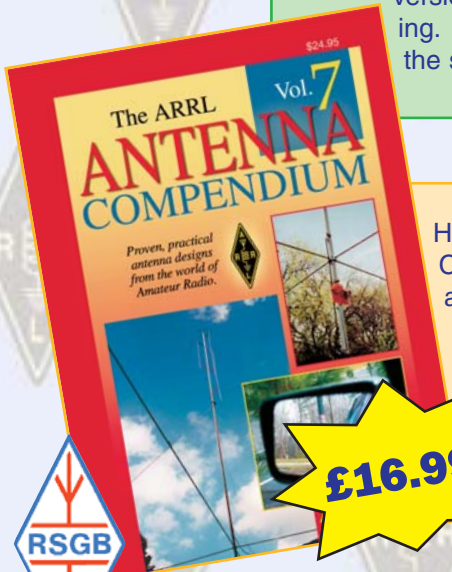

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New bands, code-free licensing, for Croatian amateurs

Expansion of 40m band has begun in Europe

Croatia has become the first country in Region 1 to benefit from the expansion of the 40m band agreed at WRC-03. New amateur radio regulations came into effect in Croatia on 26 December. Since then, 9A amateurs may operate between 7100 and 7200kHz on a Secondary basis, with a maximum power of 1000 watts PEP (in addition to the normal Region 1 allocation of 7000 - 7100kHz). On 4m, Croatian amateurs now have 70.000 to 70.450MHz, with a power limit of 10W. They also gain a new band between 3400 and 3410MHz, with a maximum power of 150W. The Morse code requirement for an HF bands licence was also dropped with the new regulations and there are now only two licence classes there: the full licence and a beginners' licence.

Transistor era hits half-century

On 21 February 1954 radio history was made when Yeovil ARC club station G3CMH made the world's first long-distance radio contact using a transistorised transmitter. The transmitter was on the 3.5MHz band and had a DC input power of 30mW. The contact made was an unarranged QSO with G3CAZ in Hazlemere, Surrey, at a distance of 85 miles. The news created quite a stir at the time: it was reported immediately in the *RSGB Bulletin* in March 1954, followed by an article about the transmitter in the April issue. Details of the historic contact were also included in the RSGB book *World at their Fingertips* by John Clarricoats, G6CL. To mark the 50th anniversary, there will be a talk at the Yeovil ARC on 19 February by Rob Micklewright, G3MYM, which will tell the story of the 1954 event. It is hoped that some of the original participants will attend the meeting.

Riverside House, London SE1, the HQ of Ofcom (www.ofcom.org.uk), which took over radio regulatory affairs - including amateur radio matters - from the RA with effect from 29 December 2003.

PHOTO: ROY CLAYTON, G4SSH

Amateur radio assists in Iran earthquake relief

The Turkey Amateur Radio Club president, Aziz Sasa, TA1E, reports that four amateur radio operators were among the Turkish teams that provided relief in Iran, following the disastrous earthquake that hit the city of Bam just after Christmas. Local communications were carried out on 2m simplex, with HF operations on 14270kHz during the day and on 7092 or 3777kHz after dark. Soyhan Erim, TA2IJ, part of the Turkish Ministry of Health team, handled HF operations at the Turkish Incident Command Post. TA2RJ, TA1CAN, and TA2NO were also in Bam as part of the Search and Rescue Teams.

IOTA 2004

'IOTA 2004' - the RSGB Islands on the Air 40th anniversary programme - started on 1 January. It runs until 31 December and has the same format and rules as the very successful IOTA Millennium Programme in the year 2000. Entrants make contact with as many different IOTA island groups as possible within the calendar year, using any amateur band, HF or VHF, or any combination of band and mode. The full rules and a set of files for downloading are now available at www.cdxc.org.uk Attractive gold, silver and bronze certificates will be available, as will certificates for those who activate island groups themselves. No QSL cards are required, but there will be scrutiny of entries. Questions about IOTA 2004 may be sent to Don Field, G3XTT, the Manager of the IOTA 2004 programme, at: don@g3xtt.com Any queries about the RSGB IOTA Programme as a whole should go to the IOTA Manager, Roger Balister, G3KMA.

Kenwood challenges you

Kenwood (UK) in conjunction with CDXC (Chiltern DX Club - www.cdxc.org.uk) has announced 'The Kenwood Challenge' to encourage operation on the HF bands and 6m. Open to CDXC members operating from the UK, Isle of Man and the Channel Islands, the objective is to contact as many DXCC entities as possible on these bands during the period 1 February to 31 December 2004. The winner of the Challenge will receive as a prize a new Kenwood TS-480HX or TS-480SAT transceiver, courtesy of Kenwood (UK). A full set of rules will be published on the CDXC website but if you're not a CDXC member it is not too late to join and take part in the challenge: membership is open to anyone with an interest in HF DX. Contact The Secretary, CDXC, 11 Charnwood Way, Langley, Southampton SO45 1ZL for details.

NEWS BRIEFS

- The Croydon YHA Group, COPSE (www.copse.freeuk. com), is celebrating its 70th anniversary in 2004 and is planning to operate special event station GB4YHA from the Wantage Youth Hostel, high up on the Ridgeway in Oxfordshire, over a weekend in June. Phil Manning, G1LKJ, is looking for radio amateurs who are also members of the Youth Hostel Association to assist with the station. Please contact G1LKJ (QTHR) or e-mail: g1lkj@hotmail.com
- *Transmission Lines* is the name of a quarterly newsletter published by the Defence Electronics History Society (DEHS). It is for anyone who has an interest in military wireless communications, the development of radar etc. Details from DEHS, Studland House, 12 Christchurch Road, Bournemouth BH1 3NA.
- Steam railway enthusiasts Mark, G1PIE; Jack, G0FQN; and Pam, 2E1HQY, who have operated from Ribblehead station platform on several occasions will be back as GB4SCL ('Settle-Carlisle Line') on 14 and 21 February.
- Len Crane, G3PED, became a silent key on 8 December. Len was very well known through his Raynet activities in Essex and at a national level. His funeral took place on 23 December at Weeley Crematorium.
- The IARU Region 1 website has recently been completely revamped. See www.iaru-r1.org
- SEAREG (Special Events Amateur Radio Educational Group) is looking for new members. If you are interested in special events and public demonstrations (including set-up and dismantling of stations, and speaking to visitors) please contact John Williams, G8LGC (QTHR) or e-mail: john-williams@tinyonline.co.uk

Brian, G3CVI, makes contact with GB2GM while Flog It presenter Paul Martin listens in.

BBC TV *Flog It* programme to feature amateur radio

While researching for an edition of the TV antiques programme *Flog It* to be recorded in Chelmsford, BBC researcher Emma Battcock came across the Chelmsford ARS website at www.g0mwt.org.uk and contacted the club. As a result, the producers decided to make the programme at the Sandford Mill Science and Industrial Museum which houses an extensive collection of old radios and transmitters. The CARS club station GX0MWT was set up in the 2MT hut at the museum and thanks to the assistance of members of the Poldhu ARC a demonstration contact was filmed with the Poldhu Marconi Centre station GB2GM. The *Flog It* programme from Chelmsford is due to be broadcast on BBC2 in February or March.

Three generations on the air

The 29 November 2003 was a special day for the Coyne family when Graham Coyne, G3YJR/M, and his son Kevin, M3KGC/P, met up with Graham's father John Coyne, G1UFH, on 2m for a three-way contact in and around Letchworth Garden City. The equipment used was an FT-817 and two FT-290s. Kevin qualified for his Foundation Licence earlier this year thanks to the excellent course run at Sheffield ARC by Tony Howard, G1TKX. Can any family manage four generations of radio amateur?

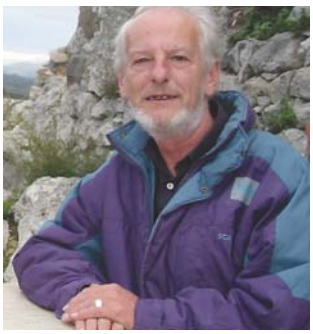
Left to right: Kevin, John and Graham Coyne.

Happy New Year

Roy G4SSH, Chairman of the Scarborough Special Events Group, took the opportunity of a visit to London at New Year to send New Year greetings over the air from the GB2RN station on board *HMS Belfast*. He is seen here with his daughter, Dr Heather Clayton, M5OOO (Director of Investigations, Ofcom), and Terry Barclay, G0TBD, Chairman of RNARS *HMS Belfast*.

Honours for amateurs after 'Project Goodwill Albania'

At the conclusion of 'Project Goodwill Albania' in mid-December, several radio amateurs including Prof John Share, G3OKA, and Roger Brown, G3LQP, were made Fellows of the University of Tirana. They were given the honour for their work on the project which put amateur radio on the syllabus at Tirana university and led to 39 new Albanian radio amateurs receiving their licences. John, from the University of Liverpool, was the lead instructor for the first part of the course, while Roger was the RSGB representative on the project.



Prof John Share, G3OKA, Fellow of the University of Tirana.

The students' graduation ceremony was also attended by IARU Region 1 Chairman Ole Garpestadt, LA2RR. While in Tirana, Ole spent time negotiating with the Albanian authorities for the integration of Albania into the CEPT licence scheme.

Roy Charlesworth, DU9/G4UNL, with Mayuree Sachati Chotikul, HS1YL, the President of the Radio Amateur Society of Thailand, at the 31st SEANet (South East Asia net) convention in Malaysia in November.

Operating from Thailand

A reciprocal licensing agreement between the UK and Thailand came into force at the end of 2002, but it has been pointed out that 'THA', the ITU country-code for Thailand, has been printed on UK licence Validation Documents along with those countries that have signed the CEPT-licence agreement. This is an error, and UK licensees should be aware that if they wish to operate from Thailand, they *must* apply for a Thai reciprocal licence. Full details of the procedure, which is quite onerous, are available at www.qsl.net/rast/text/LicensingAug6_03.htm

Club and Regional News

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.

Region 1: Scotland West & Western Isles

AYR ARG
4, Tennamast aerial masts. 18, Wind turbine power generation. John, MM1JAS, 01292 445599.

PAISLEY (YMCA) ARC
4, 'The RSGB & You'. 18, The new repeater logic system. Jim, GM3UWX.

Region 2: Scotland East & the Highlands

ABERDEEN ARS
6, Junk sale. 13, Construction night talk, Ian, GM4GVK. Ellis, GM4JLZ, 01224 580594.

COCKENZIE & PORT SETON ARC
20, Radio check night, John, MM0JXI. Bob, GM4UYZ, 01875 811723.

LOTHIANS RADIO SOCIETY
9, 'Call My Bluff' quiz night. 23, History of museum of communications, Tom Stevenson. Toby, MM0TSS, 07739 742367.

Region 3: North West

SOUTH MANCHESTER R & CC
6, Computer clinic. 13, 'Ged's Laws of Superstition', Ged, G8RSI. 20, Members discuss favourite websites. 27, 'The Dark Ages of Science', Chris, G4HON. Ed, 0161 969 1964.

STOCKPORT RS
3, Historical events leading to development of radio. 17, Practical activities, on air. David, M1ANT, 0161 456 7832.

THORNTON CLEVELEYS ARS
2, PSK31 on air. 9, Surprise talk by Steve, M3EVS. Jack, G4BFH, jack.duddington@btinternet.com

WARRINGTON ARC
3, 'The Falkirk Wheel', John, M0ANM. 10, First aid demonstration, Matt, M3MGW. 17, 'Homebrew Radio Past and Present', Robin, G3RJQ. John, G0RPG, 01925 762722.

Region 4: North East

GRIMSBY ARS
5, Astronomy. 19, Drugs squad. George, G4EBK, 01472 887720.

HALIFAX & DARS
17, 'Audio', David, G3PTU. Tom, M0TKA, 01484 715079.

NORTH WAKEFIELD RC
5, AGM. 12, IOTA planning, Nigel, M3NJW. 19, Curry night, chef Peter, G0WXG. 25, HI9 DXpedition, John, G4RCG. www.g4nok.org

SHEFFIELD ARC
2, VK2ABQ wire beam, Colin, G3VCQ. 9, VHF radio. 16, Used equipment sale. 23, HF radio. Nick, G4FAL, 0114 255 2893.

TYNEMOUTH ARC
6, HF for beginners practical. 20, 'Digital Extraction Without Tears', G0BSN. Glen, G0SBN.

WAKEFIELD & DRS
3, Curry night at Agrah Restaurant. 10, Final rally planning meeting. 15, Northern Cross Radio Rally. 17, Rally debrief. 24, On air. Rick, G4BLT, 01924 255515, www.wdrs.org.uk

Region 5: West Midlands

BROMSGROVE ARS
6, Competitions night. 13, Morse night. 20, QRP. 27, Meeting TBA. Angus, G8DEC, 01527 875573.

GLOUCESTER AR & ES
2, 'Crystal set revisited'. 9, 16, 23, On air, HF, workshop. Tony, 01452 618930 office hours.

HILLCREST ARS
5, G0SPM on the air. 19, 'Datamodes', Peter, G8JVW. Stuart, M0SJV, m0sjvstuart@supanet.com

KIDDERMINSTER & DARS
3, Green Light Exercise - an optical 'Foxhunt'. Tony, G1OZB, 01299 400172.

MID-WARWICKSHIRE ARS
10, *'Echolink'*, by Dave, G8UIO. 24, 'Technical Topics & Smith Charts', John, M0JDB. Bernard, M1AUK, 01926 420913.

STRATFORD UPON AVON DRS
9, Find that Fault!, G3MXH. 23, Skittles & buffet. Terry, G3MXH, 01789 294387.

TELFORD & DARS
4, Open evening, on air. 11, 'Shopping list': what do you think the society needs to stock, buy or make? 18, Under £5 construction competition. 25, 'My Safari in Africa', M5FHM. Mike, G3JKX, 01952 299677.

Region 6: North Wales

CONWY VALLEY ARC
4, Open forum. Wynne, GW6PMC, 01745 855068.

Region 7: South Wales

SWANSEA ARS
22, Amateur Radio & Computer Show, Afan Lido, Aberavon. Roger, GW4HSH, 01792 404422.

Region 8: Northern Ireland

BANGOR & DARS
4, Video show on the big screen, DXpeditions and DX operators, visitors & new members welcome. Mike, GI4XSF, 028 4277 2383.

GLENGORMLEY ARES
16, 'History of Amateur Radio in Northern Ireland', David, GI3OBO. Peter, MI5JYK, mi5jyk@yahoo.co.uk

Region 9: London & Thames Valley

AYLESBURY VALE RS
11, Quiz versus Chesham & DARS (return leg at Wigginton). Roger, G3MEH, 01442 826651, roger@g3meh.fsnet.co.uk

BROMLEY & DARS
17, 'How digital cameras work - the inside story', Alan, G0TLK. Alan, G0TLK, 020 8777 0420.

CRYSTAL PALACE R & EC
6, Technical discussions, club projects. 20, AGM. Bob, G3OOU, 01737 552170 or Victor, G1PKS, 020 8653 2946.

DORKING & DRS
24, Members' evening. John, G3AEZ, 01306 631236.

MAIDENHEAD & DARC
5, Using an Oscilloscope, Roger, G3VCT. 17, Simple short-wave receivers, Mark, G0OIW. John, G8RYW, 01628 628463.

RS OF HARROW
6, Newcomers' programme: 'holiday antenna workshop', Don, G0ACK. 13, Informal. 20, Junk sale, auctioneer Chris, G4AUF. 27, Informal. Jim, G0AOT, 01895 476933 or 020 7278 6421.

READING & DARC
12, Amateur Radio Observation Service, Barry Scarisbrick, G4ACK. Pete, G8FRC, 01189 695697.

SHEFFORD & DARS
5, Video. 12, 'How was it for you?' 19, Construction results. 26, Quiz night. David, G8UOD, 01234 742757.

SILVERTHORN RC
6, Construction contest. 13, Informal evening. 20, Yaesu FT-817 demonstration. 27, On air. Les, G0CIB, 07980 275081.

SOUTHGATE ARC
14, Set-up, and 15, RadioSport show at Stevenage. 22, 'The 'ZVW Years', Steve, G3ZVW. Mike, M0ASA, 020 8366 0698.

SURREY RCC
2, 'Zen and the art of HRO rebuilding', Brian, G8DIU. Ray, G4FFY, 020 8644 7589.

Region 10: South & South East

ANDOVER RAC
3, 'Feeders & Matching', Julian, G4UET. 17, 'Trying to work HF from the desert', Dave, G0AYD. Terry, G8ALR, 01980 629346.

HARWELL ARS
6, Lunchtime shack activity. 10, Construction contest. 13, 20, Lunchtime shack activity.

24, Shack activity evening. 27, Lunchtime shack activity. Angus, G0UGO, hars.g3pia@tiscali.co.uk

HASTINGS E & RC
18, AGM. R C Gornall, G7DME, 01424 444466.

HORNDEAN & DARC
3, Social evening. 24, Bring and buy. Stuart, G0FYX, 023 9247 2846.

ITCHEN VALLEY RC
13, 'The Clash of the Titans', Rod, G0EUC. 27, Heraldry, Quintin, M3ENU. Sheila, G0VNI, 023 8081 3827, sheila.williams@ivarc.org.uk

MID-SUSSEX ARS
6, *Ceilidh* with live band. 13, Talk: Brighton power station. 20, Radio evening, table top sale. 27, Baird television, Jon, G0GNA. Alan, G8YKV, 01273 844511, events@g8ykv.co.uk

OXFORD & DARS
12, 'History of the Oxford & DARS', Paul, M3JFM, buffet. Paul, M3JFM, 01865 248629.

SOUTHDOWN ARS
2, Talk on commercial radio, Ian, G7HFS, Beachy Head Site. John, G3DQY, 01424 424319.

SWINDON & DARC
12, 'Capacitors: a users' guide', Dennis, G3LLZ. 26, 'The Somerset Range of Kits', Tim Walford, G3PCJ. Mike, M5CBS, 01793 826465.

WORTHING & DARC
4, Construction evening. 11, Aviation archaeology. 18, 'Setting up your HF station'. 25, HF predictions. Roy, G4GPX, 01903 753893.

Region 11: South West & Channel Islands

APPLEDORE & DARC
16, Old receiver specifications, John Wilson, G3PCY. Brian, M0BRB, brian.jewell@ic24.net

CORNISH RAC
5, Talk by David, G3NPB. 9, CRAC rally history, Peter. John, G4LJY, 01872 863849.

SOUTH BRISTOL ARC
4, Computer clinic, David, G7PKJ. 11, HF aerial clinic, Doug, G3KUL, & Cyril, G3XED. 18, Mid-Winter Bring & Buy, Len, G4RZY. 25, On air. Len, G4RZY, 01275 834282.

SOUTH DORSET RS
10, 'Nothe Fort History', J Bithell. Carol, 2E1RBH, 01305 820400.

TAUNTON & DARC
6, 'Walford Kits', Tim Walford, G3PCJ. 20, On air. Dave, M0CIF, david.rosewarn@virgin.net

YEOVIL ARC
5, Metal detecting, 2E1LGE. 12, 'Tim's Projects No 2', Tim Walford, G3PCJ. 19, 'The first long-distance transistor transmitter QSO', Rob, G3MYM. 26, On air. Derek, M0WOB, 01935 414452, m0wob@tiscali.co.uk

Region 12: East & East Anglia

CAMBRIDGE & DARC
6, Talk, 'My reptiles', Mark, M1MPW (with Monty the Python). 13, Informal. 20, Project evening. 27, C&DARC rally preparation. 29, C&DARC rally, Wood Green, Godmanchester. Ron, G3KBR, 01223 501712.

CHELMSFORD ARS
1, The Canvey Rally, The Paddocks, Long Road, Canvey. 3, RF measurement theory and demo, Dave Penny, G3PEN. George, G3UTC, 01277 622707, george3utc@btopenworld.com

DOVER ARC
4, On air. 11, Trunked Radio, Brian, G8ZYZ. 18, On air. 25, No meeting (net on 'KS). Brian, G4SAU, g4sau@bcuff.freeserve.co.uk

EAST KENT RS
2, Component description & identification, Erwin, G4LQI. 16, Talk by Mark Francis, G0GBY, Waters & Stanton. Paul, G3VJF, mail@paulnic.com

FELIXSTOWE & DARS
9, 'Two eclipses in one year', Paul Whiting, FRAS. Paul, G4YQC, paul.whiting@bt.com

HARWICH AR INTEREST GROUP
11, Visit and talk by Essex Raynet. Tony, G4EYE, 01255 886065.

LEISTON ARC
3, Raynet, G7CIY. M3MIG, m3mig@aol.com, 01728 746044.

NORFOLK ARC
4, Informal / tuition. 11, 'Propagation', Malcolm, G3PDH. 18, Informal / construction. 25, Presentation of Construction project for 2004, David, G7URP. Reg, G0VDO, 01603 429269.

Region 13: East Midlands

DERBY & DISTRICT ARS
3, Junk sale. Martin, G3SZJ, 01332 556875.

EAGLE RADIO GROUP
10, 'Development of stereo recording and sound reproduction', Ron Oxby. Terry, G0SWS, 01507 478590.

LOUGHBOROUGH & DARC
3, On air. 10, Bring & Buy. 17, 'Darts & Eats' at Black Swan. 24, Annual club dinner at Charnwood Golf Centre. Chris, G1ETZ, 01509 504319.

MELTON MOWBRAY ARS
20, More from the seagoing log of Peter Stickland, G4WTW. Phil, G4LWB, Phil@croxtonkerr.fsnet.co.uk

PARTY IN PARK LEADS TO NEW MW3s

The first Foundation Licence course and exam in Aberystwyth was held in November. Two of the four candidates, Max Williams and Haydn Williams, became interested in amateur radio after visiting the RSGB 90th birthday celebrations in Aberystwyth in July and a third, Chris Studman, became interested after reading a report of the 90th celebrations in the local paper. So such events and publicity, if organised well, really *do* work!

The four candidates passed the examination with flying colours and are eager to get on the air. The course was tutored by Trevor Nicholas, GW4RVA, of Carmarthen. GW3BV and GW7AGG would like to thank GW4RVA for conducting the course and being willing to travel to the venue.

It is hoped to have another foundation course up and running in the Aberystwyth area soon. If you are interested, or know someone who may be interested, please contact Quentin, GW3BV, tel: 01970 639180 or e-mail: gw3bv@thersgb.net

Look happy, people - you passed! Front l to r: Max Williams, Keith Morgan, Chris Studman; back: Haydn Williams and tutor Trevor Nicholas, GW4RVA.

BRIGHT SPARKS 2003

The Kilmarnock & Loudoun ARC, GM0ADX, hosted its 20th annual 'Bright Sparks' quiz / social evening in the Foxbar hotel, Kilmarnock, on 9 December. Seven teams from local clubs competed fiercely in a pub-quiz style competition for the highly-coveted Bright Sparks trophy. The questions ranged from general knowledge to amateur radio. After seven thrilling rounds the winners were the Central Belters (Mid-Lanark ARC & Paisley ARC); in second place the Air Heads (Ayr ARC); and third Stirling Late Again (Stirling ARC).

The evening concluded with a buffet and the opportunity to renew old friendships and swap tales of rare DX.

PHOTO BY GM3OZB

Winning team captain, GM3UWX, being presented with the Bright Sparks trophy by K&LARC secretary GM4OSS. L to R: GM4OSS, GM3UWX, GM0SYV, MM3EJW, MM1HMZ, GM3JIG and GM3ULP.

NEWS OF CLUB RADIO COURSES

On 29 November the **Lincoln Short Wave Club** (www.lswc.co.uk) hosted its third Foundation exam, having spent the previous three weekends tutoring the students. All five passed. The course head tutor was Bob Shaw, G3VRD, invigilators were Mike Smith, G0TTD, and John Riddoch, G1TSL. Others helping included Gerry Duffner, G6KGG; Peter Kendall, M0EJL; Jim Stevenson, G0EJQ; and Baz Matthews, M3DMV. LSWC will host its fourth Foundation course this year, as well as an Intermediate course. The club ▶

hamfest is in September, www.hamfest2004.secretbunker.org.uk Please contact Baz Matthews m3dmv@btopenworld.com for further details. All are welcome at the club: it meets every Wednesday at 8.00pm at the Lincoln Railway Social Club, Tritton Rd, Lincoln.

- The **Shefford & DARS** will hold a new six-week Foundation Licence study course at the Samuel Whitbread Community College, Clifton, Beds, from Wednesday 25 February at 7.30 - 9.30pm. The cost is £15. For further details please contact G3RXQ baker@nildram.co.uk or the College on tel: 01462 629906.
- The **Charlie Delta Amateur Radio Club** (www.cqdx.co.uk) is planning to run its first Intermediate Licence course in February and March. Anyone interested in taking the course should contact Dave, M0DCM, tel: 01902 635244 or e-mail: m0dcm@blueyonder.co.uk The club moved to new premises on 5 January. The new address is the Woodcross Working Man's Club, Woodcross Lane, **Bilston, West Mids** WV14 9BW (there is a map on the club website).
- **Bishop Auckland Radio Amateurs Club** held its AGM on 27 November 2003 at which the committee was re-elected unopposed. The club offers Foundation and Intermediate courses: contact Mark Hill, G0GFG, tel: 01388 745353 for details.

PICTURE BY TREVOR, MSHKA.

Some of the Chelmsford licence training team.

- The **Chelmsford Amateur Radio Society** will be running a course for those wanting to upgrade to the Advanced licence class. The course will start on 2 September but places are limited, so those wanting to attend are advised to book now. You need to have passed the Intermediate in order to take the Advanced course. During the spring months Chelmsford will be running both Foundation and Intermediate courses. To book a place for any of these courses contact the training officer Clive Ward, M0SIX, tel: 01245 224577; or e-mail: training@g0mwt.org.uk

PHOTO BY PETER, GW4GST

"Gimme!" John spots the key: "Can I have it now?"

SURPRISE PRESENTATION FOR RETIRING RLO

At the Llandudno Rally on 8 November members from Region 6 held a surprise presentation for John Roberts, GW3RBM, recently retired as DRRM for Conwy & Denbigh and who was previously RLO for Clwyd. John was quite unaware of the presentation until the final hour: everyone was in on the secret but all managed to keep it quiet.

Greg, GW7NAU, opened the proceedings, and thanked John on behalf of the North Wales Radio Rally Society. Then Liz Cabban, GW0ETU, RRM 6, thanked John on behalf of the RSGB and Region 6 and presented him with a Vibroplex key. Ray Jones, Chairman of the Conwy Valley club and Mark Harper, MW1MDH, chairman of Wrexham ARS, also thanked John for his time and work with the clubs during his tenure as DRRM and RLO.

Liz took advantage of the opportunity to welcome Dave Evans, GW4GTE, who, while being DRRM for District 61, is now also officially installed as DRRM for Region 62.

KENT CLUB RAISES FUNDS FOR HOSPITAL

Members of the Hilderstone Radio and Electronics Club in Broadstairs, Kent, recently presented a cheque for £200 to Reculver Ward, Queen Elizabeth the Queen Mother Hospital, in Thanet. The money was raised by sponsorship of a 24-hour transmitting marathon, held under canvas in a Broadstairs-Margate park. The sum completed the target for the purchase of a Baxter Pump, required for treatment of patients in the ward.

Connor Williams, M3CJW, at nine the youngest member of the Hilderstone club, hands over the cheque to nursing staff in Reculver Ward. Also in the picture are Ken Godfrey, 2E1HYN; club president Dr Ken Smith, G3JIX; and Fiona Godfrey, M3BYZ.

THE SHOW MUST GO ON

After personal study and instruction by members of the Stratford upon Avon and District Radio Society, one of the club's new members arrived to take his Foundation Licence examination at the pre-arranged time. Unfortunately this coincided with the failure of the electricity supply to large areas of Stratford upon Avon. The electricity went off 90 minutes before the exam but was restored after 30 minutes then, with less than 30 minutes to go, it went off again. The invigilators, Ron, G0MRH, and John, G8HJS, set up emergency lighting using candles and a car-battery powered emergency lantern so that the exam could continue as planned.

With all the work the member had put into his studies, to think of cancelling the exam was not an option. Fortunately, with just two minutes to go, power was restored and full lighting and heating were available again. At the end of the day it was all worthwhile because it was possible to let the member know shortly afterwards that he had been successful and could now apply for his first licence.

NEWS IN BRIEF

- The Open University ARC has had a Yaesu FT-8500 dual-band transceiver (serial number 6C130194) stolen from its packet node in Milton Keynes. The radio was stolen with microphone, but minus power lead, brackets, box and manual. Anyone being offered this radio should please contact Thames Valley Police (tel: 01908 686000), quoting Crime Reference DF9094195-03, or e-mail: f.g.robertson@open.ac.uk
- It is the Hull and District ARS's 50th year under the callsign G3AMW on 15 February, and the club will be operating a special event station for 50 hours - from 2000 on Friday 13th until 2200 on Sunday 15th - to celebrate.

- The Worked All Britain awards group is holding its AGM at the RadioSport Communication & Computer Show at the Stevenage Leisure Centre at 12.30pm on 15 February.

GB4FUN flies the education flag

RADIO COMMUNICATIONS FOUNDATION

This month, three short reports from schools and colleges that have benefitted from recent visits by the RSGB's GB4FUN 'fun bus'.

Dr Keith Moseley, the Head of Physics at Monmouth School wrote: "We want to say a big thank you to the RSGB for funding the GB4FUN radio bus. Carlos Eavis brought the bus to our school today and worked tirelessly from early morning to late afternoon, demonstrating the equipment to classes of pupils between the ages of 11 and 18. Everyone enjoyed his snappy presentation and the way in which he showed the relevance of radio communication technology to everyday life. Carlos worked through much of the lunch break too, as there were numerous enthusiastic pupils visiting the bus throughout this time. I think he spoke to 200 boys and 10 teachers altogether."

ROYAL NATIONAL COLLEGE FOR BLIND

Paul Green of the Royal National College for the Blind in Hereford wrote the following piece for the college's newsletter: "RNCB students recently enjoyed a visit from the 'Radio Bus'. This touring demonstration of state-of-the-art communications technology, organised by the Radio Society of Great Britain, gave students a chance to investigate the use of satellites in weather forecasting and news gathering, and to learn about the latest developments in wireless surveillance technology, as demonstrated with the 'spycam' hard-hat. Throughout the day Carlos Eavis of the RSGB brought the underlying physics and mechanics of wireless communications alive in a series of entertaining informal lectures. The sessions had a special relevance for music technology and media students - and taught their tutors a thing or two!"

CAMBRIDGE UNIVERSITY

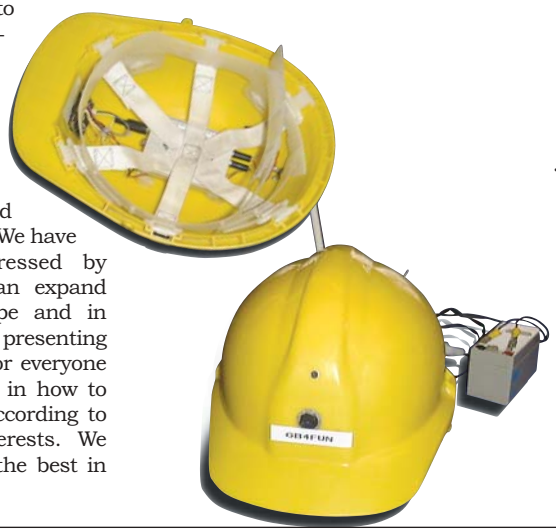
Stavros Tsiakkouris, M0BBB, the Chairman of Cambridge University Wireless Society, G6UW, wrote: "I would like to thank the RSGB for making it possible to bring the GB4FUN mobile radio shack to Cambridge during the Societies Fair. We really appreciate your help and tireless efforts throughout the day in helping us to educate people about wireless communications. The ability to demonstrate amateur radio and wireless communications on the move in an interactive fashion brings a new dimension to our hobby and enhances public awareness. We have all been favourably impressed by GB4FUN and hope you can expand your mission both in scope and in depth. Your adaptive way of presenting amateur radio as a hobby for everyone has given us a good lesson in how to approach different people according to their background and interests. We wish you and GB4FUN all the best in your future endeavours."

LATEST DEVELOPMENTS

In addition to the 'spycam' hard-hat mentioned above (see pictures), GB4FUN is now capable of receiving live pictures from weather satellites.

A new patch panel has also recently been fitted to the roof of GB4FUN, allowing for more efficient routing of the antenna feeders. The coax has recently been replaced with double screened low-loss RG-213 with N-type connectors.

Check the GB4FUN website at www.gb4fun.org.uk for all the latest news. ◆



GB4FUN's latest acquisition: the 'spycam' hard-hat. With a miniature camera fitted into the front of the hat and a 100mW 2.4GHz licence-free transmitter concealed inside, youngsters (or adults!) can wander around, sending TV pictures back to the receiver in GB4FUN. The range is about 300m.

The GB4FUN Supporters' Honour Roll

We asked members when renewing their membership to include a donation to help to continue to finance the GB4FUN mobile amateur radio demonstration vehicle. 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 'GB4FUN', c/o RSGB HQ.

GB4FUN 'Big Hitters'	
Whitehaven ARC	
Royal Naval ARS	GB3RN
Reading & DARC	G3ULT
Harwell ARS	G3PIA

P T Bracken 2M1CKE
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A D Lowden G3FIA
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D J Weaver G3IZW
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R W Gabbitas G3KHU
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D E Mills G3LEI
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P D Gaskell G4MWO
T R Underhill G4MWP
G V Jarrett G4PPV
G Rolf G4RTW
L A Kennedy G4TEP
Dr A F Gerrard G4TFU
S L Frost G4VNM
P Wilcock G4VPW
S R Gibbs G4YYR
J H Rawson G4ZJY
C B Jones G6ERZ
D G C Hicks G6IFA
L F Blackaller G6OUG
J Wainwright G6PBW
T P Emblem-English G7ITX
G T Gunn G8ACT
J O Haile G8ADC
P T Gaskin G8AYY
J W Noble G8FEQ
D L Herke G8IBC
G W Allen G8LZG
M J Dibsdall G8MTI
N E Brown G8NCK
K W Wallis G8PIB
H Warke GI6GAQ
T W Dickson GM3DIE
D Brown GM6JUA
M Glendinning GM7GIS
A Coughlin GW3TOB
D S Jones GW3XYW
R B Mowbray GW4BDS
W D Johns GW4TOU
J H Baines GW7LXI
U Bianchi I1BIN
E Bareggi I2BNA
T Arakawa JA3AER
C R Gates LA6OHA
G E Ashton M0AUG
R A Barden M0CCE
D W Summerwill M0DWS
W Hibberd M0TYW
K R Austen M1AZO
K Broxup M1BVQ
T Higginson M1GXL
R S J Bayliss M1RSJ
P A Braidwood M1TCP
F G Buck M1WDX
R W Wilkes M3DIO
R J Riggs M3DOW
S A Ferrie M3GIM
K Hughes MW1FJK
G Sowden RS185626
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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.

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All safety tested & guaranteed for 3 months

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YAESU FT-1500M	2M MOBILE TRANSCEIVER	129.00
YAESU FT-8100R	2M/70CM MOBILE TRANSCEIVER	249.00
YAESU FTL2014	VHF PMR TRANSCEIVER	50.00
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KENWOOD PS-52	KENWOOD POWER SUPPLY	159.00
MFJ 934	ANTENNA TUNER	115.00
MICROSET PRI45A	MAST HEAD AMPLIFIER 100W	79.00
MML144/40	2M 40W AMPLIFIER+PRE-AMP	59.00
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are offered as part of the forthcoming **Dxpedition to Rodrigues Islands 3B9C** in March/April 2004

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Both **Nevada** and **Trident Antennas** are proud to be a sponsor of this major event from the **Five Star Dxers Association**.

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NEW! YAESU FT-857

INCLUDES DSP CHIP!

New 1.8Mhz- 70cms Mobile/Portable.
32 colour display, Inc. DSP.

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All Band Base/Portable Covers 1.8-500Mhz, All Modes, Built in TNC, DSP Filtering, Auto ATU, Twin Receivers. Optional Wideband RX inc Airband AM.

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New All Band Transportable Radio,
Covers 1.8Mhz - 70cms ! Fitted DSP.

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"LATEST BATCH" PRODUCTION

100 Watts HF + 100Watts 6M, DSP, ATU, Multi-Colour Display Screen.

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YAESU FT-847

All Band Base Station, includes 4m, covers 1.8 - 500Mhz.

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NEW!

2 Element 30Mtr Lightweight Mono Band Yagi
- 7.11dBi Free Space Gain
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- Boom length - 2.875 Mtrs
- Weight - approx 12kg
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5.6 mtrs long - Helical loaded 1/4 wave - 1kW **£139.95**

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CFX-431A	144/430/1200MHz	£46.00

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MFJ ANTENNA TUNERS & ACCESSORIES

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1.8-30MHz 1500W
TUNER+DUMMY LOAD

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HF/VHF/UHF
ANTENNA ANALYSER

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HEIL PRO SET 4

For contesters & DX'ers who want to cut through the pile ups. Hc4 insert.

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A fuller range insert for rag chewers who want quality with clarity. Hc5 insert.

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SGC TUNERS

SGC MAC-200 Master Antenna Controller

NEW!

- Freq Range: 1.8-60MHz
- Pwr Rating: 1.5-200W
- Impedance range: 2 - 5000 Ω
- Revolving Mem bins: 168
- Outputs x 5: 3 coax, 1 wire & 1 balanced
- VSWR: Better than 2:1 • Interface: RS-232C & CI5
- Connectors: 50Ω BNC, GPS: MCX, SO-239 & wire terminals • Supply: 13.8V DC @ 230mA
- Size: 165 x 76 x 216mm • Weight: 2kg

£339.95 P&P £10 | 3 CHEQUES OF **£116.65**

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NEW LOW PRICES

Auto ATU
- 1.8-30MHz • 200W PEP

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SG-239	1.8-30MHz 200W	~~£299~~	**£189.95**
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TIMEWAVE ANC-4

Antenna Noise Canceller & Diversity Combiner

- Cancels S-9 line noise
- Nulls strong interfering signals
- Makes two antennas into phased array
- Wipes out noise before it hits your receiver
- Works with any transceiver/receiver+LOTS MORE!

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MINIATURE RUBBER DUCK ANTENNAS - *4.5cm LONG*

HA45	SMA 144/430/1200MHz	**£12.95**	£2 P&P
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200W HF Transceiver

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NEW!

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YAESU FT-8900

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PALSTAR where QUALITY counts

PALSTAR AT1500 CV
1.5kW HF Antenna Tuner

- Now with heavy duty edge-wound **silver plated roller inductor** for ***ultra high efficiency*** and ***reliability***
- Matches dipoles, centre fed doublets, G5RV's balanced feeders, Verticals, single wire, delta loops, beams, windoms, Inverted V's
- Built in 4:1 balun for balanced wire feeders
- Bypass position for quick straight-through antenna connection with SWR/POWER monitoring
- 6 position antenna selector switching
- Average power meter reading to 3000W
- Vernier dial plates for more accurate settings

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PALSTAR AT1500 BAL
1.5 kW True Balanced Tuner

- Designed to Match Open wire, balanced Line, or twin feeder antenna systems, Centre Fed Doublets, etc.
- Balanced tuning PRIOR to the BALUN ensures balun always "sees" correct input and output impedances for high efficiency and low heat
- High power components and circuit design, ensure optimum efficiency.
- Dual roller balanced L antenna tuner
- Switchable Hi-Z/Low-Z impedance ranges
- Total inductance of 44uH for extended range on 160m
- Switchable 500pF fixed capacitor for 160m
- Two edge-wound silver plated ball bearing drive roller inductors driven synchronously with a toothed fibreglass belt
- New low minimum variable capacitor with vernier drive
- 1500 Watts PEP
- Dimensions: 12 1/2" x 6 1/2" x 15"
- Weight: 16 lbs
- Requires 12V @ 100mA *(Power supply not included)*

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Palstar AA30

Active Antenna Matcher for Receiver use only. A low loss antenna tuner suitable for random long wire, dipoles, Beveridges, Delta loops, inverted V's, Verticals, G5RV and most receiving antennas. Or use as a standalone active antenna.

- Frequency: 100kHz-30MHz **£69.95** £6 P&P

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G5RV full	80-10 Mtrs (Flexweave)	**£34.95** £10 P&P

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B1500C	1.5Kw 1:1 (1.8-30)MHz	**£35.95** £6 P&P
B4000	4.0Kw 4:1 (1.8-30)Mhz	**£79.95** £6 P&P

PALSTAR R30
Portable Communications Receiver

W.R.T.H HANDBOOK Best HF Design 2002 ★★★★ RATING OVERALL

- 100kHz - 30MHz AM, SSB SW
- 100 memory chan.
- 8"w x 2.5"h x 9"d
- 4-pole crystal filter at 45MHz
- Internal batteries (not supplied) or 12V
- Switchable 7 pole input filt.
- Ceramic filters fitted
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- +15dBm 3rd order intercept

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NEW! **Palstar SPS-8250**
Switch Mode Power Supply

- Current: 25 Amp Continuous
- Variable Voltage: 3 – 15V DC
- Twin Meter Current/V Display
- Compact and Lightweight
- High Efficiency

Protected for
- Overvoltage
- Overload
- Over temperature
- High RFI stability

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NEW! IMPROVED VERSION

- Current: 40/50 Amps
- 13.8V DC
- Twin Meter Current/Voltage
- Short circuit overload protection

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- 3-15V adjustable
- 25/30A max
- Voltage + current meters
- 10mW RMS noise & ripple

£99.95 P&P £10 | 3 CHEQUES OF **£36.65**
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Palstar PS-15
15 Amp 13.8V (12A/15A max)
£59.95 £10 P&P

PS-06 4 Amp / 6 Amp peak
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HIGH QUALITY MILITARY SPEC 50 Ohm Coax cables at
WHOLESALE PRICES!

SPECIAL PRICE!

PER 100 METRE DRUMS

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FLEXWEAVE (style) ANTENNA WIRE
HIGH QUALITY VERY FLEXIBLE

SPECIAL PRICE!

- **168 strands of 14 AWG Copper Wire.**
- **Ideal for all your antenna projects**

Flexweave....*per metre*.....**55p** +10p/metre P&P
Flexweave....*per 100 Mtr Drum*....**£40** +£6.50 P&P

ALINCO EDX-2
Auto Tuner

- 3.5MHz-30MHz (with over 3 metre element)
- 200W PEP power handling
- Power for tuning = 7-20W
- 13.8V DC ±10% op Voltage

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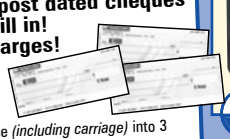

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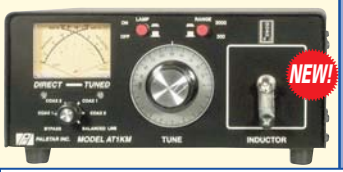

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The SteppIR 3-element

The SteppIR Yagi is a unique design which actually changes the length of the elements using stepper motors in order to provide monoband Yagi performance - and a perfect match - at any frequency from 14 to 52MHz.

SteppIR antennas are manufactured by Fluidmotion Incorporated of America (see 'Websearch' below). They were introduced at the Dayton Hamvention in 2001, when they attracted so much attention that deliveries became very protracted and it was not until autumn 2002 that the European agents, Vine Antenna Products, received supplies.

Since the initial introduction, several different models have become available. Initially a dipole, a 2-element and a 3-element Yagi were produced, these having now been joined by two verticals, the BigIR and the SmallIR covering 40m - 6m and 20m - 6m respectively. The most recent addition is a 4-element Yagi.

Some senior members of the Warrington Amateur Radio Club wondered if this antenna would be an ideal companion for our recently-purchased Icom IC-756 PRO II transceiver and Ameritron solid-state linear amplifier. The club antenna at the time was a Force 12 C4S covering 40 to 10 metres, but it was due for a complete overhaul. There was a feeling that, if we were going to change our antenna, now was the time - especially as we would also gain access to the WARC bands. Showing supreme confidence in their ability to persuade the club to make the change, some members stumped up the cash and ordered a 3-element SteppIR Yagi covering 20 to 6 metres.

UNIQUE DESIGN

All SteppIR antennas incorporate the same system, with each element consisting of two spools of a flat copper-beryllium strip which can be extended and retracted within glass fibre tubes by means of a stepper motor. This allows very precise control of each element length. The length to which each element is extended is determined by a microprocessor-based controller. The system was designed to solve the problem of how to cover six amateur bands without sacrificing performance caused by interaction between all the required antennas and without losses caused by traps or interlaced elements. The SteppIR design was developed by first modelling the antenna using *YO-PRO* and *EZNEC*. As the element length was variable, it was possible to ignore bandwidth in the calculations and create antennas with maximum gain and front-to-back ratio.

The antenna is therefore resonant at every frequency within its range and it is possible to operate it on any frequency at close to a 1:1 SWR. The only compromise is in the distance between elements, which has to remain fixed regardless of frequency.

ASSEMBLY

The antenna comes with a 32-page manual which describes step-by-step assembly, profusely illustrated by photographs and drawings. The 3-element Yagi is no lightweight, weighing 42lb (19kg), but it is strongly constructed and is rated to survive a wind speed of 100MPH and to take a power of 2000W PEP. The longest element is 36ft (10.97m) and the boom-length is 16ft (4.87m).

Assembly commences by connecting the four boom sections together. These are joined together by spigots which are already installed, together with brackets for the stepper motor housings. This ensures that the elements, when eventually installed, will be parallel with each other. The tubes are accurately pre-drilled for the stainless steel hardware and the whole assembly including the boom, motors and mast bracket, took one person one hour to assemble indoors. The next step was to install the control cables between the stepper motors. This is 4-core cable and is already wired to the motors. The cables are fixed to the boom and lead to a plastic cylinder which is fixed to the mast bracket. This cylinder has plugs at both ends to render it waterproof and eventually forms a junction box for the 12-core control cable coming from the control box.

The glass fibre tubes are telescopic, being about 4ft long when supplied. They are easily extended and lock into place. They were not all exactly the same length but as long as the shortest is a minimum of 17' 8" (5.37m) there is no problem. Each joint of the glass fibre tubes is wrapped with electrical tape covered with silicone wrap. We used the supplied tape but if doing it again we would use our own self-amalgamating tape, as the amount supplied was barely sufficient. We covered the tape with electrician's tape to protect it from ultra violet rays. The tubes are pushed into the spigots on the motor housings and wrapped with tapes to provide a waterproof seal. Each spigot has a Jubilee clip as reinforcement to prevent splitting.

The antenna works better on 6m if an additional passive element, making a 4-element beam, is mounted on the boom. The position for this is engraved on the boom. We saved

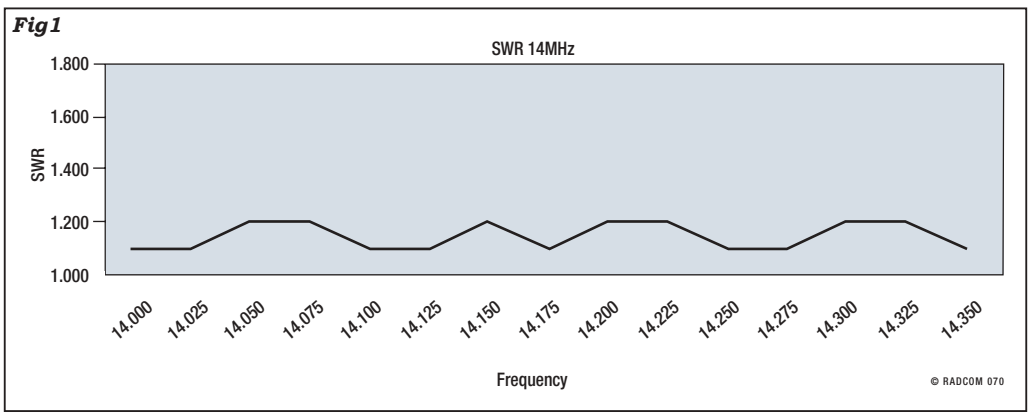


Fig 1: Graph of SWR vs frequency across the whole of the 20m band. Similar results are obtained on all bands between 14 and 52MHz.

By Ron Davies, GOWJX, 84 Hob Hey Lane, Culcheth, Cheshire WA3 4NW
and members of the Warrington Amateur radio club

Yagi Antenna

some money by making our own 6m element and boom bracket.

The antenna was then mounted on the mast. This needed several people as the assembly is quite large and heavy. The mast to boom plate is a simple rectangular plate with two U-bolts to the boom and two to the mast. It is mandatory to ensure that the U-bolts are quite tight and that the elements are perpendicular to the mast. The driven element motor housing contains a 2:1 balun to provide a reasonable match of the 22 Ω impedance of the antenna to 50 Ω coaxial cable. An SO239 socket is provided on the housing and, as this is quite exposed, we covered it with silicone sealant. The 12-conductor control cable is connected to the 4-conductor cable from each motor within the plastic tube fixed to the mast plate.

THE CONTROLLER

The control box (see photograph) measures 150 x 75 x 87mm. The display shows the mode, band and frequency to which the antenna is tuned. Apart from an on / off button, push buttons are also provided for each amateur band. Each band is divided into segments which are accessed by pressing the relevant band button each time you want to change a segment. The tuning rate is 1.17MHz per second. There are also buttons for fine-tuning the antenna in 25kHz steps up or down.

The default mode is 'Amateur' and this can be changed to 'General' coverage or 'Setup'. 'Setup' is used to adjust the factory default settings. Once an LED is lit for each respective mode, you must press the Select button within about 2.5 seconds or it will revert to Amateur mode.

A further button has three positions: Off, 180° and 'Bi-Dir' (bi-directional). When pressed the first time, the antenna will reverse direction in three seconds - much quicker than using a rotator. The next push will allow the user to operate in both directions with approximately 4dB gain both ways. Pressing the button again will disable both modes. Going from normal mode to 180° creates a new antenna by changing over the director / reflector lengths optimised for the different spacings caused by the reversing of the beam.

Power is supplied by an external PSU supplying 24V at 2.7A. If the control cable is over 200ft long, a 33V 2A supply is necessary and this can be supplied as an optional extra. It is suggested that the supply is always plugged in, even when the controller is switched off, to assist in keeping the antenna calibrated. Also, in the 'Off' position, each motor dissipates about 1W to prevent the antenna from 'creeping' in high winds. The heat generated also helps to keep the temperature in the motor housings stable and thus helps to prevent condensation.

CALIBRATION AND ADJUSTMENT

The instruction manual describes the method of calibration. In our case, the factory defaults led to the antenna performing to specification but it is quite easy to change the lengths of elements, each one individually if necessary, where, for instance, nearby objects detune the antenna.

We checked all bands and the SWR was nowhere above 1.2:1. The table of results for 14MHz is typical (see **Fig 1**). There is no need for an ATU of course, and when comparing costs with other antennas, this saving should be borne in mind

DATA CONNECTION

An optional extra allows the controller to read the transceiver's frequency and adjust the antenna to

Top: Close-up of the Controller unit, showing the unique 'Normal' / '180°' / 'Bi-Dir' control.

Below: The profusely illustrated instruction manual gives a hint of the quality of the product.

Below right: The SteppIR antenna in place, topped by a VHF / UHF collinear.

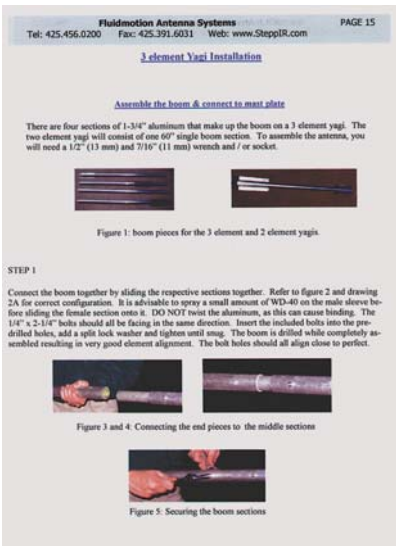
suit. We decided that it would make our installation more 'fool proof' to install the transceiver interface kit and, again to save money, we installed it ourselves. It was a simple job to install the daughter board and 25-pin connectors by soldering to the motherboard and no adjustments were necessary (or possible).

Without the interface, the user has to select the correct band and fine tune when necessary. With the interface, the band automatically changes and optimises the antenna every 50kHz. To do this, it is essential to operate the controller in 'General' coverage mode rather than 'Amateur' mode.

It is also possible to use a logging program to change frequency and adjust the antenna but in the interests of simplicity we have not done this.

OPERATION

When at last the antenna was installed, the results could be analysed. An early comment via e-mail urging members to come in and use the new antenna read: "Since the SteppIR 3-element Yagi was put up some weeks ago a few of us have been getting the feel of it. If members want to know how it's doing, just take a look at the log. Mike, G4VSS, worked into VK during International Marconi Day. On 22 April Richard worked into Japan (over the pole) and again on 29th. We tuned around a very quiet 28MHz at 1800UTC with the beam sitting on the ridge of the barn (mast retracted) and heard a PU [Brazil] about S4 with the beam looking north. We pressed the 180° button to make the beam look south. Richard then had a 599 QSO into Brazil, and then we were called by another Brazilian followed by a PZ from Surinam. The sunspot cycle is on the wane. How old will you be at the next peak?"


Fluidmotion Antenna Systems PAGE 15
Tel: 425.456.0200 Fax: 425.391.6031 Web: www.SteppIR.com

3 element Yagi Installation

Assemble the boom & connect to mast plate

There are four sections of 1-3/4" aluminum that make up the boom on a 3 element yagi. The two element yagi will consist of one 60" single boom section. To assemble the antenna, you will need a 1/2" (13 mm) and 7/16" (11 mm) wrench and / or socket.

Figure 1: boom pieces for the 3 element and 2 element yagis.

STEP 1

Connect the boom together by sliding the respective sections together. Refer to figure 2 and drawing 2A for correct configuration. It is advisable to spray a small amount of WD-40 on the male sleeve before sliding the female section onto it. DO NOT twist the aluminum, as this can cause binding. The 1/4" x 2-1/4" bolts should all be facing in the same direction. Insert the included bolts into the pre-drilled holes, add a split lock washer and tighten until snug. The boom is drilled while completely assembled resulting in very good element alignment. The bolt holes should all align close to perfect.

Figure 3 and 4: Connecting the end pieces to the middle sections

Figure 5: Securing the boom sections

Another indication of the efficiency of the antenna can be judged from the results achieved in the *CQ* WPX contest. Only two operators were able to attend and had to close down 17 hours after the start and yet, despite a dead spell between midnight and 0500 (only four contacts), they worked 197 stations in 61 countries mainly on 10 and 15 metres using only 100 watts. In their report to our club magazine they say: "The club station worked well and we were given many good reports of the signal and audio from the station. The antenna worked very well - the only problem being that the beam was the wrong way round but that didn't cause too much trouble once we had got the idea of where we were pointing it [this was a rotator setting-up error and was easily rectified]. As for the shifting of the director / reflector with the antenna control box, it was really easy to work stations in either direction. One time we did this was when working a station in Europe then flipping round to work the ARRL HQ station. . . Mostly it was one call and they returned: it was really good when you gave a single call to a KH6 (Hawaii), P29 (Papua New Guinea), 9M2 (West Malaysia) or HC8 (Galapagos Islands)."

All in all, the overriding impression is of the benefit of automatic tuning of the antenna to all bands at 1:1 SWR on all frequencies, including the WARC bands, with an antenna having full-size elements on every band without lossy traps etc. The ability to reverse direction of gain is a very worthwhile facility. After a few months use there is no sign of any deterioration. The general appearance of the antenna is good - for instance, we now have only four elements (including the extra one for 6 metres) instead of seven.

The only thing that keeps the club's equipment officer awake at nights is the thought that someone might try to operate the station without switching on the antenna control box. Some surgery to the controller so that it automatically comes on with the transceiver will be done (regardless of the warranty) which should help him to get a good night's sleep!

