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The Radio Society of Great Britain Members' Magazine

RadCom

£3.95 Vol 79 No. 5 May 2003

Review

THE SGC 'STEALTH' ANTENNA KIT **p22**

G1MFG ATV TRANSCEIVER **p26**

SSB FIELD DAY 2002

Results p49

Beginners

HOW TO WORK HF DX (. . . AND HOW NOT TO) **p56**

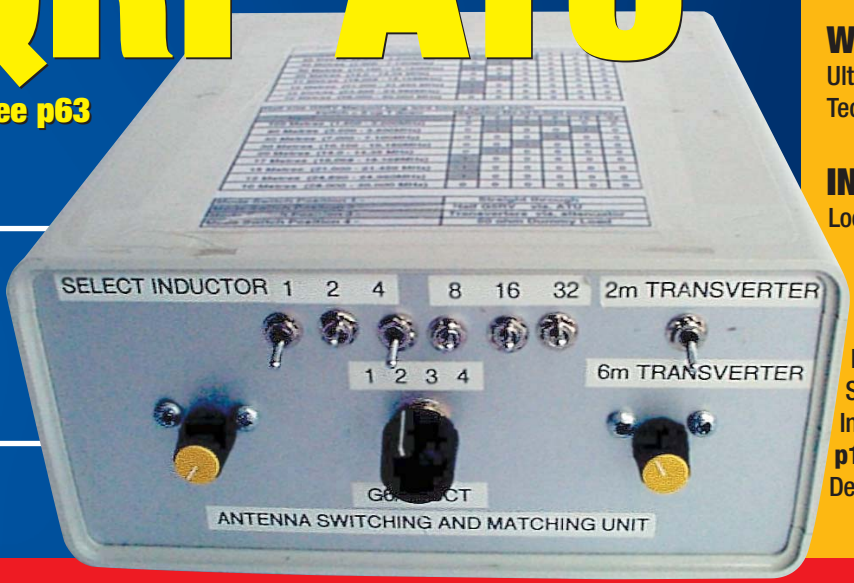
Out now!

Antennas

A MULTI-WAVELENGTH V-BEAM **p82**

A QRP ATU

for the M3 Licensee p63



WHAT'S VK6VZ DOING?

see p60

CONTENTS

TECHNICAL TOPICS
Crystal/Ceramic Ladder Filters **p72**

NEW BOOKS
QRP Basics and Microwave Projects plus WRTC Finland 2002 video reviewed **p32**

GUIDES
'Thinking Day on the Air' Introduces Hundreds to Amateur Radio **p18**

GB4FUN
On the Road Again for National Science Week **p15**

WHATEVER NEXT
Ultra Wideband Technology **p78**

IN PRACTICE
Looks at Speech Clipping **p80**

IN THE NEWS
◆ RA Amateur Radio Forums **p5** ◆ Leicester Students Contact International Space Station **p10–11** ◆ CB to be Deregulated? **p10–11**

WIN! G1MFG ATV Equipment P28

WATERS & STANTON

FREEPHONE ORDER LINE:

08000 73 73 88

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

3 STORES TO CHOOSE FROM

WEB ORDERING
www.wsplc.com

NEW RIGblaster pro

New in the line up is the RIGblaster pro rig to sound card interface. Full status front panel LEDs, electret mic. input plus second mic. Now features dual headphone outputs 1/4" and 3.5mm. Built-in Yaesu CAT and Icom CI-V interface and Kenwood compatibility. Two independent keying outputs for CW and FSK. New CD-ROM program selections including sound card based DSP software. Large number of leads supplied for most hook-ups.

£299.95 B

NEW ICOM IC-703

HF/ 50MHz Transceiver
0.1-10W Portable, Mobile, Base-Station. (9-15.87V DC)
Designed especially for the Foundation Licence/QRP. Built-in features auto ATU, DSP memory keyer. (5W when using 9.6V batts) Battery and Carry Pack to follow.

£579 C

NEW YAESU FT-857

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.

£799 C

DON'T FORGET!
SUNDAY 25th MAY 2003

HF TRANSCEIVERS

ICOM IC-756 PRO II £1999 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.

ICOM IC-7400 £1449 C

HF/VHF 100W transceiver. Features large LCD with spectrum scope, auto ATU and same DSP system as IC-756PRO II. Supplied with free SP-21 speaker & SM20 desk mic.

ICOM IC-706 IIG DSP £799 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 .

ICOM IC-718 £449 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.

KENWOOD TS-2000 £1569 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.

KENWOOD TS-870S DSP £1399 C

HFDSP 100W base station. 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.

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.

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. IC-910H version £1149

HF TX / LINEAR AMPLIFIERS

YAESU FT-1000 mKV £2499 C

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

YAESU FT-1000 FIELD £1899 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.

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.

YAESU FT-847 £1148 C

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

YAESU FT-817 £569 C

All bands & All modes gives you a totally portable HF DX or VHF/UHF station. *Ours includes* battery and charger.

LINEAR AMP UK CHALLENGER III £1795 C

HF linear amp 160-10m including WARC bands. Output 1500W CW or SSB, 400W RTTY. Soft start and timer protection at switch-on. Front panel adjustable ALC.

LINEAR AMP UK RANGER 811H £895 C

HF linear amp 160-10m including WARC bands. Drive 10-100W, output 800W (max) CW. Soft start on switch-on. Compatible with all modern 100W HF rigs. Silent running Papst fan.

TOKYO HY-POWER HL-50B £265.95 C

FT-817 VERSION !