Our only disappointment is the loss of our 40 metre capability. We had originally thought to install the 40m element from the C4S on to the SteppIR's boom, but we are now concerned that this might affect its tuning. We will have to do some trials to see if it does interact. For the present, we have 50MHz instead as a bonus and of course, we can always erect wire antennas for the lower bands.

The SteppIR 3-element Yagi is available from Vine Antenna Products (The Vine, Llandrinio, Powys SY22 6SH; tel: 01691 831111; e-mail: info@vinecom.co.uk) for £999, a reduction on the previous price of £1075. ◆

WEB SEARCH

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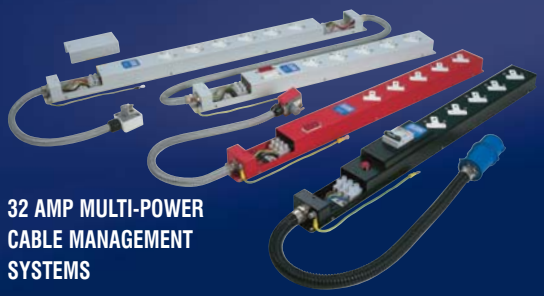

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Winter sale book review

No new books this month, instead a look back at four favourites which are currently being offered at real bargain prices in the RSGB Winter Book Sale - see pages 86 / 87 for more bargains.

AMATEUR RADIO - THE FIRST 100 YEARS

RSGB Publications
Edited by Mike Dennison, G3XDV
Reviewed by RSGB Staff

Now five years old, *Amateur Radio - the first 100 years* is that rare bird: an amateur radio 'coffee table' book. It does exactly what it says on the cover: provides a record of the first hundred years of amateur radio, from 1898 to 1998. As such, it does not age, and *Amateur Radio - the first 100 years* would be as welcome a gift today as when it was first published by the Society.

The book includes a brief written history of the major developments in amateur radio over that period, written by Ian Poole, G3YWX, but by far the biggest part is given over to full-page photographs which capture the spirit of the age beautifully. The quality of the reproductions is exceptional, some of the 80 or 90 year old photographs looking as if they were taken just yesterday. The photographs are presented in chronological order, with the year of the picture and a short caption. Naturally, most of the photographs are black and white, but colour came in (surprisingly late) in the 1980s and by the early '90s all the photographs are printed in glorious colour.

Amateur Radio - the first 100 years is published in a limited edition, each book individually numbered. It is printed on heavyweight low gloss paper, giving a feel of real quality to the publication. Leave it on your coffee table and it is bound to provoke comment when friends come to call. It is an ideal present to give to anyone interested in amateur radio - whether licensed or not. At a whopping £20 off the RRP in the winter sale you can't afford *not* to have a copy!

AMATEUR RADIO - THE FIRST 100 YEARS
RSGB Publications
266 x 260mm, hard back, 255 pages.
ISBN 1 872309 55 0.
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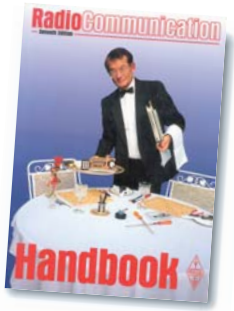
Available from the RSGB Shop.

RADIO COMMUNICATION HANDBOOK



RSGB Publications
Edited by Dick Biddulph, M0CGN and Chris Lorek, G4HCL
Reviewed by RSGB Staff

Instantly recognisable by the cover photograph of the dapper Peter Rhodes, G3XJP, serving up his PIC 'n' Mix delicacy, this book was re-discovered recently while chasing up some information on a 136kHz portable transmitter.

It provides the reader with 23 big chapters on almost every aspect of amateur radio technology. It is copiously illustrated; in fact, the average number of illustrations per page looks bigger than in any amateur radio book we have seen recently. In fact, there is probably more graphical and numerical information in this book than in most so-called 'data reference' books!

The chapters range from basic principles, components, semiconductors, valves and building blocks, through receiver and transmitter design, from LF to microwaves, to propagation, antennas, power supplies, satellites and datacomms. Also there, for good measure, is information on test gear, workshop practice, image techniques, station layout and good operating procedures.

Not got a copy? Now is the chance to remedy that - and at £10.00 off the standard price too!

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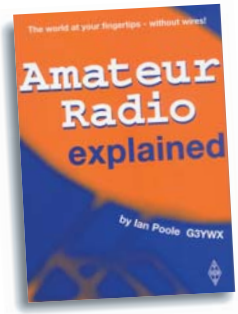

AMATEUR RADIO EXPLAINED

RSGB Publications
By Ian Poole, G3YWX
Reviewed by RSGB Staff

This little book (only 208 x 148mm and 154 pages) packs an amazing amount into its diminutive size. It is *the* introductory book to amateur radio in the UK, covering everything from 'what amateur radio is all about' right up to building your own equipment and setting up your station. It offers advice on how to solder properly, it describes HF and VHF / UHF propagation, explains what DXpeditions are, describes receiver block diagrams and explains why sensitivity and selectivity are important considerations when buying or building a receiver. Just about every aspect of amateur radio that you can imagine is covered.

Amateur Radio Explained is the perfect gift for anyone who has expressed an interest in amateur radio and wants to find out more. Written in straightforward language, it steers clear of the confusing jargon that can so easily put off those just introduced to our hobby. Where it *is* necessary to use jargon, it is explained succinctly. This is an absolutely ideal book for any recently-licensed Foundation or Intermediate licensee: anyone who has just taken out a new M3 or 2E0 licence cannot fail to be enthused by *Amateur Radio Explained* and be propelled towards the next level of licence.

At just £6.99 in the winter sale it is 30% off the normal price and a real bargain.

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RSGB TECHNICAL COMPENDIUM

Reviewed by RSGB Staff

If you have ever wanted the complete technical content of one year's *RadCom* in one volume, this is the book for the year 1999. For the sake of completeness, the 'year' includes both December 1998 and January 2000, in order to start and finish multi-part articles.

What do I mean by "complete technical content"? Just that - all the feature articles, all the 'Down to Earth' articles, all the 'Eurotek' content, all of 'In Practice', all 'Technical Topics', and miscellaneous other technical items. In addition to a complete index, many sections have their own indexes, and there is an index of authors.

1999 was a particularly good year for feature articles in *RadCom*. It featured the multi-part article on the 'PIC-'n'-Mix' digital injection system by Peter Rhodes, G3XJP; the definitive article on the new digital mode, PSK31, by its inventor, Peter Martinez, G3PLX. It was also a good year for novel antenna designs, including an electrically-tuned 6-band HF beam, the 'Screwdriver' rapid-QRV antenna, the 'Skymiser' HF antenna, and a loop antenna for 136kHz.

The 'Down to Earth' section includes several operating features, and no fewer than 11 of the popular 'An Introduction to...' series. It also includes a constructional article on an 80m CW transceiver.

'In Practice' and 'Technical Topics' speak for themselves. What else is there to say? It is now available at £8.00 off the list price in our special winter book sale.

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Stevenage Communications & Electronics Show – 15 February

Communication & Electronics Show

The old 'Picketts Lock Show' has finally found a new home worthy of this prestigious event. Come along to the Stevenage Arts & Leisure Centre on 15 February for the second Stevenage Communications & Electronics Show!

The Communications & Electronics Show takes place at Stevenage on Sunday 15 February. The new venue, the Stevenage Arts & Leisure Centre, is a clean and bright sports and leisure centre that incorporates two large halls, smart meeting rooms for lectures, and facilities for the disabled. It enjoys excellent catering and is located at the centre of road, rail and bus links. Also nearby there is a variety of restaurants, leisure facilities and a shopping centre.

WHY STEVENAGE?

For over 12 years Radiosport promoted shows at Picketts Lock in north London. This venue became highly popular with radio amateurs and indeed became known as a radio show not to be missed. But time took its toll on this building: massive repairs became necessary and finally the local council decided that it had become a financial burden that could no longer be justified. And so Picketts Lock closed its doors to all events in 2001.

A new venue for the show had to be found, preferably in London, as the event had also earned the name of 'the London Show,' but costs demanded by other London venues proved to be far too high and so a decision to move out to the fringes of London was taken. After many months of research, an ideal venue in a town with superb transport facilities was found and Stevenage is now set to be the new home for what once was 'the Picketts Lock Show'.

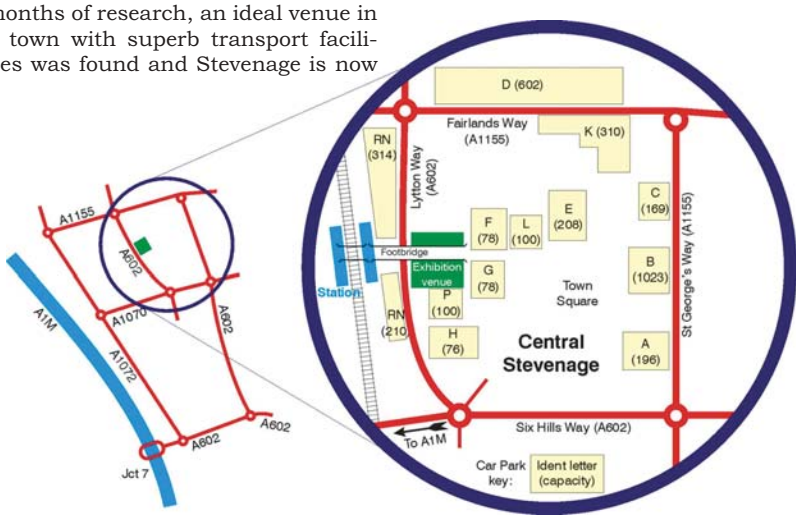
The Stevenage Arts & Leisure Centre is located less than two miles from Junction 7 on the A1(M) and there are acres of tarmac-surfaced car parks within a few minutes walk of the venue. Stevenage main-line GNER railway station is actually connected to the centre by an overhead walk-way.

AT THE SHOW

This show will be supported by the main importers, Kenwood, Icom and Yaesu. Also UK dealers, including Waters & Stanton, Martin Lynch and Sons, Moonraker, Timestep, bhi, Greenweld, Sycom, Lam Communications, Sandpiper and many others, including of course the RSGB, who will be there with a large stand where you will be able to see the range of RSGB publications and receive helpful advice.

A small selection of items traded at the show includes: new amateur radio equipment, used amateur radio equipment, computers and peripherals, printer consumables, electronic components, leads and cables, office furniture, books and CDs, software, batteries and tools.

The Radiosport Communications and Electronics Show is a one-day event taking place on 15 February at the Stevenage Arts & Leisure Centre, Lytton Way, Stevenage, Herts. Opening times: 10.00am until 4.00pm. Admission: £3.00. Further details can be found on the Radiosport website at www.radiosport.co.uk or by phoning 01923 893929. ◆



Radiosport

Left: The Stevenage Arts & Leisure Centre, seen from the station. Yes, it really is this close!

OLD TIMERS' HONOUR ROLL

The RSGB has subscription concessions to reward loyal service of many years. On 17 December 2003, the following had been members of the Society for 50 years or more.

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76 YEARS
GM6FT ..... Mr R T Frost

73 YEARS
HB9T ..... Dr R Stuber

72 YEARS
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G6NA ..... Mr H C Spencer
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G2QT ..... Mr F H Cooper
G3RQJ ..... Mr P Woollett
G5IJ ..... Mr I J P James
G5RL ..... Mr B K Rowell
G5WW ..... Mr P M Carment
G6XM ..... Mr W James

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69 YEARS
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G2KU ..... Mr R M Herbert
G3MA ..... Mr E A Perkins
G4LX ..... Mr L G Spencer
G5KM ..... Mr H H Eyre
G5ZK ..... Mr R N Lawson
G6AG ..... Mr C J McClelland
G6CS ..... Mr P T W Castle
G6HY ..... Mr R Healey
G6RJ ..... Mr A Robinson
G8FF ..... Mr S Southgate
G8JM ..... Mr W G Hall
G8PO ..... Cdr J E Ironmonger
G8PX ..... Mr F A Jefferies
GM5NU ..... Mr W B H Lord

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G2CIL ..... Mr G A Hook
G2DYM ..... Mr R Benham-Holman
G2HV ..... Mr J Dickson
G3LX ..... Mr H P Arnfield
G3WP ..... Mr J H Brazzill
G6JJ ..... Mr W N Craig
G8CXL ..... Mr N K Read
G8GP ..... Mr E V Neal
G8KW ..... Mr R G Shears
G8QM ..... Mr V J Flowers
G8VF ..... Mr A A Moss
VE3XE ..... Mr E C Ilott

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G3HN ..... Col J W W Cock
G3LD ..... Mr F W Foster
G3VA ..... Mr J P Hawker
G5BM ..... Mr F H Watts
G8FC ..... RAFARS
G8GD ..... Mr H E Ward
G8VL ..... Mr J I Sinclair
GW3SB ..... Mr T C Bryant
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ZL1AH ..... Mr J D Wightman

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G2QA ..... Mr T Simkins
G3DFA ..... Mr D B Gaggs
G3FD ..... Mr H T Brock
G3OEP ..... Mr D J Buddery
G3ZTF ..... Mr G T Sparkes
G4AL ..... Mr G R Cox
G4FB ..... Mr F Barnard
G6GN ..... Mr H J Gratton
G8FW ..... Mr K E Walters
G8GEA ..... Mr K T Warriner
G8RW ..... Mr R W Standley
GI3VQ ..... Mr J K Thompson
GM2AOL ..... Mr W S Hall
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G2HKS ..... Mr R P B Udall
G3BOB ..... Mr G M Ward
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G3FP ..... Mr B R Arnold
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G3QX ..... Mr T R Barlow
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GM2BMJ ..... Mr T D Jardine
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GW2HCJ ..... Mr R C Taylor
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G3DVV ..... Mr J O Brown
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GW2HIY ..... Mr E M Davies
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G2BPW ..... Mr I W K Smith
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G2FUU ..... Mr T Knight
G2FXQ ..... Mr S W Saddington
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G3CLL ..... Mr J Willy
G3DAM ..... Mr H Barnett
G3FVD ..... Mr R K Mildren
G4IOF ..... Mr M East
G8XXV ..... Mr G L Clarke
GJ3EML ..... Mr J H E Watson
GM2FVV ..... Mr W Girvan
GM3CIX ..... Mr L J McDougall
GU4GG ..... Mr C D S Wintle
GW2HFR ..... Mr A Ellis
RS4430 ..... Mr W Telfer
VK2FFF ..... Mr S J Hutchison

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G3AKX ..... Mr R G Lascelles
G3ALK ..... Mr E J Holmes
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G3BAP ..... Mr R Cordingley
G3BWX ..... Maj A L Fayerman
G3DRN ..... Mr E G Allen
G3GBN ..... Mr S H Feldman
G3GJX ..... Mr E B Grist
G3GYE ..... Mr P T Pitts
G3HYJ ..... Mr O F Simkin
G3LCZ ..... Mr T W Hickinbottom
G4LW ..... Mr L Huntley
G6NB ..... Mr D N Biltcliffe
G8LOK ..... Mr L E Currington
GM0IJA ..... Mr B C Skinner
GM3BCL ..... Mr A G Anderson
GM3DOD ..... Mr A M Murray
RS5272 ..... Mr C L Chappell

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G3AKU ..... Mr R A Harding
G3ANG ..... Mr J W Emmott
G3BPM ..... Mr P J H Matthews
G3CAQ ..... Mr W Moorwood
G3CBW ..... Mr H Walker
G3CXP ..... Mr R A Gill
G3DKO ..... Mr J W Stevenson
G3GHS ..... Mr J G Holland
G3IGM ..... Mr R G Hindes
G3LIA ..... Mr R J Rogers
RS6181 ..... Mr R P Hope
RS6464 ..... Mr E Valentine
VK5ZO ..... Mr D Clift

59 YEARS
G0RVQ ..... Mr A J W Harrison
G2AAN ..... Mr J H Clarke
G2CAZ ..... Mr M S Ellis
G2DGB ..... Mr A G Short
G2DQX ..... Mr R J Woodroffe
G2FQP ..... Mr L J Avory
G2FUD ..... Mr A W Owen
G3AAJ ..... Mr R J C Broadbent
G3ADQ ..... Mr A W Walmsley
G3BVU ..... Mr C J Beanland
G3CJD ..... Mr L F L Allen
G3CWW ..... Mr A W W Timme
G3EKL ..... Maj R A Webb
G3FDG ..... Mr R G Morris
G3FZR ..... Mr M W Capewell
G3HKT ..... Mr A R Partner
G3IRM ..... Mr P Lumb
G3YLR ..... Mr F R Blake
G4KID ..... Mr B C Partridge
GI5TK ..... Mr A R Irwin
GW3HGL ..... Mr B Clark
RS558 ..... Mr R D Thomas
RS8618 ..... Mr A R Cameron
RS8896 ..... Mr J Crabtree
ZL1AOA ..... Mr J R Whitney

58 YEARS
G0AEW ..... Mr D T Arlette
G0TTK ..... Mr M A Chatfield
G2ADR ..... Mr E Parvin
G2AOZ ..... Mr G W F Ashford
G2FQS ..... Mr R L Barrett
G2FSS ..... Mr J A Caley
G2HCG ..... Mr B Sykes
G3AMF ..... Mr K G Thompson
G3AUB ..... Mr N R Paul
G3BJC ..... Mr R E Sparry
G3BNE ..... Mr G W Alderman
G3BPG ..... Mr J H Richards
G3BVB ..... Mr D R J Adair
G3BZB ..... Mr R T Cunliffe
G3CRJ ..... Mr B J Shaw
G3CSC ..... Mr S J Roddan
G3DNJ ..... Mr G F Weller
G3DWQ ..... Mr G Lancefield
G3EFS ..... Mr W H Borland
G3FOO ..... Mr A Seed
G3FPN ..... Mr J R Davey
G3IJS ..... Mr J F Stratfull
G3INN ..... Mr N S Lilley
G3TXT ..... Mr R T Laing
G4AQ ..... Mr E G Filby
G4IOT ..... Mr A T Hunt-Duke
G4YK ..... Mr B M Morrisey
G5GC ..... Mr G A H Eckles
G6RO ..... Mr R C Kaye
G8GF ..... Mr W A Higgins
G8PG ..... Mr A D Taylor
GW2FYV ..... Mr M Arthur
GW3CZC ..... Mr P J Williams
GW3JGA ..... Mr J E T Lawrence
RS10128 ..... Mr A C Lees
RS10548 ..... Mr J B Gurney
RS10817 ..... Mr R J Baker
RS20428 ..... Mr A R A Bunnage
RS9475 ..... Mr J Smith
RS9710 ..... Mr F W Adderley
VK5CE ..... Mr C Taylor
W2CIH ..... Mr N A Champness

57 YEARS
5Z4DV ..... Mr T H Hutchinson
G0TTG ..... Mr M Warriner
G2ACZ ..... Mr G Whitehead
G2AFV ..... Mr P Carbutt
G2CHI ..... Mr W G Bailey
G2CKQ ..... Maj R S Trevelyan
G2CQX ..... Mr P V Pugh
G2DQW ..... Mr A Williams
G2DZF ..... Mr J H English
G2FCA ..... Mr A E Burnard
G2FKZ ..... Mr C E Newton
G2FSA ..... Mr R L Harvey
G2FTK ..... Mr F A Noakes
G2FUM ..... Mr H Hunt
G2HFW ..... Mr E G Anthoney
G2MJ ..... Mr R T Hunt
G3ABA ..... Mr L J Kennard
G3AGF ..... Mr R L Edginton
G3AIO ..... Mr S Fenwick
G3AJX ..... Mr G Stanton
G3AQF ..... Mr H F Weston
G3ASH ..... Mr R A Jackson
G3AXI ..... Mr R J Boal
G3BHF ..... Mr E C Hasted
G3BHK ..... Mr L R Mitchell
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G3BTM ..... Mr N Shires
G3BXS ..... Mr A G Stacey
G3CHD ..... Mr S R Barker
G3CLK ..... Mr K J Vickery
G3COJ ..... Mr A H B Bower
G3CRH ..... Mr H H A Sanders
G3CRR ..... Mr A E Glozier
G3CTQ ..... Mr H Westwell
G3CTR ..... Mr R L Whorwell
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G3EAT ..... Mr W H Burden
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G3ENG ..... Mr J D Mathews
G3EOO ..... Mr J Hamlett
G3EPO ..... Mr K I Procter
G3ESY ..... Mr P W F Jones
G3EUE ..... Mr E F Jones
G3EUK ..... Mr R W Curtis
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GM3DPL ..... Mr E G Morgan
GM3DSD ..... Mr A Trayler
GM3JOA ..... Mr H E Stanway
GW3ATM ..... Mr D Nasey
GW3JBH ..... Mr J S Hammond
RS12233 ..... Mr H W Sennett
RS12415 ..... Mr H J Wood
RS12840 ..... Mr J L Butcher
RS13129 ..... Mr E Chester
RS14170 ..... Mr D H Clements
RS644 ..... Mr H J Darling
VK6PZ ..... Mr P Zeid

56 YEARS
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G2CYN ..... Dr M Hely
G2DUS ..... Mr I B Howard
G2FYY ..... Mr M B Rowles
G2XP ..... Sutton & Cheam RS
G3AVE ..... Mr F C P Flanner
G3AYZ ..... Mr J F Turner
G3BDH ..... Mr R R Flaum
G3BDQ ..... Mr J D Heys
G3BFP ..... Mr J N Headland
G3BMI ..... Mr A Bolton
G3BOK ..... Mr W G Rennison
G3BPE ..... Mr R G Holland
G3BRQ ..... Mr K B Tackley
G3BRT ..... Mr G O J Parfitt
G3BRW ..... Mr R G Wyatt
G3BUF ..... Mr B J Fost
G3BZS ..... Mr C J Whistlecroft
G3CDE ..... Dr G A Jackson
G3CMH ..... Yeovil & DARC
G3COY ..... Mr V J Reynolds
G3DJK ..... Mr K Rosier
G3DOJ ..... Mr W J Omer
G3DPW ..... Mr R L Knight
G3DSV ..... Mr R W P Wilson
G3DUL ..... Mr H H Pickering
G3DWW ..... Mr G Cripps
G3ECM ..... Mr P W Bowles
G3EDM ..... Mr G L Mills
G3EDS ..... Mr K G Perkins
G3EFK ..... Mr W T Clegg
G3EFP ..... Mr J C Pennell
G3EKD ..... Mr A A Sparrow
G3EVT ..... Mr R J Mutton
G3EZZ ..... Mr J Eaton
G3FDS ..... Mr C F Ford
G3FIB ..... Mr G A Livesey
G3FMT ..... Mr D W Robinson
G3GFG ..... Mr D R Payne
G3GGG ..... Mr R A Bishop
G3GGL ..... Mr G Wormald
G3GIH ..... Mr J C Bird
G3GIQ ..... Mr H F Lewis
G3GOT ..... Mr B W Legrys
G3HCT ..... Mr J Bazley
G3HGM ..... Mr J A Ewen
G3HHU ..... Dr J C W Ickringill
G3HTP ..... Mr E G Drackley
G3IIV ..... Mr A Davies
G3IIY ..... Mr E C Clayson
G3IJE ..... Mr M J Powell
G3IVF ..... Mr H E Smith
G3JIZ ..... Mr J M Read
G3MUI ..... Mr D J Durrant
G3NTA ..... Mr G A Couzens
G3SKI ..... Mr R A Bravery
G3VHP ..... C B H Bradshaw
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G8NJF ..... Mr A J Cox
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GM3EDZ ..... Mr T P Hughes
GW3FPH ..... Mr J W Hayes
GW3HCL ..... Mr D E C Lockyer
GW3ITT ..... Mr J Cairns
HB9ALV ..... Mr K J Marley
RS15448 ..... Mr A S Kitching
RS15845 ..... Mr L Grout
RS15851 ..... Mr K J Edwards
RS17044 ..... Mr M Woodfield
RS19877 ..... Mr H J George
VK2AYD ..... Mr D A Pilley
VK2BPN ..... Mr P J Naish
VK6RV ..... Mr R G B Vaughan
W8PR ..... Mr D R Hearsum
ZB1AH ..... Mr F Hague

55 YEARS
7Q7RM ..... Mr R Macfarlane
EA7FSF ..... Mr F Pilkington
G2ACN ..... Mr B J Bale
G2HBA ..... Mr C H Spencer
G3BON ..... Mr W J Rawlings
G3BSU ..... Mr A F Cleall
G3BYG ..... Mr N L H Williams
G3CXT ..... Mr G H Clarke
G3DCZ ..... Mr R G McDonald
G3DDA ..... Mr K W Dyson
G3DEB ..... Mr T A Bennett
G3DGW ..... Mr D Early
G3DIC ..... Mr C H Bullivant
G3DQY ..... Mr J Vaughan
G3DSK ..... Mr R A Lord
G3DVQ ..... Mr R H Pounder
G3EDD ..... Mr B A Armstrong
G3EFY ..... Mr T W A Smith
G3EGV ..... Mr R Staniforth
G3EHZ ..... Mr A H Wreford
G3ELF ..... Mr F W Malpass
G3EOQ ..... Mr M Flinn
G3FBN ..... Mr W J Bolton
G3FFY ..... Mr M H Stedman
G3FHL ..... Mr G C Bagley
G3FIA ..... Mr A D Lowden
G3FIJ ..... Mr F R Howe
G3FKI ..... Mr E C Lambert
G3FNZ ..... Mr J A Lambert
G3FWB ..... Mr P L Hunt
G3FYP ..... Mr P S Robson
G3FZL ..... Mr G M C Stone
G3FZW ..... Mr E A Matthews
G3GBU ..... Stoke on Trent ARS
G3GUD ..... Mr A Bosworth
G3HAT ..... Mr M C Hately
G3HBN ..... Mr J R Bolton
G3HPM ..... Mr P J Mullock
G3HTA ..... Mr J D Forward
G3HZJ ..... Mr W J Walsh
G3HZW ..... Mr D C Mainhood
G3IGI ..... Mr L E R Hall
G3ISD ..... Mr E J Hatch
G3IWT ..... MrJ P Hewitt

G3JHI .....Mr R L S Hathaway
G3JXG .....Mr F T Hodgson
G3KKD .....Mr I M Waters
G3KXE .....Mr E W Bettles
G3NEO .....Mr P Bagshaw
G3NOX .....Mr J R T Royle
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G3WUZ .....Mr P H Brown
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G4LU .....Mr S F Brown
G6IPU .....Mr G A Edwards
GD3FLH .....Isle of Man ARS
GD3FXN .....Mr A D Radcliffe
GM3COQ .....Mr D Oswald
GM3DEE .....Mr R P Russell
GM3ENJ .....Mr K Street
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GM3HOM .....Mr J Reilly
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RS17032 .....Mr B M Collings
RS17058 .....Mr A M C Macklow-Smith
RS17624 .....Mr F J Shepherd
RS4190 .....Mr F J W Trollope
VE3EAB .....Mr W A Cheek
VK3XX .....Mr G S Bracewell
VK6HD .....Mr M E Bazley
ZL1HV .....Mr A G Godfrey

54 YEARS

DJ0OS .....Mr F C Hartles
G3BVW .....Mr C P Townley
G3EPV .....Mr R D Emes
G3ETH .....Mr J L Goldberg
G3FFH .....Mr J Frings
G3FOP .....Mr R G Barrell
G3FPK .....Mr N A S Fitch
G3FRX .....Mr J A Wilkes
G3FVL .....Mr H J Hudson
G3GVV .....Mr R J Hughes
G3GZJ .....Mr F J Crisp
G3HTC .....Mr G E Storey
G3HZT .....Mr P S Fraser
G3JNW .....Mr H L Fleming
G3KQF .....Mr J Anthony
G3LMR .....Mr J K Eley
G3SOL .....Mr J B G Parker
G3SVC .....Spen Valley ARS
G4CDB .....Mr G Lindsay
G8CDW .....Mr E H Double
GI3FJX .....Mr J Davidson
GM3EWC .....Mr R B Irvine
GM3JIJ .....Mr J D Hague
GM3OBC .....Mr R Thomson
GU3HKV .....Mr E H Page
GW3GEN .....Mr C F Cole
RS18567 .....Mr A H Turner

53 YEARS

G1KEP .....Mr J G Houghton
G3CZU .....Dorking & DRS
G3DNH .....Mr J A Spicer
G3DXJ .....Mr T H Holbert
G3GEJ .....Mr L M Airey
G3GGS .....Mr W E Waring
G3GJW .....Mr T I Lundegard
G3GKI .....Mr F V Kershaw
G3GLB .....Mr J E Lacey
G3GLL .....Mr T N Green
G3GMY .....Mr F E A Green
G3GNQ .....Mr G C Cutting
G3GRO .....Mr D Atter
G3GRV .....Mr G Halse
G3GVM .....Mr F Robins
G3GWR .....Mr A G Stormont
G3HEA .....Mr J U Burke
G3HJK .....Mr B J Mitchell
G3HMF .....Mr G G Kenyon
G3HQX .....Mr J Brodzky
G3HRK .....Mr D F Willies
G3HZM .....Mr M Barnsley
G3IAS .....Mr A M Smith
G3IVZ .....Mr W E Stephen
G3JJA .....Mr E F Steventon
G3KDP .....Mr A G Bounds
G3KGW .....Mr J D Smith
G3KPU .....Mr E Prince
G3MGW .....Mr R Wheeler
G3MVV .....Mr Norman Miller
G3OCA .....Mr K Frankcom
G3OEG .....Mr E F Harverson
G3ORW .....Mr E J Gregory
G3PMW .....Mr K W Dews
G3RQS .....Mr R A Rimmer
G3WKS .....West Kent ARS
G3YJJ .....Mr R T Palmer
G4IER .....C D Colbeck
G6BZ .....M C Bunting
G6JY .....Mr F T Farmer
GD3HDL .....Dr S E Kelly
GM3DDL .....Mr J Jackson
GM3GRG .....Mr D R Rollo
GM3IBU .....Mr A W Wright
GM3IQL .....Mr A Lawrence
GW3IGG .....Mr J P G Jones
RS18978 .....Mr R G Clement
RS20443 .....Mr M B Greenberg
VK6PG .....Mr A J Gibbs

52 YEARS

G2HLL .....Mr F H Pickard
G2XV .....Cambridge & DARC
G3FAU .....Mr V Cundall
G3FJE .....Shefford & DARS
G3GGO .....Mr C N Wridgway
G3GMM .....Mr E McFarland
G3GYF .....Mr A J F Powell
G3HIA .....Mr H C Young
G3HKQ .....Mr L V Westmoreland
G3HQH .....Mr H Froggatt
G3HRB .....Mr J Coatsworth
G3HRE .....Mr F Watson
G3HVX .....Mr W H Wells
G3HYH .....Mr S P Hay
G3IFX .....Mr A R Cooke
G3IGW .....Mr M G Whitaker
G3IJA .....Mr J Allan
G3IJW .....Mr G S Garrett
G3ISX .....Mr C J Leal
G3IUZ .....Canon H R Davis
G3JIE .....Mr D C Youngs
G3JLH .....Mr I L Hampton
G3JMX .....Mr P C Hayward
G3KHR .....Mr J W Fox
G3KKP .....Mr J Burgess
G3LMX .....Mr T W Mitchell
G3MEA .....Mr S Harle
G3MZO .....Mr D Rosen
G3TOK .....Mr J L Hall
G3VRB .....Mr J D Nias
G8HLE .....Mr R E W Marshall
GM0UPE .....Dr G R Sutherland
GW3FPF .....Mr P F Jones
GW3INW .....Mr A Davies
VE3EZP .....Mr J C Watson
VK2BE .....Mr L W Louttit
VK6LK .....Col G R K Lyon

51 YEARS

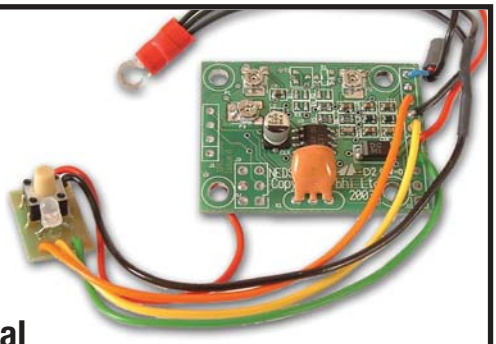
G0FMU .....Mr A J Turner
G2HDR .....Mr C N Chapman
G3BHT .....Mr B G Meaden
G3CCM .....Mr W R Harris
G3EHP .....Mr J Wilmot
G3HBW .....Mr A L Mynett
G3HHD .....Mr T J Hayward
G3HRD .....Mr J Ellis
G3HRN .....Mr D L Wright
G3HUL .....Mr D M Mallett
G3HWW .....York ARS
G3HZI .....Mr C L Hatfull
G3ICH .....Mr P N Pitt
G3IDW .....Mr R Reynolds
G3IER .....Mr D G Martin
G3IEW .....Mr S J Heard
G3IFB .....Mr F H Bliss
G3IGP .....Mr J G H Pearce
G3IGU .....Mr K H Coates
G3IGV .....Mr J W Birkbeck
G3IGZ .....Mr D W Bruce
G3IIN .....Mr M J Griffin
G3IKL .....Mr R T Craxton
G3INA .....Mr R G Robinson
G3INL .....Mr A A Chisholm
G3IOI .....Mr N R Pascoe
G3IPV .....Mr P W Haylett
G3ITH .....Mr R D Franklin
G3JBR .....Mr D P Tipper
G3JHL .....Mr J H Lepper
G3JKF .....Mr K V Franklin
G3JKT .....Mr J Huggett
G3JKV .....Mr W F Blanchard
G3JLN .....Mr F G Blain
G3JMB .....Mr J Brooker
G3JQS .....Mr J Guttridge
G3JTJ .....Mr T Jones
G3JYG .....Mr J Kirby
G3KPJ .....Mr A W Butcher
G3KSP .....Mr P O Hooper
G3KTN .....Mr J F Brown
G3LQW .....Mr K Wallace
G3LUY .....Mr E W Brett
G3LWK .....Mr H Taylor
G3LZG .....Mr E Griffiths
G3MWG .....Mr D E Bootman
G3NXX .....Mr I Miller
G3PXJ .....Mr S A Gaunt
G3TEV .....Mr M J Mills
G3VDL .....Mr J A St Leger
G4DMP .....Mr D M Pratt
G6UQ .....Stockport RS
G8IDL .....Mr D A D Smith
GM3KAM .....Mr D Mather
GM3LGU .....Mr R I Pryde
GM3MGT .....Mr A W Hope
GM3NYG .....Miss J G Fish
GW3JSV .....Mr D A S Holmes
GW3MDK .....Mr R Jones
RS19615 .....Mr M Addicott
RS21683 .....Mr J C P Sharp

50 YEARS

G3CVW .....Mr R F Saunders
G3DSS .....Maj G S Symons
G3GFT .....Mr G Oldfield
G3IHX .....Mr N J Bond
G3IKR .....Mr J P Moore
G3IMV .....Mr J Hunter
G3INU .....Mr R J Appleby
G3IYF .....Mr D E Baker
G3IYT .....Mr S R Walker
G3IZJ .....Mr M J Faulkner
G3IZQ .....Mr H Hyman
G3JBQ .....Mr J S Munn
G3JFR .....Mr N B Cottrell
G3JHP .....Mr E W G Allen
G3JIP .....Mr J W Hill
G3JME .....Mr M Watson
G3JMY .....Mr E C Halliday
G3JNB .....Mr V E Brand
G3JNM .....Mr T R Whittaker
G3JSF .....Mr A W Baker
G3JVL .....Mr M H Walters
G3KDA .....Mr M G Rimmer
G3MBL .....Mr A G Edwards
G3MCW .....Mr R A E Fronius
G3MDM .....Mr G J McGee
G4ONP .....Loughton & Epping Forest ARS
GW3KJW .....Mr P E W Allely
GW3LQE .....Mr A M Ernest
GW3MPP .....Mr G C Price
GW4BYA .....Mr P A Braham
GW4HXO .....Mr M Probert
RS20103 .....Mr A J Kightley

WIN!

A bhi NEDSP1061 digital noise reduction module



A bhi DSP noise reduction module and the cost of professional fitting can be won in our exclusive competition, courtesy of bhi Ltd

The bhi NEDSP1061 digital noise reduction module was reviewed by Chris Lorek, G4HCL, in *RadCom* last year (see December 2003 *RadCom* pages 24 / 25 or bhi's website at www.bhi-ltd.co.uk). Chris concluded that if you frequently communicate with weak and noisy signals "the bhi add-on DSP filter system could be worth its weight in gold".

Although reviewed with the Yaesu FT-817 transceiver for which it was originally designed, the bhi NEDSP1061 digital noise reduction module can be retrofitted into virtually any transceiver or receiver (the only limitation is the physical space available inside the equipment).

The prize in our competition is a bhi NEDSP1061 unit, with the cost of fitting at a dealer of the winner's choice also paid for by bhi Ltd.

The full rules are listed below. (Hint: re-reading Chris Lorek's review in the December 2003 *RadCom* will help you with the answers!)

COMPETITION RULES

Look at the three multiple choice questions. 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 **Monday 1 March**. You *must* be a current member of the RSGB on the closing date of the competition (1/3/04) in order to enter. The winner will be announced in the April *RadCom*.

Q1. *How many different levels of noise reduction are provided by the NEDSP1061?*
(a) 2. (b) 3. (c) 4.

Q2. *How much additional current is drawn when the NEDSP1061 is in circuit?*
(a) 45mA. (b) 90mA.
(c) 450mA.

Q3. *What is the greatest level of heterodyne (tone) level reduction provided by the NEDSP1061?*
(a) 21dB. (b) 65dB.
(c) 95dB.

If it proves physically impossible to fit the NEDSP1061 into the equipment chosen by the winner, an alternative prize from bhi, eg NES10-2, will be offered. If the prize is won by a winner outside the UK, bhi will offer up to £30 towards the cost of installation overseas.

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.

By John Heath, G7HIA, Chestnuts, Desford Lane, Kirkby Mallory, Leicestershire LE9 7QF E-mail: g7hia@amsat.org

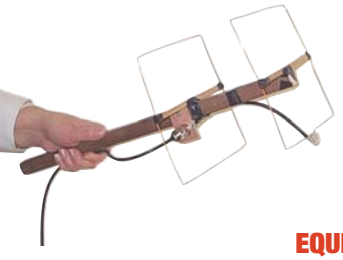
National Science Week

12-21 March

National Science Week takes place this year between 12 and 21 March. This is an ideal opportunity for radio clubs or groups of individuals to put on a special event station or other demonstration of amateur radio to the general public. John Heath, G7HIA, gives a good example of the sort of thing we have in mind.

Every satellite is an orbiting laboratory, and several operating in the amateur service have beacon transmitters sending engineering data from space. A popular demonstration at the National Space Centre is the capture and decoding of this telemetry from the AMSAT Argentina satellite, LUSAT Oscar 19. You might like to add it to your Science Week demonstrations, or give it a try yourself, especially if you have never experienced the thrill of receiving signals from an orbiting satellite.

With at least four good passes every day you will find that the 1W CW beacon gives a strong signal which is easy to copy.



The 'home brew' 70cm two-element quad used by the author for reception of LUSAT.

You will need:

1) A small antenna for 70cm;
2) A receiver with SSB or CW covering 437MHz;
3) Ability to copy, by ear or computer, Morse at 12WPM;
4) Decode Equations;
5) Times when the satellite is in range.

EQUIPMENT

A small Yagi and an antenna rotator is the ideal, but try with what you have. Many of the passes will be under 30° elevation and easily copied on your terrestrial set up, even a VHF/UHF 'white stick' collinear. I can copy LUSAT with my FT-817 and the 'rubber duck' aerial, but since it is Science Week, why not 'home brew' a simple two-element cubical quad for 70cm? Any stiff wire of around 2mm diameter will do. Wire lengths are: driven element 701.3mm, reflector 718.7mm, spacing 152.7mm (thanks to Brian, KD6NRP, for this design). I made one to test for this article. I used a 500mm length of 25mm square section timber for the boom. It took about half an hour to build. I had about a metre of RG58 connecting the rig to the antenna. Using it outdoors with an FT-817 I copied LUSAT down to the horizon. On the next pass, I could still get readable copy indoors.

Any SSB or CW receiver covering 437MHz should do.

MORSE TELEMETRY

LUSAT sends Morse telemetry at 12WPM. It uses just 10 Morse characters to represent numbers, as follows:

A=1, U=2, V=3, E=5, B=7, D=8, N=9, T=0. The numbers 4 and 6 are sent as normal. The Morse can be copied easily using a PC Soundcard. I use *CwGet* and *Hamscope* software which both work well.

The 'raw telemetry' data looks like this:

E LUSAT HI HI AO AVA ABA AAU AD6 ATV ABE TTV AEE

This is repeated, with a 35-second gap between transmissions.

DECODE EQUATIONS

After copying and writing down the three-letter groups, substitute numbers for letters to obtain numerical values, eg AVA becomes 131. Use the calibration equations below to get the engineering data. The first one, AVA is the regulated 5 volt supply, ABA the 10 volt battery, and so on for all eight.

Regulated +
5V Supply . . . . . 636 / 131 = 4.85 volts
+ 10V Battery . . . . . 0.064 x 171 = 10.94 volts
CW TX
Temperature . . 0.354 x (143.7 - 112) = 8.04 C
CW TX
Power Out . . . . . $(10.9+186)^2$ / 40.1 = 967mW
Internal
Temperature . . 0.3568 x (136 - 103) = 11.75 C
10V Supply
Current . . . . . 0.7 x 175 = 122.5 mA
Solar Panel
Voltage . . . . . 0.15 x 003 = 0.45 volts
Regulated +
8.5 V Supply . . . . . 0.056 x 155 = 8.68 volts

The solar panel is on the +Z face (the top) of the satellite and 0.45 volts is typical for the satellite in darkness. When illuminated by the sun, a value of around 22 volts is normal.

DOS programs, which take the letter groups and display the results, are available via the GB2NSC website. Alternatively, you could do the job in Excel and graph the results. We find the calculator and pencil method quite good at the Space Centre, as it helps visitors to feel more involved in the demonstration.

LUSAT TIMES

There is plenty of software around that will give orbital predictions. My favourite is *Instantrak* from AMSAT-UK. It runs in a DOS window or on legacy PCs, 486s, 386s and older laptops and costs around £25. Alternatively, you could try *SatExplorer*, which you can download free from the Internet. Your software will need current position and orbit data to work from, and these are called Keplerian Elements. You can find them on *Celestrak*: download the section marked 'amateur radio'. Your tracking software will then read the file amateur.txt

If you just want the passes for LUSAT the Heavens-Above web site will give you a listing. You can get other satellites here too, including the ISS.

HINTS & TIPS

Try out the demonstration a few times ahead of Science Week, just to get the hang of it. If you are new to receiving satellite signals, be aware that the phenomenon called Doppler shift will cause the receive frequency to fall steadily. Tune around 437.200MHz at the *start* of the pass to find the frequency.

LUSAT takes 25 seconds to send its ID and the telemetry frame, then there is a 35-second pause before the next transmission. You will need to retune, as the next transmission will be significantly lower in frequency. For your first attempts, choose passes that only reach about 20° of elevation or less. They are easier because the Doppler shift is reduced. This is especially important if using a soundcard. Set software AFC to maximum and practice tuning to keep the received audio tone steady.

If you have questions or want further information, please send me an SASE, or e-mail to g7hia@amsat.org There will be additional information on the GB2NSC website in March. ◆

In order to help you to put on a successful special event station or demonstration for National Science Week, the RSGB has produced a whole series of posters and leaflets. These include press release letterheads to give your press release a professional look, A3 and A2 size posters, and even amateur radio lectures on paper, acetates or PowerPoint. You supply the manpower, we will help with the rest. Write to RSGB Commercial Manager Mark Allgar, M1MPA, or e-mail: mark.allgar@rsgb.org.uk by **16 February** for a list of materials available.

As part of National Science Week, GB4FUN will be touring the country demonstrating amateur radio.

WEB SEARCH

INSTANTRAK	www.amsat-uk.org
SATEXPLORER	www.tu5ex.org
KEPLERIAN ELEMENTS	http://celestrak.com
HEAVENS ABOVE	www.heavens-above.com
HAMSCOPE	www.qsl.net/hamscope
CWGET	www.dxsoft.com
MORE ABOUT LUSAT	www.wwwamsat.org
GB2NSC WEBSITE	www.nsc-ars.com

RSGB Bookshop

NEW

NEW

ADVANCE!
THE FULL LICENCE MANUAL

This book is the third course-book in the RSGB series for those interested in obtaining an amateur radio licence. In line with the progressive three-tier UK licence structure Advance! the Full Licence Manual completes the natural progression from Intermediate Licence - Building on the Foundation and Foundation Licence Now!

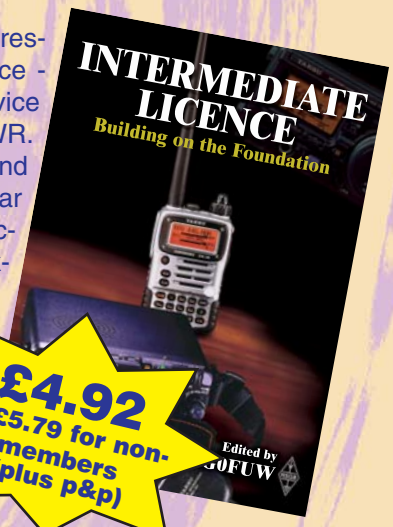
Advance! the Full Licence Manual contains all of the information required to move to the final stage of amateur radio licensing. Based on the best-selling Radio Amateurs Examination Manual, the book has been extensively updated to match the Full licence syllabus. Broken down into logical sections to match the full licence syllabus the book is ideal for all those studying for the Full licence. Presented in an accessible style this book contains everything necessary for home study. Advance! the Full Licence Manual is also the ideal companion to a formal training course. The book provides a useful reference source and so will also find a home on the shelves of many amateurs who have passed the examination.

Advance! the Full Licence Manual is a "must have" for everyone progressing to the Full licence and is the best route to success in the examination.

£8.49 or £9.99 for non-members (plus p&p)

INTERMEDIATE LICENCE
BUILDING ON THE FOUNDATION

With the introduction of the new Intermediate Licence Syllabus the RSGB is pleased to present our new companion book for those working to pass the exam. Intermediate Licence - Building on the Foundation draws heavily on the decade of success enjoyed by the Novice Licence scheme and in particular the Novice Student's Notebook by John Case, GW4HWR. However, this is more than a new edition with it adopting the easy to read and understand style of the hugely popular Foundation Licence - Now, that many readers will be familiar with. The book is broken down into manageable half-hour worksheets and contains practical exercises along with plenty of helpful advice and safety tips. This is the course workbook for the Intermediate Licence, and as such contains all the information covered during the 20 hours recommended for the course. This is the ideal book for every Intermediate Licence student.



£4.92 or £5.79 for non-members (plus p&p)

FOUNDATION LICENCE
NOW!

For those wanting to know more about the new Foundation Licence the RSGB has produced "Foundation Licence - Now". The book contains all that is required to obtain that first step into Amateur Radio hobby - gaining the Foundation Licence - Now!

This is not simply a textbook; we provide insight into the technical basics, receivers, transmitters and antennas. How and where to operate with your new licence are covered along with safety considerations and electromagnetic compatibility. Written in an easy to use and understand style this is the ideal book for young and old alike.

£3.39 or £3.99 for non-members (plus p&p)

Order today from the RSGB Bookshop
www.rsgb.org/shop or Tel: 0870 904 7373

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Mobile Transceiver with DSP.
HF/2m/6m/70cms
HF/6m - 100W.
2m - 50W. 70cms - 20W

Yaesu FT-847 **£1,149.00**
HF/6m/2m/70cms Plus
4m Satellite Transceiver

Yaesu FT-817 **£525.00**
Mobile / Portable Transceiver
HF/6m/2m/70cms
Also available now with DSP
from bhi for an extra £89.95

Yaesu FT-897
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Portable Transceiver
HF/6m/2m/70cms
HF/6m - 100W. 2m - 50W.
70cms - 20W

Yaesu VX-2E
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Wideband Receive

Yaesu VX-7R
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Kenwood TS-870S
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BaseTransceiver

Kenwood TS-570DGE **£794.00**
HF 100W Transceiver
with built in ATU

Kenwood TH-F7E
£249.00
Dualband Handhold
Transceiver with wideband
receive 0-1300MHz

Icom IC-756proII
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HF/6m Base Transceiver
with Auto ATU

Icom IC-7400
£1,299.00
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HF/VHF 100W Transceiver.
Built in Auto ATU.

Icom IC-910H
£1090.00
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Optional 23cms Board.

Icom IC-718
£449.00
HF All ModeTransceiver.
General Coverage.

Icom IC-706mkIIG **£779.00**
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Transceiver

Icom IC-703 **£589.00**
HF/6m 10W QRP Mobile Transceiver,
with built in Auto ATU

Icom IC-2725E **£299.00**
2m/70cms Mobile
Transceiver

Icom IC-E90
£269.00
2m/6m/70cms, 5W
Handheld Transceiver

Alinco DX-70TH
£599.00
HF/6m Mobile Transceiver.
100W HF & 6m.

Alinco DX-77E
£499.95
HF Transceiver.
Upto 100W Output Power.

bhi NES10-2
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Noise eliminating
speaker with built in
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HF/UHF/VHF @ £349.95

SECOND HAND LIST

PLEASE CALL TO CHECK AVAILABILITY

MAKE	MODEL	DESCRIPTION	PRICE
ADI	AR-446	70cms Mobile Transciever	£130.00
Adonis	AM-805G	Desk Microphone, Built In Compressor & VU Meter	£70.00
AEA	PK-232MBX	TNC	£125.00
AEA	PK-900	TNC	£200.00
AEA	PK-96	TNC	£90.00
AKD	6001	6m FM Transceiver	£135.00
Alinco	DJ-560	Dualband Handheld (MINT - BOXED)	£100.00
Alinco	DJ-G5EY	Dual Band Handheld	£199.00
Alinco	DJ-X10	Wide Band Receiver	£200.00
Alinco	DR-150	2m Transceiver with Air-and Receive	£150.00
Alinco	DR-435	70cms Mobile Transceiver	£159.00
Alinco	DR-M10	10 Metre Transceiver	£99.00
Alinco	DX-70	HF & 6m Transceiver	£389.00
Alinco	DX-70TH	HF & 6m Transceiver (100W Output)	£475.00
Alinco	DX-77E	HF Base Station	£399.00
Ameritron	QSK-5	Amplifier Switch / Pre Heat	£200.00
AOR	AR-3000A	Wide Band Receiver	£450.00
AOR	AR-3030	HF Receiver, Including PSU	£350.00
AOR	AR-7030	Top Receiver	£550.00
AOR	AR-7030+	HF Receiver	£625.00
AOR	AR-8600	Base Scanner / Receiver	£399.00
AOR	AR-8600mkII	Base Scanner / Receiver	£499.00
AOR	AR-950	Communications Receiver	£89.00
AOR	ARD-2	Decoder	£200.00
AOR	SDU-5000	Spectrum Display Unit	£399.00
bhi	NEIM1031	Noise Eliminating In-Line Module	£99.00
CapCo	AT-300	Antenna Tuner	£99.00
Comet	CD-270D	SWR Power Meter	£49.00
Cubic	CDR-3550	State of the Art 20 - 1300 MHz Digital Receiver	£4,999.00
Daiwa	CN-103L	2m / 70cms Cross Needle SWR Meter	£40.00
Daiwa	CN-801H	1.8 - 200 MHz Cross Needle SWR & Power Meter	£80.00
Datong	ASP	Automatic Speech Processor for FT-817, FT-77 etc.	£70.00
Datong	FL-2	Filter	£60.00
Diamond	SX-100	SWR & Power Meter - 1.6 - 60MHz	£65.00
Drake	MS-8	Speaker	£89.00
Fairhaven	RD-500	Communications Receiver	£500.00
Fairhaven	RD-500VX	Communications Receiver (20kHz - 1.75GHz)	£550.00
FDK	Multi-750	2m Multimode Transceiver	£129.00
Fujion	F-2000A	Radio Direct Finder	£99.00
Global	AT-1000	Manual Short Wave Tuner	£50.00
Hunter	750	Linear Amplifier	£599.00
Icom	IC-2100H	2m FM Mobile Transceiver	£150.00
Icom	IC-2710H	Dual Band Mobile	£225.00
Icom	IC-271E	2m Multimode Transceiver - 25W	£299.00
Icom	IC-471E	70cms Multimode Transceiver	£299.00
Icom	IC-490E	70cms Mobile Transceiver	£250.00
Icom	IC-551E	6m Multimode Base Transceiver	£299.00
Icom	IC-706mkII	HF / 6m / 2m Mobile Transceiver inc. DSP	£499.00
Icom	IC-706mkIIG	HF / 6m / 2m / 70cms Mobile Transceiver	£675.00
Icom	IC-720A	HF & FM Transceiver	£400.00
Icom	IC-726	HF / 6m with CTCSS fitted	£425.00
Icom	IC-735	Base Or Mobile Transceiver	£399.00
Icom	IC-7400	HF / 6m / 2m Built In ATU	£999.00
Icom	IC-746	HF / 6m / 2m Built In ATU	£875.00
Icom	IC-756	HF / 6M All Band Transceiver	£950.00
Icom	IC-775DSP	Icom HF DSP Transceiver	£1,600.00
Icom	IC-910	2m / 70cms Base Transceiver	£999.00
Icom	IC-E90	Tri-Band Handheld	£220.00
Icom	IC-R5	Handheld Scanner	£125.00
Icom	IC-R10	Handheld Scanner	£229.00
Icom	IC-R70	HF Receiver	£299.00
Icom	IC-R7000	MINT CONDITION!!! Receiver	£550.00
Icom	IC-R7100	25 - 2000 RECEIVER	£575.00
Icom	IC-R71E	Receiver	£325.00
Icom	IC-R72	Receiver	£350.00
Icom	IC-R75	Receiver (With DSP Unit)	£499.00
Icom	IC-T21E	2m Handheld Transceiver	£60.00
Icom	IC-T8E	Tri band Handheld Transceiver	£175.00
Icom	IC-W2E	2m / 70cms Handheld Transceiver	£140.00
Icom	PS-125	Power Supply Matching IC-7400, IC-746, IC-756 etc.	£230.00
Icom	PS-55	Power Supply Matching IC-735	£100.00
Icom	SP-21	External Speaker	£50.00
JPS	NIR-10	Noise / Interference Reduction Unit	£99.00
JRC	JST-245	HF 50MHz 1500w AC Base Transceiver	£1,199.00
JRC	NRD-525	HF Receiver	£375.00
JRC	NRD-545	DSP Receiver	£899.00
JRC	NRD-L2000	1kW Linear Amplifier Solid State (VERY RARE!!!)	£1,600.00
Kamtronics	KAM	Multimode TNC	£140.00
Kenwood	23cms	23cms Module for Kenwood TS-790E	£299.00
Kenwood	AT-230	Antenna Tuner Unit	£130.00
Kenwood	AT-50	Automatic ATU (Matching TS-50S)	£165.00
Kenwood	MC-80	Desk Microphone	£40.00
Kenwood	PS-10	Power Supply for TR-9130 etc.	£40.00
Kenwood	PS-31	Power Supply (TS-870, TS-850, etc)	£135.00
Kenwood	PS-430	Power Supply	£100.00
Kenwood	PS-50	Power Supply	£140.00
Kenwood	R-2000	Receiver Including Converter	£299.00
Kenwood	R-5000	Receiver	£499.00
Kenwood	R-5000	Receiver With VHF Converter	£600.00
Kenwood	SP-120	External Speaker	£39.00
Kenwood	SW-100E	SWR Meter	£25.00
Kenwood	TH-215E	2m Handheld Transceiver	£99.00
Kenwood	TH-235	2m Handheld Transceiver	£85.00
Kenwood	TH-47E	70cms Handheld Transceiver	£80.00
Kenwood	TH-79E	2m / 70cms Handheld Transceiver	£175.00
Kenwood	TH-D7E	Dual Band Handheld	£219.00
Kenwood	TH-F7E	Dual Band Handheld	£199.00
Kenwood	TL-120	Low Drive Linear Amplifier 100W HF	£150.00
Kenwood	TM-255E	2m Multimode Transceiver (MINT)	£395.00
Kenwood	TM-451E	70cms Mobile Transceiver - Data Ready	£175.00
Kenwood	TR-751E	2m Multimode Transceiver	£250.00
Kenwood	TR-9000	2m Multimode Transceiver	£220.00
Kenwood	TS-450S	HF Base / Mobile	£499.00
Kenwood	TS-450SAT	HF Base / Mobile built in ATU	£549.00
Kenwood	TS-570DGE	Mobile / Base HF Transceiver	£675.00
Kenwood	TS-570S	Mobile / Base HF + 6m Transceiver (VERY RARE!!)	£825.00
Kenwood	TS-790E	Dual Band Base - All Mode	£750.00
Kenwood	TS-850SAT	HF Base Station with Built In ATU	£699.00
Kenwood	TS-950SD	HF 150W DSP Base Station	£1,200.00
Kenwood	YG-455CN-1	270Hz CW Crystal Filer	£100.00
Kenwood	YK-88C-1	500Hz CW Narrow Filter	£40.00
Kenwood	YK-88CN1	270Hz CW Filter 8.83MHz	£40.00
Kenwood	YK-88S-1	2.4KHz SSB Narrow Filer 8.83MHz	£40.00
Kenwood	YK-88SN	1.8K SSB Filter	£40.00
Kenwood	YK-88SN-1	1.8KHz SSB Narrow Filter 8.83MHz	£40.00
Linear Amp	Hunter-Six	6 Meter Amplifier	£500.00
Lowe	HF-150	HF Receiver	£175.00
Lowe	HF-225	HF Receiver	£175.00
Lowe	HF-350	HF Receiver	£295.00
Magnum	M-257	10 Metre, 30 Watt, Mobile Transceiver	£165.00
MFJ	MFJ-1278	TNC All Mode	£175.00
MFJ	MFJ-414	Morse Tutor	£129.00
MFJ	MFJ-722	CW / SSB Filter with 5 Watts Amp	£59.00
MFJ	MFJ-784DSP	DSP Tunable Filter	£140.00
MFJ	MFJ-921	VHF 200 Watt ATU	£50.00
MFJ	MFJ-934	ATU and Built In Artificial Ground	£140.00
Microwave	28/144	28 / 144 MHz Transverter	£125.00
Microwave	MOD-144/30	30 Watt Amplifier	£79.00
Microwave	MML-144/100-S	100W 2m Amplifier	£99.00
Microwave	MML-432/50	50 Watt 70 cms Amp, with Built-In-PreAmp	£85.00
Palstar	PS-15	15 Amp Power Supply	£49.00
Pres. Lincoln	10 METRE	10 Metre Multimode	£175.00
RadioShack	Pro-60	200 Channel Handheld Scanner	£99.00
RevCo	RS-2000	60 - 519 MHz Home Base Scanner	£79.00
Rexon	RL-501	Dualband Handheld Transceiver	£99.00
Roberts	R-9914	Receiver	£69.00
Sangean	ATS-505	Receiver (Boxed AS NEW)	£49.00
SGC	SG-231	Smart Tuner	£275.00
Sommerkamp	FT-290R	2m Multimode Transceiver	£150.00
Sony	CV-21	World band Receiver	£950.00
Sony	ICF-SW100E	FM/SW/MW/LW Portable Receiver	£90.00
Sony	ICF-SW7600GR	World band Receiver	£99.00
Standard	C-156E	2m Handheld Transceiver	£125.00
TenTec	RX-350	HF Receiver	£999.00
Tokyo	HL-30V	2m - 25W Amplifier	£75.00
Tokyo	HL-35V	2m Power Amplifier with Pre-Amp	£89.00
Tokyo	HL-37V	Linear Amplifier	£60.00
Tono	T-777	Communications Terminal	£120.00
Transverter	QM-70	28/144 Transverter	£100.00
Trident	TRX-200	Latest Scanner	£175.00
Trio	TR-9000	2m Multimode	£199.00
Trio	TR-9130	2m All Mode Transceiver	£250.00
Trio	TS-530SP	Mains HF Base Transceiver	£275.00
Uniden	UBC-780XLT	Base Scanner with Trunking Software	£249.00
Uniden	UBC-860XLT	Base Scanner / Receiver	£99.00
Uniden	UBC-9000XLT	Base Scanner	£199.00
Welz	AC-38M	200W Mobile Matching Network	£50.00
Welz	CT-150	Dummy Load	£50.00
WinRadio	WR-1550E	Trunking Software	£450.00
Yaesu	FP-700	Power Supply	£100.00
Yaesu	FP-757GX	Power Unit for FT-757	£300.00
Yaesu	FP-800	Yaesu Power Supply (MINT & BOXED)	£199.00
Yaesu	FR-101	HF, 2m, 6m Base Transceiver	£399.00
Yaesu	FRG-8800	Receiver Including Converter	£399.00
Yaesu	FRG-9600	Communications Receiver	£199.00
Yaesu	FRT-7700	Antenna Tuner for FRG-7700	£60.00
Yaesu	FRV-7700	Converter for FRG-7700	£60.00
Yaesu	FT-100	HF / 6m / 2m / 70cms Mobile Transceiver	£499.00
Yaesu	FT-1000MPmkV	200W DSP HF Transceiver (2 months old)	£1,800.00
Yaesu	FT-1000MPmkV-Field	Top HF Radio - AC	£1,500.00
Yaesu	FT-1500M	2m 50W Mobile Transceiver with DTMF Microphone	£129.00
Yaesu	FT-221R	2m Multimode Base Station	£200.00
Yaesu	FT-2600M	Mobile VHF / FM Transceiver	£120.00
Yaesu	FT-290RmkII	2m Multimode Mobile Transceiver	£225.00
Yaesu	FT-41R	Handheld Transceiver	£120.00
Yaesu	FT-470R	Dual Band Handheld	£129.00
Yaesu	FT-480R	2m Multi-mode 10W out put (MINT)	£250.00
Yaesu	FT-50R	Dual Band Handheld	£150.00
Yaesu	FT-5100	Dual Band Transceiver	£199.00
Yaesu	FT-51R	2m / 70cms Handheld Transceiver	£199.00
Yaesu	FT-690R	6m Multimode Mobile Transceiver	£199.00
Yaesu	FT-7	HF Mobile Transceiver	£200.00
Yaesu	FT-7100M	2m / 70cms Mobile Transceiver	£220.00
Yaesu	FT-726R	6m / 2m / 70cms / HF Transceiver	£575.00
Yaesu	FT-726R	2m / 70cms / HF Transceiver	£400.00
Yaesu	FT-76R	70 cms Handheld Transceiver	£99.00
Yaesu	FT-790R	70cms Multimode Transceiver	£175.00
Yaesu	FT-790RmkII	70cms Multimode Transceiver	£250.00
Yaesu	FT-8100R	2m / 70cms Mobile Transceiver	£220.00
Yaesu	FT-817	Mobile HF, VHF, UHF Transceiver	£450.00
Yaesu	FT-847	HF / 6m / 4m / 2m / 70cms Satellite Transceiver	£899.00
Yaesu	FT-8500	Dualband Mobile Transceiver	£199.00
Yaesu	FT-897	Multiband Transceiver	£850.00
Yaesu	FT-900AT	Yaesu HF Transceiver with ATU (MINT & BOXED)	£599.00
Yaesu	FT-920AF	HF / 6M Base Transceiver	£899.00
Yaesu	FTV-101Z	External VFO	£99.00
Yaesu	FTV-1000	200 W Transverter	£475.00
Yaesu	FTV-430MHZ	Module for Transverter	£99.00
Yaesu	FTV-901R	Transverter including 2m Module	£165.00
Yaesu	MW-1	Remote Control Microphone & Infra-Red	£60.00
Yaesu	SP-901	External Speaker	£30.00
Yaesu	SP-980	Speaker	£60.00
Yaesu	System 600	HF Commercial Radio	£600.00
Yaesu	VR-120	FM / WFM / AM Receiver	£99.00
Yaesu	VR-500	Yaesu Handheld Scanner	£149.00
Yaesu	VR-5000	Top Class Base Scanner	£450.00
Yaesu	VX-1R	Handheld Transceiver	£120.00
Yaesu	VX-2E	Dualband Handheld Transceiver (1 month old)	£129.00
Yaesu	VX-5R	Triband Handheld	£220.00
Yaesu	VX-7R	Triband Handheld	£240.00
Yaesu	XF-114SN	2KHz SSB Filter	£60.00
Yupiteru	MVT-3300	Handheld Scanner	£99.00

RADIOWORLD

42, Brook Lane, Great Wyrley, Walsall, WS6 6BQ.
Tel: 01922 414796 Fax: 01922 417829
Web: www.radioworld.co.uk e-mail: sales@radioworld.co.uk

Z-100 £129.95

Automatic Antenna Tuner.
Covers 1.8 - 54MHz.
0.1 - 125 Watts.
200 Fast Memories.
Tunes antenna in 0.5 - 6 seconds.
SWR Rating of 10:1.

Z-11 £129.95

Portable Automatic ATU.
Covers 1.8 - 30MHz.
Tunes in antenna in 0.1 - 3 seconds.
Power rating 0.1 - 60W.

AT-897 £199.95

Automatic ATU for use with FT-897.
Covers 1.8 - 54MHZ.
HF Power Rating: 0.01 - 100W.
Approximate SWR Rating of 10:1.
Tunes antenna in 1 - 7 seconds.
CAT can also be used at the same time.

RBA-1 £29.95

4:1 Balun.
Covers 1.8 - 30MHz.
Takes upto 200W.

K-OTT £49.95

Kenwood One Touch Tune.
Interface module from Kenwood
to AT-11MP or RT-11.
Compatable with most Kenwood radios.
Also available is the Y-OTT (for Yaesu)

RT-11 £179.95

Waterproof Automatic ATU.
Covers 1.8 - 54MHz.
5 - 125W of RF Power.
Tunes antenna in 0.1 - 5 seconds.
SWR Ratio 10:1 or less, 3:1 on 6m.

AT-11MP £199.95

Automatic ATU.
Covers 1.8 - 30MHz.
Cross needle meter measures,
forward & reflected, power & SWR.
Tunes in antenna in 0.1 - 5 seconds.
Inter-connecting radio cables available.

AT-1000 £499.95

1kW Automatic ATU.
Covers 1.8 - 54MHz.
1kW SSB. 750W CW.
500W Digital. 100W 6m.
Tunes antenna in 1 - 8 seconds.
Approximate SWR Rating of 10:1.

By Steve Hartley, G0FUW, 5 Sydenham Buildings,
Lower Bristol Road, Bath BA2 3BS. E-mail: newcomers.radcom@rsgb.org.uk

Reports from tutors and newcomers alike this month. Many thanks for the input, keep it coming.

Newcomers' news

First of all I must correct two small mistakes in the December column. Jessica Marsh holds the callsign M3JMN *not* M3JMH and she attended the QRP Convention at Rochdale with her grandparents not her parents. Apologies for the errors and thanks go to Bernard, G6TET (Jessica's proud grandfather) for putting the record straight. Keep in touch Jessica!

RUISLIP CLUB STILL ACTIVE

It has been a while since we had news from Ruislip but Don Lamb, G0ACK, sends word that he is almost at the end of running his first Intermediate course. Indeed, by the time you read this, his three students should have sat their exams and will hopefully have their 2E0 callsigns.

Don followed the *Intermediate Licence* training book and the course went well. He says that he is fairly meticulous in preparing his lesson plans and offers this idea for others to share: "I get a pair of scissors and then cut up the 'Intermediate Licence Guidance Notes (A Guide to Tutors)'. I then paste the relevant parts on to plain white card and use highlight pens go over the important points. This way I get my notes to match the textbook and the syllabus references. I have also done this for the Foundation course."

Sounds like a good idea, thanks Don.

MUSINGS OF AN MW3

Hilton Willott, MW3HNW, passed the Foundation examination in July 2001 thanks to the support of two local amateurs. Having got his callsign he realised the course was just the start of a much longer (life-long?) learning curve. He found that whilst the hobby has its technical side there is also a requirement to become aware of the correct operating practices or 'protocols'.

Hilton reports that "The amateur radio community is 99% friendly but you will no doubt meet the 100th one on occasions. I met mine on a trip to a well-known amateur store where the person serving me expressed his views on M3s as 'letting ******* Joe Public in'. I had thought that he might appreciate the extra business. This, however, was an isolated incident.

"My advice is to listen a lot and transmit rarely, especially in the first few months. The longer contacts that us M3s make are most likely to be as a result of excellent equipment and a highly skilled operator on the other end. Thank you all of you who have come back to me. I ignore pile-ups as my 10 watts and modest antenna stand no chance against the big guns. I tend to listen on frequencies where interesting callsigns have been previously heard and then pounce after the CQ. I have a VK (Australia) and an HC8 (Galapagos Islands) in the log. No-one was more surprised than me."

Has he been tempted to turn up the power? "Yes of course, but what is the point? It is about personal achievement and I would only be cheating myself (and breaking the law). I have had some great QSOs and made many new friends on the air with the power that I have. Had there not been the Foundation licence I doubt if I would have started amateur radio, so thanks to the people with the vision and nerve to implement it."

Hilton took the RAE in December as he would like to operate maritime mobile and maybe even activate an island or two. He doubts if there are many hobbies that have so many different facets to it. As he says, "It is, at the same time, fascinating, frustrating, compelling and immensely challenging. I look forward to many years in the hobby and many more QSOs."

A great report Hilton, keep us informed of your progress.

UP THE POLE?

Martyn Metcalf, M3VAM, has been active on the bands using a 'Buddipole' antenna at his QTH (home) in Chelmsford. The antenna is a short multi-band dipole for 7 - 145MHz weighing in at 1.6kg and packing down to about 70cm in size, ideal for portable use. The antenna is manufactured in the United States (see 'Websearch' below) but can be purchased in the UK from Waters & Stanton plc.

Martyn says his took just a few minutes to assemble and tune up with SWR readings of around 1.7:1 or less. Using it on the 14 and 21MHz bands during a weekend contest he made 150 contacts in 39 countries including 4L (Georgia) and VP5 (Turks and Caicos Islands). The antenna was just 6m above the ground in Martyn's garden.

It certainly sounds like a good option for those with limited space or a desire to take the radio out portable. Thanks for the report Martyn.

Above: Martyn Medcalf, M3VAM, and his 'buddy' (see 'Up the Pole?')

Left: 2002-03 President Bob Whelan, G3PJT, presented Steve Hartley, G0FUW, with the Bennett Award at the RSGB's AGM in December.

POST SCRIPT

At the Society's AGM on 6 December, the author of this column, Steve Hartley, G0FUW, was presented with the Bennett Award. The award is normally made for a single outstanding article, but this year the award committee decided that it should be made to Steve for the consistency and quality of this column. Congratulations Steve and well done! - *Ed.* ◆

WEBSEARCH

BUDDIPOLE ANTENNA	www.buddipole.com
WATERS & STANTON PLC	www.wsplc.com

'Minimal systems' for VHF/UHF DX

For many, a daily or weekly chat on the local repeater satisfies the need for companionship and technical challenge. However, for most the amateur radio licence is the means to make contact with foreign countries - and at VHF that can be a considerable challenge. This feature, by Tony Jarvis, G6TTL, gives some pointers for those starting out on the road to VHF / UHF DX.

The author, Tony Jarvis's, G6TTL, VHF and UHF antennas: an 8-element Yagi on 2m and, above that, a 16-element Yagi for 70cm.

The amazing loft space of Derek, G8TOK, replete with antennas from 70MHz to 1.3GHz.

Leafing through *RadCom* you see reports of DX worked by some stations and that starts you thinking - maybe it is what inspired you in the first place. "But hang on a minute", I hear you say: "I can't afford big amplifiers and I can't put up 70ft towers with massive antennas!" Well, the short response is that you needn't - a great deal of enjoyment can be gained by using minimal systems that don't cost an arm and a leg. In some ways such a 'minimal system' forces you to learn how to make the hobby work for *you* , so - when time and finances allow - you will have a much fuller understanding of propagation and the skills to work that elusive DX.

EQUIPMENT

Power levels can be quite modest and rigs developing 3 or 10 watts are available at very reasonable prices in the Members' Ads or from local club members. An FT-290 for 2m (or FT-690 and FT-790 for 6m and 70cm respectively) would give you the opportunity to try a number of different modes and experience mobile and portable operation at no great financial outlay. Having obtained a rig the next thing is of course the antenna and, no, you definitely don't *need* to have a box of four Yagis - nice though that might be. Choice of antenna can very much be a matter of compromise, and in most urban areas a very serious compromise. We don't all live in a rural area and have several acres for our antennas. There may also be 'domestic' restraints and planning restrictions imposed by the local authority. If you have understanding neighbours the situation can be easier; the last thing you need are neighbours who are 'anti-radio'! VHF beams are not as easy to 'hide' as HF long wires, but a vertical for 6m can be discretely concealed, or at least made less obvious. Start small - an 8 or 9-element 2m Yagi looks small when in the air and of course to a layman a 70cm antenna doesn't look much different from a TV aerial.

So what if you can't put antennas up outside? Don't give up - if you have sufficient space in the loft that may present a possibility. Someone who operates very successfully with loft-mounted antennas for all bands from 70 - 1296MHz is Derek, G8TOK.

INTERVIEW WITH G8TOK

I spoke to Derek recently and began by asking him what is was that influenced the decision to go indoors.

G8TOK: "It was not from choice. Problems with neighbours prevented beams from going outside."

G6TTL: "You've got antennas for four bands in your loft, isn't that a bit tight?"

G8TOK: "Yes, but they did not all appear at once! When I first got my licence Class B amateurs were only allowed to use 144MHz and above, and I started off with a 6-element quad for 144MHz, selected because it was shorter than a beam and had high gain. After a great deal of experimentation I could just get it to rotate within the loft space although the clearance is less than 2cm in places, owing to the wooden beams. It seemed to work reasonably and I had QSOs with SM, OK and HA during lift conditions. At the time, 432MHz was the second band for Class B stations, and when I got a dual-band transceiver I decided to try adding a 48-element multibeam, also selected because it had high gain and was short. It rotated within the space but was a disaster because it interacted with the vertical metal support pole going through the elements and there was almost no forward gain. Unwilling to be defeated, I obtained another MBM48 [48-element multibeam] and tried baying them either side of the mast. There was no room to stack, but there was reasonable horizontal separation. It worked and I had contacts into SM, LA and OK. I was only too aware that my system was 'deaf' - attenuated by the roof - so over time I added very low noise preamps for both bands. I also use Heliax LDF4-50 cable to squeeze every bit of gain out of the system. It is still far from ideal, but better than nothing!

"Much later I wondered if I might be able to add 1296MHz beams at the top of the mast. I had learned from the 432MHz experience and also bayed them either side. I did not expect them to work, but much to my surprise they did, and my best DX is over 1000km into SM.

"Later still I added a 3-element beam for 70MHz, but this was not very successful for tropo contacts. However, it works fine with strong signals on Sporadic E. For more serious 70MHz work I use a very temporary portable mast in the garden, but this is only up for a few hours at a time, mainly for contests and MS work."

G6TTL: "Did you take any special precautions about avoiding water tanks, electrical wiring etc during the installation?"

G8TOK: "There was no room. There was only one position in which the antennas would rotate. I had to accept that in one direction on 432MHz I would beam into the water tank, luckily it is to the south west, straight down the English Channel, where there are no stations! There is a danger of interaction, but I need to

get on with my neighbours so I virtually never operate during TV hours. Despite using 250 watts for MS on 144MHz - yes MS works too - into S5, YU and I - I have never had a TVI complaint. Well, actually, I did have one, but I was not operating at the time, and it turned out to be a local PMR transmitter! I fitted a filter anyway, having first demonstrated that it was not me."

G6TTL: "The handbooks all discuss minimum spacings and interaction between adjacent antennas. Have you been aware of any interaction between the antennas and if so how much?"

G8TOK: "I have never tried to measure it because I know my system is poor. When you only have one option you make the best of what you have got. When I added 432 and 1296MHz I was not aware of any deterioration in performance, but adding the 70MHz beam certainly attenuated 144MHz, because the two beams are together. I expected that result, but I wanted a 70MHz facility so I had to live with it. 70MHz has nevertheless got me into S5, ZB, EI and GM."

G6TTL: "With such a potentially short distance between your antennas and the TV aerial system did you make any special provision to reduce interaction?"

G8TOK: "My TV system is not 'normal' because I am into DX TV. I have two huge Unix antennas, one 44-element beaming north and one of 96-elements beaming east towards PA and DL. Both are outside and have substantial low noise preamps fitted. I can get away with TV aerials because so many of my neighbours have them. I look for distant TV signals to detect lift conditions and can receive TV from OZ, SM, PA and DL to name but a few. Using these large aerials makes my local TV signal so strong that I have to attenuate it. There is no trace of my amateur signals on my domestic TV system, except a portable in the shack, and an RSGB six-way filter killed that problem."

G6TTL: "The roofing material in some instances increases radiation losses. Has this been significant?"

G8TOK: "Yes, but the preamplifiers mentioned helped."

OTHER SOLUTIONS

Derek developed his system over a number of years and it is now very sophisticated. It has brought him great success - he is the only person to have been awarded RSGB 'Senior' awards at 50, 70, 144 and 432MHz and a 'Standard' one at 1296MHz.

If something as large as this doesn't appeal, Colin Harlow, G8BTK, successfully uses loop antennas in his loft.

If the decision is that the loft is where the antennas must go, do make sure that the installation is safe from a structural point of view. Do not modify any of the structural roof timbers and do seek professional advice if you're not sure. You could invalidate your insurance policy and be required to reinstate items by the Building Control Department of the local authority. Mistakes and errors in this field can be very expensive to correct, especially if you have to employ professional assistance.

Irrespective of where the antenna is to be sited, you have to choose its size. Effectively the longer it is, the more concentrated is your transmitted energy, making the most of the limited power available - but your receive area is reduced. A shorter antenna will enable you to receive signals over a wider area.

In the early days I operated with nothing more sophisticated than an FT-221R and a 9-element Tonna and it brought back pleasant memories finding a number of current Foundation Licence holders giving a new lease of life to those older rigs.

GLOSSARY

Bay(ing) Using two or more similar antennas side-by-side (cf Stack(ing)).

DX Loosely defined as any long-distance or otherwise 'rare' contact.

Heliax LDF4-50 A type of high-quality low-loss 50 W coaxial cable.

MS Meteor Scatter: using regular meteor showers or random meteors entering the atmosphere to reflect VHF signals in order to make DX contacts.

PMR The Private Mobile Radio service.

QSO A two-way radio contact. One of the many 'Q-Codes', originally used to speed up regularly-sent messages on Morse code, but now also widely used by radio amateurs on voice modes.

quad A type of beam antenna with two or more elements based on a full-wave loop.

Sporadic E Signals which are reflected in the E layer of the atmosphere on a regular but unpredictable basis, and which can provide medium to long-distance contacts on the VHF and higher HF bands.

Stack(ing) Using two or more similar antennas one above the other (cf Bay(ing)).

Tonna A French manufacturer of VHF antennas.

tropo Tropospheric propagation: reflection of signals in the troposphere (as opposed to the ionosphere).

TVI Television Interference: something to be avoided at all costs!

Yagi A type of beam antenna with two or more elements based on the half-wave dipole.

SM, OK, HA, LA, S5, YU, I, ZB, EI, GM, PA, DL, OZ Amateurs often refer to countries by their callsign prefixes. In this case: Sweden, Czech Republic, Hungary, Norway, Slovenia, Serbia and Montenegro, Italy, Gibraltar, Ireland, Scotland, the Netherlands, Germany, and Denmark, respectively.

LOW POWER

Initially you may well not have the budget available for high power, so what can you do with low-power? A surprising amount actually, but first you have to learn a few things about the band(s) you intend to operate on.

For many years UK Novice licence holders (now the Intermediate licence class) were restricted to 3W, and Colin Fallaize, MU0FAL, who operated as 2U0ARE, makes these observations about using low power on the VHF / UHF bands:

"Learn as much as possible about propagation, how it works, when it might occur. Look at the weather forecasts and try to see when 'tropo' openings might appear. Obtain a barometer and use it to make your own observations. Use the TV weather maps to establish when a stable high pressure system is over the UK and use that to calibrate your barometer. It doesn't have to be accurate, but it does need to show change - either up or down.

"Use this information and when openings occur get on the band early and listen! Use the many beacons to assess where the best directions might be. The *RSGB Yearbook* has complete lists of both UK and European beacons which include antenna, power and direction.

"During openings look for the stations without 'pile-ups', you're more likely to be successful. When you find a strong station with a pile-up keep returning to the frequency and refrain from calling until the number of callers start dropping off - there's little point in competing with high power stations.

"When intensive Sporadic E openings occur, try at the start and end of the openings as you may have trouble competing with noise levels at peak times.

"Participate in as many contests as possible. An ideal introduction to contesting is the RSGB 'Backpacker' series which is for restricted stations.

"Make the *RSGB Yearbook* a regular purchase and use the band plans! Join the RSGB and also if your interests lie towards 6m also join the UK Six Metre Group (UKSMG). Both the RSGB and UKSMG provide propagation and activity information and have comprehensive websites."

So there you have it in a nutshell. Good operating and good DX! ◆

WEBSEARCH

RSGB WEBSITE	www.rsgb.org
RSGB VHF AWARDS	www.rsgb.org (then navigate 'Operating', 'VHF/UHF and follow the link to VHF/UHF Awards')
RSGB VHF CONTEST	www.rsgb.org (then navigate 'Operating', 'RSGB Contests & DF' and follow the link to 'RSGB VHF Contests Committee')
UK SIX METRE GROUP	www.uksmg.org

By Pat Hawker, G3VA,
37 Dovercourt Road, London SE22 8SS

TT

This month, Pat follows on from some previous 'TT' items. There is more on dynamic power control, small loops and the CFL, and bright LEDs. Also discussed are some spectrum management issues in the light of the establishment of Ofcom, and the lurking spectre of PLT. To round off, there is news about a new HF OTH radar system.

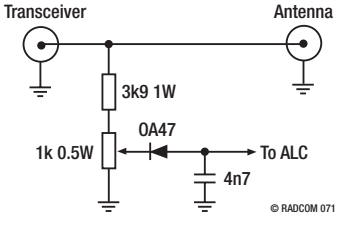
DYNAMIC POWER CONTROL MkII

'TT' June 2003, p70 with associated Fig 8 on p71 featured a possible solution, suggested by Brian Horsfall, G3GKG, to a problem facing many newer licensees, such as the M3s, but also useful to older licensees interested in low-power operation when using a 100W-class transceiver: dynamic power limiting based on existing automatic level control circuitry.

This has prompted a comment and suggested improved circuitry from Dave Gordon-Smith, G3UUR. He writes: "The dynamic power limiting circuit by G3GKG produces a negative voltage to control the power through the ALC circuitry of a transceiver. I went down the same path back in 1991, when I resurrected from the dead a small commercial 100W transceiver for portable use on 1.8MHz. Initially, I used a 9V battery to set the power to 30W, but the ALC circuitry proved so sensitive that the variations of battery voltage with temperature caused the output power to vary too much. So I abandoned this approach in favour of a closed-loop controller.

"My second version used a simple voltage sensor at the output of the transmitter, **Fig 1**, comprising two resistors to tap down the RF voltage, and a diode and capacitor to provide a negative DC voltage to the ALC.

Fig 1



This proved satisfactory for use during my 1.8MHz portable operations, as I always used an ATU that presented the output of the transceiver with a near 1:1 SWR.

"Later, when M3 licences were introduced, I made up several of these power-reducing units for the new licensees. However, complaints were received that the power was varying too much from band to band, and within the bands. When I quizzed the complainants about what antennas they were using, the problem became apparent. They were using trap dipoles and triband beams with SWRs up to 2:1. This meant that voltages and currents at the output were varying considerably from the 50Ω 10W case. G3GKG's current-sensing power controller will suffer from the same limitation.

"The solution is to use a true power sensor at the output. This increases the component count, and the complexity of the circuit, but it can still be made as quite a small unit. The circuit I ending up building for my M3 friends is shown in **Fig 2(a)**.

"A single current transformer version of the SWR sensor could be used, if preferred, instead of the two-transformer version as described by Sonderheim and Fredericks in *Ham Radio* in the 1970s. Personally, I have used two-transformer sensors in their version for many years, and prefer their approach. If the ALC voltage is taken only from the forward sensor (dashed line connection) only the forward power will be controlled.

"A further improvement could be made by reversing the polarity of the reverse power diode with respect to the forward power diode (as in diagram), and passively summing the voltage in a resistive divider (see **Fig 2(b)**). This provides a feedback voltage that is a measure of the difference between the forward and reverse powers. This should give more uniform power delivered to the load under varying SWR conditions, but will limit the lowest power at which control can be affected, unless active circuitry is used. I tried to keep my version passive for simplicity.

"The unit is built into a small box with coax connectors for insertion in-line, and works down to a few watts. Obviously, the lowest controlled power depends on the ALC circuitry and varies from one transceiver model and maker to another.

"T1 and T2 are 10 turns of 0.2 or 0.3mm diameter enamelled wire on T50-43 toroid formers with the coax cable (complete with outer conductor and PVC sheath) pushed through the

Fig 2a

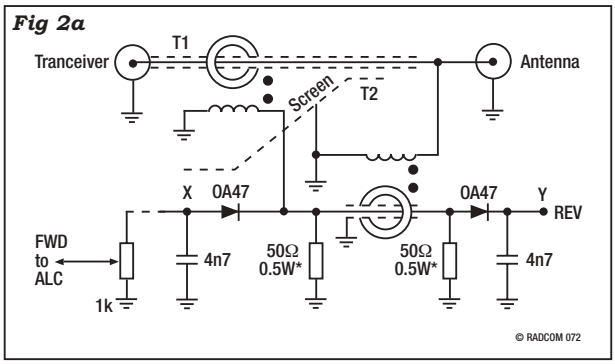


Fig 2b

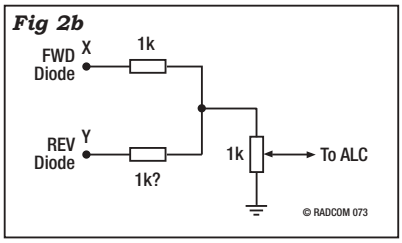


Fig 1: Voltage sensor power controller.

Fig 2: (a) Power sensor version of dynamic power controller as built by G3UUR. *see text. (b) His suggested modification to improve power control.

centre to form the one turn winding. Note that the coax outer conductor is only grounded at one end on each of the transformers. If the power controller is left in circuit at power levels of up to 100W for prolonged periods, the power rating of the resistors marked * should be increased to 1W or more.

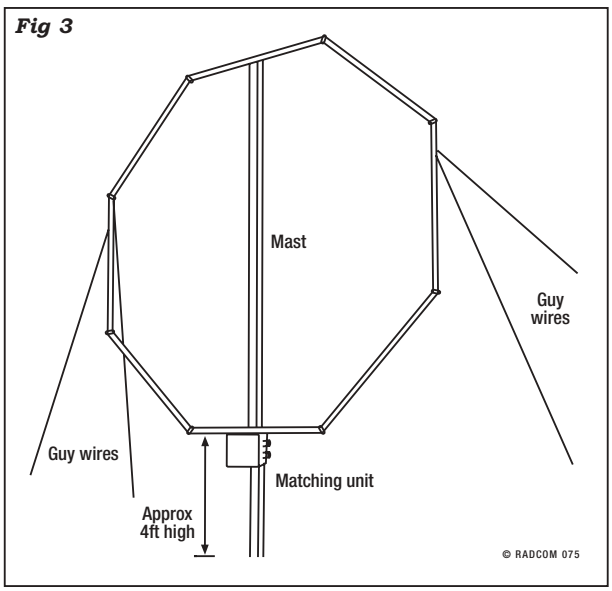
"Some further slight improvement might be made by optimising the value of the reverse-power weighting resistor, marked '1K?' although I suspect it will not be worth the effort." See the August 'TT' comment on the G3GKG controller

SMALL LOOPS & A HOME-BREW CFL

There are times when I regret that, 36 years ago. I was the first ('TT' November 1967 see *Antenna Topics,* pp19/20) to draw the attention of UK radio amateurs to the potential value of the octagon HF transmitting loop antenna with 5ft sides that had been developed by the US Army Limited War Laboratory for use in the jungles of Viet Nam (*Electronics,* 21 August 1967*).* I wrote: "Altogether, this type of approach to loops seems to offer the promise of efficient aerials for the lower frequency bands in sites where this would otherwise be almost impossible; their value for 1.8, 3.5 and possibly for 7MHz would certainly seem to be well worth investigating if some large diameter alloy tubing is available..."

Sure enough, the US Army design sparked off world-wide development of small transmitting loops for many applications, amateur radio and professional. The original claim was that the Army loop, (**Fig 3**), with its low-loss capacitance matching unit and 1.5in diameter aluminium tubing could "usually do as good a job as a full-length dipole 40ft above the ground." This was interpreted very loosely as suggesting that the overall radiation efficiency of the loop must approach that of a half-wave dipole over its tunable range.

Fig 3: The 2.5 to 5MHz octagonal loop antenna with eight 5ft sides using 1.5in-diameter tubing developed in the 1960s for the US Army and described in 'TT', November 1967. This was the design that sparked off amateur interest in small transmitting loops.



It was not realised until later that this flew in the face of the long-accepted theory of electrically small antennas. It has been argued, notably by Prof. Mike Underhill, G3LHZ, that "for loops, the simulations and ancient formulas can be as much as 20 to 30dB in error as compared with the 'truth' of the real measured results." In his interesting, but to some, flawed, contribution: 'The Truth about Loops', *International Antenna Collection* (RSGB, 2003, pp229-246), he again reiterates his belief:

"The very low efficiencies for the loop predicted by such simulations and existing 'traditional' theory [such as the Chu-Wheeler formulae] are shown by measurements to be, quite frankly, ridiculous; up to 1000 times (30dB) in error at low frequencies. How can such large errors have been overlooked for so long? It is a bit of a mystery and arguably a bit of a scandal!"

Mike Underhill clearly sees himself in the guise of a Giordano Bruno, Copernicus or Galileo striving to prove that the earth is not flat and the Sun is not the centre of the Universe. He has done much good work in drawing attention to the indisputable fact that the working of a transmitting loop is more complex than often thought, and in investigating many aspects of small loop design. But I hope I shall not be labelled reactionary if I suggest that rather than a latter-day Bruno, G3LHZ is in danger of being considered by his professional peers as a Don Quixote tilting at windmills.

It has always seemed to me that G3LHZ's ideas fall foul not only of Chu-Wheeler, but of the fundamental reciprocity theorem. A small loop receiving antenna frequently provides a signal-to-noise ratio superior to a full-size dipole, but the signal output is well-down – otherwise there would be no call for an *active* loop antenna incorporating amplification and matching circuitry. Or am I wrong, and the active device(s) required only to provide matching?

As Dr Brian Austin, G0GSF, points out: "Further, heavy calibre, ammunition against the Underhill-Harper conjectures (but with no reference to them) is published in *IEEE Trans Ant & Prop* (Vol 51, No 8, August 2003) in two associated papers: 'Physical Limitations of Antennas' and 'A Method for the Evaluation of Small Antenna *Q*'. Both are by Dr Wen Geri, the Senior Scientist at Research in Motion, Waterloo, Canada. Though very mathematical, it is worth wading through them to the crucial finding where the Chu limits:

$$Q_{min} \approx 1/(ka)^3,$$

with $k = 2\pi/\lambda$ and a the radius of the smallest sphere that surrounds the antenna, are not shown to be wanting, as Mike would have us believe. I await his rebuttal of the Wen papers with interest." Incidentally, the second paper is based on "the understanding that, for a small antenna, the total energy in the Poynting theorem can be separated into the stored energy and radiated energy by using the low frequency expansions... By solving these equations, the stored electric and magnetic energy can be obtained, thus making the *Q* calculation possible."

These papers are indeed highly mathematical and I would not attempt to comment on Dr Geri's detailed analyses. I do note in a section on the small loop antenna that he puts the *Q* as about three times lower than that of a small dipole and the input impedance as given by Schelkunoff. He also states: "It is well known that there is no mathematical limit to the gain that can be obtained from currents confined to an arbitrary small volume. But a small-sized antenna with extremely high gain will produce high field intensity in the vicinity of the antenna, which results in high heat loss or high stored energy."

In fairness, I would emphasise that G3LHZ's article does present useful new practical information, for example a list of 'Rules for the design of better loops', with which few would quarrel. Similarly, his emphasising that "no aerial is better than its environment" and that "small aerials are rarely if ever in a 'good' environment... Apparently reasonable environments can give 'apparent' efficiencies that can differ by up to +6dB to -20dB from what might be expected."

On GM3HAT's patented CFL antenna, G3LHZ comments: "The original patent shows two tightly-coupled loops oppositely detuned to achieve a 90° phase shift between them... What is most notable about the CFL is its relatively wide bandwidth of operation (after tuning). This is far more important than any pointless and sterile philosophical argument about whether or not it works by Poynting Vector Synthesis..."

The claim for the unusually-wide bandwidth of the CFL seems to be borne out in an article by well-known Australian amateur, Lloyd Butler, VK5BR: 'A crossed-field loop antenna for 3.5MHz' (*Amateur Radio,* April 2003, pp24/25). VK5BR describes experimental work carried out on a home-brew CFA, including the problems in making it work and the performance achieved. He took great care to achieve the 90° phase shift between the two currents using external reactive circuits as shown in **Fig 4**. His square loop is mounted on a wood cross with arms 1m long. UR67/U coaxial cable forms a square with sides of 86cm. Very briefly, he found that the CFA loop holds a tolerable match over a 75kHz range, although he found the performance around 20dB down on a full-size wire antenna.

He concludes: "Well I can't say I am

madly excited about this antenna. It will transmit and receive but not as well as a quarter wave Marconi antenna. (My observations indicate around 20dB difference both on receiving and transmitting). On the other hand, it might be the answer where one needs to get on 3.5MHz, at least with some sort of signal, but doesn't have the space for a larger antenna. I see no problem for the home constructor in making the unit if he can find some suitable variable capacitors of high enough capacitance and which will withstand both high voltage and high RF current. I see a problem if he doesn't have some means to monitor and set the two loop phase currents correctly."

SPECTRUM, OFCOM & PLT

The synopsis of the 39th Appleton Lecture which, by the time these notes appear, will have been given on January 8, 2004 at the IEE by Martin Cave, the Director of the Centre for Management under Regulation, Warwick Business School, University of Warwick outlines 'a revolutionary switch' by Ofcom to the use of market methods in the way that the frequency spectrum will be assigned to both public and private sector users. "Under the new regime, spectrum licences will be bought, and sold, broken up or amalgamated or leased. It will also be possible, subject to international agreements, to change the uses to which spectrum is put. In the UK this new regime will be introduced progressively from 2004-8."

The synopsis continues: "The logic of the new system is to allow spectrum to be used more productively; private firms will be able to acquire it to enter profitable markets; public bodies will have an incentive to economise on the spectrum they use to provide public services. In an ideal world, spectrum will be priced, but cheap, as artificial scarcities are eliminated.

"These changes coincide, and are driven by, new demands on spectrum and the emergence of new technologies such as software-defined radio and ultra-wide band, which will radically change spectrum use.

"But there are obvious problems: Can interference be controlled when there is change of use? ... Can a market in the UK co-exist with administrative [spectrum] assignment in neighbouring countries? Will high spectrum prices crowd out opportunities for innovation? What is the role for unlicensed spectrum, which promotes new technologies such as Wi-Fi? The lecturer will outline the pros and cons of markets, identify the key risk factors involved and discuss how they can be controlled."

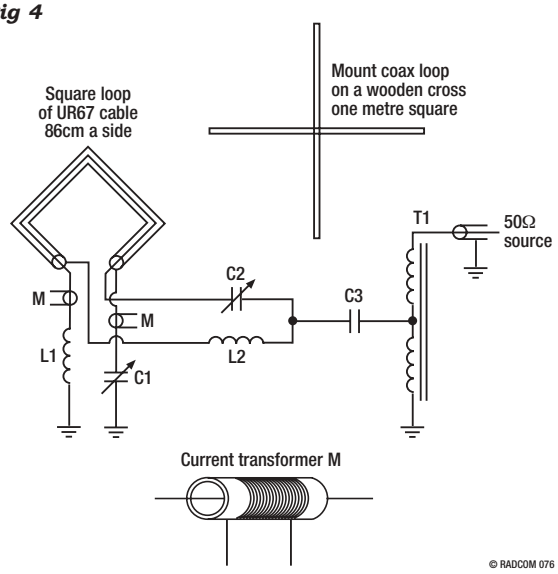
What is clearly the first step in these revolutionary changes took place at the end of December 2003 when Ofcom (Office of Communications) took over the functions and powers of five regulatory bodies – the Radio Authority, the Independent Television Commission, the Office of Telecommunications (Oftel), the Broadcasting Standards Commission and the Radiocommunications Agency. Our amateur licences will henceforth be issued by Ofcom as opposed to the Secretary of State.

It remains to be seen what administrative effect this will all have. Technically, however, there must be some foreboding with regard to interference from such potential sources as Power Line Transmission (PLT or BPL). With the market taking the upper hand, will Ofcom take a less rigorous view on interference levels from broadband data transmission? While exclusive amateur bands will clearly remain (for the present) governed by the international regulations – this would seem to be less certain for the many 'shared bands'.

The switch to market values could also have an effect on interference to weak signal reception from PLT should this be encouraged or tolerated by Ofcom. I have been reading the 32-page BBC Research & Development White Paper WHP 067 *The Effects Of Power-Line Telecommunications On Broadcast Reception: Brief Trial In Crieff*, by Jonathan Stott and John Salter. This copyright report can be found on www.bbc.co.uk/rd/–pubs/whp Briefly, it shows that even with buried electricity distribution lines, both systems being tested interfere with (strong signal) broadcast reception, not only in the premises where PLT is installed, but also in the neighbourhood. Audio recordings demonstrating the interference are available on the BBC R&D website. It is evident from the BBC report that the levels of interference around any PLT installation, even with buried distribution, would be sufficient to affect amateur HF communication severely. US amateurs, with so much overhead distribution, would be even worse off. An ARRL test in Emmaus, Pennsylvania found "very strong to severe interference to reception all across the HF range. In the area of underground wiring, when a test download was made at one location, ARRL heard strong interference. In the area of overhead wiring a very strong BPL signal was heard everywhere the mobile station was driven."

One must hope that Ofcom will respect the 'Industrial Interference' paragraph in my copy of *Radio Regulations* (ITU Geneva, 1959), which states: "Administrations shall take all practicable and necessary steps to ensure that the operation of electrical apparatus or installations of any kind, *including power networks*, does not cause harmful interference to a radio service operating in accordance with the provisions of these *Regulations*." [My italics. Brought to my notice by G3SBI - G3VA.]

Fig 4



MORE ON BRIGHT LEDs

Dave Gordon-Smith, G3UUR, points out that there is more to consider in replacing pilot and dial lights with bright LEDs than suggested in 'TT' (November, 2003, p72). He also notes that trays of 6V and 12V bulbs still turn up at rallies, while Rapid Electronics sell new MES 6V bulbs for 10p + VAT whereas white LEDs cost upwards of 80p + VAT.

He writes: "However, these bulbs produce considerable heat and can distort plastic dial scales. Changing to LEDs may be beneficial in this respect, but may well upset the thermal balance that the manufacturer intended when providing temperature compensation. LEDs could change a receiver with reasonable stability to one with poor stability. Conversely, one with poor stability might be improved. It is a matter of being aware of possible consequences and experimenting to see if improvements can be made. Wholesale replacement of incandescent lamps with new white LEDs may not be the panacea you expect!

"Some of AD5X's figures for the forward voltage drop of bright LEDs seem a bit odd. White LEDs are usually blue or UV LEDs with a phosphor coating the LED chip. The blue or UV light excites states in the phosphor, producing light over a broad range of wavelengths. Good quality white/blue UV LEDs have a forward drop of about 3.6V at 20mA. By 'good quality' I refer to perfection of the material used – InGaN in this case although, in the technical press, it seems to be generically called GaN (there is some GaN as a buffer layer, just above the sapphire substrate).

"Currently the perfection of InGaN is adequate but not good. It will get better during the next decade or so, just as GaAs and Si did with continued research. Generally, the forward voltage drop of the LEDs is higher for

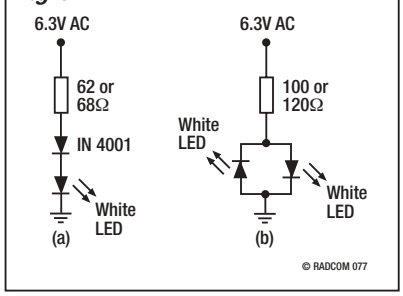
Fig 4: VK5BR's home-built experimental crossed-field loop (CFA) for 3.5MHz.

Fig 5: Improved circuits for running 20mA white LEDs from 6.3VAC supplies.

Fig 6: The UHF G-line surface-wave transmission line. The outer sheathing of each length of coaxial cable is terminated by an open cone. The feeder can be 10 to 16SWG copper wire, preferably enamelled or plastic (dielectric) covered. At microwave frequencies, the attenuation is low enough to permit the use of several hundred feet of line provided that it is kept as straight as possible. The cone diameter, D, should be 0.6L to provide the correct angle for the cone, but L can be any length greater than 3λ..

Fig 7: Driven element with reflector. Dr King suggests 12 properly-phased driven elements and a row of 12 reflecting elements for anchored floating arrays for 28MHz surface-wave radars.

Fig 5



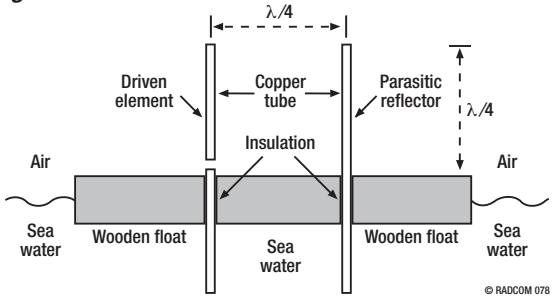
poorer quality InGaN crystals at any given wavelength – and there are some pretty poor crystals around.

"Beware of blue LEDs that are made from GaN (really InGaN and AlGaN epitaxial structures) and have a 4V forward drop at 20mA - they are much inferior, and their reliability and light output will be lower than the better devices. A general rule for the forward voltage drop of an LED is that the shorter the wavelength, the higher the voltage. Green should be higher than amber, and blue slightly higher than green.

"I also have a concern over the peak reverse voltage of InGaN devices. For a 6.3V RMS filament supply this can be as high as or even higher than 9V. InGaN LEDs have a specified reverse breakdown voltage of only 5V. They are tough little critters and will stand such abuse, especially with a current limiting resistor in circuit – but don't expect them to last for the one million hours [over 100 years – *G3VA*] specified for continuous forward operation at 20mA. In reality, they might fail quicker than an incandescent lamp!

"There is a simple fix for this problem – put a diode (1N4001) in series with the LED and this will protect it in reverse bias: **Fig 5(a)**. The series limiting resistor value needs to be reduced to get the same brightness. Alternatively, at extra cost connect two LEDs back-to-back, so that one conducts on the positive half-cycles, the other on the negative. That way you get twice the light output with each LED protecting the other: see **Fig 5(b)**. This allows you to reduce the forward current for the same brightness as one running only half the time; consequently you get a longer life from the InGaN LED and this approach should work out cheaper in the long run.

Fig 7

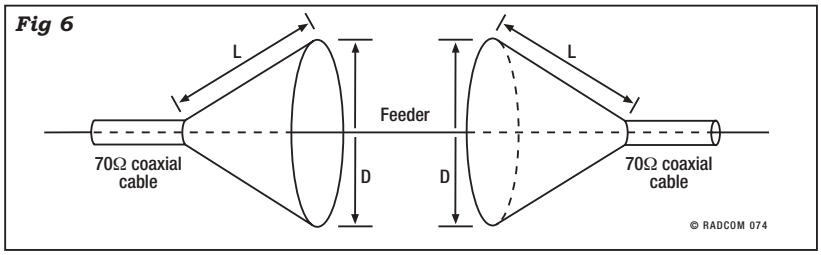


HF SURFACE-WAVE OTH RADARS?

Those who recall the mayhem caused to amateur radio by powerful over-the-horizon HF pulsed radars ('Woodpecker') tend to view all forms of HF radar with some dread. Fortunately, the most intrusive pulsed systems have largely disappeared. So it is sometimes easy to forget that HF radar is still in quite widespread use with research continuing into further development.

In *IEEE Trans Ant & Prop,* October 2003, pp3000-02, R W P King of Harvard University introduces a communication 'Surface Wave Radar and its Applications', with a reference to an existing HF system that makes use of pulses reflected from the ionosphere. He notes that the continued high demand for illegal drugs in the USA has necessitated the US government maintaining two large OTH radars to detect drug-carrying aircraft approaching the USA from South America (notably Colombia). One array is at Chesapeake, VA and the other at Corpus Christi, Texas, together covering the Gulf of Mexico. These typically have a range of about 1000km and operate on frequencies between 5 - 30MHz with a double row of 372 antennas in an array 2.5km wide.

Fig 6



Dr King points out that low-flying aircraft are difficult to detect with the signal returns lost in reflected sea-clutter. Small-boats and small very-low-flying aircraft are virtually undetectable by OTH HF radar. He proposes an alternative with 'quite different properties': surface-wave radar.

Surface-wave propagation is seldom discussed in amateur radio publications, although one practical application is the G-line (Goubau) UHF transmission line: see 'TT' September, 1967 or the more detailed item 'The G-line Feeder' ('TT' August 1984) or briefly in various editions of the RSGB *Amateur Radio Handbook*, etc).

A surface-wave is one that propagates along an interface between two different media, largely without radiation. In the G-line (**Fig 6)**, with a horn launcher and horn collector at the ends, the wave travels outside the dielectric coating of a single wire. Provided there are no sharp bends. little of the electromagnetic wave is freely radiated, so attenuation is low, approaching that of a waveguide.

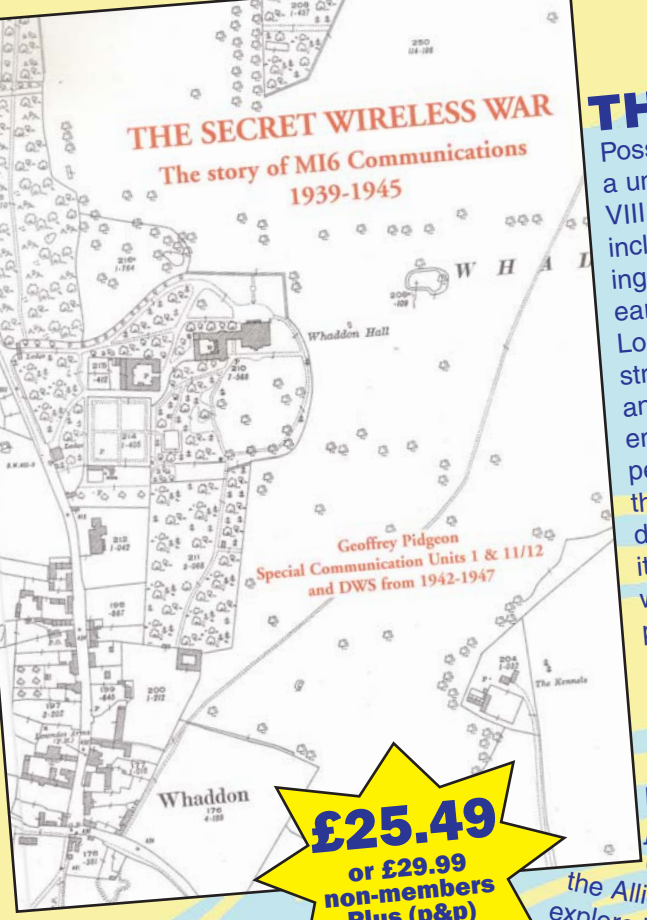
At lower frequencies, to launch an effective surface-wave requires an antenna with an extremely low vertical angle of radiation over an interface such as that between sea and air; and even then some of the radiation will be in the form of a sky-wave.

The system proposed by Dr King would make use of a part of the electric field generated by the RF current in a vertical antenna erected on the surface of the sea. At about 30MHz, the vertically-polarised electric field is radiated outward so that it grazes the surface of the sea as a surface wave as well as extending upwards as a space wave supplemented by a directly-reflected wave.

He states: "A practical surface-wave radar for detecting drug-carrying very-low-flying aircraft or boats on the Gulf of Mexico could consist of an array of 24 vertical dipoles erected on a float. The array would consist of a row of 12 properly-phased, driven elements backed by a row of 12 reflecting elements... The entire structure would be located a few metres from the shore and directed outwards towards the bay... A number of such arrays would be located at suitable intervals around the US shore from its junction with Mexico to Florida, so that radar pulses emitted by the arrays would cover the surface of the entire Gulf of Mexico and the air above it... Effective coverage would be restricted to a few hundred kilometres from each array, but this is more than adequate to locate aircraft or boats nearing the shore."

For anyone living on the coast or operating /MM, a floating antenna (either single element (**Fig 7**) or array would provide a launcher for surface waves and very-low-angle vertically-polarised signals. I recall the pioneering work of Les Moxon, G6XN, many years ago on the use of ground sites sloping down to sea-water lakes as a means of launching signals into some of the super-mode paths such as chordal hop, whispering galleries etc. G6XN originally described his work in *Wireless World*, April 1970 (see brief notes in 'TT' May 1970 and May 1972 and in various editions of *Amateur Radio Techniques*).

'TT' has also included items on an enormous array of vertical monopoles erected in Australia over a very large ground mat used to intercept signals from South-East Asia arriving at a very low angle. There also seems the possibility that genuine surface-waves could provide reliable 28MHz signals across quite large stretches of sea, regardless of the state of the ionosphere. An early suggestion was that surface waves could be used to communicate with lightships, etc. ◆



THE SECRET WIRELESS WAR

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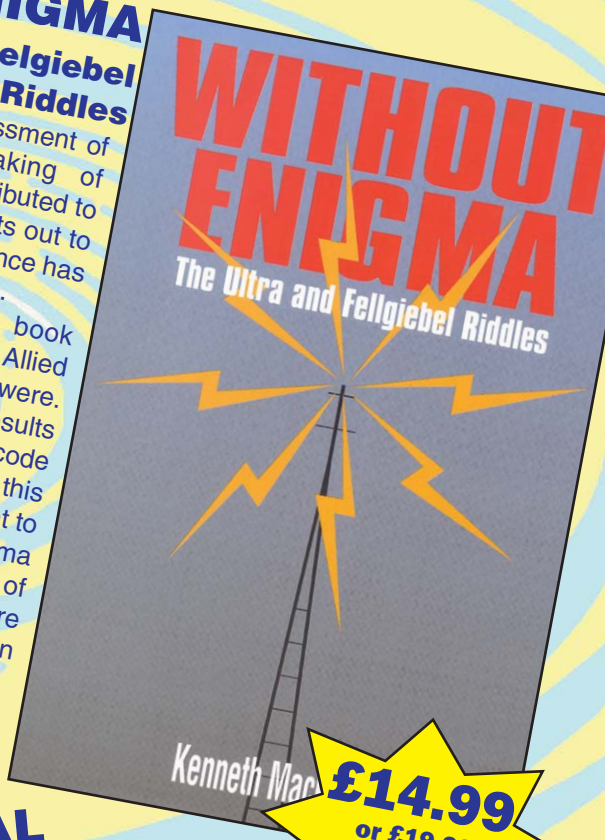

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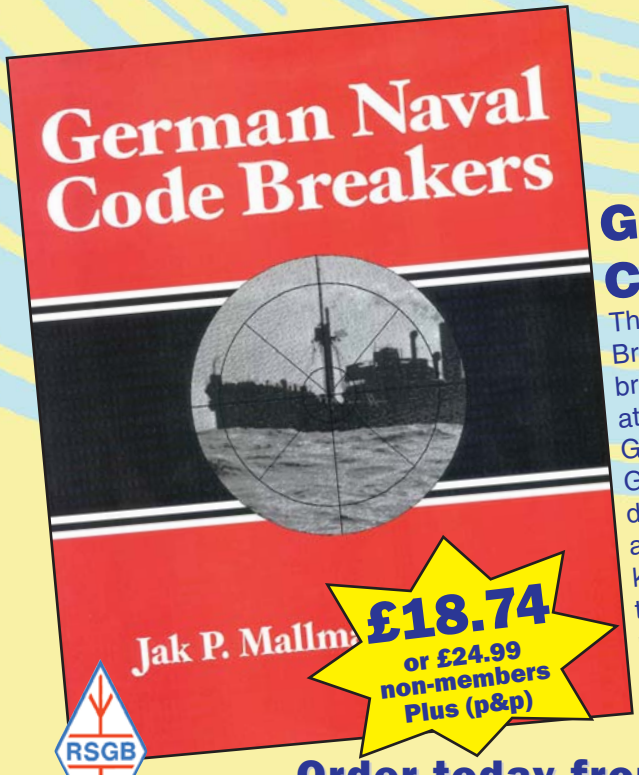

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This book details the work of the German Code Breakers although the story of the German naval code breakers in WWII is less well known than that of the British at Bletchley Park their role was undoubtably significant. German Naval Code Breakers looks in detail at how German code breaking developed after the traumas of defeat in 1918, the variety of codes used by the British and allied navies during WWII. All those who want to know more about this cruicial era in naval warfare will find that German Naval Code Breakers provides an interesting new perspective to this aspect of WWII. With over a 150 photographs on 160 glossy pages this hard back book is an excellent buy.

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Whatever next

Some thought-provoking information this month about self-assembling transistors. There is also news about why your Bluetooth-enabled mobile phone might one day be 'bluejacked'

It was recently revealed in *New Scientist* that, for the first time, a transistor had been manufactured using purely biological processes. Harnessing the electronic properties of carbon nanotubes (see 'Whatever Next', *RadCom*, July 2003) and the capability of DNA to create molecular biological matter, scientists at the Technion-Israel Institute of Technology have created self-assembling transistors. Nano-science expert Cees Dekker from Delft University in the Netherlands is quoted as saying "This is spectacular work... It demonstrates that it's possible to use biology to build an inorganic device that works."

The DNA employed is special in that it contains proteins at specific positions, to which carbon nanotubes bind. The bonding process is brought about by the placing of bacteria on the DNA and the carbon nanotubes being coated with antibodies. Next, the DNA (which is not normally a good electric conductor) is changed into a conductor by the deposition of silver ions onto its 'backbone' – but only where no protein had attached. Finally, gold is added to create a fully-conducting wire. The team responsible for the project has already managed to connect two devices together using biological techniques. "The same process could allow us to create elaborate self-assembling DNA sculptures and circuitry", explained physicist Erez Braun, who led the research.

Given the possibility of using biological processes to grow semiconductors makes me stop to think for a moment what computer viruses of the future might like. However, it is likely to be some years before such devices and organic computers become available.

MISUSING BLUETOOTH

Bluetooth is becoming an increasingly common facility on mobile phones and PDAs. Operating at 2.4GHz, it enables similarly-equipped wireless devices to communicate digitally with one another over a short range (typically up to ten metres). Now that operating a handheld mobile phone whilst driving has been banned in the UK, Bluetooth headsets are becoming more popular, but Bluetooth can also be used to send data (such as phone book entries in the case of mobile phones, mouse and keyboard commands in the case of PCs or documents in the case of PDAs). I suppose it was only a matter of time before someone devised a way of misusing it, and this has now been done in the shape of 'bluejacking'.

Bluejacking works by creating a false contact in a phone's address book, embedding a short message in it and then sending it to an unsuspecting recipient. Normally, if someone wants to send a file via Bluetooth, it can be accepted or declined, but sending a message embedded in a 'contact' bypasses this. When received, it appears in the form of an anonymous message. So how do bluejackers know who they are sending to, or that it is worthwhile sending anything at all? Before bluejacking, they need to know there is a 'victim' within range. When the bluejacker wants to send a message he composes the false address book entry and then selects 'Send via Bluetooth' on his phone, which sends a general request for other Bluetooth devices to confirm their presence. When they do, all that is required is to select which one to send to and confirm the transfer. A few seconds later the recipient's phone beeps to confirm receipt. If you find yourself bluejacked, how do you know who did it? The short answer is that unless the bluejacker identifies himself/herself, gives the game away by not being able to contain his/her laughter, or is the only other person around, you won't know.

So now that mobile phones have entered the realms of the Internet chatroom, is everybody with a Bluetooth-enabled phone going to find themselves constantly receiving cryptic, humorous or sarcastic messages? Fortunately not, as all they need to do is switch off Bluetooth functions or instruct the phone to ignore messages from devices with which is not paired – not that bluejacking represents a threat to security, because a bluejacker cannot upload from a 'victim's' phone.

Will bluejacking be a short-lived craze that is nothing more than a bit of fun? I can't really tell, but what I believe is that as Bluetooth devices proliferate the practice is likely to become more commonplace in the short to medium term. So, if your mobile phone supports Bluetooth and you're in a crowded place such as pub or a mainline railway station, it can only be a matter of time before you get bluejacked.

'WALKIE-TALKIE' PHONES UPDATE

I am indebted to Mike Chace-Ortiz, who e-mailed to let me know that US cellphone operator Nextel has always offered a PTT half-duplex service across its network (as opposed to voice messaging). Known as 'Direct Connect', it "only worked locally in major metropolitan areas, one of the main reasons why Nextel is so popular among businesses over here. However, in early 2003, the system was upgraded to allow PTT service coast-to-coast. It's really quite amazing to have a two-way contact from, say, New York to San Francisco, with virtually no delay." Direct Connect uses Nextel's proprietary iDen system, as opposed to GPRS. Mike tells me that all Nextel cellphones have a PTT button and a loudspeaker, which allow them to operate just like half-duplex walkie-talkies, and goes on to say "The other carriers here have tried to respond. Verizon recently launched a PTT service, and Sprint PCS too (both 2.5G CDMA). However, they both suffer from horrible delays, especially over long distances, which sort of negates the 'instant communications' notion of walkie-talkie style phone operation. These carriers are now re-branding their PTT service as 'voice messaging' in case customers might think that PTT service implied real-time." ◆

WEB SEARCH

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This month concludes the band-pass filters.

FILTER CONSTRUCTION

The layout is shown in **Fig 43**. Three filters are illustrated, the remainder being constructionally identical. More space has been allocated to the 160m and 80m filters to accommodate larger filter capacitors. The components are all mounted on the track-side except for the Toko coils, the RF in/out bus-bars (22SWG tinned wire) and C15. The bus-bars are connected to the IC switches with through-board wire links. Note that the middle Toko coil is rotated by 180° relative to the outer two. Unused coil pins are cut back so they do not appear on the opposite side.

The PCB artwork is shown in **Fig 44**. This assembles into an H-section brick (for the want of a better term). The filter board is single-sided - and SRBP if you want to save on drill bits; the side and end-plates are double-sided. Ensure opposite sides of all the double-sided boards are intimately connected. The outside faces of both end-plates have simple oval pads to make off the feedthrough resistors to the band-select lines at one end - and the 12VTx and Rx lines at the other. The artwork for this is not provided since some elementary removal of the masking spray after drilling and prior to etching will achieve the desired and non-critical result.

FILTER ADJUSTMENT

In the first instance, put the entire filter assembly in series with the antenna of an existing receiver and check that all the filter switches work and the coils peak.

There are sophisticated ways of tuning these filters, but if all coils are peaked mid-band and then the two

Fig 43

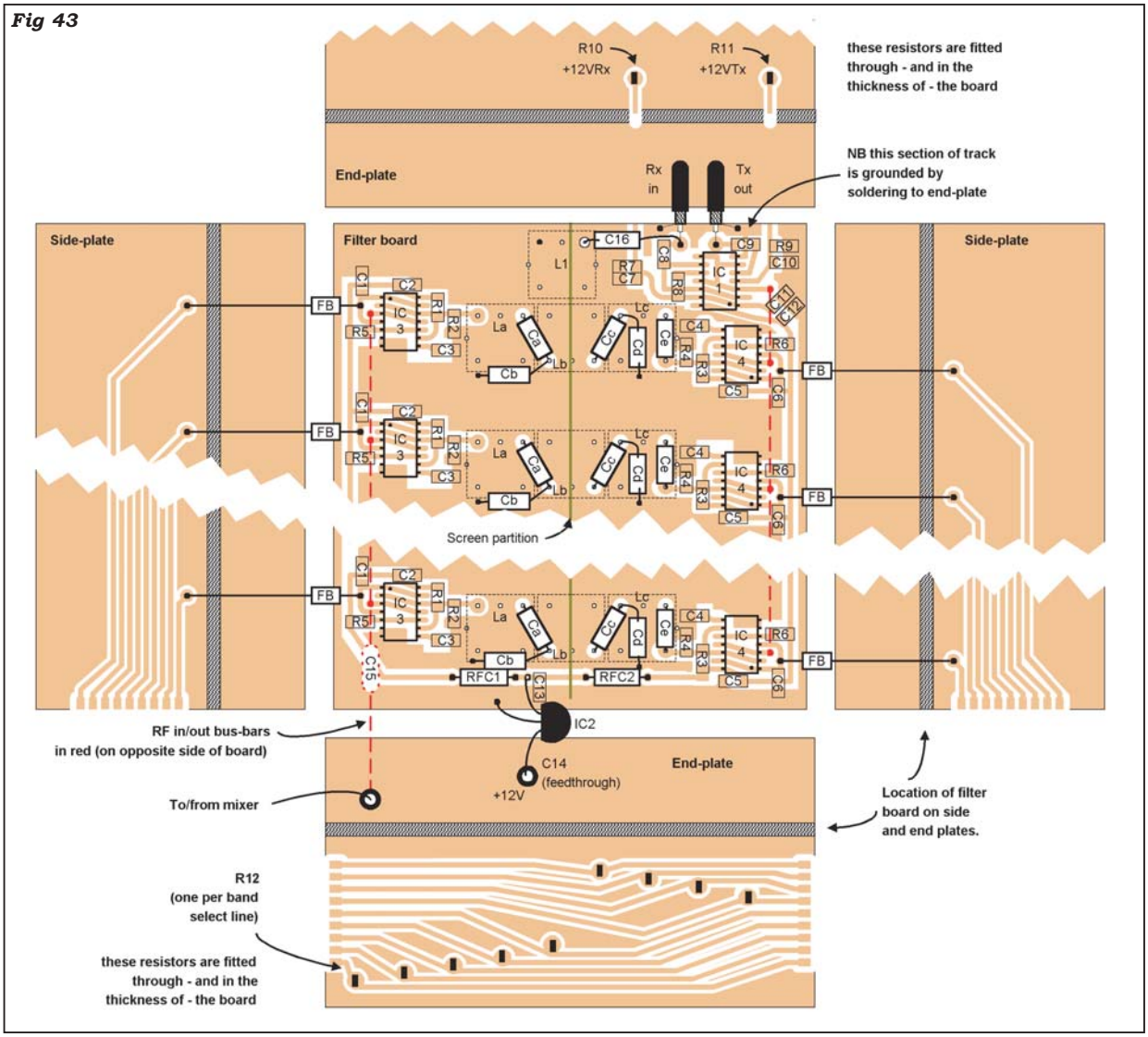


Fig 43: Component layout for band-pass filters.

end coils are peaked at the two band edges, you will not be far out. A refinement of this is to put Pic 'N' Mix in wobbulator mode [58] across the segment of interest and, while on low power CW, transmit into a dummy load and tweak for a flat pass-band.

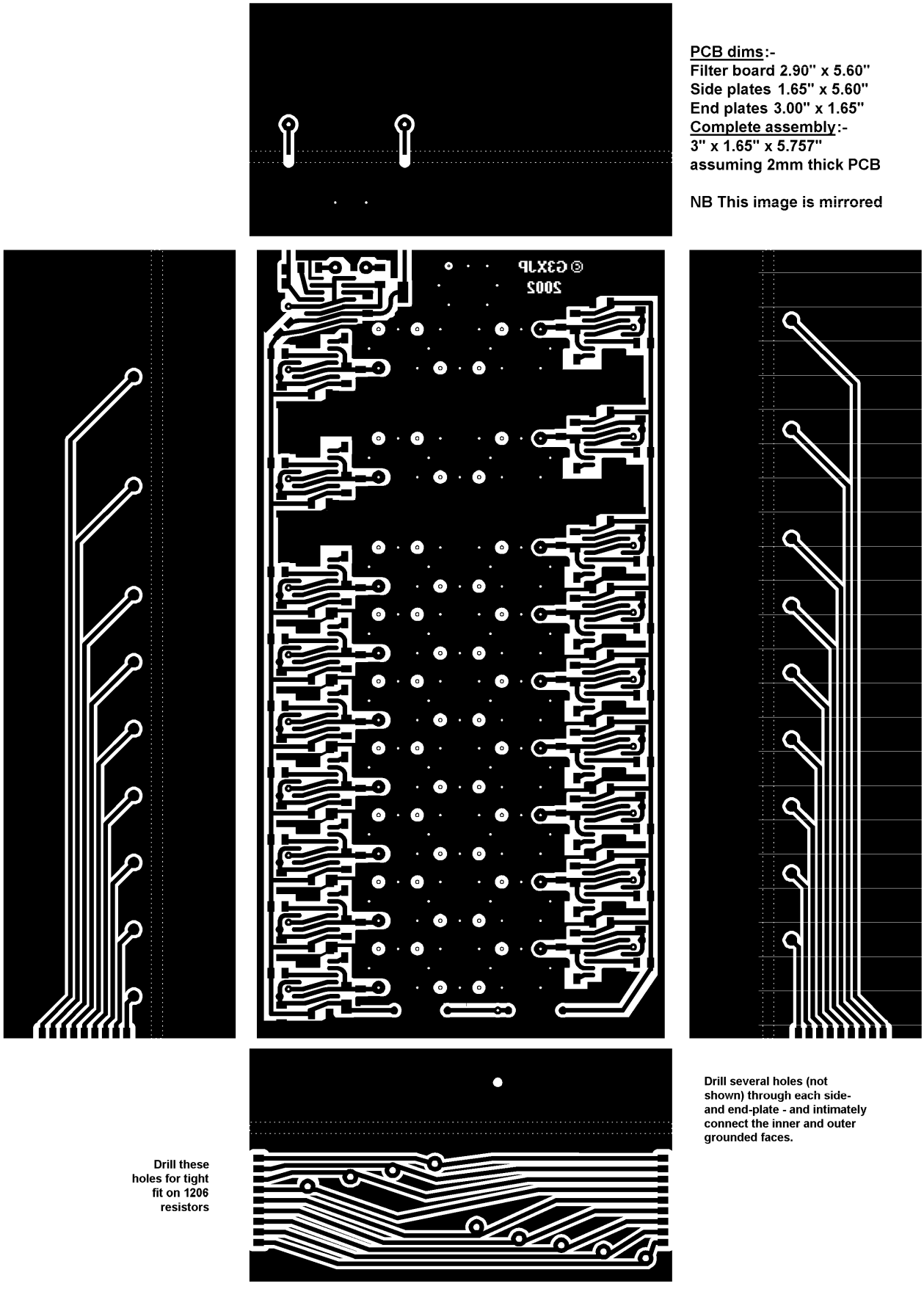
ACKNOWLEDGEMENTS

These filters were designed by Harold, W4ZCB, to whom I am much indebted. He in turn credits *ELSIE*, a filter design package by Jim Tonne, WB6BLD - which did all the sums. I have subsequently become a fan of this software. Delightful!

Harold also independently measured the switching performance. ◆

Fig 44: Band-pass filters PCB layout for nine filter blocks.

Fig 44



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By Lawrence D Woolf, BA (Hons), BSc, Dip Math (Open), GJ3RAX,
E-mail: gj3rax.lawrence@localdial.com

Part 1

Comparison of SSB phasing methods

The first part of a short series in which GJ3RAX compares the various phasing methods of generating SSB signals. In this first part, he lays the foundations.

The most popular analogue method for generating and receiving SSB is with crystal filters. These are designed to pass just the intermediate frequency range required and to reject everything else. The bandwidth of these filters is most commonly about 2.4kHz so that the carrier crystal needs to be 300Hz above or below the edges of this passband. If two crystals are to be selectable for the upper or lower sideband then these will be 3kHz apart, giving an audio frequency range of 300Hz to 2.7kHz. The commercially-made crystal filters are often more expensive than can be justified for some home construction projects, so other designs can be chosen, such as the phasing method.

Fig 1 shows the spectrum of the upper and lower sideband signals that would be generated by applying an audio signal and the carrier frequency to a doubly-balanced mixer as in **Fig 2**. The two input frequencies, which are the audio modulation and the carrier, are cancelled out in the doubly-balanced mixer leaving just the upper and lower sidebands. These output signals are then passed through a suitable filter so that only one sideband signal is transmitted. Further mixing and filtering is used to translate the SSB signal to the transmission frequency.

THE PHASING METHOD

It is also possible to generate an SSB signal without a crystal filter. The most popular method is by using the phasing method to cancel out the unwanted sideband. This method is more subtle and a certain amount of mathematics is needed to understand fully just how it works.

The block diagram of a phasing exciter is shown in **Fig 3**. After the microphone and its amplifier, the signal is applied to two phase-shift circuits. The objective is to get two audio paths with a phase difference of 90° between them, or $\pi/2$ radians, using the equivalent angular notation. It is necessary to use two phase-shift circuits, as there is no easy analogue method of getting a continuous shift of 90° over the audio spectrum, with just one circuit. It is possible to design two circuits, each shifting the phase by an amount that varies with the frequency, but maintaining a difference of approximately 90° over a wide enough range. It is this approximation that is the most important one in defining how well the unwanted sideband is suppressed.

It is equally important that the phase shifts imposed on the carrier frequency are exactly 90° apart when applied to the two mixers. This is much easier to achieve, because only one frequency is needed at any particular time and the amplitude is constant. The audio signal occupies a relatively-wide frequency range, where the highest frequency is typically about 10 times that of the lowest and

Fig 1

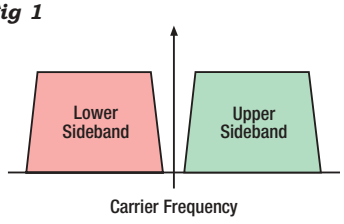


Fig 1: Upper and lower sideband response.

Fig 2: SSB filter generator.

Fig 2

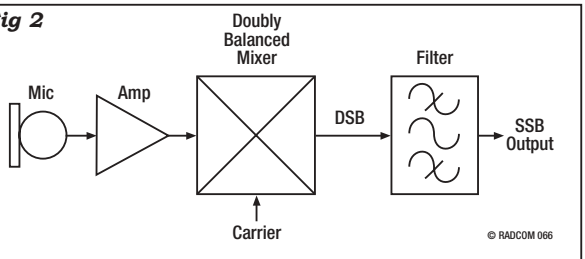
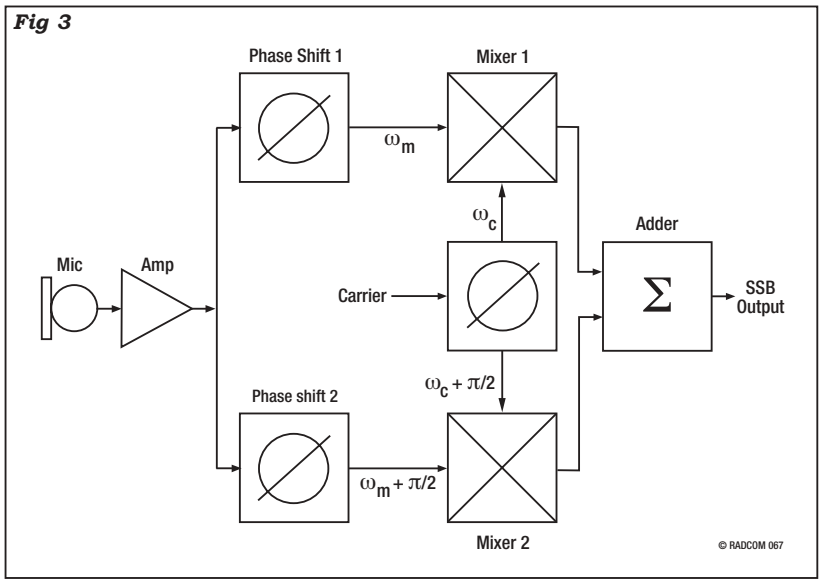
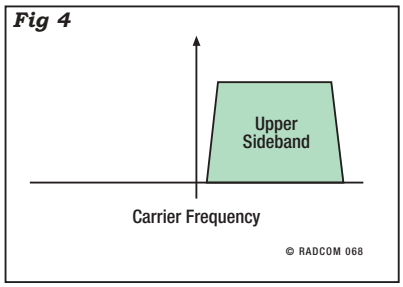


Fig 3: The phasing exciter.

Fig 4: USB filter generator spectrum.





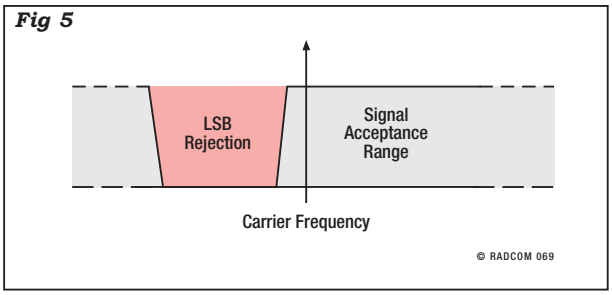


Fig 5: USB phasing generator spectrum.

the speech amplitude is varying continuously.

The sources of errors, leading to reduced opposite sideband suppression, are therefore phase shifts that differ from the ideal 90° and amplitude imbalances in both the audio signal and the carrier. It is also necessary to ensure that both the 90° phase shift and the amplitude balance are maintained over an adequate bandwidth. Techniques with low-cost digital integrated circuits can be used to ensure a virtually perfect 90° phase shift for the carrier injections. Using a CMOS digitally-controlled analogue switch should also minimise the need for balancing the signal amplitudes.

There is nothing new about the principle of the phasing method. It was originally devised and implemented before 1920 for use in frequency-division multiplexing to allow several telephone signals to be conveyed on a line that had previously carried just one signal. Later it was also used for radio signals and so it predates the filter method.

HOW IT WORKS

After the microphone amplifier, the audio signal is split into two paths before finally being combined again. The effect of the phase shifts has to be considered in each path.

The mixers are more correctly described as multipliers because, mathematically, the expressions for the two input frequencies are multiplied by each other in order to get the output expressions. The output frequencies are thus often referred to as 'products'.

In the upper path, the modulating signal, at any frequency within its range, is described as **Equation 1,**

[In all cases, $\omega = 2\pi f$, where f is the relevant frequency – *Ed.*] The carrier signal applied to the mixer in the upper path is **Equation 2.**

At the output of this mixer, the resultant signal is **Equations 2a & 3.**

This now represents both the upper and the lower sidebands. The upper sideband is given by $(\omega_c + \omega_m)$, which is the carrier frequency plus the modulating frequency. The lower sideband is given by $(\omega_c - \omega_m)$, which is the carrier frequency minus the modulating frequency. The two input signals do not appear at the mixer output if it is correctly balanced. Some versions will need additional trimming components in order to set this balance.

The signals in the lower path are basically the same, apart from the additional phase shifts of $\pi/2$ radians in both the audio signal and the carrier giving **Equations 3a & 4.**

In the first cosine function in (4) we have a constant of π. This is equivalent to inverting the graph of the function and is also the same as multiplying it by –1, so we can now remove the π but change the sign of the cosine function. **Equation 5.**

The signals that are applied to the adder stage have now been described in (3) and (5). The output is the sum of these, and it is noted that they look very similar apart from the negative sign in front of the first cosine function in (5). Those terms now cancel but the second ones add up giving **Equation 6.**

The important values are those relating to the frequencies of the carrier and the modulation. In this example, the resultant frequency is that of the carrier minus the that of the modulation, and so must be the lower sideband. If one of the lower path phase shifts, shown in Fig 3, had been $-\pi/2$, instead of $+\pi/2$, the equation would have given us the sum of the carrier and modulation frequencies, producing the upper sideband. It is therefore quite easy to switch between the upper and lower sidebands by just inverting one of the appropriate signals.

This shows that we can generate a double-sideband signal in the same way as for a filter exciter, although we have actually done it twice. Instead of filtering out the unwanted sideband, and the rest of the spectrum, we now cancel out the unwanted sideband by applying equal amplitude but opposite phase signals to the adder. The wanted sideband signals are in phase and so combine positively.

We can now see that there is a very interesting and important difference between the spectrum of a filter generator and that of a phasing generator.

The spectrum diagram in **Fig 4** is that of the output of an ideal filter generator. This shows that the filter allows only the wanted upper sideband spectrum to be transmitted and also defines its bandwidth. It could just as easily have been the lower sideband, depending on the position of the carrier frequency.

The spectrum diagram in **Fig 5** shows that the phasing generator actually passes a very wide spectrum both above and below the carrier frequency, shown in the grey ranges, and just rejects the unwanted sideband, shown in red. This means that more attention must be paid to limiting the audio bandwidth, in the microphone amplifier, than is needed in a filter generator. Similarly, a phasing receiver also needs additional audio filtering to restrict the received bandwidth. For the lower sideband, the diagram is just reversed.

The bandwidth of a filter system depends on the bandwidth of the filter. In the case of a phasing system, we need to make the opposite sideband rejection as wide as possible, within the practical limits, and also apply appropriate audio filtering. The rejection band must completely cover, and preferably exceed, the spectrum of the unwanted sideband. If the rejection bandwidth is too narrow then there could be some high and/or low audio frequency splatter detected on both the transmitted and the received signals.

A filter generator requires that the

bandwidth should be as narrow as possible in order to minimise transmission and reception of unwanted signal components. A typical crystal filter, for speech, has a bandwidth of 2.4kHz and optional narrow filters of 1.8kHz are often available. In contrast, a phasing system should ideally offer an opposite sideband rejection bandwidth that is much wider. To achieve both the rejection width and depth that are desirable can require circuitry that is somewhat more complex than is found in many of the popular phasing designs. The actual bandwidth should then be defined by audio filtering.

UNWANTED SIDEBAND SUPPRESSION

In order to predict how good the unwanted sideband suppression is, within the required bandwidth, there are four quantities that we need to know. Firstly the phase errors, relative to the ideal 90° differences, between the two audio signals reaching the mixers and also between the two carrier signals reaching the mixers. Secondly, we also need to know how well the amplitudes are balanced in both pairs of signals.

We define K_A and K_B as the constants of proportionality between the modulator output and the baseband input. Ideally, these should both equal 1 at all frequencies of interest. We also define Δ as the carrier phase error and δ as the audio phase error. These are used in the equation that gives the unwanted sideband suppression, α, in dB [1]: **Equation 7.**

If the amplitudes are perfectly balanced, so that $K_A = K_B = 1$, and the phase error between the carrier inputs is zero, so that Δ = 0, then (7) can be simplified to **Equation 8.**

This may also be expressed in an alternative form as **Equation 9.**

Some audio phase shift circuits will have a small amplitude variation over the range and there are circuits which give negligible phase and amplitude errors in the carrier signals. The approximations used in (8) and (9) are usually adequate to show the main source of error, which is in the audio phase shift circuitry.

CONCLUSIONS ON THE PHASING METHOD

In order to use the phasing method to generate and to receive SSB signals, we will have to pay close attention to achieving a 90° phase shift between the two audio signals and also between the two carrier signals. These signals will also have to be closely matched for amplitude. The audio bandwidth of the phase shift network must exceed that of the signal bandwidth. Adequate bandwidth filtering is also needed to avoid degradation at the edges of the passband. After that, the mixers must be as perfectly balanced and matched as possible in order to avoid carrier leakage and a further source of opposite sideband breakthrough.

It is then up to the designer to decide just how much opposite sideband suppression and carrier leakage is acceptable. A system with moderate performance can often be considered suitable for a QRP station and especially for use on bands with relatively low activity where these performance limitations will cause fewer problems. The higher the power to be used, and the greater the band activity, the better the required performance must be. These comments must also apply to the more conventional filter designs. ◆

NEXT MONTH

Three particular phase-shift circuits will be presented and evaluated.

Equation 1

$$v_m = V_m \cos(\omega_m t)$$

Equation 2

$$v_c = V_c \cos(\omega_c t)$$

Equation 2a

$$v_1 = v_m v_c = V_m V_c \cos(\omega_m t)\cos(\omega_c t)$$

Equation 3

$$v_1 = \frac{V_m V_c}{2}(\cos(\omega_c+\omega_m)t + \cos(\omega_c-\omega_m)t)$$

Equation 3a

$$v_2 = \frac{V_m V_c}{2}\left(\cos\left(\omega_c t+\frac{\pi}{2}+\omega_m t+\frac{\pi}{2}\right)+\cos\left(\omega_c t+\frac{\pi}{2}-\omega_m t-\frac{\pi}{2}\right)\right)$$

Equation 4

$$v_2 = \frac{V_m V_c}{2}(\cos((\omega_c+\omega_m)t+\pi)+\cos(\omega_c-\omega_m)t)$$

Equation 5

$$v_2 = \frac{V_m V_c}{2}(-\cos(\omega_c+\omega_m)t+\cos(\omega_c-\omega_m)t)$$

Equation 6

$$v_{out} = v_1 + v_2 = V_m V_c \cos(\omega_c-\omega_m)t$$

Equation 7

$$\alpha = 10\log\left(\frac{K_A^2+K_B^2-2K_A K_B\cos(\Delta+\delta)}{K_A^2+K_B^2+2K_A K_B\cos(\Delta-\delta)}\right)$$

Equation 8

$$\alpha = 10\log\left(\frac{1-\cos(\delta)}{1+\cos(\delta)}\right)$$

Equation 9

$$\alpha = 20\log\left(\frac{\sin(\delta)}{1+\cos(\delta)}\right)$$

REFERENCE

[1] *Single-Sideband Systems and Circuits*, W E Sabin and E O Schoenike (eds), McGraw-Hill Book Company, 1987, p162.

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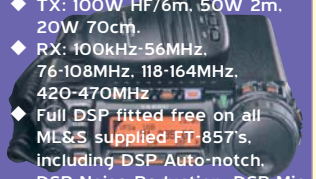

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By Peter Dodd, G3LDO 37 The Ridings, East Preston, West Sussex BN16 2TW. E-mail g3ldo@ukonline.co.uk

Antennas

Are you plagued by failing connectors and leads? This month, Peter Dodd shows you how he makes up his leads and notes how reliable they are.

In a recent re-arrangement of the shack, I found I needed a short length of coaxial cable with a PL-259 connector at each end. A rummage in my 'RF Connectors' box revealed a rather smart connector shown in the first photograph. When this was connected up I found that the rig didn't work. I checked out all the cables in the installation and found that my 'smart' coax connector had an open circuit braid. When the plastic sheath on the connector was removed it was found that the PL-259 plug relied on a crimp for connecting body of the plug to the cable outer braid; and it was this connection that had failed. The cable was consigned to the bin and replaced by one of my made-up ones - not so smart but much more reliable.

In the December 2002 'Antennas', I described the problems I had with soldering the body of the PL-259 plug to the coax braid. I proposed a solution where the braid was folded back over the coax sheath. The cable was then screwed into the into the plug and centre connection soldered. Any protruding braid was then cropped level with the PL-259 body.

Not all coax cables types of ostensibly the same type have the same outside diameter. The hodge-podge of coax cables that make up my station include RG-213 (OD 10.4mm), RG-8/U (OD 10.0mm), URM-67 (OD 10.5mm) and some cable of unknown pedigree with an OD of 9mm. Furthermore, not all PL-259 plugs have the same cable entry diameter. The internal diameter of most of my PL-259 plugs has an inside diameter of 11.4mm. This allows the type of connection of PL-259 to coax cable described above because the braid, folded back along the outer sheath, makes up the difference between the 10mm, or so, OD diameter of the cable and the plug. The other type of PL-529 plug I have in my collection has a cable entry diameter of 10mm. I found this out when I tried to fit one of these plugs to a length of URM-67 (OD 10.5mm). The larger diameter PL-259 cable entry plugs will take the RG-58c cable screw-in reducer, the other won't.

While looking through the 'RF Plugs & Sockets' box, I came across a couple of very good quality silver-plated PL-259 plugs labelled 'GE40032' as shown in the second photograph. The only reason they had not been pressed into service before is that they had a compression fitting for cable of around 6.5mm diameter cable, not compatible with the cables I had in use. When I removed the compression fitting gland, I found the plug's internal screw diameter was 11.6mm, excellent for making a connection to the URM-67 cable, using the method described later.

It has been suggested to me that a connector, where the braid is not soldered to the body of the plug, will eventually fail. I have found that connectors made up this way are very reliable provided the cable is a very tight fit to the plug. The cable is made up as shown in the third photograph, with the braid folded back along the coax sheath. Twist the strands of the inner conductor clockwise and tin (the clockwise twist prevents the inner conductor splaying out as cable is screwed into the plug). Often, the coax centre conductor treated this way will not fit inside the PL-259 centre pin. This can be fixed by scraping any excess solder off the coax centre conductor and running a suitable size twist drill through the centre pin of the plug before assembly.

For PL-259 connectors used externally, I smear the area around the cable centre insulator and the outer braid with grease before assembly. I also push grease into the holes that were originally designed for soldering the plug to the cable braid. I have never experienced a failure or a problem with this type of connector, even though I live close to the sea where the degree of atmospheric corrosion is higher than average.

TESTING COAXIAL CABLE

You might be forgiven for asking why I have such a mixture of coaxial cables - why not chuck the lot away and buy a drum of new cable and get everything standardised. The answer is that, after all these years, I am still a bit of a radio junk kleptomaniac and have many hundreds of metres of coax cable and a large box of RF connectors. I see no problem using these cables and connectors, however, it is very important to test a length of cable before connecting it into an antenna installation (also important for new cable and plug installations).

This can be done using an RF power meter and dummy load (which are built in to some ATUs). First, measure the power at the transmitter then perform the measurement at the far end of the coax under test. The power loss can be converted into dBs and the test results compared with the published losses for the cable under test. This is done taking into account the length of the cable and the measurement frequency. ◆

Top: Smart-looking coax connector with PL-259 plugs, but found to have a faulty crimp connection.

Middle: The GE40032 connector fitted to URM-67 coax cable (top) after removing the original cable glands shown below.

Bottom: Coax cable preparation prior to fitting to the plug. Note the clockwise twist in the centre conductor.

In practice

FREE FERRITE

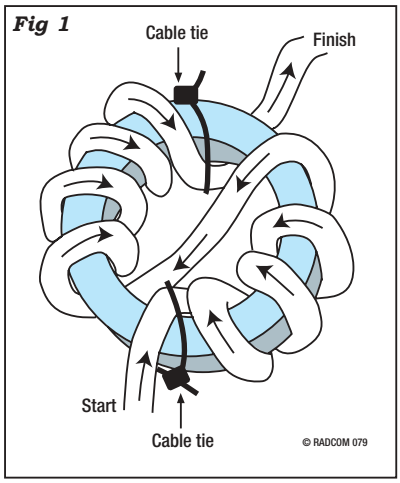
Fig 1: Recommended winding method for toroid (ring) cores.

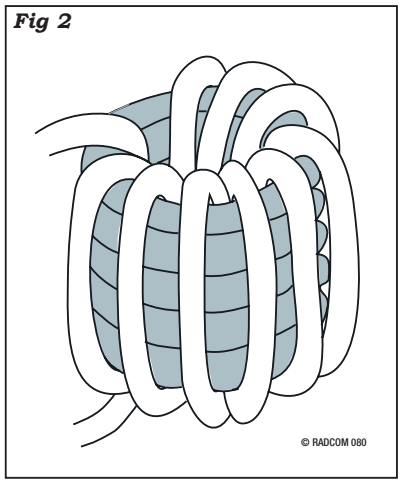
Fig 2: A choke wound on a stack of five toroids, superglued together (use the winding method of Fig 1).

Q Previously you have mentioned 'scan coils' as a source of ferrite for RF chokes. Can you give more details, please?

A Broadband RF chokes wound on ferrite cores are often a cure for many kinds of RF interference (RFI), especially on the HF and lower VHF bands. RSGB and most radio dealers can supply suitable ferrite toroids of about 25mm inside diameter. **Fig 1** shows the recommended way of winding a cable onto such a core (more about this later) but it's fairly obvious that you cannot use very thick cable, or many turns. This means there's a limit to the inductance you can practically achieve using a single core, which in turn means there's a limit to the effectiveness of the RF choke - especially on the lower HF bands. To achieve higher inductance, you can superglue two or more cores together to increase the cross-sectional area of ferrite (**Fig 2**). However, that still doesn't help with the problem of thick cable. What you really need is a much bigger core, with a larger cross-sectional area *and* a larger inside diameter... but have you seen the prices of those?

That's where G0SNO, of the RSGB EMC Committee came up with a brilliant solution. The ferrite cores used in the deflection yoke or 'scan coils' of TVs or computer monitors fit the bill exactly. They're big, they're made from a grade of ferrite that is reasonably good for RF chokes operating in the HF region - and they're free! To get hold of a few, you'll have to visit an old-style TV repair shop, or a small-town independent computer shop [1]. Explain what you want and why (it may help to show them this article) and you should be able to talk your way through into their backyard. There you'll find piles of TVs or monitors waiting to go to the dump, and almost any of them will contain exactly what you want. Bring your own screwdrivers, wire cutters, a Stanley knife, heavy gloves and safety glasses - you're going to be working on a glass cathode ray tube so there's some risk of implosion (not a large risk, if you're gentle, but don't say I didn't warn you).





When you have removed the back cover, the kind of thing you're looking for is shown on the left in the photograph. You'll find this deflection yoke assembly sitting on the neck of the tube, and here are some practical tips for removing it. First, you'll have to remove the assembly around the base of the tube. I can't say exactly how to do this, because every model is different - but there *always is* a simple and completely non-violent way, because it's necessary for servicing purposes. Just look... and think... until you see how it's done for this particular model. The socket on the base of the tube may be either integrated into the main assembly or on flying leads, but in either case it just pulls straight off backwards. Since it's already a scrap unit, feel free to cut all connecting wires. Now you can reach to cut off the connecting wires to the deflection yoke as well. The yoke is held onto the neck of the tube by a combination of a circlip and possibly some silicone adhesive, and once again it's intended to be possible to remove the yoke without any violence to the tube. The circlip is usually fastened by a screw (as seen in the photograph), so release that screw until the clip rattles freely and is no longer gripping the neck. At this point, check for support brackets, a second circlip, or anything else holding the yoke assembly on to the neck of the tube. *Very gently*, try to pull the yoke assembly backward over the neck of the tube; if it won't come away with minimal force, check again to see what else is holding it. It could be nothing more than stickiness due to old age, but also check for any dabs of silicone adhesive around the wide end (that's what the Stanley knife is for). If you're careful and patient, it's really very simple and safe to remove the complete deflection yoke [2].

Finally, replace the back cover (for safety), clear up any mess you've made, and say "thank you" nicely. Of course you must offer to pay for what you've taken - but if you've chosen the right place and handled the encounter well, I'd bet there will be little or no charge.

Back at home, you'll need a hacksaw and a large vice in order to strip the yoke down and recover the bare ferrite core (to the right in the photograph). This part *is* violent - and don't even think about recovering anything else but the ferrite core; it just isn't practical. First snap off any small windings on the side of the yoke; again, see the photograph. Then saw right through the plastic former, next to the narrow end of the ferrite core. Also saw and snip clean through all

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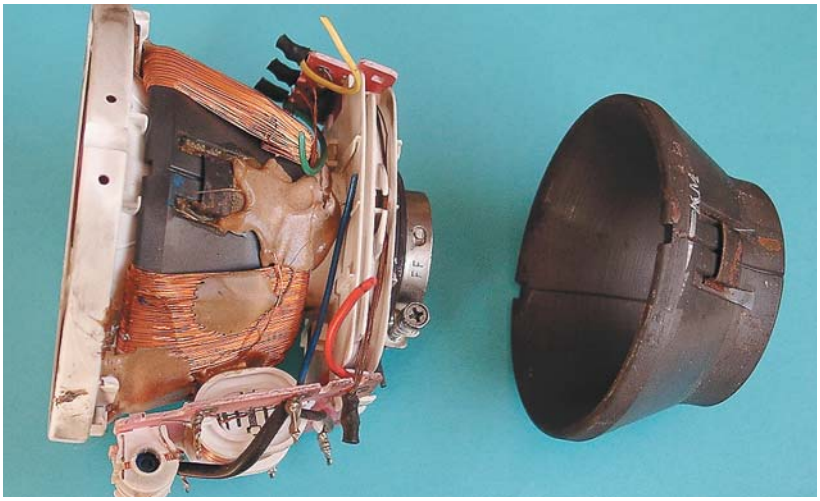


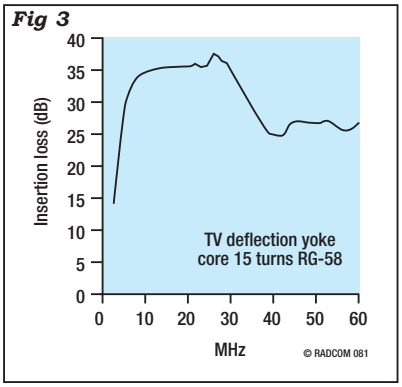
A typical deflection yoke, and the ferrite core inside.

the outside windings, and then the ferrite core should come clean away as shown on the right in the photograph.

With a core of this size, winding thick cable becomes much easier because the inside diameter may be as much as 50mm. (Although the core is actually made from two identical halves, do *not* attempt to remove the two metal spring clips unless you absolutely have to, eg where the cable has a very large SCART or printer plug, permanently attached.) Based on impedance measurements, the EMC Committee recommends about 18-20 turns for a good HF choke, but if you're using very thick cable such as RG-213 or rotator cable, you could get away with fewer turns by supergluing two similar-sized cores together. Even 8-10 turns will show if you're on the right track in curing the RFI, and then you can experiment using a clip-on RF current meter to monitor progress [3].

While we're here, let's deal with two more points about broadband ferrite chokes for HF. One is the issue of self-capacitance, or distributed capacitance. This appears in parallel with the inductance of the choke, causing a very broad peak in impedance and insertion loss, as shown in **Fig 3**. The peak is centred on the frequency where the L-C combination is parallel-resonant (though Fig 3 also shows some wiggles due to minor resonances). For general HF coverage, the impedance charts in the *RSGB Yearbook* and the *RSGB Guide to EMC* (available from RSGB Sales) show that it's best to position the peak at about 20-25MHz. Above the parallel-resonant frequency, the impedance starts to drop again, but it may level off at VHF if the ferrite becomes increasingly lossy. More turns will make performance better on 1.8 and 3.5MHz, but the higher frequencies will then be even further down the slope. If you need better performance on the low bands, wind a second choke with more turns on a deflection core and connect it in series with one that's already optimised for the higher bands. If your problem is with 50 or 70MHz, use fewer turns to shift the impedance maximum closer to those bands.

Fig 3



For the best broadband performance, you're striving for the minimum possible self-capacitance. The winding method of Fig 1 helps because it keeps the input end of the winding as far as possible from the output end, minimising the capacitance between the two. In contrast, the normal winding method brings the two ends close together, especially if you're using the maximum possible number of turns around the circumference. One 'turn' represents one pass through the centre of the core, so you can count nine turns in Fig 1. The vital thing is that all the turns go through the centre of the core in the same direction - in Fig 1, that is always downwards. Simply make sure that the middle turn crosses *diagonally through* the centre of the core to the opposite side, as shown in Fig 1, and you can't go wrong. It isn't essential that the two halves of the winding have equal numbers of turns, although that configuration will generally give the minimum self-capacitance.

The second issue is: why go to all this trouble with winding cores, when you can use clip-on ferrite beads? The answer is that, with thick cables, each bead can only be a single turn (one pass through the middle) so the impedance is simply proportional to the total number of beads. In contrast, the inductance of a multi-turn choke increases as the *square* of the number of turns, so you'd probably need at least 20-30 beads to build up the same impedance as 10-15 turns on a single large core. On the other hand, the broadband performance of a long string of beads is better because of the much lower self-capacitance. In the end, it's a balance between performance, cost and convenience. If you are determined to use a string of beads, it's much better value to buy solid beads than the split type. Suppliers such as Farnell carry a wide selection [4]... but the cost of 20-30 large ferrite beads may be well over £50, so that option is a long way from our original topic of 'free ferrite.' ◆

NOTES AND REFERENCES

[1] Don't try this at big national chains like Dixon's or PC World - sadly, they won't have a clue what you're talking about.

[2] *RadCom*'s EMC columnist David Lauder, G3SNO, points out that: "One type of surplus ferrite core that definitely does not give good results at RF is the ferrite core from a line output transformer in a TV or monitor, or from a switch-mode power supply transformer. The maximum operating frequency [of these grades of ferrite] is too low, leading to poor performance in all HF bands." So don't bother to reclaim those cores from old TVs or monitors, at least not for EMC purposes. Thanks to David for his comments on the whole of this month's column.

[3] 'In Practice', December 2003.

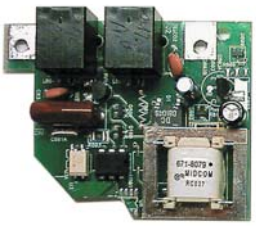
[4] To see an example, go to www.farnell.com/uk and enter 559570 in the 'Product Search' box. For advice on dealing with component suppliers, see www.ifwtech.co.uk/in-prac/components.htm

Fig 3: The effectiveness of the choke shows a broad peak and several minor resonances, due to self-capacitance.

By Andy Talbot, G4JNT, 15 Noble Road, Hedge End, Southampton SO30 0PH. E-mail: data.radcom@rsgb.org.uk

Readers' feedback

Andy Talbot airs readers' suggestions and problems resulting from his last column, and discusses interference issues relating to PCs.



Photograph of DAA sections (the line interface circuitry) cut from old telephone modem cards.

A rather different format for the column this month, as we go into its fifth year. The appeal for feedback last time certainly opened the floodgates! Immediately after the column appeared in print, the 'New mail' window just kept popping up on my computer at work. Many of you have written in to say what you've been doing, how you came onto data modes, and why. I now know there are at least 40 readers of this column. Here are just a few of the comments received so far.

One amateur wrote in to say that, after a serious accident at work, he was left with a severe speech difficulty, and thought his days on the bands were over, especially as his Morse key hand was damaged as well! However, full activity resumed on first discovering Slow Scan TV via the soundcard, then the various data modes, and he is now a fully-fledged operator of these, having become an avid collector of them. Now activity is fully resumed on MFSK16, PSK, Hell, Throb - and presumably on any more that come along.

Stan, G3SRM, returned to this country from Cyprus and, being limited to QRP operation from a built-up area with a small antenna, decided to give PSK31 a go. He found the mode to be very competitive and managed to work most of the world - with just the ZLs and VKs getting away and being snapped up by the big boys - so far.

Dave Jones, GW3LYF, used an MFJ-1278 many years ago for the data modes that were in use on HF in those days (RTTY, AmTOR and the like, presumably). After several years, and an upgrade to a modern computer running the *XP* operating system, he returns to find that the new digital modes have overtaken that modem's capabilities, and asks "where is there a review of available software that will run in a *Windows* environment ?". Your best route is to buy a copy of the book *Digital Modes for All Occasions*, by Murray Greenman, ZL1BPU. This dedicates a chapter to each of the latest modes now in use, as well as showing how the computer is connected up. Your old modem is now redundant, the modes that it covered are now all available via the soundcard interface and there is probably no modern software to support it anyway - unless anyone knows better! The latest modes are all used with similar connections, directly from the receiver to the soundcard line input, and from the soundcard output via a simple resistive attenuator to the transmitter microphone, or better still the line input. All connection details are given in Murray's book, and there have been many article written over the last few years in this magazine. A search though the indexes will throw up all the references.

Foundation licensee Bob Towers, MM3KDZ, uses many of the modes and prefers Hell, although finding it difficult to find anyone to talk to (Hell has this rather fun element to it - watching words gradually appear on the screen out of the noise, rather than just appearing). He finds RTTY a bit too cryptic for normal tastes. Rather ironic really, as RTTY was the first amateur digital mode, at one time being the only one permitted at all. There is no shortage of finding anyone to work with the maximum legally permitted 10 watts, and Bob wonders how many other M3s are getting dispirited with low power HF SSB, and whether they could be persuaded onto PSK31 where there is a much greater chance of having QSOs. "OK, so data isn't everybody's taste, but most of us would rather have data contacts than no contacts."

From Victor, G7TMU: "As for future ideas for your column it might be helpful to have a brief intro to building SoundBlaster interfaces and linking rigs to PC's, if only a list of relevant web links for newcomers". See the comments above for interfacing Soundcards. [You will also find the 'In Practice' column on p59 of the January issue very useful – *Ed.*]

Clive Kidd, G3YTQ, came into my office at work after seeing the request for feedback, and stated that "In my opinion, CW is a valid digital mode, and would like to see that covered more in this column". I guess that particular RNARS member was just trying to wind me up! [He may be placated by the new 'Morse' column starting this month on p70 - *Ed.*]

PC INTERFERENCE

Following on from the last column, several readers commented on their differing experiences of interference from computers:

I Swan, G3MNS, says: "I suffered with this problem on HF and found that the PC was interfering regardless of whether it was running or not. I cured it by replacing the mains input socket with one which is fitted with suppression. It was a direct replacement - no mods whatever required. I managed to purchase one at a rally at a cost of £1.50. Hope this may be of help."

G3SRM also adds : I did not find the need for an elaborate interface (opto-isolators, transformers etc). I was concerned initially that the lack of isolation between the computer and the rig would cause problems, but it proved not to be so.

G7TMU asks: "Is there a UK source for suitable isolation transformers as I can't find any, since Kanga went out of business! The commercial interfaces are much too pricey! Incidentally I have never found it necessary to use optical transistors on the serial port lines, whereas it seems to be essential to isolate the soundcard ones."

Farnell sells a range of 600ohm audio matching transformers at prices starting from less than £2. Look at stock numbers 309-8011 and 149-152. Farnell can be found on the Web at the address below. But a cheap source is old discarded PC modem cards. At the recent MARS rally, I found dozens of these in a bucket being sold for £1.50 each and scrap modems have another use too. Anyone building hardware to interface to a telephone line, such as the DTMF controller described in *RadCom* August 2001, needs an approved type of telephone line interface, or Data Access Arrangement, DAA. This hardware already exists in modems and is easily identified on the PCB by the wide 6mm gap all around it passing through the middle of the transformer and opto-isolators / relays forming the interface. By judicious use of tin snips or hacksaw, and unsoldering surplus SMT components, the DAA can be removed and used on its own. ◆

WEB SEARCH

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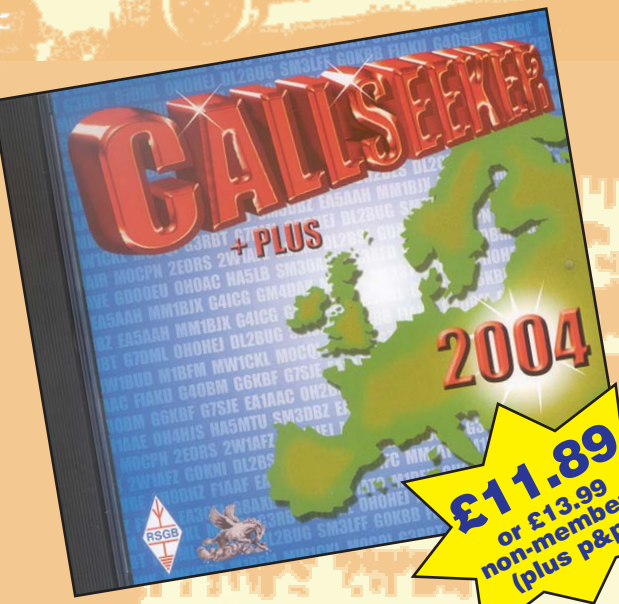

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EMC

This month's column includes items on locating sources of interference and dealing with the RF triggering of intruder alarms.

The EMC Committee receives a number of enquiries from members about how to identify and locate a local source of Radio Frequency Interference (RFI) that affects reception of signals in HF or VHF amateur bands. This article summarises some of the main points, but further details are available in the EMC Committee's six-page information sheet, EMC04, *Interference to Amateur Radio Reception*. This is available on the EMC Committee website (see 'Websearch'). Keep an open mind as to whatever you think it may be, it often turns out to be something different!

Some sources of RFI can be identified from their characteristics, but a burst of noise that lasts for 1 - 30 seconds or more, and can be heard on a number of HF and/or VHF bands at once, is likely to be an arcing thermostat, probably in a gas central heating boiler. This is likely to occur more frequently in cold weather and may occur every 5 - 20 minutes or more often, up to two or three times per minute.

TV sets can radiate RFI from the switch-mode power supply or from the line timebase, but in either case, the sound of the RFI usually changes with TV picture content. By watching a TV (with low RFI) while listening to the RFI on an amateur band, it may be possible to find a TV channel where the changing picture content corresponds to the changing sound of the RFI. On many TV sets, the switch-mode power supply also runs when in standby mode but its characteristics may change and may be continuous or a regular or pulsating or 'chuff-chuff' noise.

Another device with a characteristic sound is an electronic water conditioner. The RFI from these usually sounds like a slowly-stepping sequence of tones. Electronic transformers for low-voltage halogen spotlights can be a significant source of RFI, but can be identified if the RFI is only present when a light is visible in a nearby window.

Various electronic products use switch-mode power supplies where the RFI does not have any distinguishing characteristics. These include video recorders, TV set-top boxes, computers, monitors and fax machines. Electronic variable-speed AC motor drives for machines or large ventilation systems can radiate RFI on the amateur HF bands, but are likely to be found only in commercial or industrial premises.

SEARCHING FOR AN RFI SOURCE

First of all, don't forget to check everything in your own home! If you have a receiver which can run on battery power, switch off the all the mains power at the fuse box. If the receiver needs mains power, disconnect absolutely everything else from the mains, not forgetting anything in a 'standby' mode.

In many cases, the only way to find an interference source is to go out and search for the strongest signal using a portable receiver with an 'S' meter, enlisting the help of another radio amateur if necessary. It is important to note that, on the HF bands, RFI can travel along mains wiring or other wiring, making the actual source hard to pin-point. The first thing to establish is whether the source is nearby (within about 100m for example) or further afield. Getting someone to drive you around the local roads in a car with a portable receiver connected to an aerial on the car can show a clear peak at a certain point which is not apparent when walking. If interference is being conducted along telephone wiring or mains wiring, there may be a number of peaks which coincide with telephone poles, overhead power lines or lamp posts. Sometimes, interference radiates from overhead phone wires but this does *not* prove that the source is something that is directly connected to the telephone network. Any mains-operated equipment that also has a connection to a telephone line can couple RFI from mains to the phone wiring so the actual source could be some completely different equipment on the mains.

If you contact the occupier of a house or flat where you think an interference source is located, it is important to be diplomatic. Being able to hear interference in an amateur band does *not* prove that the equipment generating RFI exceeds the relevant EMC standards, and the owner of the equipment is under no obligation to help you. They will probably want to be sure of your identity and your motive before letting you in. It is a good idea to write or telephone first to gain their confidence and arrange a visit. Remember that the source may not be *where* you think it is and it may not be *what* you think it is!

The amateur radio service is classed as 'unprotected' by the Radiocommunications Agency but it is worth notifying the RA in writing if you find an interference source that is likely to interfere with broadcast FM radio or UHF TV reception or other protected radio services.

INTRUDER ALARMS

Intruder alarm systems can sometimes suffer false triggering due to nearby amateur radio transmissions, usually on the HF bands rather than VHF. Information in this month's 'EMC' applies to wired security systems, not wireless alarms, which are another story. If your transmissions set off a neighbour's alarm system, it is advisable to inform the neighbour as soon as possible, as there are various rules about the maximum number of false alarms that is tolerated in a certain period. The EMC Committee

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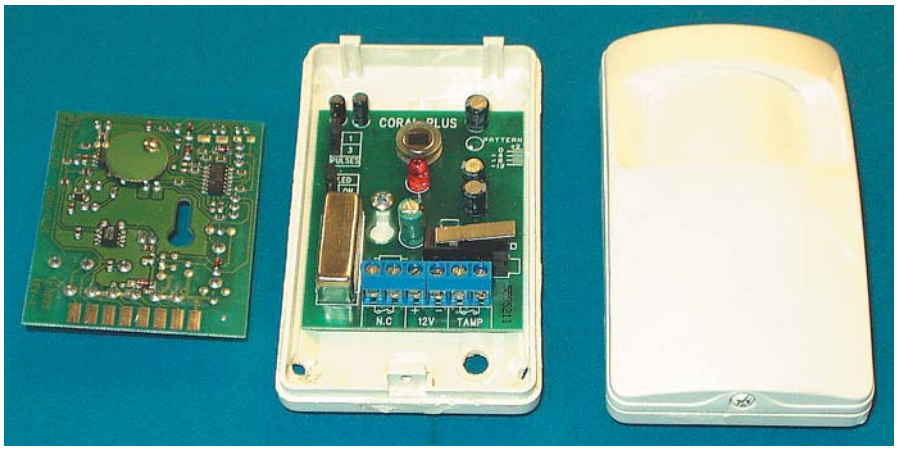

Above left: If an intruder alarm system suffers RF triggering, it is seldom the control panel itself that is affected.

Above right: A typical Passive Infra-red (PIR) sensor used in intruder alarm systems. The disc on the PCB is a shield to improve RF immunity.

has produced two information sheets on this subject, one for members' own use and one to give to neighbours (see 'Websearch'). It is advisable to obtain copies of these and provide the neighbour with a copy of leaflet EMC02.

Some alarm installers know what to do as they have come across RF triggering before although not necessarily from amateur radio transmissions whereas others have not come across it before and may waste time trying things which are unlikely to work. A few may tell their customer that there couldn't possibly be a problem with the alarm system so it must be the radio amateur's fault.

An alarm control panel might suffer RF triggering but in practice this is rare. In general, if false alarms are caused by nearby RF fields, RF triggering of the Passive Infra-Red (PIR) sensors is the most likely cause. This can be checked by performing test transmissions while someone observes the 'walk test' LED on the PIRs. If this LED is enabled and if the PIR is responding to changes in RF field, the LED will flash. This allows an RF immunity problem to be identified and investigated when the alarm is not set and without making a noise.

PIR sensors contain a high-gain amplifier that detects signals that are a fraction a millivolt. The bandwidth of this amplifier is only about 1Hz, but changes in RF field strength can be detected by the input stages of the operational amplifier chip. The LM324/LM358 type of op-amp seem to be prone to this effect. Because it responds to *changes* in RF, amateur SSB or CW transmissions are far more likely to cause RF triggering than FM. The RF immunity of PIR sensors has improved in recent years since a product-specific standard, EN50130-4, has been introduced, but there are still a lot of PIR sensors in use that were tested to an earlier and less-demanding standard or were not tested at all.

The first thing that an alarm installer may suggest is to increase the pulse count setting in the PIRs. This will not solve the problem, as the alarm will trigger after two seconds of CW or SSB transmission instead of one! Another idea that is unlikely to make much difference is to fit RF filters in the wires to the PIRs. I have tested such filters and found that they generally do not have enough impedance to be useful below about 15MHz. In any case, the problem cannot normally be solved by fitting filters, because it is normally caused by direct pickup in the PIR sensor itself, and each filter can cost as much as a new PIR.

Another thing that an installer may suggest is to fit 'dual-technology' sensors. These use a PIR detector and a microwave detector in the same housing so that both detectors must agree that they have seen something move before they sound the alarm. These are immune to just about any RF field with the possible exception of the radar from military aircraft flying very low, which can RF trigger both sensors. Dual-technology sensors are rather expensive, especially if all the PIRs in a house need to be replaced. They are useful in certain situations, but are probably unnecessarily expensive if an amateur radio RF immunity problem is the only reason for using them. There is another type of PIR sensor called a 'quad detector' such as the Rokonet 'Cosmos PQ' model. A quad detector generally has significantly better RF immunity than a standard type of PIR, but doesn't cost much extra. Replacing PIRs with good quality quad detectors should solve the problem, but this raises the question of who pays.

If you can find out the manufacturer of the existing PIRs, it may be possible to arrange an exchange for a more RF-immune type free of charge. The problem is how to find out the make and model of the PIRs as they do not normally have any visible identification on them; apparently, this is in the interests of security. Installers often take away the instruction leaflet so the householder does not know what type of PIRs are fitted and the installer won't tell anyone apart from the householder.

One argument that is sometimes heard from alarm installers or manufacturers is that, if the existing PIRs are tested to 10V/m, any transmitter that triggers them must be exceeding 10V/m, so the transmitter power should be reduced. There are several flaws in this argument. The first is that many PIRs, made before the introduction of the EN50130-4 standard, were tested to IEC801-3, and this only tests from 26 - 1000MHz, so their immunity at frequencies such as 3.5MHz or 7MHz is unknown and claimed immunity levels may not be achieved at these frequencies. The second is that IEC801-3 tests specified a carrier modulated with 80% AM at 1kHz, but this is not a realistic test method, as the carrier needs to be pulsed on and off slowly. The third is that a radiated RF immunity test is applied to the PIR alone in a test chamber whereas, in an actual installation, it is fixed to a wall and is mounted on the end of a length of cable that may resonate. The recent EN50130-4 standard addresses the shortcomings in earlier test methods.

The EMC Committee has heard of other miscellaneous alarm immunity problems. We do have one long-running alarm case where nearby amateur SSB transmissions break through as audio from the sounder in the control panel. The installer will not reveal the make and model of the control panel without the customer's consent so we cannot complain to the manufacturer.

We have also heard of a few cases where the alarm bell box is sensitive to RF and the siren may sound while RF is present. This can result in a very loud CW sidetone squawking down the street. ◆

WEBSEARCH

RSGB EMC COMMITTEE WEBSITE www.qsl.net/rsgb_emc/
(Includes EMC information sheet EMC02, *Radio Transmitters and Home Security Systems*, EMC 03, *Dealing with Alarm EMC Problems - Advice for RSGB Members*, and EMC04, *Interference to Amateur Radio Reception*.)

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OPTIONAL 10-15-20mtr radial kit **£34.95**
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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) **£139.95**
OPTIONAL 10-15-20mtr radial kit **£34.95**
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MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts **£89.95**
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts **£44.95**
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts **£79.95**
(MTD-5 is a crossed di-pole with 4 legs)

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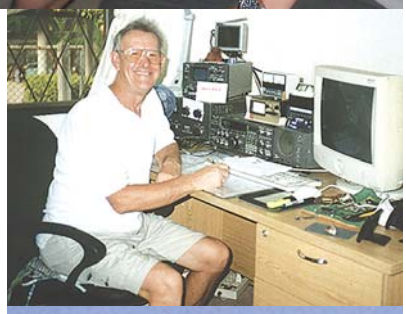
HF



Top: Richard Newstead, G3CWI, and Bob Read, 9V1GO/G4VGO, in Bob's Singapore apartment.

Middle: Don, HS0ZEE (ex-A92BE), in his new shack in Chiang Mai, Thailand.

Bottom: The impressive antenna tower of HS0ZEE.

I started last month with news that the **Peter 1 Island** expedition had been postponed for a year, and this month I have to report that a planned UK-led expedition to **Eritrea (E3)** has also hit the buffers, in this case because of licensing difficulties. It's obviously a pity when such things happen, but that's why some DXCC entities remain rare, of course. Talking about which, the **Europa Island** (TO4E, TO4WW) expedition made a total of about 34,000 contacts, the main constraint being that the island's generator was available only for a limited period each day. Some battery-powered operation was possible outside these times, but signals were obviously a lot weaker. Getting permission for the operation, and arranging all the logistics, took about three years in total, but the team is hoping that, now they have opened the door, there may be an opportunity to go back at some stage.

Alan, G3XAQ, was due to be back in **Ghana**, operating as 9G5XA from 23 January to 2 February. He then expects to be active from **St Lucia** as J6/G3XAQ from 14 to 23March.

Peter, NO2R, will be visiting Hiroo, XU7ACY, in Sihanoukville, **Cambodia** during the first week of February, and will be concentrating on 160. This is a nice one, being quite rare on the band, so let's hope for some good low-band propagation at that time.

Gerd, DJ4KW, and Gisela (YL), DK9GG, were due to be active as V31YN (CW) and V31GW (RTTY) from the Corozal district in **Belize** until the end of February. Look for them on 10 through 160. Between 2 and 6 February they will use V31YN/P from Lighthouse Reef (NA-123). During that part of the operation they will be on CW only on 10 to 40m. QSL via the bureau to their home calls or direct. They will have an on-line log search which will be updated weekly.

A US team will be in **St Lucia** as J6DX from 11 to 25 February, taking in the WPX RTTY contest. Dale, G3VMK, will also be in St Lucia from 14 - 27 February. He will be operating CW only on the higher bands with an IC-706 and a wire antenna. This will be a family holiday and radio will take second place.

WN9O, WO9Z and W9IU will be active as 6Y5/homecall from **Jamaica** between 28 February and 14 March. Activity will be on 160 - 10m, including the WARC bands. QSL via W9IU (direct).

Joeke, PA0VDV, will operate (CW only) as PJ6/PA0VDV from **Saba** (NA-145) from 24 January to 18 February. QSL via his home call, direct or through the bureau.

Dave, G3TBK, reports that during his recent operation as J88DR (**St Vincent**) he made another 8000 QSOs, bringing his all-time total from the island to just over 50,000. He reports working a good number of Foundation and Intermediate UK stations, and also a lot of newly 'liberated' former Class B licensees. Unfortunately, high levels of local noise severely affected his capabilities on 160 and, to a lesser extent, 80. His next activity from J88DR is likely to be in March, once again to include the Commonwealth Contest.

I2YSB, I2MOV, IK1AOD and IK2DIA will be active from **Tokelau** (ZK3) between 13 and 25 February. They will have two stations, one on CW and the other on SSB. QSL direct to I2YSB or via the bureau to IK2DIA.

Babs, DL7AFS, and Lot, DJ7ZG, will be active from **Lord Howe Island** (VK9L) between 16 and 27 February and from **Norfolk Island** (VK9N) from 29 February to 13 March. Activity will be on 10 through 80 on SSB, RTTY and PSK. Further details from their web page. QSL via DL7AFS.

Mike, GM0HCQ, writes that he will be operating as VP8CMH/MM from on board the Royal Research Ship *James Clark Ross* from about 24 January. He will operate with this VP8 call whilst in Falkland Island / Antarctic waters, reverting to his

By Don Field, G3XTT, 105 Shiplake Bottom, Peppard Common, Henley on Thames RG9 5HJ. E-mail: hf.radcom@rsgb.org.uk

News of DXpeditions planned - and ones that haven't quite come off. Plus latest news from those active on the HF bands from the UK and overseas.

GM0HCQ/MM call when the vessel heads north for the UK in late April. He also hopes to be able to operate from King Edward Point, **South Georgia**, as VP8SGK when the vessel calls in and, if time allows, will be operational from Signy Island (**South Orkney Group**) using the base call VP8SIG. Further updates will be posted on his web site.

CORRESPONDENCE AND TABLES

Richard, G3CWI, took the opportunity on a recent visit to Singapore to meet up with Bob, 9V1GO. Bob (perhaps better known as G4VGO) is a well-known topband DXer and is gradually improving his topband capability in Singapore. His main problem is the high level of electrical noise from thunderstorms that is encountered in the tropics. Bob's antenna is a novel implementation of a retractable long wire that runs from his 11th floor apartment down to nearby tree tops and is supported by a catenary cord. His QTH overlooks a saltwater creek which helps to get his signal out!

Sheridon (Don) Street, HS0ZEE (perhaps better known as A92BE), is now retired and living in Chiang Mai, 500 miles north of Bangkok. He writes that he received his HS call early this year and worked for a few months using a dipole, operating PSK31 mode until his antenna and tower were ready. The antenna system now installed comprises a tri-band Cubex quad on top of a 35m guyed tower. The 40m wire dipole is about half-way up. Installation was finished just in time for the Seanet contest in August. He joins the table with a score which is pretty respectable, despite the late start. Don's favourite operating frequencies on SSB are 7052, 14200, 21290 and 28490kHz. QSL details are on qrz.com.

The penultimate 2003 table appears this month, though some of you actually managed to sneak your year-end figures in under the wire. Bernd, DF3CB, reports that 288 DXCC entities were reported active on the *DX Summit* web pages during 2003, some 12 countries fewer than 2002 (300). He also noted 299 during 2001. This being the case, the 286 entities racked up by Joe, W1JR, is quite astonishing, but four of the table entrants have 250 or more entities, which is pretty good going.

David, M0CNP, notes some nice ones, especially on the WARC bands: J8DX (St Vincent), VQ9LA (Chagos Islands), TS7N (Tunisia) on 17m and YN4SU (Nicaragua), HI9/DL4NCF (Dominican Republic), and TS7N (Tunisia) on 12m. Terry, G1UGH, reports some nice SSB QSOs, mainly during the CQWW Phone contest at the end of October. Lots of Caribbean DX, plus Africa (eg C5Z Gambia and D4B Cape Verde) and Asia (eg A61AJ UAE and EX9A Kyrgyzstan), though he doesn't mention the band(s). All worked on a 10m length of wire. Colin, MU0FAL, enjoyed the CQWW CW Contest and made a point of running more, and spending less time in search and pounce mode. The result was more QSOs than in previous years, but fewer multipliers. Of course, I'm sure his rare MU prefix attracts plenty of callers. Peter, G3JFS, mentions the unusual conditions during the ARRL 10m contest in early December, with lots of short-skip European stations audible in the early evening. He remarks that signals were loud on his end-fed wire (normally not a good performer on 10m) but much weaker on the dipole. I would assume this is because the angle of arrival was much higher than usual on 10m, perhaps by way of Sporadic E.

Andy, GM8OEG, sends an extensive report, and is obviously enjoying his early forays on to the HF bands. He uses a venerable TS-830 with inverted-Vees and ground planes for 15 and 20 and a dipole for 40, and is running mainly SSB at present. He comments that, over the summer, he

PHOTO BY SB4AGY

Top: Jim Bullington, 5U7JB, in his shack in Niamey. Jim is head of the US Peace Corps volunteers in Niger.

Bottom: Cypriot ex-pat radio amateurs and their wives during a visit by last year's RSGB president, Bob, G3PJT. Left: Mike, 5B4AGX; Tom, 5B4AGP; Nick, 5B4FL; Arthur, 5B4AFZ; Roger, SWL. Right (near to far): Wilf, SWL; Alf, 5B4AFB; Bob, G3PJT; Alan, 5B4AHJ.

COUNTRIES WORKED, 2003

(sorted this month by CW totals, showing only those who have updated since October)

CALL	CW	SSB	DATA	MIXED
W1JR	261	243	160	286
G3TBK	245	165	0	254
G3TXF	242	137	0	246
G3SXW	237	0	0	237
G3XTT	231	166	134	247
G3YVH	227	179	0	250
G4WFQ	219	76	100	238
G4KFT	218	0	0	218
G4IRN	217	1	0	217
G3VDL	199	0	0	199
G3LHJ	188	105	109	203
G4WXZ	178	192	0	233
GM0TGE	168	221	0	252
MU0FAL	163	`35	0	183
GU4YOX	149	138	0	188
G4OBK	149	24	69	160
G3YMC (QRP)	145	0	0	145
G4IDL	142	15	0	153
M0BVE	136	0	0	136
G3JFS (QRP)	127	91	74	143
GW4ALG (QRP)	90	0	0	90
G4DDL	74	45	26	77
G4FVK	67	108	0	119
G3WP	59	0	0	59
M0RZZ	49	33	0	62
GU7DHI	17	107	0	107
M0CNP	12	164	47	171
G0GFQ	1	154	4	154
M0BKV	1	141	66	148
GI0NQC	1	71	69	102
GM8OEG	1	94	44	95
GM6MEN	1	76	0	77
M0AWX	0	239	85	243
HS0ZEE	0	172	40	212
G0ARF	0	0	177	177
G0LGJ/M	0	119	0	119
G6FCI	0	84	32	91
G1UGH	0	77	0	77
G3URA	0	0	71	71

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 April issue by 21 February (some seem to get confused by the changing deadlines, but it is generally around the third weekend of the month).

worked lots of South and Central American stations on 40 around midnight and, one morning in August, topped this off with a 58 report from ZL2JR at 0535UTC. The high bands have produced most of the usual suspects, especially as the autumn wore on. Andy also made his first RTTY QSOs in the WAE RTTY contest. He downloaded the software on the Friday before the contest, intending to give out a few contacts, and ended up making 338, with ZF2NT (Cayman Is) as best DX.

Ken, M0RZZ (ex-M3NPB), apologises for the long period of silence, due to a change of QTH. Antennas (a G5RV and homebrew minibeam) are close to completion at the new place and he hopes to be active (and enjoying the higher power limits of his M0 call) round about now. Sean, G4UCJ, writes that a move to new accommodation has effectively brought an end to his transmitting activities, due to the large number of communal electronic systems and other wiring. Even listening is proving a challenge, and only possible with the use of an MFJ noise canceller. Sadly, this a route that many amateurs have to follow eventually, due to age or disability, and there is no easy solution.

Les, GM3ITN, writes that his web pages contain a wealth of information of interest to DX operators, and have received some 16,000 hits in the past two years. Take a look. Dave, G3YMC, who focuses nowadays on QRP operation, picks up on my recommendations about QSL cards to the effect that the card should also show transmit power if it is to be used for 2-way QRP awards. Dave finds that he can produce perfectly acceptable QSL cards on his PC printer, using 160gm card stock. Paul, M0BSW, writes that he has been receiving QSL cards for RTTY and CW, modes which he does not use. He attributes this to someone pirating his callsign, but I am more inclined to think it may be just errors in copying or bad spots on the *PacketCluster* system (Tim, M0BEW, for example, is very active and the call is similar).

John, G3JAG, picks up on my January comments about HAARP. He feels that I understated the significance of the HAARP project and says, "Even a fairly casual glance through the official HAARP website, let alone through the many unofficial websites, will show that drastic modification of the ionosphere is a major target. This 'modification' will hopefully enable the US to shut down (hostile) ionospheric communications, disable incoming missile / aircraft control systems, carry out extra low frequency surveillance etc." Certainly, Del, KL7HF, is convinced that HAARP is affecting HF propagation from his QTH, with a dramatic falloff in low-band propagation in recent years. Maybe one of our technical or propagation experts is better placed to comment?

Finally, Mike, MD0IOM, reports a 15m QSO between Tony, MD3DCI, and Philip, K4QH, in Tennessee. What is remarkable is that Tony was using an FT-817 from inside the Isle of Man radio club, using a Miracle Whip antenna! Quite an achievement. Further details can be found on the Scarlett Point website. ◆

WEB SEARCH

GM0HCQ	www.gm0hcq.com
GM3ITN	www.gm3itn.co.uk
HAARP	www.haarp.alaska.edu
SCARLETT POINT	www.scarlettpoint.com
V31YN/V31GW	www.qsl.net/dj4kw
VK9L/N	www.qsl.net/d17afs
ZK3 BY ITALIANS	www.qsl.net/i2ysb

HF F-Layer, Propagation Predictions for February 2004

	7.0MHz	10.1MHz	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	723...167677	..5112476...	...55677....	...99998....	...8999.....	....343.....	.....
*** Asia							
Yakutsk	1......14442	...1233774..	...662......	...33.......	.....	.....	.....
Tokyo	.......1211.	.......12...	.....	.....	.....	.....	.....
Singapore	.......121..	......142...	......251...	.....154....	.....132....	....1221....	.....11.....
Hyderabad	.....	.......2322.	......144...	.....267....	...22577....	...77786....	...5777.....
Tel Aviv	623....57777	..31..277...	...544773...	...45564....	....323.....	.....	.....
*** Oceania							
Wellington	......165...	....34674...	...267761...	....3321....	....221.....	....2.......	.....
Well (NZ) (LP)	..1.....	.14.....	33.......122	...51....4..	...5.....4..	.....	.....
Perth	.....	.......11...	......12....	.....155....	.....233....	...2243.....	...123......
Sydney	.....	......12....	......32....	....2565....	....2352....	...24.......	...2........
Melbourne (LP)	...6.....	...72.......	...57.......	....71......	....6.......	.....	.....
Honolulu	...1.....	...211.1....	.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....1...	.....41..	...1.1..5...	...221..4...	...22.....
W. Samoa	.....	...11122....	....355.....	....143.....	.....21.....	.....1......	.....
*** Africa							
Mauritius	1.....	.....	.....1....	.....2....	.....1....	.....	.....
Johannesburg	77......1677	44......5766	1......27632	.....351..	...111143...	...456674...	...25666....
Ibadan	331.....1222	637.....4556	..43...155..	...876678...	...887888...	...998998...	...89799....
Nairobi	11.....	22......1111	1.1....12322	..21112451..	...222354...	...43456....	...55564....
Canary Isles	6761....6666	6723...26566	...63113572.	...7676776..	...427778...	.....6663...	.....534....
*** S. America							
Buenos Aires	3423......23	11.3........	...2........	...41...12..	....211121..	....12121...	.....2111...
Rio de Janeiro	.....	.....	.....	....21.123..	....421231..	....42122...	....32.21...
Lima	...1.....	...1.....	.....	.....1..1...	.....2111...	.....2221...	.....211....
Caracas	111.....1	11.1......11	.....	.....	.....1.11...	.....5552...	.....554....
*** N. America							
Guatemala	...1.....	...1.....	.....	.....	.....	......11....	.....
New Orleans	11.....1	...1.....	.....	......545...	......666...	......77....	......45....
Washington	4411......45	21.1.....162	.....1..15..	.....53562..	......567...	......562...	......12....
Quebec	66.3.....376	...21....2..	.....11124..	.....7888...	......888...	......88....	......77....
Anchorage	5321.....112	.....11..	.....	.....	.....	.....	.....
Vancouver	11.....	.....	.....	.....15...	.....1...	.....	.....
San Francisco	.....	.....	.....	.....11...	.....1....	.....	.....
San Fran (LP)	.....	.....	.....5....	.....61...	.....62...	.....5....	.....

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 December 2003 issued by the Sunspot Data Centre, Brussels, was 47.0. The daily maximum / minimum numbers were 98 and 16 on 1 December and 9 & 31 December respectively. The predicted smoothed sunspot numbers for February, March and April are respectively: (SIDC classical method - Waldmeier's standard) 59, 57, 55 (combined method) 58, 57, 56. 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.

KENWOOD

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200W Model

TS-480SAT

100W Model with Built-in Antenna Tuner

DX Deluxe

- 200W output (50MHz: 100W) DC 13.8V operation
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- Compact construction for easy carrying
- Separate LCD control panel with speaker
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- TX: covers all Amateur bands 1.8MHz to 50MHz

Unique concept, brilliant execution. Kenwood's compact TS-480HX/480SAT is tailor-made for DX'ing. But its smartly designed standalone LCD control panel — featuring backlit keys to enhance operating ease — is equally at home on your desk, with the main unit up to 4 metres away. And wherever it is, this HF transceiver delivers an astonishing punch: 200W. Performance is equally impressive. For example, a quad-mixer provides RX dynamic range in the TS-950 class, while AF DSP processing offers many powerful features, including noise reduction, a speech processor, and AF filters. And of course you can enjoy all of the convenience of PC-based control. The TS-480HX/480SAT lets you enjoy the best of both worlds.

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Contest

Tim Kirby describes the specialised technique of 'SO2R' - Single Operator, Two Radios - and takes a look at how all operators can improve their contest scores by using variations on this theme.

One or two people wondered why we couldn't have a full listing of UK participants in the CQWW phone and CW contests. The reason, quite simply, is space. Last month, for example, it was hard enough to find space to print all the RSGB results, let alone anything else! What we settled on was to print the stations who had achieved leader board positions and to print the URL of where to find the full results. It's great to see so many UK stations appearing throughout the results.

Tim, M0BEW, did remind me that there are not just SSB and CW legs to CQWW - there's an RTTY event too. I should know, but I must admit I managed to omit the highlights from the CQWW RTTY 2002 results which I am very happy to rectify this month! World fifth place in the Single Operator, High Power section went to Sergei, M0SDX. World eighth place in Single Operator, 28MHz went to Robert, M0TTT. World fourth place Single Operator, 14MHz was Tim, M0BEW. Multi-Operator, Single Transmitter, High Power World fourth place was MW2I. Very many congratulations to all concerned, as well as to everyone else who sent a log in.

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest	Bands	Exchange
2 Feb	2000-2130	SSB	RSGB 80m Championship	3.5	RST+SN
7 / 8-Feb	0000-2359	RTTY	CQ WW RTTY WPX	3.5-28	RST+SN
11 Feb	2000-2130	Data	RSGB 80m Championship	3.5	RST+SN
14 / 15 Feb	2100-0100	CW	RSGB 1st 1.8MHz	1.8	RST+SN+District
19 Feb	2000-2130	CW	RSGB 80m Championship	3.5	RST+SN
21 / 22 Feb	0000-2359	CW	ARRL CW	1.8-28	RST+Power
28 / 29 Feb	0000-2359	SSB	CQ WW 160m	1.8	RS+Country

VHF Contests

Date	Time	Mode	Contest	Bands	Exchange
3 Feb	2000-2230 Local	All	RSGB 144MHz Activity & Club Championship	144	RST+SN+Locator
8 Feb	1000-1200	All	RSGB 70MHz Cumulative	70	RST+SN+Locator+QTH
10 Feb	2000-2230 Local	All	RSGB 432MHz Activity	432	RST+SN+Locator
17 Feb	2000-2230 Local	All	RSGB 1.3/2.3GHz Activity	1.3/2.3G	RST+SN+Locator
22 Feb	1000-1200	All	RSGB 70MHz Cumulative	70	RST+SN+Locator+QTH
24 Feb	2000-2230 Local	All	RSGB 50MHz Activity	50	RST+SN+Locator

SO2R

What is SO2R? A Polish Special Contest Call? Well, it could be [in fact, there *is* such a call! - *Ed*], but in contesting terms it actually stands for Single Operator, 2 Radios. The technique has been around for a few years and my first experience of it was from John's, VE3EJ, station in, I think, 1993. The idea is 'simple': you have two independent radios and antennas, so that you can listen on one set-up, whilst you transmit on the other. What isn't so simple is training your brain to do it! Particularly on CW, listening around on a second receiver whilst you're calling CQ is quite demanding in terms of CW skill.

Some set-ups can be extremely advanced, with lockouts to prevent both systems transmitting at the same time, or transmitting and receiving on the same band with different systems at the same time. Some software, such as *Writelog, CT* and *TR* allows control of the two radio set-up. *TR* is particularly well thought of for two radio control and *Writelog* is catching up fast.

However, it's extremely easy and effective to start with a very simple SO2R set-up. At MW2I, we wanted to improve our multiplier performance. We bolted a simple multi-band vertical to the fence, ran the coax in through the window to another rig. Immediately we saw an improvement in a multiplier hit rate! We added an amplifier to the second station which helped us work the mults quicker and get back to the run band. It's not high-tech but it does work well.

You could start off by using an old, but faithful rig - or even just a receiver. If you have a transceiver with two receivers built in, then you can do something with that, though of course, it's hard to listen accurately when you're transmitting on the other band. Once you start playing with the techniques, it becomes compulsive and I found myself wanting to do more with the operating time when I was in the 2m Backpackers contests. I couldn't use another radio, but I could use the second VFO more actively. So, if I called CQ and no-one came back, I'd quickly switch to the second VFO and tune a few more kHz to see what I could find. It makes the whole process more active - and I think rewarding.

If SO2R isn't something you've tried, then have a play. It's fun! And if you can't do the two radio bit, then chances are that you have a second VFO that you can do more with. Have fun!

The view from the antennas of 5U5Z across the River Niger towards the USA (CQWW CW 2003).

PHOTO: DON FIELD, G3XTT

CONTESTS THIS MONTH

The *CQ* WW RTTY Contest is on 7 / 8 February. The RSGB's 1st 1.8MHz Contest is on 14 / 15 February and usually sees a good mix of UK, European and DX activity. It's also good preparation for your 160m station to take part in the *CQ* 160m Phone contest which is on the 28 / 29 February. The French REF SSB contest is the same weekend, an excellent one if you are chasing French *departements*! ◆

By Tim Kirby, G4VXE, Willowside, Bowbank, Longworth, Abingdon, Oxfordshire OX13 5ER. E-mail: tim@g4vxe.com

MAY 2003 UHF / SHF CONTEST

It was really good to see nearly 50% more entries this year over last year, even with one or two old faithfuls missing. Activity on the high bands continues to increase, but 70cm activity was also up this year. The results on many of the bands were clear cut, but the single operator fixed section on 10GHz was very closely fought, with careful adjudication needed to confirm the placing between G3XDY and G4EAT.

In spite of just losing out on 3cm, John Quarmby, G3XDY, had a commanding lead over Neil Whiting, G4BRK, in the overall Single Operator Fixed section. After many years of trying, the South Birmingham RS finally won the Open Section, leaving the Northern Lights, operating from the Isle of Man, in second place.

Andy Cook, G4PIQ

Single Operator Fixed Overall Results

Pos	Call	Loc	432 MHz	1.3 GHz	2.3 GHz	3.4 GHz	5.7 GHz	10 GHz	24 GHz	47 GHz	Total
1*	G3XDY	02OB	557	1000	1000	1000	1000	1000	0	0	5556
2*	G4BRK	91DP	214	585	587	348	176	494	1000	0	3404
3=	G1OGY	01GR	1000	0	0	0	0	0	0	0	1000
3=	G4EAT	01HR	0	0	0	0	0	1000	0	0	1000
5	G4LDR	91EC	0	60	48	61	149	361	0	0	679
6	G8SRL	01ED	372	0	0	0	0	0	0	0	372
7	G3YDY	01FQ	322	0	0	0	0	0	0	0	322
8	G4NNS	91FF	0	0	0	0	0	247	0	0	247
9	G4APJ	83UP	160	0	0	0	0	0	0	0	160
10*	2E1GUA	01FR	145	0	0	0	0	0	0	0	145
11	M0DDT	91JR	141	0	0	0	0	0	0	0	141
12	G3YJR	93FJ	105	0	0	0	0	0	0	0	105
13	M1DUD	02QC	53	0	0	0	0	0	0	0	53
14*	M3KGC	93FJ	30	0	0	0	0	0	0	0	30

Open Section Overall Results

Pos	Group	Loc	432 MHz	1.3 GHz	2.3 GHz	3.4 GHz	5.7 GHz	10 GHz	24 GHz	47 GHz	Total
1*	South Birmingham RS	92GB	569	698	1000	1000	1000	1000	1000	57	6324
2*	The Northern Lights	74QD	1000	1000	720	429	295	503	0	0	3947
3	Flight Refuelling ARS	80UU	741	518	298	327	14	633	0	0	2532
4	Telford & DARS	82QL	11	218	104	213	235	475	0	1000	2256
5	Five Bells CG	03CE	950	0	0	0	0	0	0	0	950
6	Luton VHF Group	91RU	158	340	49	0	0	0	0	0	548
7	GW1ATZ/P	82KW	169	0	0	0	0	0	0	0	169
8	GM4V	85NR	161	0	0	0	0	0	0	0	161
9	Lothians Radio Society	85SS	109	0	0	0	0	0	0	0	109
10	Norman Stewart	85VW	93	0	0	0	0	0	0	0	93
11	G6GVI/P	91IN	0	78	0	0	0	0	0	0	78
12	Oldham Radio Club	83WN	11	0	0	0	0	0	0	0	11

432MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G1OGY	17424	1000	71	01GR	300	4 x 21Y	DF0MMO	533
2*	G3XDY	9699	557	26	02OB	250	28Y	DL0GTH	684
3	G8SRL	6484	372	31	01ED	80	2 x 21Y	PI4GN	496
4	G3YDY	5610	322	20	01FQ	50	19Y	DL0GTH	729
5	G4BRK	3733	214	10	91DP	30	21Y	DF0EK	547
6*	G4APJ	2782	160	13	83UP	25	19Y	PA6NL	469
7*	2E1GUA	2532	145	15	01FR	10	19Y	DF2VJ	530
8	M0DDT	2450	141	15	91JR	80	21Y	GM3HAM/P	457
9	G3YJR	1837	105	10	93FJ	10	19Y	PA6NL	413
10	M1DUD	927	53	8	02QC	2.5	6Y	PA6NL	189
11*	M3KGC	522	30	3	93FJ	10	19Y	GM1CNH/P	286

432MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	GD0EMG	26048	1000	80	74QD	400	4 x 20Y	ON5PX	724
2*	G5B	24734	950	76	03CE	400	8 x 28Y	DK6AS	716
3	G4RFR/P	19314	741	79	80UU	400	QLY	EA1DDU	851
4	G8OHM/P	14814	569	78	92GB	400	4 x 19Y	DF2VJ	664
5	GW1ATZ/P	4405	169	30	82KW	50	18Y	PA6NL	502
6	GM4V	4183	161	18	85NR	40	24Y	PA6NL	620
7	G4LOO/P	4123	158	28	91RU	400	3 x 36Y	DL5DAW/P	557
8	GM3HAM/P	2850	109	13	85SS	400	2 x 37QLY	M0DDT	457
9	GM1CNH/P	2424	93	7	85VW	400	27QLY	G4RFR/P	565
10	G1ORC/P	291	11	4	83WN	3	2 x 9Y	GD0EMG	176
11	G3ZME/P	275	11	3	82QL	200	17Y	G3PHO/P	117

1296MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G3XDY	13702	1000	42	02OB	250	4 x 23Y	DL0GTH	684
2*	G4BRK	8016	171	34	91DP	40	67Y	DJ6JJ	602
3*	G4LDR	817	30	5	91EC	8	55Y	DF0HS/P	536

1296MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	GD0EMG	12215	1000	34	74QD	120	8 x 23Y	F6DKW	762
2*	G3OHM/P	8522	698	51	92GB	130	8 x 23Y	DG9KAF/P	563
3	G4RFR/P	6333	518	35	80UU	-	-	PA0WMX	578
4	G8ATD/P	4156	340	40	91RU	25	4 x 36Y	DF0HS/P	465
5	G3ZME/P	2666	218	18	82QL	200	1.4m	PA6NL	461
6*	G6GVI/P	950	78	10	91IN	15	15/15	GD0EMG	364

2320MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G3XDY	6739	1000	22	02OB	50	0.6m	DL3YEE	501
2*	G4BRK	3955	587	12	91DP	30	0.8m	PA5DD	444
3	G4LDR	323	48	5	91EC	35	66QLY	G3OHM/P	107

2320MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G3OHM/P	3614	1000	17	92GB	60	1.2m	PA6C	546
2*	GD0EMG	2601	720	8	74QD	60	66Y	PA0EZ	688
3	G4RFR/P	1076	298	11	80UU	-	-	G3XDY	276
4*	G3ZME/P	377	104	4	82QL	8	1.4m	G4BRK	111
5	G4FFM/P	178	49	8	91RU	1	20QLY	M1EPM	33

3400MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G3XDY	3649	1000	12	02OB	15	0.6m	DL3YEE	501
2*	G4BRK	1269	348	7	91DP	6	0.6m	PA6NL	403
3	G4LDR	222	61	3	91EC	-	0.9m	G8IFT/P	107

3400MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G8IFT/P	2032	1000	13	92GB	30	1.2m	PA6NL	382
2*	GD0EMG	872	429	3	74QD	15	1m	G4BRK	340
3	G4RFR/P	665	327	6	80UU	-	-	G3PHO/P	275
4	G3ZME/P	433	213	4	82QL	20	0.9m	G3PHO/P	117

5700MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G3XDY	2703	1000	10	02OB	15	0.6m	DK2MN	416
2*	G4BRK	477	176	5	91DP	4	0.8m	G3XDY	206
3	G4LDR	404	149	5	91EC	15	0.9m	G4ALY	194

5700MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G8IFT/P	1837	1000	10	92GB	15	1.2m	PA6NL	382
2*	GD0EMG	542	295	2	74QD	10	1m	G8IFT/P	314
3	G3ZME/P	431	235	3	82QL	10	0.9m	GD0EMG	230
4	G4RFR/P	26	14	0.5	80UU	-	-	G4LDR	52

10368MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G4EAT	4044	1000	18	01HR	10	0.6m	GD0EMG	443
2*	G3XDY	4042	1000	10	02OB	10	0.6m	DK2MN	416
3	G4BRK	1997	494	12	91DP	10	0.8m	PA6NL	403
4	G4LDR	1461	361	12	91EC	8	0.9m	F6DKW	378
5	G4NNS	999	247	9	91FF	4	0.55m	F6DKW	386

10368MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1	G4MAP/P	3802	1000	22	92GB	10	0.9m	F5HRY	463
2	G4RFR/P	2406	633	15	80UU	0	0	GD0EMG	399
3	GD0EMG	1913	503	8	74QD	15	1m	G4EAT	443
4	G3ZME/P	1806	475	20	82QL	5	0.9m	GD0EMG	230

24000MHz Single Operator Fixed

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G4BRK	49	1000	1	91DP	-	0.8m	G8IFT/P	49

24000MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G8IFT/P	49	1000	1	92GB	0.35	0.3m	G4BRK	49

47000MHz Open

Pos	Callsign	Score	Norm	QSO	Loc	Pwr	Ant	Best DX	km
1*	G3ZME/P	87	1000	1	82QL	0.025	0.3m	G7MRF/P	87
2*	G3OHM/P	5	57	1	92GB	0.0001	0.3m	G7VDE/P	5

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By Dave Lawley, G4BUO Carramore, Coldharbour Road, Penshurst, Kent TN11 8EX. E-mail g4buo@compuserve.com

Morse

This new quarterly column by well-known Morse aficionado Dave Lawley is aimed right across the spectrum - from those who swear they'll never touch a key to those who use nothing else.

1991 saw the first ever use of the MO prefix in the UK, when the MORSE special callsign was activated to celebrate the bicentenary of Samuel Morse. The code bearing his name actually owes its development to Morse's assistant, Alfred Vail.

Morse Code is dead – long live Morse Code! Since the World Radio Conference (WRC) in July 2003 removed knowledge of Morse as a requirement for access to the bands below 30MHz, some have pronounced its demise but for thousands of amateurs the death of Morse code would mean the death of amateur radio itself.

The Morse Assessment for former Class B licensees and the introduction of the Foundation Licence has brought a very welcome influx of new operators to the HF bands, and following WRC-03 the RA moved swiftly to allow full HF access for former Class B licensees, which gave G8, G6, G7, G1, M1 and 2E1s the opportunity to explore HF. However, many who have tried HF for the first time have found the bands to be extremely crowded. M3s in particular, with their 10-watt limit, may have trouble 'getting out'. Now that Morse is no longer compulsory, it's possible to take your time and develop your skills so that CW becomes a real option.

ADVANTAGES

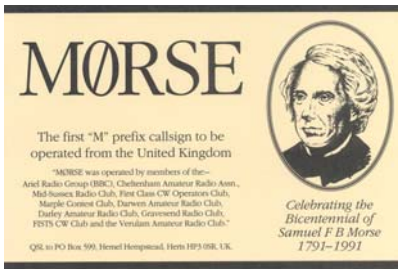
If you choose to use Morse on the bands, you'll be doing it on its own merits and not out of compulsion, though it has to be said that many present Morse aficionados saw it at the time of taking their test as an imposition, but came to love it. So, what are the advantages of using CW?

Here in no particular order are 10 arguments in favour of the use of Morse:

1. Simple equipment. It's possible to build a simple CW transmitter using fewer than a dozen parts, while a direct conversion receiver can give acceptable performance on CW. The art of homebrewing, as promoted by the G-QRP Club and others, is alive and well today and can get you on to the air on CW very easily.

2. International. You easily get around the language barrier by use of abbreviations such as QTH and 73, so that two amateurs can have an elementary QSO without knowing each other's language, and without accent or phonetic problems that may arise on phone.

3. Silent operation. When first licensed I liked to operate late into the night but other family members would not have appreciated me shouting into a microphone. Wearing headphones and using a straight key, night time CW operation was possible and did not disturb others sleeping in the house.



4. Morse gets through. Cross-mode contacts aren't very common, perhaps because they're not valid for most awards, but if you're struggling to copy a weak phone station on a crowded band it's surprising how often a switch to CW will enable the contact to be completed [provided the phone operator is also a competent Morse operator! - *Ed.*]

5. Spectrum efficiency. The minimum bandwidth needed to copy an SSB signal is about 1.8kHz, and to sound natural you need to occupy at least 2.5kHz. On the other hand IF filters for CW operation are typically only 500Hz wide, and if needed you can copy CW through filters of 100Hz or less. Put simply you can get at least five times as many CW QSOs in the bandwidth required for SSB.

6. Less TVI. Those who operate both modes know that EMC problems are worse on SSB than CW. If you're having TVI or RFI headaches the very best approach is to solve the problem, but if this is not possible you may find that switching to CW provides a cure.

7. More competitive. The difference between 'big gun' and 'little pistol' seems to be accentuated on phone. If you have antenna limitations (and who doesn't?) or run low power, you may struggle for QSOs on phone, whereas CW is a great leveller.

8. Morse is a skill. It's wrong to say that phone operation doesn't require skill, but the basic skill required is that of speech, which just about everyone has. You have to learn a new skill in order to be able to communicate using CW.

9. Automation. This is contentious, but there are computer programs which make it possible to automate the reception of Morse code. It's a much simpler task to get the computer to send CW. So in theory you could engage in CW QSOs without knowing the code, but this would be to miss the whole point: you may as well use a more efficient automated mode such as PSK31. In any case, a good human operator can easily out-perform most computer techniques when copying a CW signal on a channel with even a moderate amount of QRM or QSB.

10. Morse is easy. The general public thinks that Morse is a language, and at special event stations Morse operation always proves fascinating to visitors. Strictly speaking, Morse isn't a code at all, it's a cypher. That is because each character is represented by a specific combination of dots and dashes. Unlike learning a foreign language which will have a grammar and vocabulary, you just have to learn the symbols for 26 letters, 10 numbers and a few special characters.

I dare say readers can think of some other advantages (if you saw the film *Independence Day* you'll know that it can also be useful when fighting invaders from outer space). ◆

MORSE PROFICIENCY PROGRAMME

Many places have joined the UK in dropping the Morse requirement, but if you wish to get a reciprocal licence for a number of countries, you will still have to show that you have passed a Morse test. With this in mind, together with a wish to recognise Morse skills over a range of speeds, a Morse Proficiency Programme is being developed in the UK. 5WPM tests under the programme were available at the RSGB AGM in December, and the aim is to offer certificates for copy at 0, 5, 10, 15, 20 and 25WPM. Morse proficiency tests will be offered at major rallies and events throughout the year. No, that's not a typo - the basic award will be for 0WPM but, to the mathematically-minded, this would mean that the test would take an infinity to complete. What it means in practice is that characters are sent singly, with plenty of time to decode each character. The overall speed can therefore be very slow, but you must show that you have learned to copy all the characters. This is a step beyond the Morse Assessment, which remains part of the Foundation Licence course.

NEXT TIME

In future columns I plan to cover some of the ways of learning the code and developing Morse skills. There is no magic way to learn but if you tune the bands and hear someone rattling away at a seemingly impossible speed, it is as well to remember that they too started out knowing no Morse at all. I'd be interested in reader's comments, and particularly how they learnt the code. For those that can't wait until the May *RadCom* to start learning, my recommendation is the Koch method (see 'Websearch' below).

WEBSEARCH

KOCH METHOD	www.ees.nmt.edu/sara/sara/finley.morse.html

By Rev George Dobbs, G3RJV, St Aidan's Vicarage,
498 Manchester Road, Rochdale OL11 3HE. E-mail: g3rjv@gqrp.co.uk

QRP

Dick Pascoe, G0BPS, is elected as the new President of QRP ARCI. There are two QRP events to look out for, one on the midlands and one in the north. A new company of interest to QRPers has been launched.

The QRP Amateur Radio Club International (QRP ARCI) is a large QRP organisation based in the USA. The QRP ARCI club was originally started up by the late Harry Blomquist, K6JSS, with the idea of voluntarily limiting power to 100W to reduce QRM on the bands and make ham radio more enjoyable. Around 1977, Tom Davis, K8IF, became president of the QRP ARCI and proposed that it abandon the 100W focus and convert itself into a true QRP club, at the 5W level. It aims specifically to promote fellowship and activity among QRP operators on an international level, through an extensive programme of contests, awards, and a large-format glossy quarterly magazine called the *QRP Quarterly*. For many years, the club has been responsible for the 'Four Days in May' QRP symposium, a programme of QRP lectures and events beginning the day before the largest amateur radio event in the world, the Dayton Hamvention in Ohio. The Hamvention lasts three days and, adding the QRP component, gives the 'Four Days in May'.

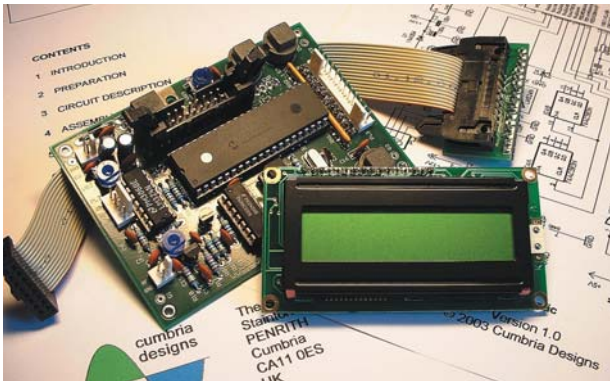
The QRP ARCI is run by an elected Board of Directors under a President and Vice-president. For the first time ever, living up to the 'international' part of the title, the club has elected a non-American president. Dick Pascoe, G0BPS, is president of the QRP ARCI for three years from January 2004. Dick has been on the QRP ARCI Board of Directors for some years, and is well known in UK QRP circles, being the SSB and Data Manager of the G QRP Club and a regular at QRP meetings and events (see the photograph).

Dick was co-founder, with G3ROO, of Kanga Products which, for many years, supplied a wide range of kits for the QRP constructor. He is no stranger to the American QRP scene, having regularly attended the QRP events at the Dayton Hamvention. In fact, for many years, Dick was my travelling companion and room-mate on visits to the USA. We congratulate Dick on his new appointment. Naturally, he will be at the 'Four Days in May' event in 2004. More information about the QRP ARCI can be found at www.qrparci.org The current subscription rates are $18 in the USA, $21 in Canada and $23 for all other countries. The membership secretary is Jack Nelson, K5FSE, 1540 Stonehaven, Cumming, GA 30040, USA (jack.nelson@mindspring.com).

CUMBRIA DESIGNS

A new company, Cumbria Designs, is beginning to interest many QRP project constructors. It is launching a series of kits for the 'difficult and tedious' parts of radio construction. Cumbria Designs was formed early in 2003 as a partnership run by Ron and Gill Taylor. Ron, G4GXO, a Chartered Engineer, decided upon a 'lifestyle change,' leaving his job as Head of Area Operations for a mobile phone company, to set up Cumbria Designs in partnership with his wife Gill. Based in their home near Penrith, Cumbria Designs will be marketing a range of kits aimed at the amateur radio enthusiast. Ron says, "We're interested in removing the difficult or tedious stages in radio projects - for example, my intense dislike of all things DIY and in particular metalwork, drove me to develop the forerunner of our first kit, a versatile display module that greatly simplifies transceiver construction".

The FD-01 was launched at the G QRP Mini-Convention in October and created a lot of interest. Based upon a 16F877, the FD-01 conveniently provides all of the main operational information of a transceiver on a 16x2 backlit LCD (see the photograph). Able to operate as a 10Hz-resolution frequency counter with an upper limit in excess of 100MHz, the FD-01 features user-programmable IF offsets, delta shift measurement, a novel multiplier factor system for VXO chains, a bargraph S-meter, mode indicators and a transmit/receive indicator with hysteresis for full break-in operation.



Other kits are planned, including a simple 50MHz frequency counter and an HF synthesiser of simple and unconventional design. Ron says "Simplicity and the unconventional are the key ingredients of innovation". The retail price of FD-01 kit is £59.95 inclusive of VAT. Further information may be found on its website: www.cumbriadesigns.co.uk (rontaylor@g4gxo.freeserve.co.uk) or from Cumbria Designs, The Steading, Stainton, Penrith, Cumbria CA11 0ES. ◆

Left: Dick Pascoe, G0BPS, new President of the QRP ARCI, speaking at the 'Four Days in May' symposium in 2003.

Above: The FD-01 kit module by Cumbria Designs.

QRP EVENTS IN 2004

THE JUNCTION 28 QRP RALLY

On Saturday 20 March, the South Normanton, Alfreton and District Amateur Radio Club (SNADARC) in association with the G-QRP Club is running the fourth Junction 28 QRP Rally at the Village Hall Community Centre, Market Street, South Normanton, near Alfreton, Derbyshire. The venue will be fully signposted and is just five minutes from the M1 at junction 28 and the A38. The event includes amateur radio, electronics and related items, a bring-and-buy stall and special interest group stands. The full range of refreshments will include the traditional QRP Rally pie and peas and a licensed bar. The event is open to the public from 10am. Due to demand from previous traders, table space is limited, so early booking is advised. Please contact Russell Bradley, G0OKD, on 01773 783 394, or e-mail russel.bradley@ntlworld.com Further information and directions will be posted on the club website www.qsl.net/snadarc/

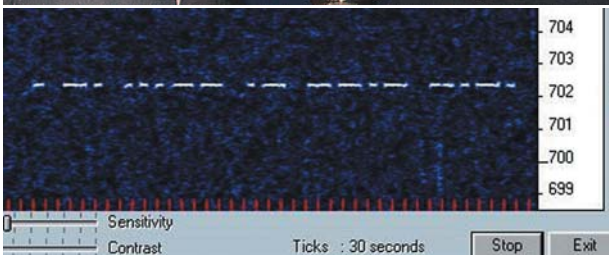
EIGHTH RED ROSE QRP FESTIVAL

The eighth Red Rose QRP Festival is on Sunday 6 June, 11am to 4pm, at The Formby Hall, Alder Street (off High Street), Atherton, Manchester. The organisers describe it as a friendly get-together, intended to promote low power amateur radio operating and home construction. It will feature trade and individual stalls, sales of new and surplus equipment and components, club stands (including RSGB, GQRP), and a low-cost bring-and-buy stall (no sell, no pay!). Morse receiving tests with certificates are also on offer. The venue has large spacious halls at ground level with facilities for the disabled, and a large free car park. A wide range of refreshments and a comfortable lounge bar are available. The event opens at 11am and the admission price is £1.50. Tables are available from £7, but please book early. Contact Les Jackson, G4HZJ (g4hzj@ntlworld.com), on 01942 870 634.

By Dave Pick, G3YXM, 178 Alcester Road South, Kings Heath, Birmingham B14 6DE. E-mail: lf.radcom@rsgb.org.uk

LF

There has been a little juggling of the regular columns recently. In order to equalise the number of regular columns in each month's RadCom, 'LF' took a three- instead of a two-month break this time, there being no January column. We resume the usual bi-monthly schedule from this issue, with a selection of news on the LF front.



David Bowman, G0MRF, receiving the prestigious Courtney-Price Trophy from the RSGB President, Bob Whelan, G3PJT, for his article 'A Class-D Transmitter for 136kHz', published in* RadCom, *February 2003.

Argo grab of G3AQC's signal at CN2PD. Although the 'G' has a piece missing, the rest is perfect.

Late autumn and early winter have been disappointing for DX compared with previous years. This has been largely due to a period of high solar activity which disrupted night-time DX paths, but occasionally enhanced daytime propagation. These day-time peaks can give rise to some quite surprising results; M0BMU caught a little of VO1NA's signal around 2000UTC one day and, on another occasion, WD2XDW in Alaska was received by a listener in Oregon, 2800km away, at midday!

BEACONS

As a consolation to the US hams who had been looking forward to a proper 136kHz allocation which never materialised, the FCC has promised to look favourably on applications for 'Part 5' experimental permits to use the band. These permits are for experiments only, not QSOs, and apply to spot frequencies. The application must justify the need for the permit and specify exactly the types of transmissions to be made. However favourably it may look at the applications, only two have so far been granted!

WEB SEARCH

G3NYK LF PROPAGATION NEWS www.alan.melia.btinternet.co.uk/latest.htm

The first was to Laurence, KL1X, in Alaska. His Part 5 beacon, WD2XDW, took a short break during Laurence and Sheri's wedding, which was held at home. During the ceremony, the whirring fans had to be silenced! It has since resumed on 137.77355kHz.

They will be moving in January, possibly to somewhere near the Kansas/Oklahoma border so the beacon will be QRT until a new Part 5 permit can be obtained.

At the time of writing, the only other successful applicant is Eric, KD5UWL, who has his beacon, WD2XFX, running 24 hours a day on 137.78077kHz. Eric is located in Glenpool, Oklahoma, locator EM25AX. He has been slowly raising the power past the 100W mark and has already set the aerial on fire!

The Canadian regulars on the band are VO1NA on 137.7770kHz, using QRSS60, and 'MP' (London, Ontario) on 137.7798kHz with QRSS30. VO1NA is regularly seen in the UK and Western Europe.

FIRSTS

Marek, SQ5BPM, has been busy upgrading his transmitter and now has 400W of RF at his disposal. In October he used the club station, SP5ZCC, to work RU6LA, YU7AR and M0BMU (best DX at 1467km). All these contacts were in QRSS and are firsts from Poland. Marek's first VFO proved to be not quite stable enough for the 10-second QRSS which he needed to use to make the longer distance contacts. He is now working on a frequency synthesiser.

Another first was the contact of Jim, M0BMU, with YO2IS at the crack of dawn one morning in late October. The distance was 1701km and the mode in use was QRSS3.

A newcomer on the band in the past few months is Gary, G4WGT, who has been steadily improving his signal. Gary is located in Lancashire.

MARAKESH CROSSBAND ON 136kHz

G3LDO was lucky enough to take a holiday to Marakesh in October, and he went equipped for LF reception. Peter used his trusty IC-706 which has a CW filter, two preamps, some coils and a laptop with *Argo* loaded. Having been issued with the local callsign, CN2PD, he was able to transmit on 40m and eventually made a cross-band contact with G3AQC. Laurie's signals were a remarkably good 'O' copy on QRSS. Congratulations to both for making the first 136kHz contact with Africa.

RU6LA RECEIVED IN UAE

When Ed Lesnichy, RU6LA, activated the club station at the portable site near Machta in November, conditions were still poor and no really long-distance contacts were to be had. However, the trip was made worthwhile by a report from RV6LNA who was in the United Arab Emirates at the time. This appears to be the first 136kHz report from the Middle East.

ZL6QH TESTS

A test session in September saw the Quartz Hill club's 136kHz QRSS signal being received in Anchorage (KL1X again), but no further East. This is still a remarkable distance during indifferent conditions. By the time you see this, the boys should have completed another test session over the Christmas holiday.

LF AT THE HF CONVENTION

The RSGB HF Convention near Manchester attracted quite a crowd but, unfortunately, the LF contingent was small, a long trip from the South-East putting off many of the regulars. It was this lack of manpower that prevented us from setting up an LF station at the venue. Having seen the extensive grounds of the hotel, I am sure we could have radiated a good signal. Maybe next year?

The LF forum took place as normal, chaired by John, G3WKL. Laurence, GM4DMA, received the Nevada cup by Internet video linkup and we were 'shown round' the KL1X shack. Steve, W3EEE, was present at the forum for the first time and, in a separate session, gave a very interesting talk on his experiments with LF and MF receiving loops. ◆

By Mark Lewis, GW7KDU, 14 Hornbeam Close,
St Mellons, Cardiff CF3 0JA. E-mail rmcwales@ntlworld.com

GB3DX – One year on with *EchoLink*

GB3DX celebrates its first anniversary using the *EchoLink* Internet-linking software. The reasoning behind the choice of software and the results of its use are discussed. An important notice from the RMC to all 70cm repeater keepers is included.

The new Internet-linked voice repeater, GB3DX, in Birmingham, has had a successful year according to Peter, G4KQU, and Steve, M1KQU. They have sent a report of the first year of operation. "It has been a very successful year since GB3DX came on air on 9 February, 2003. The local amateurs welcomed it, as there had not been a VHF repeater that would cover the whole of Birmingham and some of the surrounding areas. Quite a lot of changes have taken place to the repeater since coming on air, as we have strived to improve the service to the local amateurs.

"Donations of Marconi RC-742 transmitting and receiving equipment and the fitting of some awesome Sinclair duplexers, provided by Ian, G8PWE, have been welcome. These have 115dB isolation. There is a limited number of the duplexer sets still available to repeater groups at a good price. These can be tuned to your repeater frequency. Check the GB3DX website for more information.

"An experiment took place, soon after the repeater came on-line, to select the type of Internet connection that would be suitable for the repeater. The choices were *EchoLink*, *eQSO* and *IRLP*; the decision was left for the local amateurs to choose which system they wanted, as they would be using it. After some lengthy tests and discussions about each of the systems, it was found that *EchoLink* was the best by far for repeater operation with GB3DX. For normal (simplex) links, *eQSO* was very good. *IRLP* was good for repeater use, but there did not seem to be many users on it. The repeater is now directly connected to the Internet via a simple interface and the *EchoLink* software.

"GB3DX has established it self on the *EchoLink* system, with node number 7125, and is well used by many hundreds of radio amateurs from every part of the world via the Internet.

"We were lucky to obtain the node number 7125, because this was the decimal part of the frequency of the repeater (145.7125MHz). A website was built and domain bought. The website is well used, with between 400 and 500 hits a day. There is a full history of the repeater on the site, with photos and a lot more for the radio amateur, with a list of RF users who have accessed the repeater by radio. At the time of writing, well over 300 direct RF users have been logged.

"Many amateurs have said that they had lost all interest in amateur radio and that there had been a decline in use of the 2m and 70cm; the introduction of Internet-linked repeaters (and simplex links) up and down the country has re-kindled their interest in the hobby, as they find it fascinating to be able to talk to amateurs all over the world with their hand-helds or mobiles. Others have said that they have moved to retirement homes and areas where HF antennas are not allowed, and now they are able to have their hobby back again."

GB3LF

Details appeared in August 2002 of a simple upgrade to the GB3US MkI logic on GB3LF to include CTCSS access. Bob Wilkinson, G3VVT, has now extended this to the transmit side of the repeater as there are plans to add *IRLP* 'in the near future'. Details of Bob's upgrade, based around CML Microcircuits' FX365CJ and FX315P2 devices, will be covered in the 'Repeaters' column later in the year.

RMC REQUEST TO 70cm REPEATER KEEPERS

The Repeater Management committee of the RSGB would like to make the following recommendations to all keepers of 70cm repeaters. Please do your best to avoid site changes or the need to make specification changes to 70cm repeaters. In cases where a site change is made because of the loss of site, this will mean an immediate issuing of a second Notice of Variation removing permission for the repeater without any possibility of being able to apply for a replacement site for the foreseeable future. Specification changes (eg transmitter power, ERP etc) cannot be processed, as these have to be referred to the primary user.

REPEATER PROPOSAL STATUS AS OF 4 JANUARY 2004

The latest clearance status can be obtained from the RMC website. Please note that, even though an application may have cleared, it is beyond the control of the RMC as to when the keeper will bring the repeater into service. ◆

GB3DX cavity filters, control logic, receiver and transmitter.

LATEST CLEARED REPEATERS

Callsign	Type	Channel/Frequency	Keeper
GB3PK	New 2m Ballycastle, NI	RV53 Input 145.0625MHz Output 145.6625MHz	MI0CRR

OUTSTANDING VOICE REPEATER PROPOSALS SUBMITTED FOR LICENSING ARE

Callsign	Type	Process Stage	Proposed Keeper
GB3AA	New 23cm, Alveston, North of Bristol	PU	G4CJZ
GB3AI	New 2m, Amersham	RA	G0RDI
GB3BO	New 2m, Bolton	RA	G4YYB
GB3BW	New 23cm, Weston-super-Mare	RA	G4SZM
GB3FF	New 2m, Lochgelly, Fife	RA	MM0EEY
GB3GO	New 2m, Llandudno	RA	MW1DSB
GB3JF	New 2m, Lincolnshire	PU	G8LXI
GB3KD	New 2m, Kidderminster	RA	G8PZT
GB3LG	New 2m, Lochgilphead, Argyll	RA	MM1FEO
GB3LP	New 6m, Liverpool	RA	M1SWB
GB3SH	2m site change, Southampton	RA	M1AFM
GB3TY	New 6m, Carrickfergus	RMC	GI6IXD
GB3WE	New 2m, Backwell, North Somerset	RA	G4SZM

WEBSEARCH

GB3DX	www.gb3dx.co.uk
RMC	www.coldal.org.uk/rmc

By Norman Fitch, G3FPK, 40 Eskdale Gardens,
Purley, Surrey CR8 1EZ. E-mail: g3fpk@compuserve.com

VHF/UHF

As with the January 'VHF/UHF', this month's column is dominated by many reports of another superb aurora on 20 November and which provided rich pickings for operators on the VHF bands and on 70cm as well.

In the November 'VHF/UHF' I queried whether multi-hop Sporadic E (Es) could happen on 2m following the confirmed reception of Band 2 FM broadcasts in Scotland and Ireland from Canada and the USA on 26 June last year - see 'VHF/UHF' September 2003, page 47. Geoff Grayer, G3NAQ, writes, "*The VHF/UHF DX Book* has been available since 1995 and on pp2-43 you will see in Fig 2-34 a distance plot for 2m Es which I compiled from the *DUBUS* top operators' DX list and which clearly shows a double-hop peak where you would expect it (read the text for an explanation). It also implies that about 10% of the top DX operators have worked double-hop contacts on 2m. If you doubt the validity of this plot, compare it with similar plots made from the same source for auroral QSOs (Fig 2-26) - no evidence of double-hop - and for tropo ducting (Fig 2-19), which of course does not involve 'hops'."

Perhaps I should have made it clear that I was referring to the trans-Atlantic path. As the mechanism is proven, there is no reason why double-hop Es across the North Atlantic couldn't occur on 2m. The reason why it apparently hasn't thus far been observed is due to the lack of stations on either side of 'the pond' trying when conditions could be favourable. Thanks for your contribution, Geoff. *The VHF/UHF DX Book* is available from the RSGB Shop.

SOLAR AND GEOMAGNETIC DATA

In the 30 days from 5 November, the 10.7cm radio flux was over 100 units on 21 days. The minimum value was 91 on 7 November, the maximum was 178 on the 23rd and the average was 133.7. The sunspot number was lowest at just 11 on 7 November increasing to a maximum of 209 on the 26th. 21 new regions were recorded and spots 484, 486 and 488 were still very active in early December.

Geomagnetic activity was high when these spots were on the visible disc and in the 9-23 November period the average A-index at Fredericksburg was 24, the peak on the 20th being 67. That day it was 161 at College in Alaska and the resulting aurora was reportedly seen as far south as Greece. The Space Weather website - see the panel - is a mine of information and has links to many others. After you log on, scroll down the opening page to the 'Essential Web Links' section and click on the first one, 'NOAA Space Environment Center'. Now click on the 'Current Weather' button for a resumé of up-to-the-minute data including the Bz, solar wind velocity and dynamic pressure dials.

BEACON NOTE

From the 4m website - see the panel - there is a note that the RSGB received information from the Radiocommunications Authority that the Wessex beacon, GB3WSX, has been cleared to operate on 70.007MHz and that the authority to operate it would be issued to the designated keeper shortly.

IRAQ

Ian Abel, G3ZHI, reports a 90min QSO with YI1SRA in Baghdad on 4 December using the Echolink program. Laith was operating from an Internet café as full Internet access has yet to be widely restored in the city. With fellow members of the Baghdad Radio Club he is hoping to install a 2m repeater which could then be linked up to the Echolink network. Laith's e-mail address is laithtariq@yahoo.com

LEONIDS FEEDBACK

After the good results in 2002, there were no reports of meteor scatter contacts in last November's Leonids shower, which is composed of dust streams from comet Temple-Tuttle, and it seemed that it was a rather poor one this time. However, on the Space Weather website a leader entitled, 'What happened to the Leonids?' linked to a paper, '2003 Leonid Post-Mortem', by Bill Cooke of the Space Environment Team at the Marshall Space Flight Center questions this.

MOONBOUNCE

Roy Reed, G3ZIG (JO02), was QRV in the second leg of the 2003 ARRL contest over the 15/16 November weekend but didn't start operating until 0700 due to very strong winds. On 2m conditions were much better than those on the first weekend and he added another 35 QSOs to make 97 in all with 38 multipliers, all on CW. New initials were DK3EE, DL8UCC, AC3A, W4ZRZ, SK0UX, DL8YHR, DK4RC, G3LTF, LU6KK and K2TXB to bring his total to 334.

Howard Ling, G4CCH (IO93), has an as yet unresolved intermittent problem with the elevation readout on his antenna system but that didn't make any difference in the contest. He made a few more QSOs on 23cm but he, too, delayed his Saturday start due to high winds. His total for the event was 70 contacts with 29 multipliers. New initials were VA7MM, SK0UX, OH3MCK and UR5LX bringing his total to 186 in 35 DXCC entities, 31 fields and 137 grids. Progress was extremely slow, especially in the last few hours of the contest, with no QSOs made from 0920 until the end of his window at 1230. Stuart Jones, GW3XYW (IO71), operated only on 70cm in both legs of the event and lists 30 completed contacts including JW/SM2LTA in the first weekend.

Al Katz, K2UYH, editor of the *432 and Above EME News*, suggests in the December issue that activity was pretty good in the ARRL contest. It seems that with 125 QSOs on 70cm in one weekend, JW/SM2BYA still leads, but is a special case as a non-amateur-owned dish antenna was used. Otherwise, HB9Q appears to have the top spot on the band with 119x40. On 23cm, OE9XXI retained the lead with 79x31.

Other Brits who reported to the newsletter were Simon Freeman, G3LQR (JO02), who was QRV on 70, 23 and 13cm and Peter Blair, G3LTF (IO91), who reckoned that 70cm conditions were down in the second weekend compared with the October session. His final band scores were 8x8 on 2m, 47x26 on 70cm, 50x25 on 23cm and 13x12 on 13cm for a grand total of 837,800 points. He writes, "Overall I enjoyed the contest, my only gripe is the 'weakies', who only call the 'biggies' and rarely call CQ, so us medium guys don't get the chance to have a go at them."

The December newsletter includes G3SEK's Lunar Weekend Calendar for this year with the suggested activity weekends highlighted. The February one is 7/8 when London latitude stations will have about 27 hours of Moon time. The declination varies from +17.78° to +7.10°, the 144/432 sky temperature range is 212/15K to 249/19K and the signal degradation range, referred to perigee, is -1.20dB to -0.77dB. The Sun offset at Saturday midnight is -160°

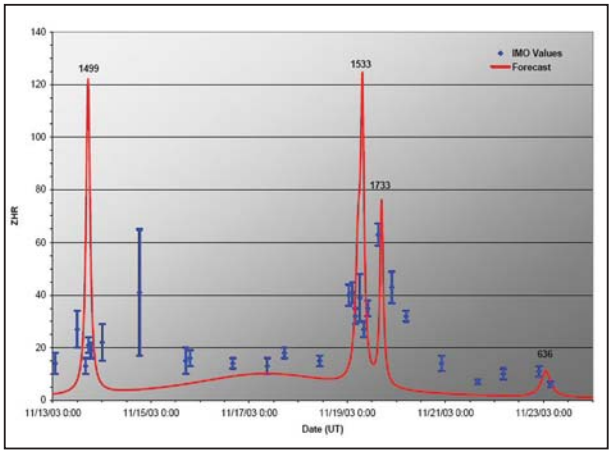


Fig 1: November's Leonid meteor show predictions (in red) compared with International Meteor Organisation data.

Bill has kindly given us permission to use his data and the accompanying graphics, which were current as of 1 December 2003.

Bill writes, "Despite expressions of disappointment from many visual observers, the 2003 Leonids appear to have taken place largely as usual (times of maxima predicted well, amplitude of maxima over-predicted). Enhanced numbers of meteors were seen at times corresponding to Earth's encounters with the 1499 and 1533 dust trails, with a contribution from the 1733 stream as well."

He continues, "An optimistic scenario involving the broad dust component known as the Filament failed to materialise. It had been hoped that the Filament would contribute a population of bright meteors to produce a more visually appealing display.

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	70MHz	144MHz	430MHz	1296MHz	Total
G4YTL	11	56	555	136	13	771
G1SWH	448	42	242	81	30	843
G8TOK	419	39	145	57	29	689
G3XDY	-	34	261	179	130	604
G4DEZ	665	29	195	87	41	1017
G3FIJ	278	29	108	51	23	489
G0JHC	1040	26	48	4	-	1118
G4OBK	469	25	79	10	-	583
M5MUF	155	23	70	-	6	254
GM4VVX	356	22	170	2	-	550
G3IMV	846	20	619	125	53	1663
G4FUJ	111	20	28	6	5	170
G4ZHI	107	17	280	33	-	437
M5BXB	423	15	177	57	-	672
G0FYD	717	9	294	48	17	1067
G0ISW	230	6	91	22	-	349
GM4JJJ	206	3	430	46	-	685
M1DUD	269	1	49	9	-	328
GW7SMV	664	-	216	-	-	880
G6TTL	405	-	140	94	28	667
G8BCG	661	-	-	-	-	661
G8HGN	346	-	200	73	-	619
M3CLY	262	-	285	20	-	567
MU0FAL	503	-	28	9	3	543
G7KHF	510	-	18	-	-	528
G1UGH	280	-	130	18	-	428
G8VHI	-	-	217	76	40	333
GW3EJR	313	-	-	-	-	313
G1EFL	231	-	67	2	-	300
G3FPK	30	-	246	-	-	276
G4APJ	184	-	61	29	-	274
GM6MEN	186	-	-	-	-	186
EA7IT	67	-	108	-	-	175
G8RWG	-	-	108	-	-	108
MM1FEO	50	-	13	1	-	64
M3VAM	17	-	18	6	-	41

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Band of the month 70MHz. Next deadline is 10 February.

"Instead, each of the Leonid stream encounters between 13 and 23 November yielded only relatively faint meteors, which makes sense when one considers that the meteors must have been significantly retarded by radiation pressure in order for them to encounter Earth this far past comet perihelion (the effect of radiation pressure upon a particle is approximately inversely proportional to the particle size, all else being equal).

"**Fig 1** compares the forecast predictions for Earth with the IMO (International Meteor Organisation) data as of 27 November. Note that: 1) Three forecast peaks (1499, 1533, 1733) are obvious in the ZHR data... 2) As with past years, the forecast peaks tend to be too high and narrow with the timing of the maxima pretty close to observed.

"Integrating the ZHR profiles over the 11 days of activity yields 5124 Leonids for the IMO data as opposed to 2435 for the forecast, implying that the actual LEO fluence was a factor of 2.1 greater than predicted. It is important to note that the IMO visual observers were often hampered by poor seeing and the Moon's presence." The article also included an all-sky plot of 38MHz radar meteors provided by Peter Brown of the University of Western Ontario in Canada.

AURORAL REPORTS

The aurora on 20 November was another major event triggered off by an X1/2B flare that day. The very strong southward component of 55 nanoTeslas of the interplanetary magnetic field resulted in a severe geomagnetic storm when the planetary A-index, Ap, reached 117 and the K-index rose to a maximum 9 in the evening.

On 70cm, Graham Daubney, F5VHX (JN04), completed with G4RGK, G3XDY and PA5DD for what were pretty certainly the first auroral contacts on the band from southwest France. The visual aurora was overhead and even to the south of his QTH on the western side.

John Quarmby, G3XDY (JO02), says the results on the band were second only to those in the mega event of March 1989 and he completed with F6CRP (IN96), 9A2SB (JN95 and ODX at 1458km), DF6NA (JN49), OK2MWR (JN86), S51ZO (JN86), DL6NAA (JO50), HB9DKM (JN37), OE3JPC (JN87), F5VHX and DK6AS (JO52). He also heard HA2RD.

Chris Bartram, GW4DGU (IO71), had to re-arrange his EME set-up after which his highlights were QSOs with 9A2SB at 1821km and S51ZO at 1603km. Also worked were F6CRP and EI5FK (IO51) at a QTE of 80°. He thinks that the QSO with 9A2SB may be a 'first' GW/9A on the band, while Zlatko says it's a new Croatian DX record. Chris was running 10W at the feed of a 4m long 17.3dBi GW4DGU Yagi at 13m AGL with an MGF1302 masthead preamp.

Next to 2m where G3XDY lists HA8V (KN06), S51ZO and I2FAK (JN45) who was still audible at 54A half an hour after all the other auroral signals had disappeared. Dave Butler, G4ASR (IO81), came on at 1915 and completed 34 CW contacts with stations in DL, EI, F, GM, HA, HB9, I, OK, OM, SP, SM and S5. ODX was HA8V at 1792km at QTE 80°.

Bryn Llewellyn, G4DEZ (JO03), was beaming to the south when he switched on and found the band alive with tone A signals. The optimum beam heading was 85° and at first he tried SSB, working 20-30 stations, but the distortion was more than usual so he changed to CW. The band was full of signals all evening and he had to QSY frequently to find a clear spot. He contacted 86 stations, 25 of them DLs and 16 OKs. Other countries worked were EI, F, HA, HB9, I, ON, PA, SP, S5, YU and 9A.

Richard Staples, G4HGI (IO83), worked 125 stations on CW in the 1550-1911 period. For the first hour the optimum QTE was 50-55° but then it changed to 90°. ODX were UT5DL and UZ5DZ at 1830km and he also worked down into the I3 and I4 call areas. Other countries mentioned included DL, F, HB9, OK, PA, S5, SP and 9A. He runs an IC-271E, GS35 PA and 17-ele Yagi. Using 10W to a 9-ele Yagi Roger Daniel, G4RUW (IO91), worked into EA, F, I, OK, S5 and SP on SSB.

Mike Ray, G4XBF (IO91), was alerted to the aurora at 1400 by Paul Pasquet, G4RRA, and from 1430 was copying beacons he had never heard before. He worked 118 stations in 57 grids and ODX was ES6RQ (KO28) at 1855km. He lists nine contacts over 1500km including US5WU (KO20/-1746km), LY2BJ (KO25/1721km) and EU3AI (KO22/1708km).

Steve Burrows, M5BXB (IO91), started calling CQ at 1620 and went on to work 100 stations in 54 grids, including four new ones, and 14 countries. His last QSO was at 1928 when he had to go QRT. He runs 400W to a 9-ele Yagi 15m AGL and was beaming at 35° most of the time. He reckons it was the best aurora by far that he has heard in 15 years and included a couple of maps showing the grids he worked.

Bob Harrison, G8HGN (JO01), made 67 QSOs with stations in 13 countries and 42 grids between 1507 and 1925, ODX being SP8NCJ (KO12) at 1552km. Other good DX were HA6ZB (KN07/1467km), SP7CNL (JO91/1302km) and OK2VSO (JN89/1258km). Virtually all QSOs resulted from his CQ calls and he runs 150W to a pair of 15-ele Yagis 13m AGL.

Steve Eldridge, G8IZY (IO91), was QRV from 1559 to 1928 when the first phase ended and then again for 15min from 2057 making 72 SSB QSOs with stations in 12 countries

and 36 grids. Almost all the QSOs were at QTE 70°. GJ0JSY (IN89) was the first Jersey QSO in 2003, F1JRD (JN13) and SP9QMP (JO90) were new grids and IW4BET (JN54) was his 36th country in 2003. It was by far the best aurora that Steve has experienced but an overcast sky obscured the visual display.

Colin Smith, GM0CLN (IO85), was QRV 1611-1657 in which time he completed 16 contacts, ODX being S54M (JN86) at 1710km. OK1KDO (JN69) was an all-time new grid and other good DX were OM3TZZ (JN88/-1651km) and SP6IQW (JO80/-1458km). At 1730 the visual aurora was in full swing and he took another 20 photos. The display was fantastic with lots of red and green rays and many overhead coronas. He came on again for a short while from 2232 and worked five British Isles stations. He runs 100W to a 14-ele Yagi 3m AGL through 40m of W103 feeder.

Clive O'Hennessy, GM4VVX (IO78), had a mega pile-up and got a break when he was called by OE5XBL* at QTE 90° for another new country. S54M* and 9A2ME* (JN86) were copied for a few minutes but no QSOs resulted. On 22 November he was called by RA4LIF* and Clive sent his report and locator but the Russian faded before completion.

GW4DGU made 37 contacts in 'search and pounce' mode and a GJ was his 43rd country in 2003. Chris's ODX was LY2IC (KO14) at 1894km and he also heard EW8FS (KN06) but couldn't break the pile-up of DLs calling. John Nelson, GW4FRX (IO82), came on at 1830 and made 97 QSOs all at QTE 60-70°. HA0HO (KN07) was ODX at 1813km among a string of HAs and SPs. The country total was 21 and F6DRO (JN03) and SP7EXY (KN00) were new grids. The Doppler shift at times was outside the RIT range on his IC-251E so he had to use split VFOs, which has never happened before.

Last to 6m, where Ted Collins, G4UPS (IO80) was copying beacon GB3BUX very auroral at 1350 and then went on to work EI, G and GM stations till 1513 after which he contacted SM5CEU* (JO78) and lots of continentals. These included SP1EUS* (JO74), OK1ACF* (JO70), LY1CX* (KO25), EH2KP (IN83), OK1AVY* (JN79), 4U1ITU* (JN36), SP2CNW* (JO93), OK2DPU* (JO60), I4EAT* (JN54), OK1AUN* (JO60), SP6NIC* (JO81), SP8AWL* (KO11), SP6GWB* (JO80) until a complete fade-out at 2120.

G4ASR worked OK2DW* (JN99) and SP9EVR* (JO90) at 2100 and G4DEZ contacted ES, LA and SM stations. Gavin Stirling, GM0WDD (IO85), heard lots of signals on his newly installed loop antenna in his loft. At 1743 he worked G3ZVW* (IO91) and later ON7GB* (JO21) and DL8YHR (JO41); not bad for just 5W and an indoor antenna. Thanks also to David Whitaker, BRS25429, for an SWL report: he heard 200 stations in 83 grids but little from Scandinavia.

70MHz

Michael Husted, OZ8AFE, reported to the 70MHz website that from 1 January this year, all Danish amateurs will have 70.0125-70.0625, 70.0875-70.1125, 70.3125-70.3875 and 70.4125-70.4875MHz, that last looking useful for FM.

FINAL NOTES

That's all there's room for, so apologies for the lack of band reports on other activity. Thanks to Neil Clarke, G0CAS, for the October issue of *SunMag*, to KM Publications for the winter edition of *VHF Communications* and the UKSMG for the October issue of *Six News*. The copy deadline for April is **10 February** and for May it's **9 March**. My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk. ◆

WEB SEARCH

SPACE WEATHER	www.spaceweather.com
4M WEBSITE	www.70mhz.org

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.

- Adrian, G4JBH, is looking for the instructions and circuit diagram for a **Microwave Modules MMT 144/28R transverter**. This is not the standard transverter, but the later model that was produced with the higher power output and metering on the front panel - sometimes known as the High Performance 'HP' model. The information is needed for a repair job and all costs will be willingly covered. G4JBH, QTHR. Tel: 01288 331 113, or e-mail: g4jbh@compuserve.com

- Geoff, G4DED, is building up a **VLF monitor receiver** and, in time, an A/D into a PC to record the data, and wonders if any others are doing the same? He would be pleased to hear from you. G4DED, QTHR. E-mail: g4ded@ukonline.co.uk

- Ted, G8HLJ, is looking for service information on the **Thandar TF-200 Frequency Counter**, plug-in coil racks A, B and C for the **HRO MX**, and knobs for the **Hallicrafters Skyrider Defiant**. All expenses will be refunded in full. G8HLJ, QTHR. Tel: 0151 632 0614.

- David, G4CWB, needs spares for a **Kenwood 530SP** in order to repair one with a counter board/display problem. If you have a working counter board or display that you can spare, you may be able to help. G4CWB, QTHR. Tel: 07711 443 076, or e-mail: g4cwb@qsl.net

- Mr McFarland, G3GMM, needs some unused, not overprinted, **RSGB Golden Jubilee QSL cards**, which are surplus to requirements. He would appreciate them in order to fulfil the demand he has for that contest. He will meet all costs incurred. G3GMM, QTHR. Tel: 01477 537 708.

- Roy, G3JNM, would appreciate help in troubleshooting a **Sony Trinitron 15in colour computer display, model CPD-100ES**. Can anyone supply a circuit diagram and service manual? Any photocopying costs will be refunded. G3JNM, QTHR. Tel: 01204 843 999.

- Bill Nichols is looking for the circuit and manual for the **Airmec 877 TeleVet**, a 1960s oscillator, wobbulator and oscilloscope. He also needs a **20mA** (or greater) **tunnel diode**. Bill Nichols, tel: 01363 866 339, or e-mail: billnichols@wnichols.freeserve.co.uk

- George, M5ACN, would welcome the gift of a tuning dial from an **R-107 receiver**. Alternatively, a good photocopy or high-resolution digital photograph would suffice. Please help to keep another of these historic receivers in working order and looking well. Expenses will be gratefully repaid. M5ACN, QTHR. Tel: 0870 904 7373, ext 37.

- Freddy, RS176466, would welcome any information, eg handbooks, circuit diagrams or, ideally, a workshop manual for a **GEC communications receiver type RC410R or RC411R**. Any expenses incurred will be reimbursed by return. RS176466, tel: 01670 827 741.

- Victor, G8WCQ, is looking for an **MRF427A power transistor** for 2m RF work. It must be a 50V device. G8WCQ, QTHR. Tel: 01297 23421, or e-mail: poisonpen@poisonpen.freeserve.co.uk

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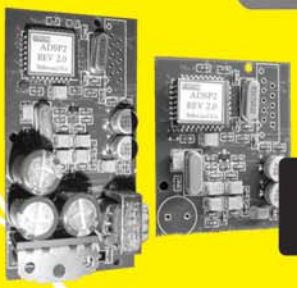
Cat. # 05-04



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By Don Field, G3XTT, 105 Shiplake Bottom,
Peppard Common, Henley on Thames, RG9 5HJ. E-mail: iotacontest@rsgbhfcc.org

RSGB IOTA Contest 2003

Here it is: well over 1200 entries makes this by far and away the RSGB's biggest contest, with support from all over the world.

Another year, another IOTA contest. However, every year brings its own surprises and challenges, and this year was no exception. The most frequent 'Soapbox' comment was about propagation, which almost everyone thought was little short of diabolical! Certainly the bands were in poor shape but, although the leading scores are down from 2002, the level of competition was as intense as ever. Indeed, there were several upsets at the top, especially in the close-fought Multi-op High Power section, where very few points separate the first and second-placed entrants, and also between the third and fourth placed. In the end 9A1V pipped 9A0R by the slenderest of margins, having started slightly behind in the Claimed Scores. The 9A0R team will no doubt be disappointed, given the strenuous efforts they had made to improve on their previous year's third place, taking along a huge amount of hardware (monobanders for 10 to 40m, a delta loop at 50m for 80m, etc) and a large team of operators. Hopefully they will be back to resume the challenge in 2004. Despite conditions, most entrants appear to have thoroughly enjoyed themselves; obviously IOTA contest participants appreciate a challenge!

What a location: part of the antenna farm at GM3PPG/P on EU-010 South Uist.

This is the team at 9A0R that made the highest number of QSOs in the 2003 IOTA contest.

SOME OBSERVATIONS

At this point some general impressions and observations may be in order. After propagation, the second most common topic of the log comments was those stations who identify infrequently and / or give their IOTA reference sparingly. Both of these habits lead to substantial frustration all round and I rather suspect that the offenders do themselves no favours, as some potential callers will get fed up and move on.

Overall entries are almost exactly the same as for 2002 which, considering the poor band conditions, is good news. Of course, we'll all be hoping for better conditions in 2004. Another piece of good news is that there were many first-time entrants this year, and quite a lot of activity from UK ex-Class B licensees for whom this was the very first weekend that they could be active on HF. Welcome to all new entrants; do please take part again in the 2004 event, and encourage your friends to do so too (and send in a log!). More confusingly, it was also the RSGB 90th Anniversary weekend, with lots of activity from the GB90RSGB special-event callsigns. Each used a distinct suffix, but most stations who worked them logged them without the suffix. Poor Steve, G4JVG, operating the HQ GB90RSGB station from Potters Bar was frequently frustrated to call stations, only to be answered with "worked before". It didn't make the adjudicators' job any easier, either!

Thanks, as always, to those who mounted an expedition for the contest. As usual, there were many comments about the expedition category, with each entrant wanting the rules to tie in with his own specific circumstances (quite understandably, of course). One recurring theme is to allow Low Power expeditioners to use Yagis, now that the sunspot cycle is on the decline. However, the current definition of a Low Power expedition is very much akin to widely accepted rules (at least within Europe) for Restricted Section stations in Field Day, so will be maintained as is to minimise confusion. As always, some who activated islands did so in comfort, while others experienced the usual visitations from Murphy and his various overseas relatives. Do look up the 'Soapbox' comments on the RSGB HFCC website to read some of the anecdotes.

2002 saw just one change to the rules, which was the introduction of a QRP option in all single-operator categories. It was very gratifying, therefore, to see a good number of QRP entries, with some excellent scores.

SCORES

South-east Europe was again an ideal place to be, whether on an island or not. 9A stations dominated the island categories, while YZ1V was World multi-op (Low Power) winner. When band conditions are poor, it clearly helps to be farther south which, coupled with also being to the east, helps with those runs of JA stations at 15 points a time. All credit then to those winners who took pole position from elsewhere, for example YL4U World multi-op (High Power), G5W (operator G3BJ) Single-op Island Mixed Mode (High Power) and MM0BQI/P Island Single-op Mixed Mode (Low Power). But especial mention must go to KC2LLM, winner of the Island Single-op Mixed Mode (Low Power 12-hour) category, showing that the leaders need by no means be confined to Europe. And in the Island Mixed Mode (High Power 12-hour) category, it is notable that seven of the top 10 entries were from the UK, ably led by G0MTN.

It would be tedious to go blow-by-

blow through every category. All the results appear in these pages, and you can always download them from the web page for further analysis (or request a spreadsheet from me with the full listing). There were some excellent QRP scores, definitely validating the introduction of this particular power category, and the number of Assisted entries is up again, suggesting that there is a real interest in participating in the contest while keeping an eye on the *PacketCluster* for possible new island counters.

TROPHY WINNERS

Many new trophies have been added for this year's contest, and we are extremely grateful to the sponsors. A short explanation of the category appears in the following list, where appropriate. Congratulations to all concerned. More trophies will be added for 2004, particularly for World (non-island) stations. Do check the rules beforehand to see what trophies you can compete for.

Multi-Operator Trophies

Island High Power

Geoff Watts Memorial - CDXC (Island Non Expedition)	**9A1V** (9A2R 9A3LG 9A3NY 9A3PA 9A4GL 9A4RV 9A7KNB 9A7R OM2VL OM3BH OM3GI OM3RG OM3RM OM7JG
IOTA- IOTA Committee (Expedition)	**9A0CI** (9A6AA HA1AG HA1TNX HA3NU HA3OV HA6OI)
UK High Score Plaque (Not Expedition)	**MD4K** (G0HSS G4XUM G1GEY G3NKC G4MJS M0BEW)
UK High Score Plaque (Expedition)	**GM4V** (GM0CLN GM0FZM GM0RLZ GM4ZRR MM0ANT MM0CCC)
USA High Score Plaque (Expedition)	**N1DX** (W0NO K0BJ K1TWF)

Island Low Power

Roger Balister, G3KMA, Trophy (Island Expedition)	**9A7T/P** (9A2EU 9A3SM 9A4KJ 9A5ADS 9A5MR)
UK High Score Plaque (Expedition)	**GN0ADX/P** (GM3OZB GM3ZRT GM4OSS MM0BIM)
NA High Score Plaque (Expedition)	**VE9ND** (VE1ACU VE1JH VE9XA)

World High Power

High Score Plaque	**YL4U** (YL1ZF YL2LY)

World Low Power

High Score Plaque	**YZ1Z** (YT1DT YU1DF YZ1DO YU1DO)

Single Operator Trophies (Island)

MM0BQI Summer Isles Trophy sponsored by www.summer-isles.com (Single Op Island High Score no restriction Expedition)	**GM3PPG/P** (G4BYB)
W9DWQ Trophy (NA Island DXpedition)	**VE1JS**

High Power Section

12Hr Mixed Mode High Score	**G0MTN**
12Hr Mixed Outside UK High Score	**OZ1AA**
12Hr SSB High Score	**SV8CS**
Dave King G3PFS Trophy (UK 12Hr SSB High Score)	**GW0GEI**
G3LZQ Trophy (12Hr CW High Score)	**9A6NL**
Cyril Leyden Memorial Trophy (UK 12Hr CW High Score)	**M7M** (G0CKP)
GMDX Group Trophy (24Hr Mixed Mode High Score)	**G5W** (G3BJ)
CDXC Plaque (24Hr Mixed Outside UK)	**VY2TT**
GMDX Group Trophy (24Hr SSB High Score Plaque)	**M6T** (G4PIQ)
24Hr SSB Outside UK High Score	**5B4KH**
24Hr CW Outside UK High Score	**9H1ZA**
G3DYY Memorial Trophy (24Hr CW UK High Score)	**G3GLL**

Low Power Section

12Hr Mixed Mode High Score	**KC2LLM**
12Hr SSB Mode High Score	**IC8WIC**
12Hr CW Mode High Score	**SP4JWR/1**
24Hr Mixed Mode High Score	**MM0BQI/P**
24Hr SSB Mode High Score	**YM0T** (TA2RC)
24Hr CW Mode High Score	**SV8/OL8R/P** (OK1FCJ)

QRP Section

High Score QRP Plaque	**MM3BRR**

Single Operator Trophies Non-Island

For 2003 Trophies are 12Hr and 24Hr High Power and Low Power with no mode classifications

High Power Section

12Hr High Score Plaque	**UT5UGR**
24Hr High Score	**UT7QF**

Low Power Section

12Hr High Score	**HA1CW**
24Hr High Score	**UR3HC**

QRP Section

High Score QRP Plaque	**EU6TV**

Single Operator Assisted (All Entries)

High Score no time restriction

High Power	**UW5Q**
Low Power	**HA1DAE**

SWL entries remain at a steady level. Relative to amateur logs, SWL entries are much more time-consuming to check, but there are clearly some very enthusiastic listeners out there who enjoy the chase, so we will maintain an SWL section for the time being, but will be keeping this under review. Some SWLs are still confused by the '1 in 3' rule, whereby two other callsigns must appear in the 'station worked' column before the same station can appear again. Actually there is a very simple way to maximise your SWL score while obeying this rule, a method which one entrant exploited very successfully. This is to have at least three run stations (probably islands) programmed into your receiver memories, and switch between them, logging the next station you hear working them.

Table 1: QSO breakdown by band and mode.

10	CW	4,554
10	SSB	7,171
15	CW	30,700
15	SSB	40,167
20	CW	89,229
20	SSB	101,972
40	CW	47,707
40	SSB	30,833
80	CW	20,070
80	SSB	13,990
Total:		386,442

Table 2: IOTA (Island to Island only) QSOs by continent.

AF	3973
AN	166
AS	13,539
EU	114,109
NA	10,737
OC	2672
SA	1591
Total:	146,787

SOME STATISTICS

I did think it would be of interest if I provided some statistics, based on an analysis of contest logs (with thanks to Tim Kirby, G4VXE). 1251 logs were received (including check logs), giving a database of 386,441 QSOs. Of these, 192,308 were CW and 194,133 were SSB. Almost exactly a 50:50 split, which really does indicate that any multi-op or multi-mode station largely ignoring one or other mode will be at a severe disadvantage. **Table 1** shows the breakdown both by mode and by band. In total, there were 44,306 QSOs with UK stations in the database, or 11.4% of the total. **Table 2** shows the continental breakdown of 'Island' to 'Island' QSOs. Once again it is clear that European activity continues to dominate this contest, while Asia (mainly Japan) comes a somewhat distant second. Remember, though, these are island to island contacts only, which gives only a partial picture. It is good to see that Japanese interest in the IOTA programme continues to grow in leaps and bounds, so hopefully the continental balance will start to become more even as the years go by. And obviously we would love to see more island participation from our North American friends. Finally, there are 239,655 'World' QSOs in the database of which 87,848 are 'World' to 'World'. In other words, 38% of contest QSOs are 'Island' to 'Island', 39% are 'Island' to 'World' and the remaining 23% are 'World' to 'World'. Clearly, non-island stations are getting plenty of opportunity to work islands which, after all, is one of the key motivations behind running the contest.

LOGGING

The adoption of Cabrillo as the favoured format for logs seems to have been readily accepted by the great majority of entrants. Thanks are due to those logging software authors who implemented this in good time for the contest. *SDI* (EI5DI), *LuxLog* (LX1NO), *N1MM Logger*, *GenLog* and *CKLog* conformed exactly, but most others offered perfectly adequate support. It is a pity *CT* (now available to download free of charge) still does not support Cabrillo for IOTA. It is also a little irritating to receive so-called Cabrillo logs which run data together ("5991063AS135") or separate with something other than spaces ("599 1063/AS135"). This makes parsing the data into the master database somewhat laborious. Please do check your logs before sending them in. For example, the log must contain sent serial numbers; the adjudicators simply cannot assume that serial numbers were given consecutively. Empty logs, logs for other contests, and various corrupted logs showed up amongst the entries. The easiest check is to open the log in a text editor such as Windows *Notepad* and give it a quick once-over. Some entrants still send paper logs which were clearly computer-generated. From 2004 these will no longer be accepted. If you use a computer, then send in the file. Even if it's not Cabrillo, it will almost certainly be easier to convert it than to OCR the paper log (which leads to errors, which we simply do not have the time or inclination to resolve). Of course, if you are without a PC, handwritten logs will continue to be accepted for the foreseeable future. But with such logs, please, please, please prepare them in chronological order, not by band. You don't even need to include scoring information or dupe sheets nowadays, as the logs will be typed into a computer and scored and duped correctly.

Incidentally, however you send in the log, please do give an e-mail address if at all possible, even if it's that of a friend. It is frequently necessary to get in touch to clarify information that is missing or ambiguous in log entries, and e-mail is much easier and quicker than any other method. It is noticeable, though, that a very high percentage of entrants have changed their e-mail address since the 2001 contest, so there seems little point in the organisers e-mailing the final results directly to entrants - too many get bounced as undeliverable. When the results are available, a note is always posted to the main contest reflectors and you can then find the listings on the RSGB HF Contests Committee web page.

The standard of logging was generally good despite some potential pitfalls. For example, RI1CA, RI1CG and RI1CGR were all active, causing more than a little confusion. EM1U and EN1U didn't help either! The most fre-

quently mislogged callsign was SQ4GXE/1 (copied as SQ4GX/1 on some 68 occasions). It wasn't clear whether this was a sending problem, a receiving problem, or a mis-spot on *PacketCluster*. However, in the absence of other evidence, a mislogged call is always penalised in the log of the station who has logged it incorrectly. It was also a little disconcerting to find one 'broken' callsign, which to the best of my knowledge only ever appeared as a *Cluster* spot, not on the air, appearing in five single-op unassisted logs and one SWL log. Do note that checking gets more comprehensive each year and, if appropriate, action will be taken by the adjudicators.

RULES AND AWARDS

There were fewer comments on the rules this year, so it looks as though we are converging on a set of rules which satisfies most entrants. Several entrants each year comment about the number of categories. Actually, the number is quite small compared with those contests with single-band categories and / or where each country is listed separately in the results. In IOTA you compete with those in the same category, whether from your country or not, which we consider to be fair. Otherwise those in countries with fewer entrants are at an advantage, in terms of certificates and awards, compared with those with many entrants. We do recognise, however, that it remains much more difficult to achieve a high score in the IOTA contest if you are located well away from Europe, for example in

RESULTS LISTINGS

(An asterisk * by the callsign indicates Low Power. Two asterisks ** indicates QRP)

Island - Multi-Operator

Pos	Callsign	QSOs	Mults	Score	IOTA Ref	Island Name
1	9A1V	2808	572	11,600,160	EU-016	Korcula
2	9A0R	2887	543	11,512,143	EU-136	Krk
3	OH0R	2561	409	7,481,019	EU-002	Brändö
4	MD4K	2706	450	7,422,300	EU-116	Isle of Man
5	9A0CI	2196	428	6,589,488	EU-110	Sveti Nikola
6	GU8D	2235	359	6,047,355	EU-114	Guernsey
7	GM4V	1851	367	5,732,907	EU-010	Benbecula
8	PI4HQ	2145	401	5,607,183	EU-146	Schouwen
9	TM3ON	2047	393	5,422,221	EU-068	Ile de Sein
10	GX6YB	2204	381	5,404,104	EU-120	Isle of Wight
11	CT9D	2647	329	5,143,257	AF-046	Desertas
12	G5XV	1870	399	5,125,554	EU-120	Isle of Wight
13	CS4B	2278	285	4,270,725	EU-040	Bugio
14	*9A7T/P	1606	315	3,649,590	EU-136	Trstenik
15	*LZ1KSL	1695	325	3,356,925	EU-181	Sveta Anastasia
16	CS5C	1967	276	3,327,732	EU-145	Culatra
17	GM2T	1543	230	3,173,310	EU-008	Tiree
18	*ES8X	1745	260	2,986,620	EU-178	Kihnu
19	RI1CA	1811	232	2,777,736	EU-133	Malyj Tyuters
20	*ED1ONS	1612	252	2,585,520	EU-080	Ons
21	J49RW	2360	206	2,368,176	EU-187	Gavdos
22	*IB0P	1689	220	2,352,900	EU-045	Ponza
23	G8A	1390	257	1,999,974	EU-005	UK Mainland
24	CQ3T	1593	182	1,966,146	AF-014	Madeira
25	*EJ7M	1336	239	1,924,428	EU-121	Bere
26	TM7Z	1476	203	1,880,592	EU-032	Ré
27	EJ2SDR	1294	212	1,853,304	EU-121	Inishbofin
28	PS2I	1637	181	1,838,055	SA-071	Santo Amaro
29	9A3W/P	844	248	1,669,536	EU-170	Dugi Otok
30	N1DX	1278	215	1,662,810	NA-031	Block
31	*UW0G	1864	170	1,583,040	EU-179	Kalanchakskiy
32	DL0KWH/P	1054	213	1,539,990	EU-129	Usedom
33	*EG9IC	1388	180	1,520,640	AF-036	Chafarinas
34	*YW6P	1503	188	1,515,468	SA-090	Piritu Afuera
35	*F/ON5MF/P	1205	179	1,474,065	EU-058	Sainte Marguerite
36	VP2MX	1600	180	1,425,600	NA-103	Montserrat
37	PA6Z	1180	171	1,346,112	EU-146	Goeree Overflakkee
38	*UU7J/P	1403	174	1,296,126	EU-180	Tuzla
39	GM3HAM/P	1134	163	1,262,598	EU-123	Great Cumbrae
40	GW8K	1021	189	1,218,483	EU-124	Flat Holm
41	DF1LON	976	175	1,138,200	EU-127	Helgoland
42	AA4V/P	1149	163	1,121,277	NA-110	Isle of Palms
43	*9A6K	964	175	1,073,100	EU-170	Kakan
44	M2C	522	227	1,055,550	EU-005	UK Mainland
45	IL7/I7RIZ	1025	159	977,373	EU-050	Pianosa
46	*TE8IP	1136	144	950,400	NA-116	Isla Pajaros
47	IL7M	1187	129	933,057	EU-050	San Domino
48	BI5P	815	118	886,062	AS-138	Pingtan
49	*9A/OK2SG	766	171	881,334	EU-170	Vrgada
50	*CT6B	901	136	858,840	EU-040	Berlenga
51	*DL0HGW/P	815	143	766,623	EU-057	Greifswalder Oie
52	G8OO/P	961	149	765,711	EU-005	UK Mainland
53	HI3/ON4IQ	1265	121	756,855	NA-096	Hispaniola
54	M6C	920	149	724,140	EU-005	UK Mainland
55	RI1CGR	1102	115	687,930	EU-133	Rodsher
56	*TM5T	706	141	637,038	EU-039	Chausey
57	*RI0MR	569	98	632,982	AS-066	Popov
58	*9A/S55A	645	129	593,271	EU-136	Krk
59	*GN0ADX/P	786	97	583,746	EU-122	Rathlin
60	*OZ/DF0TX	693	121	534,699	EU-125	Romo
61	*3D2BT	834	112	511,392	OC-016	Fiji
62	G3SAD	693	127	491,109	EU-005	UK Mainland
63	3Z0I/1	714	113	471,210	EU-129	Uznam
64	RI1CG	1096	84	454,608	EU-133	Kotlin
65	GI3XRQ/P	518	127	441,198	EU-115	Ireland
66	SK7DX	635	117	440,505	EU-138	Hanö
67	*M5Q	317	147	432,621	EU-005	UK Mainland
68	G4FOX/P	498	122	409,188	EU-005	UK Mainland
69	G6PZ	574	122	407,724	EU-005	UK Mainland
70	GM5C	692	99	406,296	EU-123	Great Cumbrae
71	W3TBG	460	124	394,320	NA-140	Smith
72	*IQ3UD/P	666	94	379,572	EU-130	Grado
73	*OZ8MW/P	611	90	361,530	EU-088	Anholt
74	BV2B/BV9W	567	70	344,190	AS-155	Peng Chia Yu
75	J49DIA	577	97	343,671	EU-187	Dia
76	VA7CW	660	77	340,032	NA-091	Texada
77	*SK7MQ	517	88	320,232	EU-138	Tjurkö
78	M4W	299	122	314,394	EU-005	UK Mainland
79	*VE9ND	493	87	270,657	NA-068	Miscou
80	*SK7A/P	361	88	248,424	EU-137	Lindö
81	JA1YPA	332	88	191,136	AS-007	Honshu
82	RK3AWK/1	514	51	131,274	EU-133	Kotlin
83	*IZ7AUH/P	284	66	130,680	EU-091	Grande Porto Cesario
84	IV3WMS	203	68	118,932	EU-130	Grado - Le Cove
85	*BI4HS	228	46	106,536	AS-136	Hengsha
86	*YE5X	416	39	95,472	OC-075	Galang
87	9V1YC	328	33	72,468	AS-019	Singapore
88	*OH5AD	248	39	58,968	EU-140	Kuorsalo
89	*JF2SKV	76	49	44,688	AS-007	Honshu
90	*VE3CTD	82	28	18,312	NA-128	Ile d'Orleans
91	*AH6RH	57	26	14,430	OC-019	Honolulu
92	*VY1/N7FL	55	14	5,502	NA-193	Herschel

Island - Single-Operator - Mixed Mode

Posn	Callsign	QSOs	Mults	Score	Op Time	IOTA Ref	Island Name
1	G5W	1627	331	3,160,719	24	EU-005	UK Mainland
2	VY2TT	1672	246	2,624,328	24	NA-029	Prince Edward Island
3	9A7P	1710	209	2,105,466	24	EU-016	Vis
4	OH6RX/P	1600	194	1,719,228	24	EU-101	Raippaluoto/Replot Is
5	N2GC	1056	220	1,594,560	24	NA-026	Long
6	9A0A	1487	179	1,591,131	24	EU-170	Dugi Otok
7	SM5/DL5AXX	938	162	1,062,396	24	EU-084	Raggarön
8	G0MTN	668	210	1,030,680	12	EU-005	UK Mainland
9	M0DXR	913	180	983,340	12	EU-005	UK Mainland
10	*MM0BQI/P	602	153	838,134	24	EU-092	Tanera Mor
11	*TK/F5RAB	914	138	825,516	24	EU-014	Corsica
12	GJ2A	731	143	728,871	12	EU-013	Jersey
13	OZ1AA	723	132	660,132	12	EU-029	Sjaelland
14	*9A5JR/P	720	123	504,792	24	EU-170	Vrgada
15	*K1VSJ	496	142	502,680	24	NA-046	Martha's Vineyard
16	G3LZQ	336	141	414,540	12	EU-005	UK Mainland
17	*N6NF	644	98	329,280	24	NA-092	Padre
18	*KC2LLM	642	94	327,684	12	NA-026	Long Island
19	JH4UYB	574	100	323,400	24	AS-007	Honshu
20	*SK0HS/5	442	86	311,148	24	EU-084	Vassaro
21	*EI4CF	273	123	307,377	12	EU-115	Ireland
22	*FS/N3OC	687	87	294,147	12	NA-105	St Martin
23	*G3RSD	414	105	279,090	12	EU-005	UK Mainland
24	*IM0M	775	70	278,670	24	EU-165	Ogliastra
25	G4FAL	309	112	277,200	12	EU-005	UK Mainland
26	EI7GY	437	90	257,310	24	EU-115	Ireland
27	*DL7VSN/P	130	129	250,002	24	EU-057	Ruegen
28	*IT9GAC	229	106	243,270	12	EU-025	Sicily
29	*VE1JS	589	76	238,260	24	NA-127	Brier
30	**MM3BRR	297	87	237,249	24	EU-010	Isle of Barra
31	*WB8YJF/4	441	85	226,695	24	NA-067	Ocracoke
32	RA0FF	324	65	205,140	12	AS-018	Sakhalin
33	SP1/OK1TN	556	60	203,760	24	EU-132	Wolin
34	*N2US/P	520	72	196,128	12	NA-139	Assateague
35	G4BGW	206	92	179,400	12	EU-005	UK Mainland
36	GM2Z	295	80	170,640	12	EU-005	UK Mainland
37	OZ0J/P	449	60	150,660	24	EU-088	Læsø
38	VO1TA	466	44	128,568	12	NA-027	Newfoundland
39	*G4OWT	147	82	120,786	12	EU-005	UK Mainland
40	*G3JJZ	148	77	109,956	12	EU-005	UK Mainland
41	*G4FVK	185	71	106,713	12	EU-005	UK Mainland
42	SV5/DL3DRN	469	48	98,064	12	EU-001	Rhodes
43	*RW0LKA	145	52	86,892	12	AS-066	Russky
44	*E21EIC/P	211	41	63,345	12	AS-107	Si Chang
45	*JA1BPA	123	49	49,245	12	AS-007	Honshu
46	*9A/S50K	198	40	48,240	12	EU-016	Vis
47	*SV5/DL2VFK	270	34	44,676	12	EU-001	Kos
48	*JE1COB	77	50	44,550	24	AS-007	Honshu
49	*JA4GXS/4	147	28	43,932	12	AS-117	Yashiro-jima
50	*C6ASB	188	34	35,904	12	NA-080	Great Abaco
51	EM1U	287	28	34,860	12	AN-006	Argentine
52	*UA0FDX	89	29	30,363	12	AS-018	Sakhalin
53	*EI5DI	108	32	26,880	12	EU-115	Ireland
54	*SO1CE	99	34	26,826	12	EU-132	Wolin
55	*PR2C	79	27	17,415	12	SA-024	Comprida
56	*9A3LN/P	78	26	17,316	24	EU-136	Krk
57	*SV9/PA0NMH	88	28	17,136	12	EU-015	Crete
58	*OZ1DYI/P	72	28	15,792	12	EU-125	Romo
59	*G0MRH	70	27	13,770	12	EU-005	UK Mainland
60	*OZ/DL7UXG/P	128	17	12,444	12	EU-172	Langeland
61	*JG1VGX	65	24	11,016	12	AS-007	Honshu
62	*F/G0MEU/P	52	27	10,692	12	EU-068	Ile de Sein
63	*JA1XPU	33	23	9,177	24	AS-007	Honshu
64	*DL8DZL/P	34	21	8,190	12	EU-057	Ruegen
65	*ZY2C	51	19	7,467	12	SA-024	Comprida
66	*DS5KJR/5	55	10	5,850	12	AS-081	Changson
67	*JH3OXM	22	19	5,814	12	AS-007	Honshu
68	*G4XPE	19	16	4,176	12	EU-005	UK Mainland
69	*M3OKU	39	14	4,158	12	EU-005	UK Mainland
70	*WA6WPG/P	26	14	3,780	12	NA-144	San Miguel
71	*KH6QJ	20	15	3,600	24	OC-019	Oahu
72	*KH2/JH0SPE	29	7	2,793	12	OC-026	Guam
73	*JG3WCZ	3	3	135	12	AS-007	Honshu
74	*OZ1DUG	12	2	120	12	EU-029	Sjaelland

Island - Single-Operator - SSB

Pos	Callsign	QSOs	Mults	Score	Op Time	IOTA Ref	Island Name
1	M6T	1703	279	2,771,307	24	EU-005	UK Mainland
2	GM3PPG/P	1271	218	1,995,354	24	EU-010	South Uist
3	5B4KH	1694	188	1,959,336	24	AS-004	Cyprus
4	GM0F	1288	187	1,292,544	24	EU-005	UK Mainland
5	*IC8WIC	1267	136	1,202,376	12	EU-031	Capri
6	SV8CS	1014	137	962,562	12	EU-052	Zakynthos
7	GB90RSGB	1009	152	843,144	24	EU-005	UK Mainland
8	*YM0T	1432	123	841,320	24	AS-159	Kefken
9	EI8GS	1094	130	785,460	24	EU-115	Ireland
10	DK8OL	621	138	687,654	12	EU-042	Sylt
11	GW0GEI	881	128	674,688	12	EU-124	Anglesey
12	EA8BVX	862	110	622,380	12	AF-004	Gran Canaria
13	EJ9HQ	643	106	528,834	12	EU-121	Aranmore
14	*EI7IQ	401	123	428,409	24	EU-115	Ireland

South-East Asia or the Pacific, so we are introducing much more recognition for continental leaders in the various categories.

Which brings us on nicely to trophies. John Dunnington, G3LZQ, takes over co-ordination of the IOTA trophy programme with effect from the 2003 contest, and has already lined up sponsors for many new trophies, reflecting the growth in the contest and its high profile around the world. Thanks are due to John and to all those sponsors for making this possible. It would be nice if those of you who receive a trophy in due course would drop the sponsors a line and record your appreciation.

Unfortunately there were some hiccups in sending out certificates after the 2002 contest, mainly due to the substantial rule changes which had taken place, introducing additional Low Power categories as well as World multi-op categories. Our apologies for that, which will hopefully have been addressed by the time you read this write-up. A large number of certificates will be sent out to leading stations in the 2002 event, and thanks are due especially to Dave Sharred, G3NKC, and Alan Hydes, G3XSV, for making this possible.

Returning to the rules, these will remain the same for 2004, to reflect the general level of satisfaction with the current rules. What we do hope to do is, as well as offering e-mail submission, offer web-based submission

15	*GM0FGI	419	123	404,055	24	EU-123	Isle of Bute
16	*OH1TD	569	107	400,929	24	EU-096	Korpo
17	LA6IHA	828	85	384,540	24	EU-055	Sotra
18	IT9VCE	635	96	379,872	12	EU-025	Sicily
19	EA8AJO	503	98	376,026	12	AF-004	La Palma
20	N7GYD	740	88	354,816	12	NA-065	Camano
21	*ZC4RR	544	75	342,900	12	AS-004	Cyprus
22	SP6CZ/1	427	104	325,416	12	EU-129	Uznam
23	*OZ/DJ1AA/P	436	93	312,480	24	EU-125	Romo
24	*M5BFL	309	116	305,196	24	EU-005	UK Mainland
25	YB0AI	636	71	296,496	24	OC-021	Java
26	*GI0KVQ	429	90	292,950	12	EU-115	Ireland
27	*EI7CC	261	111	278,721	24	EU-115	Ireland
28	*9H4JB	486	83	258,462	12	EU-023	Gozo
29	DL3KZA	410	87	256,302	12	EU-057	Ruegen
30	9Y4/DL2RVS	476	84	247,968	24	SA-011	Trinidad
31	*DF6QC	376	93	246,636	12	EU-127	Helgoland
32	*IS0LLJ	391	83	245,763	24	EU-024	Sardinia
33	*OZ1ACB	248	99	242,352	12	EU-029	Sjaelland
34	G0DIZ	236	109	232,824	12	EU-005	UK Mainland
35	SP6ECA/1	252	90	225,720	12	EU-132	Wolin
36	*SV5/G4DHF	760	62	223,200	12	EU-001	Kalymnos
37	*M/ON4CJK	480	77	206,976	24	EU-120	Lundy
38	*EA6XD	433	64	206,784	12	EU-004	Mallorca
39	*SP3GHK/1	323	86	206,142	24	EU-129	Uznam
40	*G0AJH	247	92	194,028	12	EU-005	UK Mainland
41	*SV8DCY	473	72	180,792	12	EU-049	Lesvos
42	W2/NP3D	491	68	170,340	12	NA-111	Long Beach
43	*5B4AFB	175	88	164,472	12	AS-004	Cyprus
44	*GM0NTL	206	89	161,802	12	EU-005	UK Mainland
45	*W3I	272	74	145,632	12	NA-140	Kent
46	*YB0A	448	45	143,640	12	OC-021	Java
47	*LA9RY	242	73	143,226	24	EU-055	Stord
48	*EI2II	235	75	139,275	24	EU-115	Ireland
49	*V31MF	558	53	133,878	12	NA-073	Caye Caulker
50	GM4EMX	183	80	132,240	24	EU-005	UK Mainland
51	*IT9/S550	419	42	123,354	12	EU-025	Sicily
52	N2NB	482	49	123,186	12	NA-026	Long Island
53	*PA/DH5HV	171	72	112,104	12	EU-146	Goeree/Schouwen
54	*9A/ON6AA	410	40	109,200	12	EU-016	Korcula
55	*SV8DTP	232	65	104,520	12	EU-049	Lesvos
56	*CU2YK	393	45	95,175	12	EU-003	São Miguel
57	9V1UV	341	46	93,978	12	AS-019	Singapore
58	*DZ1BP	260	37	80,364	24	OC-042	Luzon
59	*M0AQM	170	55	71,610	24	EU-005	UK Mainland
60	*CY9A	419	34	64,362	12	NA-094	St Paul
61	*M0CNP	76	61	63,684	12	EU-005	UK Mainland
62	KH6GMP	234	42	59,220	12	OC-019	Hawaii
63	*M5KJM	101	57	58,311	24	EU-005	UK Mainland
64	*M0GEB	113	51	53,397	12	EU-005	UK Mainland
65	**M3YCQ/P	92	52	51,168	24	EU-005	UK Mainland
66	*CT9T	330	26	47,892	12	AF-014	Porto Santo
67	*MM0LSB	113	35	44,625	12	EU-010	Baleshare
68	*JH1UUT	82	46	41,676	24	AS-007	Honshu
69	9V1RH	88	37	40,404	12	AS-019	Singapore
70	*2E1OIC	89	44	39,204	12	EU-005	UK Mainland
71	*G4WGE/P	103	43	38,571	12	EU-005	UK Mainland
72	*YC3BCK	111	23	33,603	12	OC-021	Java
73	*M0AFZ	80	40	33,120	12	EU-005	UK Mainland
74	VE7AVV	236	26	31,200	12	NA-036	Vancouver
75	*EA8CAC	117	36	29,916	12	AF-004	Gran Canaria
76	VE9MY	362	21	29,106	12	NA-038	La Grosse Ile
77	*JH4FKX	68	27	26,892	12	AS-041	Oki Archipelago
78	*DJ7WG	75	34	25,602	12	EU-098	Poel
79	JA3AER	68	35	23,940	12	AS-007	Honshu
80	*OZ1IOA	82	31	21,762	12	EU-029	Sjaelland
81	*JD1YAB/JD1	104	13	19,656	12	AS-031	Ogasawara
82	*DL/PA4EM/M	62	20	14,520	24	EU-047	Langeoog & Borkum
83	*M0BAO/P	50	28	13,944	12	EU-005	UK Mainland
84	PP5WG	66	23	12,834	12	SA-026	Santa Catarina
85	*EA8AD	103	20	12,420	12	AF-004	Tenerife
86	*RV6ASX/P	126	18	11,556	12	EU-185	Krupinin
87	*SP9XUD/1	42	26	11,388	12	EU-132	Wolin
88	*IT9YSW	60	20	9,360	12	EU-025	Sicily
89	*JR3RIY	47	20	9,300	24	AS-007	Honshu
90	*OZ/DL7VEA/P	71	18	8,586	12	EU-172	Fyn
91	*7N2UQC	28	23	8,280	12	AS-007	Honshu
92	*M0RHI	40	18	6,264	12	EU-005	UK Mainland
93	**EA8/DL8CX	32	18	5,616	12	AF-004	La Palma
94	WP4LNY	29	15	3,825	12	NA-099	Puerto Rico
95	*WP3GW	30	14	3,612	12	NA-099	Puerto Rico
96	*M0COP	16	16	3,456	24	EU-005	UK Mainland
97	*GI4TSK	30	12	2,664	24	EU-115	Ireland
98	*VA7MJR	25	11	2,277	24	NA-075	Gabriola
99	VK2CZ	28	10	1,920	24	OC-001	Australia
100	*JG1GCO	7	7	735	12	AS-007	Honshu
101	*JQ1AHZ/2	5	5	375	12	AS-007	Honshu
102	*JR1BSV	4	4	240	12	AS-007	Honshu
103	*2E1GUA	7	3	171	12	EU-005	UK Mainland

Island - Single-Operator - CW

Pos	Callsign	QSOs	Mults	Score	Op Time	IOTA Ref	Island Name
1	9H1ZA	2042	228	2,723,688	24	EU-023	Malta
2	9A6C/P	1424	179	1,559,448	24	EU-016	Brac
3	9A6NL	1002	136	834,768	12	EU-170	Pasman
4	H2G	1171	119	830,739	12	AS-004	Cyprus
5	*SV8/OL8R/P	1307	111	730,935	24	EU-174	Thassos
6	M7M	902	147	724,122	12	EU-005	UK Mainland
7	SP8RX/1	646	134	621,492	12	EU-129	Uznam
8	RW3TN/1	1266	90	577,260	24	EU-066	Solovetskiy
9	0Y1CT	1067	92	571,596	12	EU-018	Faroe Islands
10	*SP4JWR/1	541	136	558,552	12	EU-132	Wolin
11	*F/DJ9RR	1169	92	510,324	24	EU-032	Isle d'Oleron
12	OZ4O	619	125	508,125	24	EU-029	Sjaelland
13	*DL5KUD	384	128	437,760	12	EU-057	Ruegen
14	*SQ4GXE/1	701	102	434,826	12	EU-132	Wolin
15	*GM7X	665	104	413,400	12	EU-123	Isle of Arran
16	*G4IFB	484	128	408,576	12	EU-005	UK Mainland
17	*OH0N	525	108	408,564	12	EU-002	Aland Islands
18	VE1ZJ	575	108	401,436	24	NA-010	Cape Breton
19	*TK/OK2WH	929	82	386,958	24	EU-014	Corsica
20	*W4SAA/P	651	97	378,009	24	NA-141	Virginia Key
21	G3GLL	498	115	366,390	24	EU-005	UK Mainland
22	*OZ8AE	402	111	340,326	12	EU-029	Sjaelland
23	5B4AHA	758	81	333,882	24	AS-004	Cyprus
24	G3KZR	352	112	311,808	12	EU-005	UK Mainland
25	*9A/HA8KW/P	520	92	306,912	12	EU-170	Prvic
26	SM1T	729	75	304,425	12	EU-020	Gotland
27	*IV3/DL3OCH	472	89	299,040	12	EU-131	Lido di Venezia
28	*ES0MC	704	75	297,900	12	EU-034	Saaremaa
29	RA0FU	375	74	284,826	24	AS-018	Sakhalin
30	9A/HA6PS/P	738	72	278,640	12	EU-170	Pasman
31	GM4SID	643	81	256,365	12	EU-005	UK Mainland
32	*PA/DJ1YFK/P	504	72	237,600	12	EU-038	Texel
33	EI5GM	355	92	219,420	12	EU-115	Ireland
34	*G3LHJ	439	85	208,845	12	EU-005	UK Mainland
35	*GM3CFS	240	98	208,152	12	EU-005	UK Mainland
36	G3OOK	321	91	206,661	24	EU-005	UK Mainland
37	*SP3BJK/1	459	67	193,563	24	EU-132	Wolin
38	W2WB	509	71	191,061	12	NA-111	Long Beach
39	PA5TT	480	68	187,680	12	EU-146	Schouwen Duiveland
40	EI4DW	289	85	181,815	12	EU-115	Ireland
41	*ZC4VG	620	53	163,452	24	AS-004	Cyprus
42	*EI6IZ	427	63	160,083	12	EU-115	Ireland
43	G2HLU	181	84	146,412	12	EU-005	UK Mainland
44	*IT9ORA	348	62	145,824	12	EU-025	Sicily
45	*YB0ECT	296	57	145,008	24	OC-021	Java
46	*G2AFV	224	80	142,080	12	EU-005	UK Mainland
47	*CO8ZZ	375	62	131,502	12	NA-015	Cuba
48	JA7IC	301	68	127,500	12	AS-007	Honshu
49	*9M2/G4ZFE/P	399	41	112,053	24	AS-072	Pangkor
50	*OZ4FF	320	54	108,864	12	EU-030	Bornholm
51	*YB0DPO	237	55	105,765	24	OC-021	Java
52	G3UFY	121	75	103,725	12	EU-005	UK Mainland
53	*G4DDL	198	67	102,510	12	EU-005	UK Mainland
54	*9A/OK1KA/P	398	50	101,100	12	EU-170	Dugi Otok
55	G4BUO	222	66	100,980	12	EU-005	UK Mainland
56	*BW4/UA3VCS	406	36	91,800	24	AS-020	Taiwan
57	*G3GMS	161	63	90,909	12	EU-005	UK Mainland
58	JA1BNW	169	63	89,397	24	AS-007	Honshu
59	*IS0SDX	247	49	86,289	24	EU-024	Sardinia
60	*EI8JM	172	48	73,728	12	EU-115	Ireland
61	**G3YMC	169	57	73,359	12	EU-005	UK Mainland
62	G4BJM	267	46	70,518	12	EU-005	UK Mainland
63	*MU0FAL	290	45	68,850	12	EU-114	Guernsey
64	*SM5BAX	467	30	68,670	24	EU-084	Ornö
65	*G0UKX	160	53	67,416	12	EU-005	UK Mainland
66	*YV7QP	240	42	61,488	12	SA-012	Margarita
67	P43JB	114	53	60,102	12	SA-036	Aruba
68	**G0DCK	203	48	58,032	24	EU-005	UK Mainland
69	*SO1VAF	197	41	50,307	12	EU-132	Wolin
70	*KU8E	240	37	47,952	12	NA-058	Jekyll & St Simon's Is
71	**G3KKQ	103	49	45,129	12	EU-005	UK Mainland
72	*JI1RXQ	276	32	40,704	12	AS-007	Honshu
73	*VE2EM/M	125	42	37,926	12	NA-128	Ile d'Orleans
74	*KP4AH	243	28	37,212	12	NA-099	Puerto Rico
75	*VK4TT	143	34	36,618	12	OC-001	Australia
76	*G3GMM	108	41	34,440	24	EU-005	UK Mainland
77	*OZ1BMA	125	32	29,280	12	EU-029	Sjaelland
78	*EA6NB	303	19	25,707	12	EU-004	Mallorca
79	*YB2DGR	133	22	24,090	12	OC-021	Java
80	*G3ZRJ	114	30	21,780	12	EU-005	UK Mainland
81	*JA3HBF	74	33	21,582	24	AS-007	Honshu
82	*JA2KKA	70	28	17,304	12	AS-007	Honshu
83	*JR1NKN	47	31	17,019	12	AS-007	Honshu
84	*GW3SB	59	27	13,851	12	EU-005	UK Mainland
85	*MM/PA0INA/P	72	21	12,096	12	EU-005	UK Mainland
86	*SP1RXE	80	17	7,956	12	EU-129	Uznam
87	*DL5CX/P	106	12	5,544	12	EU-098	Poel
88	*JR3NDM	24	17	4,488	12	AS-007	Honshu
89	*YD3JMO	33	11	3,201	12	OC-021	Java
90	*JF7GDF	22	8	1,392	12	AS-007	Honshu
91	DP1POL	31	6	990	12	AN-016	Antarctica
92	*4S7NI	13	7	945	12	AS-003	Sri Lanka
93	*JR7HOD/1	13	6	594	12	AS-007	Honshu
94	*JJ1BDX/3	7	4	276	24	AS-007	Honshu
95	*JA1AAT	6	4	264	24	AS-007	Honshu
96	JK1LUY	4	3	180	12	AS-007	Honshu
97	**OZ/DL8HG	5	3	153	12	EU-029	Sjaelland

too. This has been tested over the past few months, and appears to be an excellent way of enabling entrants to upload their log and other entry data in a clear and comprehensive way, with instant feedback. The URL will be posted as part of the overall rules on the HFCC website, and you are encouraged to give it a try. All these developments help to speed up the whole adjudication process. Incidentally, I must apologise for an error in the published e-mail address for 2002. As far as I am aware, all logs did get forwarded without mishap, but make a note for 2004 that the correct e-mail address is iota.logs@rsgbhfcc.org

Many of you will be aware that the 2003 results first appeared at the beginning of November, at the RSGB HF and IOTA Convention and, immediately afterwards, on the web. This is significantly earlier than ever before, and is largely due to the ease with which electronically submitted logs can be handled and checked.

2004 - BOOK YOUR ISLAND!

There's nothing worse than planning a DXpedition only to find when you arrive at your destination that there's another group already on the air. With that in mind, the Cray Valley Radio Club has already announced that it will be operating from the Isles of Scilly (EU-011) between 21 and 26 July 2004. During the IOTA contest they will use the callsign M8C/P. At other times operators Nobby, G0VJG; Dave, G4BUO; Richard, G7GLW; Chris,

World - Multi-Operator

Pos	Callsign	QSOs	Mults	Score
1	YL4U	1578	290	3,471,300
2	OK7K	653	217	1,336,503
3	S57L	974	186	1,210,860
4	RK3MWD	591	172	884,940
5	RK3DZD	685	167	858,213
6	YL1ZS	442	120	441,360
7	N6VR	223	127	336,423
8	*YZ1Z	212	108	243,648
9	*UV7M	539	80	235,920
10	US0Q	300	80	187,200
11	*DF3HS	119	66	80,586
12	*LA1K	101	44	44,484
13	*AG1C	83	43	33,927
14	SL2ZA	206	23	29,118
15	*UT2IWT/P	190	25	24,150
16	PY2GEC	177	26	23,166
17	PY2TEL	109	25	16,275
18	*LA1TUR	57	27	15,633
19	*W8LKY	6	5	390
20	*TA3KM	19	2	162

World - Single-Operator - Mixed

Pos	Callsign	QSOs	Mults	Score	Op Time
1	UT7QF	1302	399	4,383,414	24
2	YT9X	1289	380	4,383,300	24
3	LY3BA	1383	300	3,555,900	24
4	EO6F	1919	266	3,350,802	24
5	RK4FF	1178	279	2,579,634	24
6	RM3C	1134	279	2,341,926	24
7	UT5UGR	944	261	2,098,440	12
8	*UR3HC	1001	262	2,085,258	24
9	K9NW	870	269	1,973,922	24
10	UZ7U	1093	226	1,725,510	24
11	*YO7LCB	355	279	1,485,675	24
12	*HA1CW	622	250	1,483,500	12
13	*RK3DH	592	238	1,402,296	24
14	*Z36W	781	229	1,402,167	24
15	DJ6QT	692	224	1,338,624	24
16	DL1WA	514	232	1,245,840	24
17	LZ1BJ	924	183	1,117,764	24
18	OM7CW	696	194	1,049,928	24
19	*UW5U	901	170	1,020,510	24
20	*UT9FJ	610	198	1,018,116	24
21	UA1QW/P	930	140	852,600	24
22	LZ4UU	275	195	804,375	24
23	*SP9KRT	505	172	766,260	24
24	UT2FA	760	137	725,004	24
25	*RW3GB	305	173	710,511	24
26	UY5ZZ	441	168	696,024	12
27	*DL3ZAI	417	177	695,079	24
28	UR5E	343	173	665,877	24
29	K4BAI	612	141	588,816	24
30	LZ1DQ	623	135	573,075	24
31	*I2WIJ	344	153	545,292	12
32	EN1U	606	134	542,700	12
33	RZ3BY/0	514	106	539,964	24
34	*YU8/DL2JRM	559	119	500,871	24
35	*F5NOD	451	142	500,550	24
36	PA3FDO	586	130	473,460	12
37	UA9AM	528	117	454,896	24
38	RX3AEX	453	128	453,504	24
39	*K1HT	321	143	453,453	12
40	RK0AXX	544	114	445,968	24
41	*OK1TFH	263	138	406,962	24
42	*UA9CDC	380	126	390,096	12
43	W5FO	315	128	377,472	24
44	*LZ1NG	392	120	362,880	24
45	*UR7EU	350	123	344,646	24
46	N4UH	310	115	340,170	12
47	*YO4AAC	335	115	333,615	24
48	*EA2BNU	287	121	323,433	24
49	HG8W	400	100	320,400	24
50	*UZ4E	392	104	319,488	24
51	PA0JNH	215	131	312,435	24
52	*RA6YJ	159	134	311,550	24
53	*UA6NZ	335	109	309,669	12
54	*S58MU	341	109	299,859	24
55	*SQ9MZ	283	112	294,000	24
56	*UA0ACG	406	96	293,184	24
57	*RU4SS	315	100	279,300	12
58	*UT1WW	262	110	277,860	12
59	*9A3ND	225	101	263,307	24
60	*VE3XD	223	115	260,475	12
61	*VE2AYU	244	108	252,720	24
62	F5NBX	214	112	249,312	12
63	*SP2BBD	182	110	248,820	24
64	*OM7TJ	207	108	232,956	24
65	*DL1ARJ	227	101	232,401	24
66	*DL6LZM	218	106	232,140	12
67	*DL3BRA	252	98	228,144	12
68	*OK1FMX	237	100	227,100	12
69	*SP4AVG	227	102	223,686	24
70	*EU2MM	250	86	218,268	12
71	*ON7YX	201	105	210,735	12
72	*OK1VBA	207	97	205,737	24
73	*VE3DZ	213	103	204,249	12
74	*EA2AAZ	284	87	192,096	24
75	RA0BA	389	67	189,141	12
76	*YO5BRZ	252	84	181,440	24
77	*EA7TG	146	102	176,868	24
78	EA5SM	193	92	172,500	24
79	*DL0GL/P	344	79	169,692	24
80	HA3OU	158	96	168,768	12
81	UA4RC	170	91	164,346	24
82	*OK1ANN	204	83	157,368	12
83	*VE3CR	155	94	156,510	12
84	**EU6TV	146	84	152,712	24
85	*YU1EQ	195	80	141,840	12
86	K9UQN	145	84	134,316	24
87	*OM7RC	104	84	130,032	12
88	UA9SP	216	74	127,872	24
89	ES1QD	250	54	125,388	12
90	*UT2UZ	149	78	124,722	12
91	DL3APO	104	88	124,608	24
92	WB2YQH	130	79	121,818	12
93	*SM0ELV	153	75	121,725	12
94	RW3GU	110	72	118,800	24
95	UA9HR	230	60	116,280	12
96	*RK0SXF	101	74	105,894	12
97	*DJ3DQ	97	80	104,880	24
98	*SP9MRQ	168	64	102,912	12
99	*DL2GBB	142	71	101,814	12
100	W2OO	117	74	101,454	12
101	*PA0RBS	91	74	101,010	12
102	W6FRH	122	74	99,900	24
103	**LY3BY	185	62	99,138	12
104	*EA5DCL	88	77	98,868	12
105	*DJ5MW	163	67	98,691	12
106	*US7IGF	210	63	97,902	12
107	RD4M	152	66	97,416	12
108	SM3W	377	47	96,021	12
109	PT2ADM	316	50	92,400	12
110	N4MM	115	70	91,350	24
111	*UN6G	162	59	89,562	24
112	*YU1PJ	177	61	89,487	12
113	*RK9CR	154	60	88,920	12
114	*RU3DM	132	62	87,048	12
115	*RU6YY	81	74	86,358	24
116	*PP2RON	324	44	83,952	12
117	*RX3MM	109	63	83,349	12
118	OM4JD	124	59	78,588	12
119	*UR6QS	150	58	78,300	12
120	KODEQ	103	66	75,834	12
121	*DL1DQY	73	65	69,615	12
122	*UN7JX	171	52	67,236	12
123	*RA9DZ/P	271	38	64,638	12
124	OM7YC	142	52	63,960	12
125	*EA7CWA	90	59	63,366	12
126	*RK9CWW	71	58	61,074	12
127	*RX9WN	79	58	59,682	24
128	*SM6D	69	57	58,995	12
129	SM7BJW	118	52	56,472	12
130	LY2KM	147	45	56,025	12
131	K5KG	117	51	53,397	12
132	*OK1ARO	117	47	53,157	12
133	*PY8DAN	313	31	52,545	12
134	*K4AMC	77	53	52,311	12
135	*T97C	151	47	52,311	12
136	*SP5CGN	75	49	51,009	12
137	*OK1DSA	142	44	50,952	12
138	*HA5X	105	46	44,298	12
139	*UR5IFB	93	47	43,005	12
140	*RW3VZ	67	46	41,814	12
141	*LZ2UZ	155	35	39,795	12
142	*9A9Z/P	105	41	39,483	24
143	*UZ2H	56	46	35,880	12
144	*YO9GJX	98	39	35,802	12
145	*WB0YJT	75	43	35,475	12
146	*K1KU	72	42	33,264	12
147	VE3TAZ	74	40	30,000	24
148	*OM5LR	123	32	29,856	12
149	*SP6M	80	37	29,304	12
150	*UA6BAE	110	35	29,190	24
151	*US0YA	62	38	28,044	24
152	*RA9XF/3	121	31	26,877	12
153	RV1CC	74	36	25,272	12
154	*PY7EG	147	27	25,191	12
155	UR7MA	57	34	24,582	12
156	YO8RIX	85	34	24,582	12
157	SP3FAR	41	37	22,755	24
158	*OK2SWD	62	31	21,018	12
159	*XM2AWR/M	65	32	19,296	12
160	*PP7ZZ	102	24	16,272	12
161	*YO9FYP	101	22	15,114	12
162	*YO6KNY	64	27	14,580	12
163	*DL8UAT	35	27	13,851	12
164	*F/PA0MIR/M	62	24	13,680	12
165	**F5NLX	50	26	13,260	12
166	*SM3AF	68	23	13,248	12
167	*W1EBI	50	26	12,948	12
168	*UT5ECZ	68	22	12,408	12
169	*PY2NY	114	18	12,204	12
170	E21CJN	29	27	11,421	12
171	*EU4LY	51	20	9,060	12
172	*W9AEM	25	23	8,073	12
173	*RX3RZ	37	20	7,980	12
174	*YO8MI	52	18	7,776	12
175	*PY3CQ	41	19	6,669	12
176	*PA0FAW	31	18	6,210	12
177	*PA5BM	30	18	5,724	12
178	*DL0AKR	21	18	5,454	12
179	*N4DL	48	15	4,860	12
180	*SM6CAW	19	17	4,845	12
181	*PY7ZY	22	17	4,590	12
182	*US1UU	30	15	4,410	12
183	*N5PU	24	16	4,224	12
184	*RU9UG	18	16	4,128	12
185	*UA4CIF	19	14	3,822	12
186	*SM3EAE	90	8	3,792	12
187	UA9OS	18	14	3,276	12
188	*7S6V	32	12	2,880	12
189	*EA7BR	13	12	2,196	12
190	*RA6AR	11	8	1,032	24
191	*UA0SMF/0	19	3	819	12
192	*PY4PW	15	4	372	12
193	**UA3QIX	12	4	336	24
194	RA1QJM	5	4	252	12

World - Single-Operator - SSB

Pos	Callsign	QSOs	Mults	Score	Op Time
1	DL4MCF	1169	245	2,711,415	24
2	LY2WJ	1005	215	1,806,645	24
3	9A4D	971	186	1,470,330	12
4	YT1RA	1001	169	1,229,475	24
5	EA5DFV	842	152	1,009,584	12
6	LY2FY	844	141	906,912	12
7	ZX2B	829	145	839,115	12
8	WZ3AR	901	132	784,476	24
9	LZ3UA	703	123	662,355	24
10	*HK3JJH	970	105	546,210	24
11	DH9SB	322	155	536,610	24
12	*RN3OG	437	141	528,327	24
13	ON5GQ	355	141	463,185	24
14	*CT1DHM	406	128	461,568	24
15	N3FX	516	117	456,300	24
16	*T94DO	433	115	424,005	24
17	I2AT	261	138	416,070	12
18	*UP5P	404	116	380,016	12
19	*UR7M	397	102	312,426	12
20	*UA3BM	221	110	266,970	12
21	RA6AFB	317	93	248,031	12
22	*SO5M	257	96	243,360	24
23	*9K2QA	408	75	214,200	12
24	DJ4PI	167	104	205,608	12
25	*DL3KDC	212	92	204,240	12
26	*YO9KIG	248	90	200,880	24
27	*SP4SHD	203	91	198,471	12
28	SM7CQY	230	90	198,180	12
29	*F8ATS	231	92	196,236	12
30	*SP1HTS	225	86	195,306	24
31	*SP5EWX/7	199	91	194,103	12
32	*ON7TQ	206	95	186,390	12
33	*OM3YK	163	92	184,092	24
34	*I7FMN	262	80	171,360	12
35	*EA1OT	299	71	170,187	24
36	*IZ7EDQ	216	82	163,344	24
37	9A2YC	149	91	159,705	12
38	*S57UYX	209	81	157,707	24
39	*PA0IJM	114	89	152,190	12
40	US1MM	156	88	148,896	24
41	*SP2JYR	171	79	141,963	24
42	*SP6NVK	167	75	140,175	12
43	LU8ADX	315	66	139,194	12
44	RV9BI	228	69	128,340	24
45	*IK5PWN	117	82	128,166	12
46	EW6AF	260	60	125,280	12
47	RW3FY	211	69	123,165	12
48	*IV3AJZ	153	77	123,123	24
49	*DH5WB	171	72	121,608	24
50	*W6AFA	250	66	121,572	12
51	*EA1AAW	95	85	121,125	12
52	*SP1MVG	158	71	112,890	24
53	OK2BHM	163	70	112,350	12
54	*IK2RPE	149	70	107,730	12
55	*DL1CWI	107	79	104,991	24
56	N1BCL	198	65	104,910	24
57	*3Z6V	134	70	104,580	24
58	LX7I	197	65	100,815	12
59	*UA9OA	278	49	99,666	12
60	VE3MR	143	67	97,887	12
61	*ER3CT	220	54	95,904	24
62	*EA5KV	184	59	95,580	12
63	*RV6BC	132	68	95,472	24
64	LR1F	208	58	95,352	24
65	*RA6CT	152	61	88,572	12
66	*PP5ZP	277	54	88,290	12
67	*UA9ACJ	98	63	86,562	12
68	*YO7ARY	152	60	86,400	12
69	*HB9CQS	137	63	86,373	24
70	*UA1AFZ	220	47	85,164	24
71	*SP1RW	124	61	84,180	24

G0FDZ; Ralph, 2E0ATY, and Simon, M3CVN, will use their own callsigns /P. Activity will be on all bands SSB, CW and datamodes.

THANKS

As well as those already mentioned, I want to thank the following, who all played a part in helping to make the 2003 contest such a success: MM0BQI GM4UYZ G4IIY G3KKQ G3YMC G4OGB G3VAO EI4BZ G3LET GM4FDM G3ZBE G4FON N5KO 5B4WN/G0WWW EI5DI along with G4TSH and all members of the HF Contests Committee.

POSTSCRIPT

As a postscript, there was great sadness to hear that David ('Dick') King, G3PFS, one of the trophy sponsors and a long-time supporter of the IOTA contest, passed away on the very day of the contest. He was active until a few weeks before his death and will be sadly missed.

CHECKLOGS

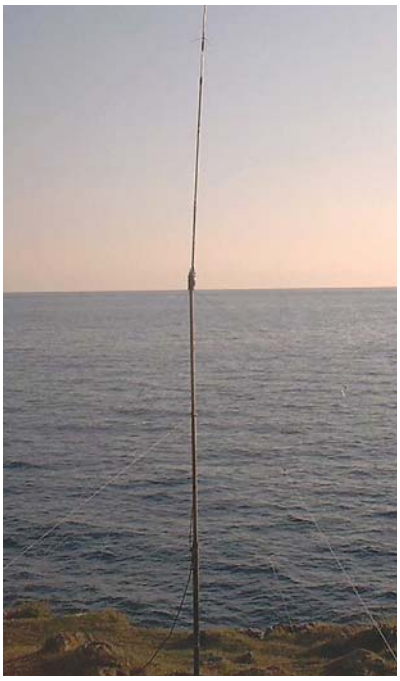
As ever, checklogs are very gratefully received. All are imported to the database and help in the adjudication process. Of course, we would be even more delighted to have your log as an actual entry. This year we thank the following for their checklogs:
4M7A 4X6HP 4Z5OZ 8S0F 9A3KS 9A5KV AA3DD CK2/VE3EXY/P DK9EA DK9KW DL2AL DL2AWW DL2AXM DL2HWI DL5DWW DL5KVV/P DL5NA DL6YRM

72	UR5ZMK	138	61	82,350	24
73	*SP9HQC	80	67	80,400	24
74	IZ2ABI	144	60	79,200	12
75	*RA3XAU	185	51	77,265	12
76	*OK1VHV	123	60	76,860	24
77	*DL1OFD	157	57	70,623	24
78	I5JFG	108	60	69,120	12
79	*DJ2IA	81	63	68,229	12
80	SM3LIV	135	51	67,779	12
81	*F5VHQ	75	64	67,392	12
82	*ON7VZ	114	58	67,164	24
83	*9A6AJK	200	48	66,816	24
84	*IK2VUC	75	58	65,250	24
85	*F8DFN	125	54	64,962	12
86	*9A2GA	131	52	60,372	12
87	*ER5OK	178	45	60,210	12
88	*XL3OX	148	50	59,400	12
89	*PR7QI	266	36	58,968	12
90	*OK1FJD	121	47	57,105	12
91	*IZ1ANZ	99	47	52,875	24
92	*DF3IS	100	49	51,744	12
93	SQ6FHP	122	46	51,060	12
94	*EA1YB	83	52	50,388	12
95	*HA3FHH	101	46	50,370	24
96	*SP7TEX	135	46	49,542	24
97	*DH5AO	88	48	47,808	12
98	*IZ5DKG	58	54	46,332	12
99	*RX3MX	87	44	46,332	12
100	*SQ6R	86	46	46,092	24
101	LU1YY	208	38	46,056	12
102	RZ3TZA	105	43	45,021	12
103	*DK5DS	105	46	44,850	12
104	VA6MA	102	47	44,838	12
105	OH2NAF	64	49	44,688	12
106	*IZ6CZV	60	51	44,064	12
107	*DL2VB	100	47	43,428	12
108	*N0YO	83	48	43,056	12
109	*EA7HCU	102	44	41,976	12
110	*EA7FRX	84	45	41,040	12
111	*CT1ELF	79	47	41,031	12
112	*UA1CGF	74	44	40,392	12
113	*OK1MJA	95	42	40,194	12
114	*LA2YT	91	43	40,119	12
115	*EA3NA	71	47	39,903	12
116	*HB9DUJ	79	46	39,054	24
117	SP8OOB	109	38	37,962	24
118	*IV3KSE	90	41	36,654	12
119	*VE9ZL	106	42	36,036	12
120	*SP6RGC	79	41	35,301	12
121	*SP9BQX	92	39	35,100	12
122	*PA8MO	96	41	34,932	12
123	*UA4PKM	60	39	32,760	12
124	UR4MO	56	43	31,992	24
125	*SQ8FEW	70	39	29,718	12
126	*EA3LS	47	42	29,106	24
127	*HA9MDP	48	41	29,028	12
128	YO6AJI	78	38	28,956	24
129	*IZ8EDL	72	36	28,080	12
130	*SP8EDD	48	39	28,080	12
131	*LT5Y	152	27	27,216	12
132	IZ8DWH	104	33	26,928	12
133	*DL4NT	47	37	24,309	12
134	*RU9BB	113	31	24,273	12
135	*EA2CHL	78	33	23,958	12
136	*IK3SCB	87	24	23,832	12
137	*SP3BVI	96	30	23,400	12
138	*OK2BEN	63	33	23,265	12
139	*SN9A	59	34	22,746	12
140	**UR5WDQ	75	31	22,599	12
141	*IZ7EQX	93	30	22,050	24
142	*IZ0EHL/0	47	34	21,930	24
143	*SP9TCC	44	35	21,840	12
144	*9A4VM	75	33	21,681	12
145	*HS1PDY	103	28	21,420	12
146	*EA4WC	57	35	21,105	12
147	N9GKE	43	36	21,060	12
148	*LA2GN	63	32	21,024	24
149	*UT8EL	95	28	20,748	12
150	*RV3YR	112	24	20,736	12
151	YV6BTF	106	29	20,706	12
152	*SQ1BVG	47	34	20,298	12
153	*UA9MQR	43	33	20,097	12
154	*RK9XX	82	28	19,656	12
155	*EA5VR	100	28	19,488	12
156	*LU6YR	104	26	18,408	12
157	*UR5ZLK	79	28	18,396	24
158	*RA2FIA	74	24	17,712	24
159	PY3PA	113	25	17,475	12
160	*DL2MIH	69	27	17,253	12
161	*ON4CIN	60	30	16,560	12
162	*RU3SD	65	24	16,488	12
163	*HB9FBI	59	27	16,119	12
164	*DK4IO	41	29	16,095	24
165	*K3VY	48	30	15,840	12
166	*UA3BZ	52	27	15,552	12
167	*UA3LHL	55	28	15,036	12
168	*IK0OTJ	61	25	14,175	12
169	*EA3EYD	33	30	14,130	12
170	*US5WEP	46	25	13,950	24
171	*OH5PA	34	27	13,770	12
172	*YO5CRQ	50	26	13,260	12
173	*3XY1L	110	21	13,230	12
174	*PA3GZC	52	24	11,520	12
175	*EA1DFP	30	26	11,076	12
176	*IZ2ABZ	52	22	10,824	24
177	K6JAT	50	23	10,626	12
178	*KC0IGY	39	23	9,867	12
179	SP7FBQ	27	24	9,432	12
180	*PA0LRK	32	23	9,384	12
181	*DL7CU	52	21	9,324	12
182	*EA7HE	48	22	9,240	12
183	*PA2SWL	26	22	8,316	12
184	*PT2GE	54	14	6,636	12
185	*SP5DRE	26	17	6,630	12
186	*UR5WBQ	21	20	6,300	12
187	*RA6HJR	64	15	5,940	12
188	UR7EM	22	19	5,814	12
189	*DL2FK	22	18	5,508	12
190	*DL4HBA	36	17	5,508	24
191	*EA3FHP	40	16	5,376	12
192	*UA0IV	23	15	5,175	24
193	SM3FJF	32	17	5,100	12
194	EA4RCT	59	13	4,797	24
195	UT7MD	35	14	4,326	12
196	*K5WW	28	15	4,320	12
197	**DL7VWH	38	13	4,290	12
198	PA0OI	25	14	4,074	12
199	*N2LQQ	23	15	3,915	12
200	*OK1CAZ	35	13	3,861	24
201	*PA0KHS	41	13	3,783	12
202	*IZ7EUB	15	15	3,375	24
203	RZ6HDX	17	14	3,234	12
204	*ER3CAB	24	13	3,120	12
205	*PT7CB	37	10	2,790	12
206	PY6KW	25	12	2,628	12
207	*IZ0CRN	14	12	2,376	12
208	*EA1CYW	20	11	2,112	12
209	*SQ9IDE	14	11	2,046	12
210	**YO6GCW	20	10	2,040	12
211	*UA3UBT	13	10	1,830	12
212	*HS1JNB	14	9	1,458	12
213	*IV3HAX	16	8	1,344	12
214	KC7UP	13	8	1,176	12
215	*PY3AJB	23	7	1,155	12
216	*WB8AEV	15	8	1,128	12
217	*HC1JQ	9	8	984	12
218	*AB0OX	10	7	798	12
219	*LU5FF	22	4	600	12
220	*XL7IRL	11	5	585	12
221	*PU5HAS	25	4	492	24
222	*LU5EVK	8	4	288	12
223	*SQ4CTS/4	7	4	276	12
224	*W6RMK/M	7	4	276	12
225	*VE3RCN	6	4	264	12
226	*PY1EJ	16	3	252	12
227	*PR7BOK	12	2	120	12
228	*DL7FA	10	2	108	12
229	*VE4VID	6	2	84	12
230	*PY1AFS	3	1	21	12

World - Single-Operator - CW

Pos	Callsign	QSOs	Mults	Score	Op Time
1	RA1ACJ	1337	214	1,970,298	24
2	HG1S	1080	207	1,669,248	24
3	*OK2WTM	846	203	1,409,226	24
4	DL6KVA	387	252	1,357,020	24
5	*OK2BYW	518	203	1,046,262	24
6	UY0ZG	531	193	1,004,565	24
7	RZ3AZ	956	147	919,044	24
8	DL6JZ	583	177	912,789	24
9	*HB9CZF	439	188	838,668	24
10	*RU3GN	549	157	789,867	24
11	*OK1HX	559	169	780,273	24
12	DK3DM/P	813	135	687,285	12
13	OH2CI	726	130	674,700	24
14	RA3UT	694	130	643,500	24
15	IK2UCK	528	136	605,472	12
16	UA3TU	483	136	578,952	12
17	*ER3DX	444	145	553,320	24
18	UA3AGW	462	139	549,606	12
19	*OK1CZ	434	145	548,970	12
20	*YU1WC	462	145	545,490	24
21	*YZ1V	505	131	541,161	12
22	LZ7X	397	141	514,791	12
23	UT8LL	460	140	504,000	24
24	*UT2PX	656	104	481,728	12
25	SP5CJQ	303	141	469,953	12
26	*SN2E	540	113	451,548	12
27	N9RV	593	106	430,254	12
28	*YO5CBX	550	111	413,586	24
29	*HA5JP	346	127	397,002	24
30	*YO6BHN	443	115	392,955	12
31	*SP6LV	331	123	390,771	24
32	*OK2QX	323	126	389,718	12
33	EW8EW	266	122	365,268	24
34	*HB9ARF	290	124	362,328	24
35	SP9W	472	103	362,148	12
36	*HA6NW	391	114	353,970	24
37	AA3B	448	102	335,376	12
38	OE3ZK	309	113	320,355	24
39	*4N1GM	385	107	320,037	12
40	*RA6FV	329	108	308,772	24
41	*UY5ZI	343	105	305,865	24
42	DK3KD	436	98	303,408	12
43	*LU7EE	395	102	299,574	24
44	**RA4HW	391	95	294,975	24
45	*T95A	568	83	292,824	12
46	*EW8OS	268	106	292,560	12
47	DL6UNF	227	105	280,665	12
48	*OK1DXD	273	105	271,215	24
49	SP2QG	403	93	268,677	12
50	*OK2DU	267	105	261,765	12
51	*UY5TE	340	97	253,752	12
52	K5ZD	338	93	246,078	12
53	*OK1MKI	287	98	240,786	24
54	*TA3DD	401	92	239,844	12
55	*UR3LM	330	89	236,562	12
56	*3Z2D	515	72	235,656	24
57	*OK2TBC	247	99	233,739	24
58	*OM4DN	315	89	233,625	12
59	*UA9AFS	272	89	220,008	24
60	*DJ5AA	197	98	219,030	12
61	*YT7Z	450	71	215,130	12
62	*OK1FCA	233	87	210,105	24
63	OM1GM	301	90	209,790	12
64	*UY5LQ	445	73	209,583	24
65	*SP8BAB	145	95	205,485	24
66	*9A3TU	244	95	204,060	24
67	*DL4JYT	250	89	203,454	12
68	*RK4HD	205	88	188,232	12
69	*PA3BFH	242	87	186,354	24
70	*HA6IAM	153	92	181,332	12
71	*VE1RGB	201	90	178,470	24
72	*HA5BWW	224	83	169,320	12
73	*ES4MM	150	87	166,518	24
74	*LA1YE	240	75	162,900	12
75	*WB2AA	188	89	162,336	12
76	*UX5EF	234	77	162,162	24
77	*RN4SS	336	70	160,440	12
78	UA9MC	175	87	159,471	12
79	*OM7AG	212	84	159,264	24
80	LZ6C	305	69	158,355	12
81	UT4NY	390	59	158,238	24
82	*YT1VM	128	82	155,472	24
83	*YU1KT	324	69	152,352	12
84	DF0LI	281	66	151,470	12
85	*IK2NUX	203	77	151,305	24
86	*OK2BNC	198	80	145,440	12
87	*UT4XU	235	72	144,072	24
88	*UA1NFA	278	65	143,910	24
89	*OK1KI	171	80	142,800	12
90	*UA1ZZ	263	67	139,695	24
91	*SM7EH	262	69	139,518	12
92	*UA3QU	272	67	139,092	12
93	*SP4GFG	208	70	136,080	12
94	*OK1MPM	237	70	135,450	12
95	HL5UOG	202	62	132,060	24
96	*UA4QK	214	69	130,410	12
97	*LZ4GL	243	66	129,690	12
98	YO9WF	213	71	128,013	12
99	*RV3DAK	216	70	126,840	24
100	*SP3LWP	195	69	125,649	12
101	*SP2HMT	210	66	123,948	12
102	*I2AZ/1	295	61	123,525	24
103	*UY5WA	186	69	120,474	12
104	*IK0HIT	189	69	116,127	12
105	*PA0RRS	180	71	115,872	12
106	*DL3KWR	160	70	112,560	24
107	*EA5EOH	114	74	107,892	24
108	UU9JH	204	65	106,860	12
109	*SP9FT	186	60	105,480	24
110	F5IN	345	54	105,138	12
111	*RW0LIA	181	43	104,877	24
112	*UX7QD	374	46	102,396	12
113	RV3FD	154	59	95,934	24
114	*DM3PKK	129	67	88,641	12
115	*DL3BZZ	100	65	86,580	12
116	*VE3KP	181	58	85,086	12
117	*OM3CDN	186	58	83,868	12
118	DL3YA	109	65	83,655	12
119	*SM3AVW	251	45	83,565	12
120	*OM7AT	164	58	82,128	12
121	*DL7UIO	126	63	81,270	12
122	F6GQO	139	59	77,703	12
123	RX3AP	204	45	77,220	12

DL7VMM DL8UFO EA1VB EA3AGB EA5JC EA6ADV EA6AZ EA7GBD EI7JK ES1FB/1 F5JOT/P F6CKH/P G0RCI G0TSM G3JTO G3KKP G3PMR G3VQO G3XTT G4KFT GM3YTS GM4FDM GW3KJN GW4BLE HA3OD HK3AXY IK7RVY IQ2CJ/3 K1JD K9AJ/VY0 LA1UJ/P LZ1CW LZ1DM LZ1FJ LZ2TRC MD0BJM/M N5CRO OL5Y OY3QN OZ/SM7GCZ OZ1BTE OZ5RM OZ6TL P3F PA0TON PA3FXS PA7XG PP2JP PP5AMP PS7AB PT2CMN RA1QGO RA1TV RV3DBK RV3DUT RV6ASU RZ6AE RZ6AS SM0BDS SM0BXT SM1CXE SM6AVD SM6BSK SM6DUA SM6NJK SM6Z SM7AIL SN1A SP/DJ0IF SP1DMD SP1DOT/6 SP1GZT SP2AVE SP4IGV SP5AHY SP5NZN SP5UAF SP6FJ SP8JUS SP9CVY SQ8GHY/8 SQ9CAQ SV1XV TF3KW TF8GX UA3AKI UA3URD UR7IRL UT0FT UT4EK VE3PYG/VY2 VE7TUB VE9GLF WA5PAE YO2BP YO4US YO6LA YO8COK. ◆



What a location (2): the 9A0CI multiplier antenna on a cliff on Sveti Nikola, EU-110, at sunset.

PHOTO: ZOLI, HA1AG

124	*PA0JED	119	62	77,190	12
125	KH6SH/K7	131	55	75,735	12
126	*RW6CW	98	58	75,516	12
127	*SN5J	101	58	73,950	12
128	*DL7AXM	75	68	73,236	12
129	*DS1CCU	236	37	72,372	12
130	*RU2FM	199	50	71,850	12
131	*RN9AA	172	49	68,208	12
132	*YL2EC	115	55	65,835	12
133	**HA0GK	140	52	64,896	12
134	DL1CW	145	51	64,413	12
135	*HA3JB	211	42	63,378	12
136	*4K9W	115	54	62,694	12
137	*VE3NBJ	124	55	62,040	12
138	*I6FDJ	145	50	60,750	12
139	K5NZ	165	49	60,711	12
140	*YL2NK	166	44	60,456	12
141	*YU7LS	122	51	59,670	12
142	*SP7EXJ	72	57	59,508	12
143	*UN7EX	148	43	58,308	12
144	VR2BG	116	46	54,096	12
145	*SP9EMI	116	47	53,580	12
146	*IK2RLS	81	50	51,750	12
147	*OM3PQ	110	47	51,042	12
148	*SP2MKI/2	120	45	50,220	12
149	**DL1LAW	143	43	48,375	24
150	**DK3WW	102	48	46,944	24
151	RA3FD	129	40	46,680	12
152	*RD3AT	136	38	46,056	12
153	*HS0ZDZ	161	33	45,639	12
154	*IZ1DFI	199	33	43,857	12
155	*RW3DOX	168	35	42,420	12
156	*DF2CH	110	44	41,976	12
157	*LZ1QH	81	46	39,330	12
158	*YO6ADW	112	42	39,312	12
159	*OK2BJ	70	46	37,812	24
160	*DL3KWF	100	41	37,392	12
161	*K9QVB/9	102	42	37,044	12
162	*HS0/OZ1HET	257	28	36,372	24
163	*EA1DGG	97	39	34,749	12
164	*YO4CSL	117	39	33,813	12
165	*OK1AOU	106	34	33,660	12
166	*F2NZ/P	96	40	33,600	12
167	*UN7CZ	86	35	32,550	12
168	*UY5YA	124	31	31,992	12
169	*LA7SI	118	33	29,898	12
170	*YL2GTD	120	32	29,568	24
171	*PA3AFF	71	39	29,367	12
172	OH2LU	245	22	29,106	12
173	RK3TJ	85	33	28,215	12
174	*EA4EFJ	179	26	26,754	12
175	*DL1EV/P	52	38	26,448	12
176	*EA7CA	76	34	25,296	12
177	*IV3DYS	64	33	24,156	24
178	*F6FTB/P	66	35	24,150	24
179	*OM2TB	110	27	23,490	12
180	*SP2UKB	101	28	23,268	12
181	*OM3BA	84	28	21,840	12
182	*W4NZ	60	35	21,840	12
183	*WA2VQV	46	36	21,816	12
184	**YO2CJX	73	32	21,216	12
185	*OK2PBG	72	30	20,160	24
186	*YZ7EM	110	24	19,728	12
187	*PA5GU	47	33	19,305	24
188	*DL5FCO	70	28	16,968	12
189	*PY7OJ	53	29	16,443	12
190	UT3EK	87	21	15,813	12
191	*RK1NA	125	19	15,789	12
192	*SP3XR	55	28	15,708	12
193	*PA9CW	75	25	14,325	12
194	*YO3BWK	36	29	13,920	12
195	*SP9MDY	71	24	13,752	12
196	*W9OA	30	29	13,050	12
197	OK1DSU	30	28	12,600	12
198	OA4O	224	14	11,760	12
199	*OH3TZ	53	21	11,151	12
200	*UA6HON	46	24	11,088	12
201	W6RKC	35	21	10,017	12
202	*DJ4KW	44	23	9,936	12
203	*WJ9B	80	20	9,840	12
204	*RA3UAG	28	25	9,600	12
205	PA5KT	56	21	9,576	12
206	*ON4KVA	50	22	9,372	12
207	*SM4DDS	29	23	8,901	12
208	*N5IJE	30	23	8,418	24
209	*OM4DA	73	18	8,262	12
210	NO6X	31	22	8,118	12
211	*OK1FMG	43	20	7,860	24
212	*OK2PKY	50	18	7,452	12
213	*EA3ALV	45	17	6,171	12
214	*RV9CLF	35	16	5,904	12
215	*DJ5GG	27	17	5,661	12
216	*SP6XP	38	17	5,610	24
217	*OK1XC	27	17	5,049	24
218	*PY7IQ	26	16	4,320	12
219	*E20NTS	21	16	4,272	12
220	*UR5IAW	19	16	4,176	12
221	*LY2BBF	70	11	4,158	12
222	*F2FX	38	13	4,134	12
223	*RX3AGQ	51	11	4,059	12
224	*W1AWB	22	15	3,870	12
225	*VA3XRZ	30	13	3,354	12
226	SM6E	75	9	3,321	12
227	*SP2IHG	32	12	3,312	12
228	*PY3AU	40	11	3,300	12
229	*W1END	31	12	3,276	12
230	*UT5UGQ	38	11	3,234	12
231	*DL3JRA	20	13	3,120	12
232	*W1TO	28	13	3,120	12
233	*RA6MS	32	11	2,904	12
234	*DK5ZX	23	11	2,211	12
235	**UA4WLI	42	9	2,106	12
236	*RA1QKB	41	8	1,944	12
237	*OM8HG	33	9	1,863	12
238	*EA3AXM	22	10	1,860	12
239	*EA1FBJ	11	10	1,650	12
240	*EU6AA	24	8	1,536	12
241	*W5AC	17	9	1,431	12
242	*UX1IB	16	9	1,404	12
243	**OH6NPV	22	8	1,392	12
244	*F/DL4HRM/P	22	7	1,218	12
245	**UY2RZ	55	5	1,125	12
246	*PA3CLQ	17	4	396	12
247	WA1Z	5	5	375	12
248	*W040	5	5	375	12
249	*UA9FGJ	11	4	324	12
250	*UK/JI2MED	6	3	162	12
251	*TA3BN	55	0	0	12

WEBSEARCH

HF Contests Committee (2004 Rules and 2003 Results):	www.rsgbhfcc.org
IOTA Programme Information:	www.eo19.dial.pipex.com/index.shtml
EI5DI *(SDI)*:	www.ei5di.com
RSGB IOTA:	www.rsgbiota.org/dx.htm

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RSGB HF Contests Committee:	hfcc.chairman@rsgb.org.uk
IOTA Contest Manager:	iotacontest@rsgbhfcc.org
IOTA Contest Log entries:	iota.logs@rsgbhfcc.org
RSGB IOTA Programme:	iota.hq@rsgb.org.uk

Single-Operator Assisted

Pos	Callsign	QSOs	Mults	Score	Op Time	Section	IOTA Ref	Island Name
1	UW5Q	1171	410	4,594,050	24	Mix	-	-
2	DL5AWI	876	415	3,909,300	24	Mix	-	-
3	RX3DCX	1183	215	1,975,635	24	SSB	-	-
4	IN3ASW	950	219	1,843,542	24	Mix	-	-
5	*HA1DAE	498	229	1,174,770	24	Mix	-	-
6	IK0YVV	552	206	1,077,792	12	CW	-	-
7	*YT1LT	792	182	1,072,344	24	Mix	-	-
8	PY5EG	583	150	676,350	12	SSB	-	-
9	G3ZAY	435	163	594,135	12	SSB	EU-005	UK Mainland
10	UU2JQ	306	168	559,440	12	Mix	-	-
11	G3TXF	223	183	557,235	24	CW	EU-005	UK Mainland
12	EI2JD	485	115	454,365	24	SSB	EU-115	Ireland
13	*RA3OU	428	117	432,432	24	SSB	-	-
14	LT0H	661	99	405,405	12	SSB	-	-
15	LX1NO	280	123	342,432	12	SSB	-	-
16	*OH2FS	142	130	272,220	24	Mix	-	-
17	PA9ZZ	248	103	243,492	24	Mix	-	-
18	*PY8AZT	404	89	225,348	24	Mix	-	-
19	RA3TT	299	84	204,372	12	Mix	-	-
20	OZ4RT	138	106	197,796	12	Mix	-	-
21	*SP9OHP	198	84	164,808	24	SSB	-	-
22	JA7DLE	395	65	148,785	12	CW	AS-007	Honshu
23	*EA3AYP	221	75	145,125	24	SSB	-	-
24	N5JR	113	87	134,937	12	Mix	-	-
25	LU7DW	249	70	133,770	12	SSB	-	-
26	*DL8DXL	194	71	124,818	12	CW	-	-
27	*EA8NQ	217	61	96,075	24	CW	AF-004	Tenerife
28	K7GK	95	67	81,003	12	Mix	-	-
29	*EA5YJ	140	60	76,320	12	SSB	-	-
30	*KG1E	168	53	72,504	12	SSB	-	
31	*DL9JON	85	60	68,580	12	CW	-	-
32	*JK2VOC	94	49	44,394	12	Mix	AS-007	Honshu
33	*DL4RCK	81	42	35,910	12	SSB	-	-
34	OH4RH	260	21	32,760	12	CW	-	-
35	*JH5OXF	112	37	31,080	24	Mix	AS-076	Shikoku Island
36	*SP9IBJ	106	27	23,814	24	CW	-	-
37	*DL8DXL	53	26	12,558	12	SSB	-	-
38	*PT2ND	189	14	12,138	12	SSB	-	-
39	DL1TC	29	27	11,745	12	Mix	-	-
40	G4TSH	100	17	8,772	12	CW	EU-005	UK Mainland
41	*CT1CXP	24	24	8,640	24	SSB	-	-
42	*DL1XAS	27	22	8,382	24	SSB	-	-
43	*DL8ZAJ	42	21	8,190	12	Mix	-	-
44	N0RQ	20	19	5,700	12	Mix	-	-
45	*PA4TU	20	16	4,224	12	CW	-	-
46	*PT2FM	37	13	3,783	12	SSB	-	-
47	*G4JFS	13	13	2,535	12	SSB	EU-005	UK Mainland
48	SP7GAQ	11	11	1,815	24	Mix	-	-
49	*KI6MX	11	9	1,377	12	SSB	-	-
50	*PU7EEL	8	6	576	12	CW	-	-
51	*MI/EI2IE	5	4	108	24	Mix	EU-115	Ireland

IOTA Contest Expeditions
High-Power / Yagis - Top 10*

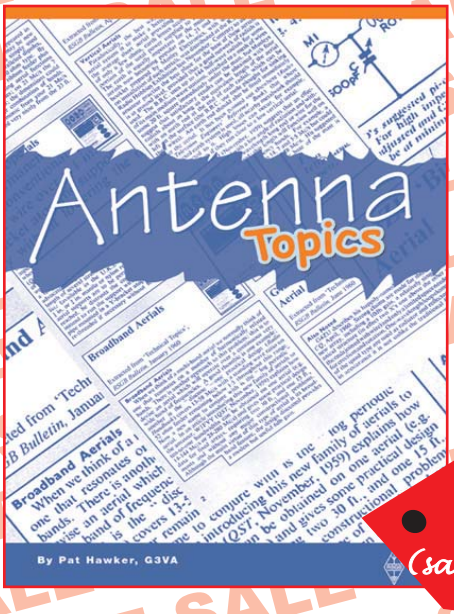
9A0CI	6,589,488
GM4V	5,732,907
TM3ON	5,422,221
GX6YB	5,404,104
CT9D	5,143,257
CS4B	4,270,725
CS5C	3,327,732
RI1CA	2,777,736
J49RW	2,368,176
GM3PPG/P	1,995,354

IOTA Contest Expeditions
Low Power / Single-element antennas - Top 10*

9A7T/P	3,649,590
LZ1KSL	3,356,925
ES8X	2,986,620
ED1ONS	2,585,520
IB0P	2,352,900
EJ7M	1,924,428
UW0G	1,583,040
EG9IC	1,520,640
YW6P	1,515,468
F/ON5MF/P	1,474,065

* Full IOTA Contest Expeditions listing can be found on the RSGB HF Contests Committee website at www.rsgbhfcc.org

MEMBERS SPRING



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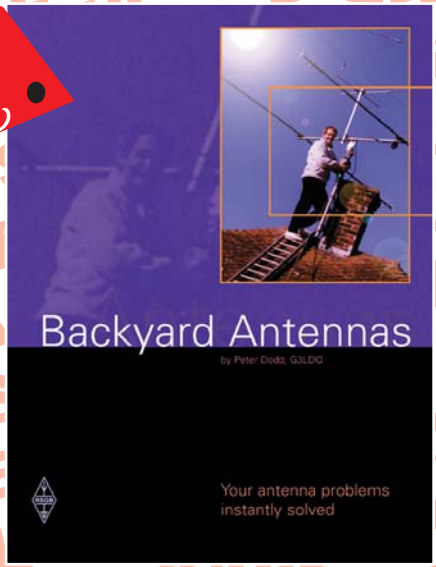

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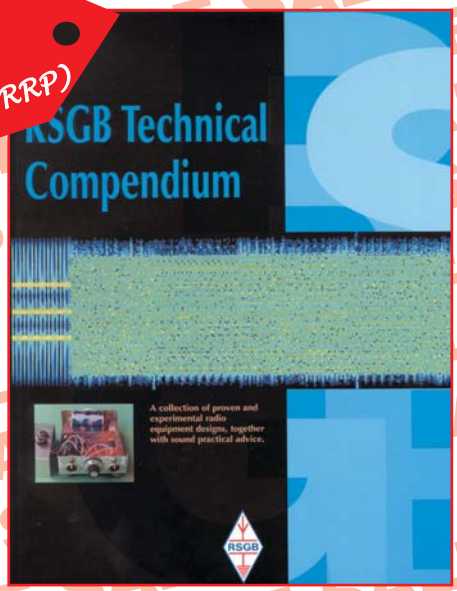

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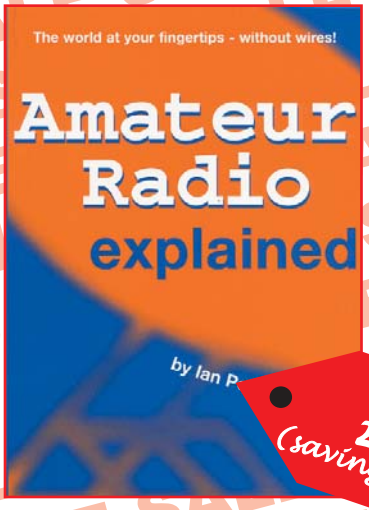

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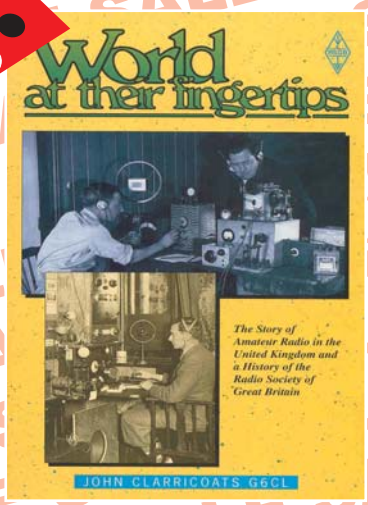

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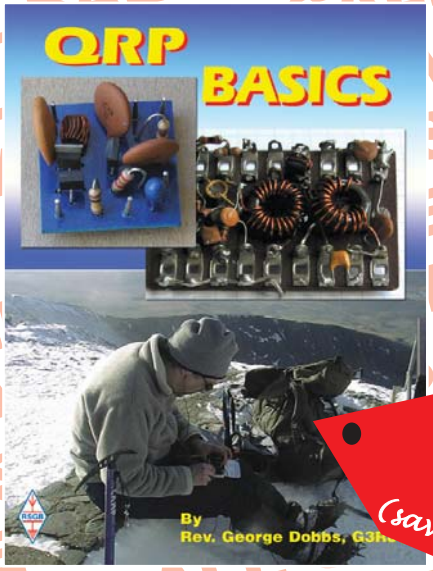

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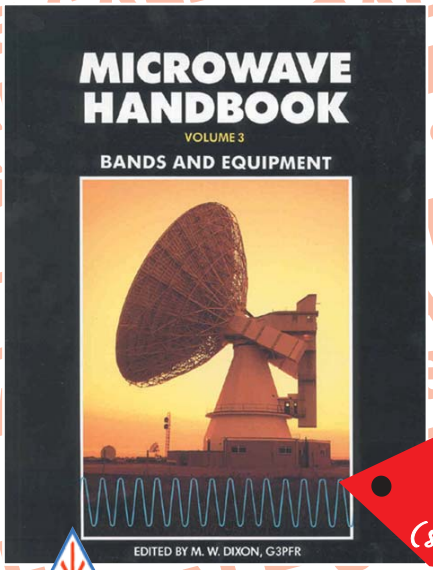

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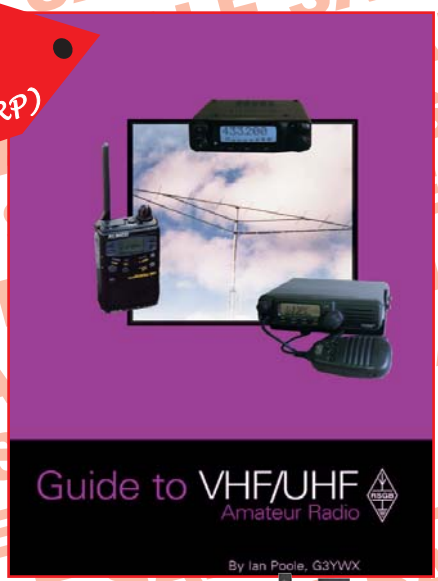

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A Radio Amateurs' paradise, complete with 55ft BXI Tower, Hi-Gain TH6dXX 140-ft buried HF 7/8 "pressurised feeder SHF"

An outstanding, surprisingly spacious Chalet Bungalow well positioned with double front access and ample off road parking. Set in secluded gardens, twin in line garages set to the rear on the R/H Partition, with generous parking area. Plot size about 20m wide x 100m ending at agricultural land. All rooms central heated. Two in line Workshop/hobby rooms and two block constructed buildings on the L>H>S. Partition for tools and machinery for gardening and lawn care, a concrete extends to upper part of garden orchard, apple plumb and pears. Front entrance into Hall16ft 6" x 5ft 3" to access all ground floor rooms and open stairway to Chalet rooms upstairs. Consisting of lounge 15 ft x13 ft with surprising natural light from on LH side 6ft x 4ft on the front 12ft x 5ft. NTL CABLE AND TWO TELEPHONE LINES, AND BROADBAND INTERNET ACCESS. The Bathroom 8ft x 8ft is fully tiled with bath and shower diverter, a separate enclosed/stand up shower, the hot water cylinder is enclosed and has airing cupboard above. The bath , bidet and toilet are finished in white. Dining Room/Party Room/another Bedroom13ft x 13ft. Separate toilet & w. h. b. 2ft 6" x 6ft 6". Spacious room 18ft x 13ft arranged as 9ft x 9ft. Bedroom and 9ft x 13ft Study/Hobby/Office with Mirror w.h.b. vanity unit. Kitchen with Stunning Space 19ft x 1fr av. Walls fully Tiled.

Photo of house from right hand entrance

A Balanced Flue Boiler provides hot water and drives the central heating to all rooms. This Kitchen has access to two small utility rooms and the House side entrance door. The Chalet rooms are accessed by the "open styled" stairway at the front entrance. Two generous double bedrooms at the top of the stairs. The two single bedrooms, the toilet and shower room are on the wall facing the Garden and have both wall windows and Velux overhead windows fitted. All the Chalet rooms have large storage space accessed by doors. Offers invited over £300k.

For further information:
G3HZP 23, RAMPTON ROAD, WILLINGHAM,
CAMBRIDGE CB4 5JG
e-mail howard.james2@ntlworld.com
http://homepage.ntlworld.com/howard.james2/

Members' Ads

FOR SALE

COMPUTER programmes - printer doctor that sends any command to any printer £4.20. Spectrum analyser/tuner for digital equipment, £4.20. Morse transceive free, if you buy both programmes or £5.20 separately. G8WCQ, 01297 23421 (Seaton). E-mail: **poisonpen@poisonpen.freeserve.co.uk**

EMIGRATION sale, Yaesu FT-290R 2m multimode, fitted Mutek front end. Mic, charger and man, no nicads, £165. Tokyo hi-power all-mode power amp, model HL-160V 2m, i/p 1-12W, o/p 20-160W, 13.8V DC, 23A. Modes of operation: FM, SSB, CW, £120. Yaesu MMB-11 mobile mount for FT-290R, complete, £30. Yaesu FT-290 carry pouch & strap, £5. Yaesu FT-290 portable headset/mic & switch assembly, £10. Yaesu YD-844A desk mic, £10. Yaesu MD-1B8 desk mic, up/down switching, £60. Kenwood MC-60A desk mic, up/down switching, £60. Kenwood TH-77E dual-band h/h 2m/70cm with man, spare battery pack, charger and external speaker/mic, £90. Kenwood AT-250 automatic ATU with man etc, £165. Brian, G1EUA, 01626 778 554 (Teignmouth). E-mail: **bf.wall@virgin.net**

FATHER time has won - whole station for sale. Major items. Kenwood TS-850S HF tcvr ATU, CW filter fitted, matching PS-50 PSU, man, £500. Kenwood TS-450S HF tcvr, EP-925 PSU, man £375. Kenwood TR-751E 2m tcvr, man, £300. EP-925 PSU, variable, £40. MFJ-948 Versatuner, man, £50. Kenwood extension speaker, SP-230, £40, SP-31, £25. ETMSQ twin paddle key, utilises side tone, £35. Yupiteru h/h rcvr 7000, £70, Yupiteru h/h rcvr 7100, £85. Much associated equipment, books, all gc, prefer inspect & collect. Will discuss favourable lot price. Les, G0VIG, 01452 714 728 (Gloucester).

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***

GW3JSV selling hillside bungalow, 6 acres at 1000ft. Towers and aerials, contact agents Norman Lloyd on 01938 552 371 quoting RE/DJ (Welshpool).

HF antenna – Diamond CP6 vertical 80/40/20/15/10 and 6m, 200W, height 4.6m, no guy ropes required,1.8m radials - cost £240, accept £170. Alan, G7CDK, 01763 262 433 (Royston). E-mail: **aj.flo@virgin.net**

HOMEBREW Z-Match, inbuilt dummy load and Monimatch, £50. Class-D wavemeter 240V + man, correct phones, £20, both plus carriage. G3HGM, QTHR, 01582 733 436 (Luton).

ICOM 726S 10W model, 160-6m fitted FL-100 500Hz CW filter, gc, new HM-12 mic, mobile mount, man, box, power leads, £295. MFJ-1026 noise canceller, mint, man, no box, £135. Steve, G4MPK, QTHR, 01424 893 386 (nr Hastings). E-mail: **stephen.foster27@btopenworld.com**

KENWOOD TS-2000, SP-23, £1250. Hustler 6-BTV, £180. Daiwa NS660P SWR meter, £15. Little Rascal GLX interface, £15. G3VLQ, QTHR, 01935 422 973. E-mail: merv@v2email.co.uk

KENWOOD TS-570D, internal ATU, narrow CW filter, boxed as new, £400. Yaesu FC-700 ATU, mint, £50. G4UOS, QTHR, 01278 783 941 (Highbridge).

LOGBOOK Webbs 1960 illustrated. Ham M rotator 110V. FT-101, needs attention. Offers? Barry, G3TTY, QTHR, 01704 541 361 (Southport).

MFJ pocket Morse code tutor also a 35W 2m amplifier as new, all modes £40 or exchange for PSU rated at 13.8V and at least 10-15A. M3ACU, QTHR, 01255 436 118 (Clacton). E-mail: **m.ashley@amserve.com**

NOMBREX model 27 sig gen 220kHz – 220MHz, £15. WWII USA military multimeter in original wooden case, with instruction man (dated 1944) - offers invited. G3ZOG, QTHR, 0191528 0080 (Sunderland).

QTH for sale, north Shropshire, 1000ft ASL - large 3 bed bungalow with extensive views, £275,000 including mast and beams. Check website **www.radioham.freeserve.co.uk** G0JFM, 01691 777688 (nr Oswestry). E-mail: **stephen@radioham.freeserve.co.uk**

RACAL RA-1772 rcvr with all instructions and workshop mans. Exc cond, £350. Prefer buyer collects. Fred, 01670 827 741 (Bedlington).

SATELLITE dish 1.5m aluminium, centre focus, steel floor stand, H to H mount, powerful 36V screw jack motor, dismantled, £100 ono. 01274 221 823 (Bingley). E-mail: **bsimpson_g8pzf@onetel.net.uk**

SELLING for silent key G4LCX, all ono. Yaesu FT-920AF with PSU, £800. Kenwood TS-680S, £350. Alinco DJ–G1, £80. Icom IC-255E, £40. TA33 Junior, £50. Advance OS250 scope, £45. Avo, £12, also valves, *RadCom*s and Newnes books, £1 per year. Bits, test gear, homebrew from £1. Clubs welcome. Paul, G8HBQ, 01132 402 345 or 07799 770 402 (Leeds). E-mail **pauldaviestve@aol.com**

SILENT KEY (G4UAC). Sensible offers please for any of the following items. JRC JST 135 HF tcvr c/w matching NBD-520G/U PSU. Alinco DR-590 2m/70cm tcvr, Yaesu FT-290 2m mobile tcvr, Yaesu FT-290R2 mobile 2m tcvr, inc Yaesu YM-47 mic. Yaesu MD-1 desk mic, Yaesu FC-102 ATU, Yaesu SP-102 spkr, Yaesu FF-501DX low pass filter, Yaesu FAS-1-4R remote antenna selector (selects up to 4 antennas). Yaesu MMB-38 mobile mount bracket, Yaesu FL-2100Z HF linear amplifier, Kenwood MC-85 desck mic, Daiwa PS-80M 6A PSU, DRAE 13.5V 24A PSU, Kantronics KAM Plus all-mode date controller, Daiwa LA2035 2m linear amp, 30W. CX-401 4-way antenna switch, AMU 400 ATU (grey box), Revex duplexer D-24 2m/70cm Hi-Mound HK-704 twin paddle key. Codemaster CWR-610E CW/RTTY

CONGRATULATIONS to the following, whom our records show as having reached 50 or 60 years' continuous RSGB membership this month:

60 years		50 years	
G3CJD	Mr L F L Allen	G3JYP	Mr W B Capstick
G3AAJ	Mr R J C Broadbent, MBE	G3JJG	Mr G F Gearing
G3IRM	Mr P Lumb	VK3CEC	Dr H Maclean
G3CWW	Mr A W W Timme		

SILENT KEYS

We regret to record the passing of the following radio amateurs:

G0BYP	Mr G Webster	
G0VTT	Mr B R Richards	15/12/03
G3CUN	Mr J Leonard	02/11/03
G3EGS	M R W Collett	
G3MLP	Mr B C Poole	01/12/03
G3PED	Mr L Crane	08/12/03
G4UAC	Mr R Grant	09/03
G8PXG	Mr W Halls	16/11/03
G8RSL	Mr R J Carter	03
M1CTE	Mr F A Oakeley	11/03
RS94543	Mr J R Pluck	28/10/03

decoder. Timestep GOES rcvr, Timestep WX satellite interface V12.0, Timestep 90cm weather satellite dish, Altai KDM6 transistor dip meter, Yupiteru MVT-7700 scanner, MFJ-784B tunable DSP filter, MFJ-259 HF/VHF SWR analyser, MFJ-451 Morse keyboard, MFJ-1315X AC adapter, MFJ-1272BYH mic/TNC switch. G-whip tri-bander, inc full set of coils and extend-a-rod. G3HEE, 01780 755 001 (Stamford). E-mail: p.facourt@btinternet.com

SILENT key sale. Kenwood TS-520S SSB tcvr. Yaesu FT-101 SSB tcvr. Trio-Kenwood TS-940S tcvr. Sensible offers, please, to Carole, 01923 260 538 (King's Langley).

TEN-TEC Argonaut V tcvr with TCXO model 516TCXO, plus cooling fan. All HF bands 1-20W, ALC stabilised DSP rcvr, 35 built-in filters, rcvr extended coverage 500kHz to 30MHz, 7A PSU, not Ten-Tec, £550 ono inc carriage. Surplus to requirements, virtually as new. G0GPO, QTHR, 01227 711 261 (Canterbury).

VALVES 572B, brand new, boxed with bases and top caps. QRO capacitors oil-filled Sprague 2500V – 230µF. G4SGV, QTHR, 01527 545 304 (Redditch).

VANN Draper Lodestar sig gen SG-4160, £70 inc p&p. ERA MkII Microreader, Morse reader & tutor, £55 inc p&p. Tom, G4AHC, QTHR, 0151 691 0729 (Wallasey). E-mail: **g4ahc@supaman.com**

YAESU FT- 847 160-10m, 6m, 2m, 70cm, £775. FT- 857, £575. Icom IC-706 MkI, OPC-581 separation cable, £400. FL-101 250Hz filter, £50. MFJ-989C, £175. Icom AH-3 autotuner, unopened, £200. HyGain 155CA, £300, 105CA, £200, both unopened. Most items boxed with original accessories. Carriage in UK extra. Please phone (12-22 February), Wyn, GW3YGH, 01792 367 790. E-mail: **vr2ax@attglobal.net**

YAESU FT-1000MP MkV. This radio is 2.5 years old and has very little use. It is in original immaculate condition from a non-smoker. Serviced in February and packed away since. Original packing, any trial welcome, reason for sale, lost interest and need the money. A bargain at £1,250, well below trade price. 01303 863 891 (Folkestone).

YAESU FT-290RII with new nicads charger, man & 5/8 mag-mount antenna, £110. Collection or carriage required. G3MA, QTHR, 01452 539 519 (Gloucester).

WANTED

FT-101Z or ZD & station accessories, must be vgc. Also old *Fox-Tango* newsletters, FT-101 instruction mans. Paul, M0BIT, 01702 528 288 (Leigh-on-Sea). E-mail: smithclamp@aol.com

MORSE keys wanted please. Early brass keys especially by Marconi, GPO etc, but all considered. John, G0RDO, 01626 206 090 (Newton Abbot). E-mail: john@morsemad.com

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 603 892 (Leeds). E-mail: g4uzn@qsl.net

TENNAMAST 12m, free standing, c/w rotator cage, will collect. M3BOT, 01789 764 889 (Alcester).

HEATHKIT Mohican GC1 for restoration, must be complete, cond immaterial, preferably working, but not essential. Can collect up to 100 miles or carriage at cost. Ray, G3VHE, QTHR, 07768 846 960 or 01235 765 360 (Wantage). E-mail: raytheham@hotmail.com

POWER cable and plug that mates with socket on front of Marconi TF144H sig gen. Jack Troup, WA6JYU, 15 Rica Vista, Novato CA USA 94947, tel: 415 897 3987.

RALLIES

1 FEBRUARY 2004

SOUTH ESSEX ARS Mobile Radio Rally – The Paddocks, Long Road, Canvey Island, Essex, at the southernmost extremity of the A130. Radio, computers and electronics. OT 10.30am. C (home-made), CP free, DF, TS, MA (book with examiners before midday). Brian, G7IIO, 01268 756 331 or briang7iio@yahoo.com [www.southessex.ars.btinternet.co.uk]

8 FEBRUARY 2004

HARWELL ARC Radio & Computing Rally – Didcot Leisure Centre, Mereland Road, Didcot, Oxon. Signposted from A34. OT 10.15 / 10.30am, £1.50. B&B, C, LB, TS, SIG, DF, TI on 145.550MHz, CP free. Ann, G8NVI, 01235 816 379 or ann.stevens@btinternet.com. [www.hamradio.harwell.com]

15 FEBRUARY 2004

RADIOSPORT Communication & Computer Show – Stevenage Leisure Centre. RadioSport 01923 893 929. [www.radiosport.co.uk]

WAKEFIELD & DRS Northern Cross Radio Rally – Thornes Park Athletics Stadium, Wakefield, W Yorkshire. Just out of town on the Horbury Road. Easy access from M1 jns 39 and 40 – well signposted. OT 10.15 / 10.30am, £2. B&B. John, G7JTH, 01924 251 822 or g7jth@wdrs.org.uk [www.wdrs.org.uk]

Worked All Britain Awards Group AGM – Radiosport Communication & Computer Show, Stevenage Leisure Centre. Begins 12.30pm. Geoff, G7GJU, 0191 370 2032.

22 FEBRUARY 2004

SWANSEA ARS Amateur Radio & Computer Show – Afan Lido, Aberavon seafront, Port Talbot. OT 10.30am, £1.50, children 50p. TS, B&B, SIG, repeater groups, TI on 145.550MHz. Roger, GW4HSH, 01792 404 422.

27 FEBRUARY 2004

GLENGORMLEY ELECTRONICS & ARS Annual Table Quiz – Knockagh Lodge, Greenisland at 8pm. All amateur radio clubs invited to enter teams for the GEARS quiz trophy, currently held by South Dublin RC. David, MI1VOX, mi1vox@ntlworld.com

29 FEBRUARY 2004

CAMBRIDGE & DARC Rally – Britten Arena, Wood Green Animal Shelter, King's Bush Farm, London Road, Godmanchester. [www.cdarc.org.uk]

BREDHURST RTS Rainham Radio Rally – Rainham School for Girls, Derwent Way, Rainham, Kent. Exit M2 jn 4, on to A278, follow RRR arrows. OT 9.30 / 10am, £2, under-14s free. TI on 144.550MHz (GB4RRR), TS, SIG, ATV, Kent RG, RNARS, digital comms, C, CP off road. Martin, 01634 365 980. [www.the-brats.net]

SWANSEA ARS Amateur Radio & Computer Show – ***** Venue closed – now on 22 Feb at different venue *****. Roger, GW4HSH, 01792 404 422.

6 MARCH 2004

CRYSTAL PALACE R & EC Spring Radio Fair – St John's Hall, Sylvan Road, SE19. OT 10.30am, £1 (inc free drink), under-16s free. C, local parking free. Bob, 01737 552 170. [www.members.aol.com/rfcburns]

7 MARCH 2004

BLACKMORE VALE ARS Valve Day – Youth Club Hall, Coppice Street, Shaftesbury, Dorset. OT 10am, admission free. LEC, C, TS, Internet, VMARS, BYLARA, clubs, HF station, valve radios, 405-line TVs, valve test gear, etc. Tony, 01258 860 741. [www.bvars.org.uk]

Vintage Valve Technology Fair – Newton le Willows, Merseyside, 5min from M6 jn 23. OT 9.30am, £2.50 accompanied wives & children free. CP free. Up to 120 stalls selling vintage wireless, valve Hi-Fi, classic Hi-Fi, gramophones, telephones, comms eqpt, valves, records (shellac 78, vinyl and CD), vintage TV, etc. VVT Holdings 01274 824 816, vvt@supanet.com [www.myciunka.supanet.com/VVTF2003 (case-sensitive)]

13 MARCH 2004

LAGAN VALLEY ARC Rally – Lagan Valley Hospital Conference Centre. OT 11am, TS, B&B, C, radio, computers, etc. Ron, GI4NTO, 028 92 601 941, ronnie@mccaughey2.freeserve.co.uk [www.gi4lkg@qsl.net]

14 MARCH 2004

ABERYSTWYTH Amateur Radio & Computer Rally – ***** New Venue ***** – Ray, 01970 611 853 or mwmg01@aber.ac.uk

BOURNEMOUTH RS 16th Annual Sale – Kinson Community Association Centre, Pelhams Park, Millhams Road, Kinson. OT 10am, £1. TI via G1BRS on 144.550MHz, TS, B&B, SIG, computers, clubs, C. Olive & Frank, G0GOX, 01202 887 721.

WYTHALL RC Radio & Computer Rally – *** New Venue *** – Woodrush Sports Centre, Shawhurst Lane, Hollywood, on the A435, two miles from jn 3, M42. OT 10am, £1.50. TS, C, B&B, CP, TI on 145.550MHz. Martin, G8VXX, 0121 474 2077, or enquiries@wrcrally.co.uk [www.wrcrally.co.uk]

20 MARCH 2004

SOUTH NORMANTON, ALFRETON & DARC 4th Junction 28 QRP Rally – Village Hall Community Centre, Market Street, South Normanton, Derbyshire, fully signposted, five minutes from M1 jn 28 and the A38. OT 10am. B&B, SIG, outdoor FM, C, LB, WIN. Includes traditional QRP Rally pie & peas. Russell, G0OKD, 01773 783 394 or russel.bradley@ntlworld.com or Mike, M0RMJ, 01949 876 523 or mike.jeffs@ntlworld.com [www.qsl.net/snadarc/]

21 MARCH 2004

TIVERTON (Mid Devon) Radio Rally – Pannier Market, Tiverton, Devon. OT 9.45/10am, £1. TS, B&B, C, TI, CP free. club@g4tsw.freeserve.co.uk [www.g4tsw.freeserve.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.

3 MAY 2004

DARTMOOR RC Radio Rally – *** New Venue *** – David, G4XUV, 01606 77787.

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]

16 MAY 2004

MIDLAND ARS Drayton Manor Radio & Computer Rally – Norman, G8BHE, 0121 422 9787 or 07808 078 003.

6 JUNE 2004

SPALDING & DARS Annual Rally – John, G4NBR, 07946 302 815. [www.sdars.org.uk]

WEST MANCHESTER RC 8th Red Rose QRP Festival – Les, G4HZJ, 01942 870 634, or g4hzj@ntlworld.com

13 JUNE 2004

East Suffolk Wireless Revival – 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 – Les, G4CWD, 01332 559 965, les@g4cwd.demon.co.uk

20 JUNE 2004

NEWBURY & DARS Car Boot Sale – [www.nadars.org.uk]

25 – 27 JUNE 2004

HAM RADIO 2004 – [www.messe-friedrichshafen.de]

27 JUNE 2004

SEVERNSIDE TV GROUP West of England Radio Rally – Shaun, G8VPG, 01225 873 003 (OH), 01225 873 098. [www.westrally.org.uk]

SWINDON & DARC Car Boot Sale – Mike, M5CBS, 01793 826 465.

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 or 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, hamfest@frars.org.uk [www.frars.org.uk]

13 AUGUST 2004

COCKENZIE & PORT SETON ARC 11th Annual Junk Night – Bob, M4UYZ, 01875 811 723, gm4uyz@btinternet.com

RALLIES & EVENTS

TI – Talk-In; **CP** – Car Park; **£** – admission; **OT** – Opening Time – time for disabled visitors appears first, eg (10.30/11am); **TS** – Trade Stands; **FM** – Flea Market; **CBS** – Car Boot Sale; **B&B** – Bring and Buy; **A** – Auction; **SIG** – Special Interest Groups; **MT** – Morse Tests; **MA** – Foundation Morse Assessments; **LB** – Licensed Bar; **C** – Catering; **DF** – Disabled Facilities; **WIN** – prize draw, raffle; **LEC** – LECtures/ seminars; **FAM** – FAMily attractions; **CS** – Camp Site.

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?

14 Feb GB5TT: PACC Contest. Essex. LH (G4UHM)
21 Feb GB4SCL: Settle Carlisle Line. North Yorkshire. LH (G0FQN)

The Members' Ads order form is now published here. 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 separate 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; separate applications must be made.

Please ensure you read and understand the conditions of acceptance of these subsidised Members' Advertisements, printed at the top of the Members' Ads page of the current *RadCom*.

FOR SALE ☐
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Tick one box

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RATES: UP TO 20 WORDS £5.50; 21-40, £6.50; 41-60, £7.50

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Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

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Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

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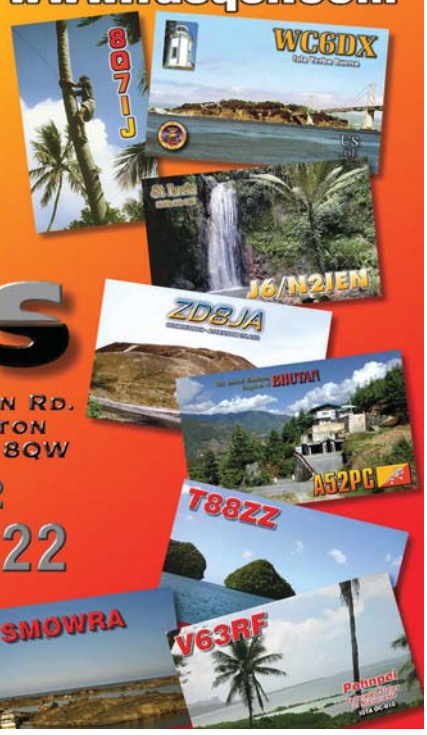

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The last word

Foundation re-ignites passion

Earlier this year a good friend of mine and ham mentor gave me the coupon from *RadCom* with membership for a guinea. After years of badgering to sit the RAE (I'd already taken and passed the 12WPM Morse test and then 'forgot' to sit the exam), Ian persuaded me to take the Foundation course run by the Dover Radio Club. I was put off initially as many of my fellow students were children, some under 10 years old, but I decided to give it a bash and subsequently became an M3 and went on to join the RSGB for the princely sum of £1.05. It certainly re-ignited my passion for radio and I recently acquired a new FT-1000MP MkV Field (a bit of overkill for an M3, perhaps but . . .) to replace my IC-737. With a G5RV in the garden at a decent height I have been able to do a fair amount of quite respectable DX work on both CW and SSB.

Apart from the obvious recipients of my gratitude, namely Ian Keyser, G3ROO; David Harding, G0DQI (Lead instructor M3 course); Brian Joyner, G8ZYZ (lecturer), and the Dover Radio Club for their enthusiasm and dedication to the furtherance of the hobby, I would also like to say a great big thank you to the wider amateur radio community, who have been overwhelmingly welcoming and supportive. This is especially so for the older age group and die-hard CW operators who have been thoroughly encouraging and complimentary of my CW abilities and pleased that CW is not being ignored by the new generation of amateurs.

Much help and advice (which incidentally is always welcome) has been freely given both on and off air. Amateur radio clearly groups a vast majority of decent, kind-hearted and sensible people - happy to share their hobby with newcomers to safeguard and ensure the future of one of the most fascinating hobbies going. I'm proud to have a callsign, to be a small part of the big community, proud to be a member of RSGB and grateful for the acceptance I have had from others within the hobby.

I start my Intermediate course on 7 January, again with the Dover Radio Club, and hope to gain a full licence later this year. I can't tell you how grateful I am to the RSGB for its campaigning on my and others behalf, to the lecturers at the Dover Radio Club for their unstinting efforts to further amateur radio, and to all the many amateurs that have welcomed M3s on the air.

Geoffrey I Dunne, M3GID

Drastic action

I enjoy contests, both VHF and HF, although have to be a bit selective as I'm still a working person with domestic duties at weekends. Every year I am amazed that the VHF and HF Contests organisers don't seem to communicate with one another, and put two very interesting contests on the same day, so it's only possible to have a go at one of them. Specific examples are: 5/6 June NFD, 6 June 50MHz Backpackers; 4/5 September HF SSB Field Day, 4/5 September 144MHz Trophy; 17 October 21/28 MHz CW, 17 October 50MHz contest. These are only a few of the examples which reduce the number of participants in a contest because they can't do both in the same day (almost seems to be 'divide and rule').

Now that B licensees have been given free and effortless access to the HF bands it seems that the VHF bands will get less and less use until they are taken away from us. Surely sensibly co-ordinated contest dates would have encouraged greater use of the bands? However, more and more I get the feeling that the RSGB doesn't give a toss about us members that had to work for our HF privileges, and is only interested in boosting sales figures for the short term. After all, with no real challenge left, how long do they expect these cornflake packet licensees to retain an interest in the hobby? It's because of the way the RSGB has lied to us longer term members over the last few years, taken away our pride in achievement, and released a lot of poorly-trained black box operators on to the bands (bit like CBers) that I am giving up the hobby. I certainly won't be paying any more subscriptions to an organisation that rides roughshod over us. It would have been better to let the hobby die through increasing age of those with skills, rather than dumb it down so much that it just becomes another toy for the youngsters which they will soon lose interest in.

PS: Bet you won't be allowed to publish this, as we are not allowed to criticise the 'organisation'. They just turn a blind eye to what we want, and it's too easy to use censorship on correspondence pages.

Malcolm Sadler, M0BHE

[You will find it hard to enjoy contests if you give up the hobby - *Ed.*]

Courses should not be compulsory

I find myself in total agreement with the letter by Mr Talbot, G4JNT, (*RadCom* December 2003). He suggested that a candidate for a licence should not be compelled to take any courses. He did not suggest that the exams should be bypassed. The reply, from Mr Kirby, G0TWW, appeared to have missed the point. He did not mention the exams at all. I am sure that anyone who can pass the exams has little need to take a course. Most of us who are licensed just took whatever exam was required at the time and the hobby has survived quite well. We then have to gain our own practical operating experience and learn from that with the help of those who are already active. I believe that this is what the hobby is really about - self-training and helping others.

The new system can be discriminatory and biased against those who do not live near to where a course is being run. I live in Jersey where I understand that courses are available. Consider the plight of anyone who lives on one of the smaller islands such as Sark or Herm. I assume that they would be happy to make a trip to a larger island, such as Guernsey, to take the exams. To have to make repeated trips to take a course before they could take an exam is likely to prevent them from ever getting a licence. There must be many more who are also in remote locations or, for other reasons, cannot attend a formal course.

Up to now the Foundation and Intermediate courses and exams could be bypassed by just taking the Full exam. This could be continued by taking the three exam elements in one session, or more if needed. The courses should be considered as being very useful for those who need them and can attend them.

Lawrence D Woolf, GJ3RAX

[RSGB General Manager Peter Kirby, G0TWW, comments: "There would appear to be a misconception that under the new structure you have to attend formal courses of instruction. This is not the case. At all levels you can self-teach just as you could under the C&G scheme. However, at Foundation and Intermediate levels there are practical elements to the examination format which must be completed."]

...I must say that I found Peter Kirby's reply to G4JNT ('The Last

Word', December 2003) patronising in the extreme. To suggest that Mr Talbot's friend is a "complete beginner" (in amateur radio terms) is an insult to the qualifications that she has, over the years, gained for herself. The suggestion in the original letter is not that the friend was a military radio operator, but that she had a background in military radio communications, which is an altogether different thing. To suggest that, because of a military connection, the person has no concept of equipment and antenna construction, or is likely to be procedurally poor on the air is, in my opinion, naive and insulting. The simple construction projects undertaken at Foundation tuition level hardly qualify a new licensee to be able to show someone of Mr Talbot's friend's expertise "how to do it"…

Whilst I accept that some changes to the licence structure were probably needed, I think that we now have just got ourselves into a ' catch-all ' situation where everyone has to follow the same - often unsuitable - path to a licence, whereas when the exam was administered by that very worthy body, City & Guilds it was not necessary to attend a course. I would be willing to bet that with a couple weeks spent 'bulling up' on regulations and procedures, G4JNT's friend would be able to pass the original RAE, both papers, in half an hour each, with at least a credit level, as I, and many others who I know, did in the past. It is a shame that an obviously technically well-educated person will now be denied this route to getting a licence, and using that expertise on the air to help others.

Geoff R Darby, G7RTC

[Mark Allgar, M1MPA, the RSGB Commercial Manager, took both the Foundation Licence course and then the RAE. He comments: "It is clear that those corresponding don't seem to grasp the direction or content of the Foundation exam. Having taken my M3 call in 2002 and since moved on to a full licence via the G&G RAE, I can say with validity that I have experience of both the old and the new. During the Foundation course I was given hands-on experience of operation and a thorough grounding in good practice. I would not have gained any of this if I had not attended the weekend course and merely turned up for the exam (which I would probably have passed, having read the book). Having sat the C&G exam and done much study for it, I can see the exam and syllabus in no way equipped me to be a good operator or in fact provided me with practical help in any operational area. Peter Kirby's comments about driving a car seem very apt: I agree with Mr Talbot that his friend could have passed the exam, but would you sit in a car with someone to drive down a motorway at 70MPH knowing they had never driven before but were aware how the engine worked?"]

More on re-issued callsigns

Peter Fox, G2YT ('The Last Word' November 2003) is a very fortunate person to have been given the callsign G2YT from the family of Cris Redshaw. Cris Redshaw had a fairly impressive career in the Marconi & Cable Wireless companies and was also a very keen radio amateur. When G2YT became available he must have jumped at it. Why? G2YT, or 2YT as it once was, was the callsign used by Guglielmo Marconi on his motor yacht *Elettra* during numerous trials of short-wave radio in the 1920s, some of which Cris Redshaw had some involvement in.

With no offence to the Redshaw family or Peter Fox intended, if I had been involved in the archives / heritage museum associated the Marconi company at the time Cris Redshaw became a silent key, I would have requested the callsign returned to its rightful owners as part of the Marconi heritage. Peter Fox is a very lucky man to have one of Marconi's callsigns.

Whilst I am not against the re-issue of callsigns, the RSGB needs to exercise some control over the process especially when the callsign is being re-issued for a second, or perhaps third time. When vintage callsigns are re-issued the RSGB should make sure the callsign is just vintage and not part of our heritage.

Paul Hawkins, G4KHU

…I agree entirely with the points expressed in the December issue by GW3KJW regarding the reissuing of callsigns. Personally I do not believe there is any justification to reissue a callsign belonging to a deceased person. If there is any at all it can only be to the son or daughter of the original holder and then only if there are strong reasons. The *ad hoc* way old callsigns are applied for and apparently granted is just another example of the decline in standards that this hobby has suffered in recent years. Do we really want people in the hobby who scan obituary columns looking for suitable callsigns to meet their strange needs?

Perhaps the Society could be more proactive regarding the loose practice as described in 'RSGB Matters' and persuade the RA to do something about it, not just consider the issue. My solution would be to revoke all callsigns that have been issued to people other than sons, daughters or relatives, and in future only reissue to sons or daughters with valid justification.

As the only person interested in amateur radio in my family is me I doubt whether my call would be reissued - unless the person who has G4ADE for their car registration develops an interest in the hobby.

Mike Woollin, G4ADE

…I write to express my profound disagreement with the letter from GW3KJW and the editorial comment 'Misuse of Re-allocated Callsigns' in the December issue of *RadCom*. I cherish my British and Canadian callsigns, much as I cherish my British and Canadian citizenships. I know with certainty that the previous holder of VE3ZI cherished his call. There is no question that passports will be issued to other people with my same name after my death, and there is no doubt that my Canadian callsign will be re-issued. It is a normal and proper part of nature that life moves on after we leave this mortal coil, and it is presumptuous to assume that it can be otherwise.

In Canada all callsigns are available for re-issue 12 months after they are relinquished, but during that year may be 'claimed' by a close family member. I believe that many other countries have similar systems and also believe that these are in the best interests of the amateur community.

The UK has a huge availability of callsign blocks, to the extent that most full licence-holders could have either a 1 x 2 or a 2 x 1 callsign. I certainly disapprove of the re-issue of callsigns by skullduggery, but would suggest that it should be done openly and fairly. Perhaps the RSGB could establish whether my feelings are shared by others?

Roger Parsons, VE3ZI / G3RBP

…I find I cannot really agree with all that Patrick Allely says in his letter on the re-issue of callsigns. There certainly is misuse of the callsign reissuing procedure and I support the RSGB initiative to correct this, but the motivation behind seeking a new callsign cannot be totally dismissed as vanity. . .

My sister suggested I take over her callsign as she no longer used it, or better still take over my father's. She felt the latter solution best as, not only did she express the view that my father would be delighted at the thought, but also the reactivation of his callsign would be a small memorial to someone who in fact donated to the development of radio communication in the past. I feel no emotional loss with the departure of G3XHK - a call held for well over 30 years - but there has been some financial loss with the need to obtain new QSL cards!

My new callsign does suggest greater antiquity, but I enjoy explaining the situation during QSOs. To date I have yet to find anyone who has objected to this change and quite a few who would like to do the same.

Alex Wickham, G3IAZ

…My brand new EA callsign arrived and I rushed to go on the air with it. The first call was answered with "Hola Enrique". My name being Dan, I politely corrected the offending station only to be told that the CD call-

book said my name was Enrique. Had I misread the callsign on my licence? No: here, apparently, they re-issue old callsigns! I have no idea why the callsign was unused but I feel as though I'm stepping into a dead man's shoes by taking his own personal callsign. On the air I have been quizzed many a time and, once, was accused of being a pirate!

My biggest fear, now, is that incoming QSL cards go to some little old widow as I have not been able to contact the local QSL bureau yet. Please save us from re-issued callsigns!

Dan Sleigh, EA5AOR / GM4BBF

Times change

Denzil Roden, G3KXF, asks plaintively ('The Last Word', January 2004) "What became of GMT?" Well, the short answer is "it became obsolete". Nothing to do with metrication or the EEC, just simple physics. The problem with GMT was that it was unrealisable. It was based on the rotation of the Earth and as such had a variable length of the second. That's not very useful for accurate work and there could not be any such thing as a true GMT clock. The best you got was an approximation, which needed its 'rate' twiddling every so often to match the Earth's erratic rotation. During the 20th century atomic clocks evolved, and allowed the physical realisation of a uniform timescale with a standard second. Thus Uniform Coordinated Time, UTC, has represented timekeeping since 1972. Based on an ensemble of some 250 real clocks, the tick you get is always at the same moment world-wide (allowing for static delays) and the tick-tocks always have identical spacing. And should do so for evermore.

Times change, and GMT is no longer and cannot be the basis of rational timekeeping. The *name* GMT, however, remains immortal.

James Miller G3RUH, ZB1BY

... I covered [this] topic in 'In Practice' for July 1999. Briefly, UTC is the world's standard time system, for all except the most specialised scientific uses. The BBC World Service may still talk about "GMT" as part of its image, but in reality the BBC time signals have been synchronised to UTC since 1990 ... and so too has that most British of institutions, Big Ben.

Ian White, G3SEK

... G3KXF states: "Conversion to metrication in the UK was begun on 1 January 1969 ... " I was an SWL in the days before WWII, and I cannot recollect anyone calling "CQ 87 1/2 yards" in those days ... or since!

H Bluer, G3UUZ

HRO stigma

Despise as I might the need to prolong the now rather boring HRO question posed my G3VA in his last 'TT' missive, I feel I have to add the odd word or two in my own defence, yet again! He insists that it is *my* opinion that the HRO was outdated during WWII. As I was not around during WWII it is somewhat difficult to argue with someone with such a depth of experience in both the clandestine and general radio trade of the time. G3VA should remember that others are entitled to their own opinions, whether considered right or wrong by himself.

G3VA asked what receiver I thought better than the HRO. I offer the R1155, the B40/41, the WS 19, 22, 52, the BC312/348, the CR100/300, the German Torn B and UKWe, the French Saram and numerous others. All of these had a band switch and a marked tuning dial, the operator could at least get to within ball park tuning of the required frequency without the need to plug in a coil and read off a calibration chart. I really fail to see the need for so much adulation to be placed on what is in effect a rather basic receiver, propelled into the limelight by a quirk of fate. Had WWII not happened would we really be raving about such a set?

Ben Nock, G4BXD

Morse for '@'

I was pleased to learn that my campaign for a Morse sequence for @ [as used in e-mail addresses - *Ed*] has come to fruition. It would appear that the ITU has added another 'dit' to what I suggested, making it AC run together (di-dah-dah-di-dah-dit). Perhaps this is because my original suggestion of di-dah-dah-di-dah is already used for four different accents of the letter A. There is information about this on the ARRL website (www.arrl.org/news/stories/2003/12/10/2/?nc=1)

David M Pratt, G4DMP

Hosting the AGM

Telford & District ARS recently hosted the 2003 RSGB AGM. Hosting is not an onerous task, as most of the work was carried out by the RSGB HQ staff themselves. All we had to do was research a suitable venue with the necessary facilities and provide a few bodies on the day. I would encourage more societies to consider holding the AGM where they are, as variety is the spice of life. The rather poor turnout was typical of any AGM, the very words 'Annual General Meeting' putting off members from attending. In my view, the Society should hold their 20-minute AGM (yes, 20 minutes!) at an event of some standing: say a large rally or convention, where the RSGB business is only one part of a good day out. The really interesting part was the Open Forum in the afternoon. No doubt the discussions during it will be published elsewhere. The dinner in the evening was an event in itself, with good food and excellent company. Very cheap beer too! Those who did not come missed out on an interesting day.

Mike J Street, G3JKX

Why does it matter who speaks?

Now that Morse code has become voluntary, rather than compulsory, may I suggest it is time to look at another anomaly? The area of use that I wish to look at is authorisation by a licence holder for a non-licence holder to operate his equipment. If, as a licence holder, I accept responsibility for a piece of equipment operating within the power and interference regulations, I question (for normal speech communication), why does it matter who speaks? . . .

I therefore propose that the licence requirement should be transferred to our equipment and its operation, rather than 'who speaks', with licensed holders being able to authorise 'sub-licensees' for family / friends, for limited operation that must at all times be supervised by licence holders.

PMR-446 radios generate a degree of interest, and are a start - but if as responsible licence holders, we can only by use demonstrate to our nearest and dearest the practical advantages of our rather more sophisticated equipment. Now, let's see if the society can look at the practicalities of making this possible.

Mike Solomons, G8DKW

'Thanks to amateur radio'

Having just retired, may I, through your journal, say thank you to amateur radio in general, and to many Cornish licensees (some now silent keys) for enabling me to pursue a career in radio and TV servicing. My early interest and encouragement from other amateurs enabled me to earn money from the start. I initially passed the RAE in 1963 and became licensed as G6CEP in 1981 meanwhile being a SWL. The earlier written exam was excellent grounding in radio theory which held me in good stead for progressing to TV servicing later. I have been an active member of the Newquay & DARS for many years and shall continue to enjoy the company of radio enthusiasts on and off the air.

Frank Kneebone, G6CEP / M3CEP

New SSTV allocation?

Why is slow-scan television (SSTV) located in the middle of the 14MHz SSB band? Is it a technical reason? I do not know, but the majority of the time the upper part of the band (14330 - 14350kHz) is completely free. If SSTV users should move up, it would be beneficial for both parts, avoiding interference. Currently there are still many SSB operators who do not know what that strange modulation sound of SSTV really is.

Jorge Dorvier, EA4EO

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FREEPHONE ORDERLINE: 08000 73 73 88

AUDIO

HEIL USA- QUALITY AUDIO

HEIL PROSET HEADPHONES & BOOM MICS

New Low 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	£169.95	B
PRO-SET-PLUS-IC	Large H/phones with IC & HC-4	£179.95	B
PRO-SET-4	Large H/phones with HC-4 element	£114.95	B
PRO-SET-5	Large H/phones with HC-5 element	£114.95	B
PRO-SET-IC	Large H/phones with ICOM element	£124.95	B

HEIL HERITAGE MIC £139.95 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.

£59.95 B

PL-2 BALANCED STUDIO MIC

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

£54.95 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

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	£129.95	B
GM-5	Goldline HC-5 hand mic	£129.95	B
GM-V	Goldline Vintage Hi-z hand mic	£149.95	B

HEIL CLASSIC DESK MICS

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	£219.95	B
HCL4	Classic retro-look HC-4 desk mic	£219.95	B
HCLic	Classic retro-look IC desk mic	£219.95	B

CB-1 MATCHING DESK STAND

This desk stand has been designed specifically for the Heil Classic & Heritage microphones.

£69.95 A

FS-2 PTT FOOT SWITCH

£44.95 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.

TB-1 MATCHING DESK STAND

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.

£27.95 A

SECONDHAND LIST

Glenrothes (Tel: 01592 756962)

TS-2000 HF/6m/2m/70cms	£1275.00
FT-847 HF/6M/2M/70cms As New!	£899.00
IC-706 MK2 Hf - 2m	£485.00
FT-840 HF Transceiver	£440.00
FC-20 AUTO ATU	£159.00
FT-1000MPAC HF Transceiver	£1299.00
IC-R8500 Receiver As New	£850.00
LINCOLN 10M Multimode	£150.00
IC-718 HF Transceiver	£399.00
R-2000 G.C Receiver plus VHF convertor	£295.00
IC-72 HF Receiver	£385.00
IC-R71E All mode receiver	£375.00
WIN 1550i Computer receiver	£275.00
LOWE HF-225 HF Receiver.	£150.00
TM-G707E 2m/70cms	£195.00
TR-751E 2M SSB/FM	£199.00
TM-751E 2M SSB/FM	£235.00
FT-1500M 2m	£130.00
IC-T8E 6/2/70 Handy	£199.00
TS-711E 2m Base Multimode	£375.00
IC-T3H 2M Handy Transceiver	£110.00
FT-11R 2m Handy.	£90.00

Matlock (Tel: 01629 832375)

AR-7030 HF Receiver	£475.00
IC-R75 HF Receiver	£475.00
IC-726 HF Transceiver	£395.00
IC-2000 2m Multimode	£130.00
AT-180 IC-706 Auto ATU	£245.00
HL-37VSX 2m Linear	£95.00

Hockley (Tel: 01702 204935)

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
SG-230 Auto ATU	£289.00

Phone respective branch for more information

bhi SPECIAL OFFER!

SAVE £10!
bhi 1042 SWITCHBOX
~~£29.95~~ **£19.95**

No more swapping of wires. The bhi 1042 Switch Box allows up to six piecies of equipment to be connected to one bhi noise eliminating module/speaker or even to a standard extension speaker. **6x inputs: 3x loaded (8 Ohms speaker level) *6x unloaded (headphone/line level), *1x output (to speaker/module) *All sockets 3.5mm mono*
c/w 3.5mm mono to 3.5mm mono 1.2m lead.

Place your order quoting the serial number of your NES10-2 DSP Filter Unit.

Offer ends 31st March 2004. Offer limited to purchasers of NES10-2 DSP Unit and limited to one per person.

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.
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SGC SPECIAL OFFER

Buy an SG-2020 or SG-2020ADSP 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-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.

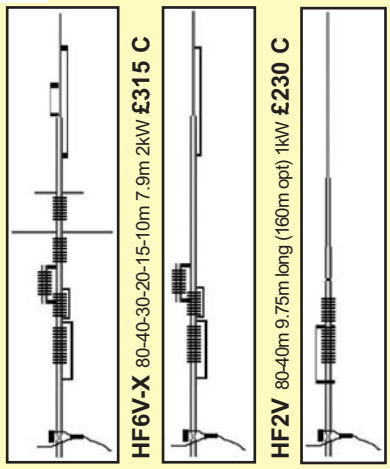
£359.95 c

SG-230 Auto ATU

1.6 - 60MHz. 3 - 200W pep (80W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 500mA.

£359.95 c

Butternut Antennas from Bencher inc, USA



HF9V-X 80-6m 7.9m long 1kW PEP **£369 C**

HF6V-X 80-40-30-20-15-10m 7.9m 2kW **£315 C**

HF2V 80-40m 9.75m long (160m opt) 1kW **£230 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**
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RMK-II Roof Mount Kit Includes tripod/STR-II/hardware **£155 C**
TBR-160S 160m Resonator Kit **£115 C**
A17-12 17 & 12m adaptor for HF6V-X **£50 C**
A-6 6m Resonator for HF6V-X **£15 B**
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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.

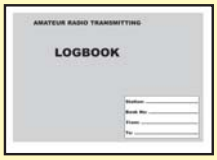
Super Searcher	RF finder & freq. cnter 10MHz-3GHz	£99.95	B
Super Hunter	Frequency counter 10Hz-3GHz	£149.95	B
Hunter	Frequency counter 10MHz-3GHz	£49.95	B
FC-130	Frequency counter 1MHz-3GHz	£59.95	B

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.

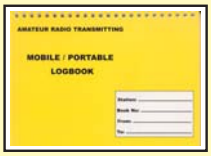
X-Sweeper NEW	Nearfield Receiver 30MHz-3GHz	£1699.95	C
Xplorer	Freq. cnter / CTCSS/DTMF decode	£685.95	B
Digital-Scout	Digital Freq. counter 60MHz-2.6GHz	£459.95	C
Scout	Freq. finder 10MHz-1.4GHz	£349.95	B
M1	Freq. cntr 50Hz - 40MHz	£239.95	B
M1-TCX0	M1 + temp controlled crystal oscillator	£289.95	B
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

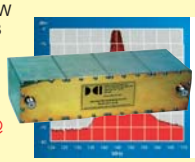
CS-600 2-way coax switch rated over 1kw (HF) and up to 600MHz @100W. Fitted SO-239 sockets. **£12.95 A**

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**

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Blending leading-edge technologies developed on the FT-897 and MARK-V FT1000MP transceivers, the FT-857 is the world's smallest HF/VHF/UHF Multimode Transceiver, and it's available now!

FT-857 DESIGN HIGHLIGHTS

The FT-857 is a high-performance, ultra-compact transceiver operating on the 160-10 meter HF bands, plus the 50, 144, and 430 MHz VHF/UHF bands. Providing 100 Watts of power on HF/6 meters, 50 Watts on 2 meters, and 20 Watts on 70 cm, the FT-857 is ideal for mobile, vacation, DX-pedition, or home use when space is at a premium.

Utilising the renowned receiver performance of the FT-897 and MARK-VFT-1000MP, the FT-857 features wide dynamic range, optional Digital Signal Processing, and outstanding audio.
(*DSP supplied as standard in the UK)

The wide array of convenience features includes a 32-colour display; Spectrum Scope; built-in keyer with memory and beacon mode; U.S. Weather Band reception; 200 memories with Alpha-Numeric labels; AM Aircraft reception; detachable front panel (optional YSK-857 required); and much, much more.

You've asked for it, and it's here today: the FT-857 New Mobile. . .from the engineers at Yaesu!

New Remote Control DTMF Microphone MH-59A8J (Option)

The optional MH-59A8J Remote Microphone provides control of the major functions of the FT-857 from the microphone's keypad. The MH-59A8J includes a rotary control knob for adjusting the operating frequency and the receiver volume level.

UP/DWN keys
SEL/DIAL key and indicator
LOCK switch
SEL knob
PTT switch
9(BAND UP) key
* key
0(CNTL) key
ENT(#) key
Keypad
A key
B key
C key
1(DISP) key
2(MHz) key
3(CLAR) key
4(HOME) key
5(MODE) key
6(MODE) key
7(V/M) key
8(BAND DWN) key
F(D) key
ACC key
PWR(FAST) key
P1 key
P2 key

Actual Size

HF EXCITEMENT

FT-857

ULTRA-COMPACT HF/VHF/UHF 100 W ALL-MODE TRANSCEIVER (HF/6m 100W, 2m 50W, 70cm 20W)

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