This model has been specifically designed for the FT-817. Enjoy up to 50 Watts output

THE W&S HOCKLEY OPEN DAY

In our 30th Year of Trading!
Great Deals!Free raffle!Free Food!
Stands include-Manufacturers, Repeater Groups & Clubs

1973 WATERS & STANTON PLC 30th ANNIVERSARY 2003

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THE ONLY THING WE CUSTOMER SERVICE WON'T DISCOUNT

VHF / UHF TRANSCEIVERS

ICOM IC-2725E NEW £309 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-207H £279 C

Great budget price dual band FM 50W/35W transceiver. Simple band operation. Front panel detachable from main unit if required.

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 £369 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-7100 £329 C

Excellent dual band radio that has extended rx. Power is 50/35W. Features dual in-band reception and detachable display (requires YSK-7100).

YAESU FT-1500M £159 B

Remarkably small and compact, yet built like a Battleship!
Should last for years.
Look at the Price!

KENWOOD TMD-700E £449 C

Certainly the best 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

A lovely cool blue display, easy with 50/35W output. 50W/35W plus 280 memos and five storable operating profiles.

KENWOOD TM-G707E £289 C

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 TX & HANDHELDS

YAESU VX-7R NEW £319 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-1R GREAT PRICE £119.95 B

2m/70cm

Ultra-wide frequency coverage which includes VHF and UHF TV audio, AM broadcast, FM broadcast and AM airband.

YAESU VX-110 £99 B

Combining the ruggedness of the VX-150 with the simplicity of 8-Key operation, the VX-110 is a fully featured 2m handheld ideal for the most demanding of applications. It has a die-cast case, large speaker and illuminated keypad.

ICOM IC-E90 NEW £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.

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 NEW	2m/70cm On glass 3.7m coax 50W	**£29.95**	B

MOBILE BASES

DIAMOND

K-600M.
Deluxe boot mount SO-239, c/w 5m RG-58 & PL-259

AML	Gutter mount fold over type	**£15.95**	A
K-11	Universal gutter mount	**£24.95**	A
K-33	Adjustable hatch mount	**£23.95**	A
K-400	Adjustable boot mount heavy duty	**£26.95**	A
K-600M	Deluxe boot mount + cable	**£49.95**	B
DPK-TR	Stainless Steel boot mount (ECH)	**£18.95**	A

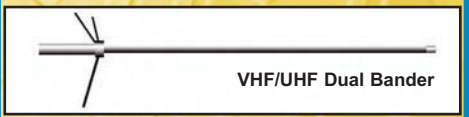
WATSON

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

BASE STATION ANTENNAS

DIAMOND



VHF/UHF Dual Bander

X-200	2m/70cm colinear 6/8dB 2.5m	**£79.95**	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

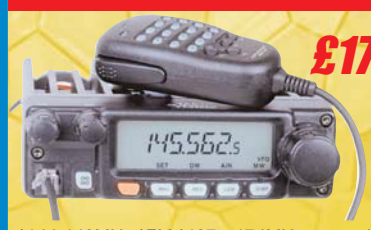
WATSON

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

NEW YAESU FT-2800M

£179 B



**144-146MHz *FM *137 - 174MHz expanded Rx*
**RF Pwr 65/25/10/5W *25/12.5kHz channel spacing*
**High/Low deviation *Supply 13.8V DC*

The FT-2800M is the latest model from Yaesu with 65 Watts High Power, rugged consruction, excellent receiver performance and direct keypad entry.

WATERS & STANTON

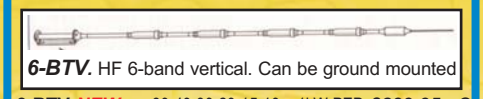
1973 WATERS & STANTON PLC 30th ANNIVERSARY 2003

PRICE MATCH

HF ANTENNAS

VERTICAL ANTENNAS

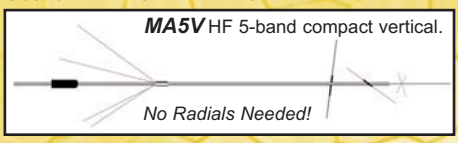
HUSTLER BASE ANTENNAS



6-BTV. HF 6-band vertical. Can be ground mounted

6-BTV *NEW*	80-40-30-20-15-10m 1kW PEP	**£239.95**	C
5-BTV	80-40-20-15-10m 7.64m 1kW	**£209.95**	C
4-BTV	40-20-15-10m 6.52m 1kW PEP	**£169.95**	C

CUSHCRAFT BASE ANTENNAS

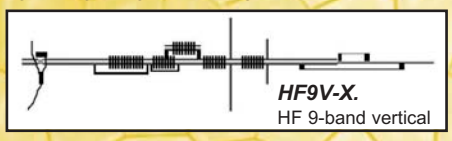


MA5V HF 5-band compact vertical.

No Radials Needed!

MA5V	20-17-14-12-10m 250W PEP	**£229.95**	C
R8	40-30-20-17-15-12-10-6m 1.5kW	**£529.95**	C
R6000	20-17-15-12-10-6m 1.5kW PEP	**£349.95**	C

BUTTERNUT BASE ANTENNAS



HF9V-X.
HF 9-band vertical

HF9V-X	80-6m 7.9m 1kW PEP	**£365.00**	C
HF6V-X	80-40-30-20-15-10m 7.9m 2kW	**£315.00**	C
HF2V	80-40m 9.75m (160m opt) 1kW	**£230.00**	C

HY-GAIN BASE ANTENNAS

DX-88. HF 8-band vertical

AV-640	40-6m 1.5kW, 300W 6m (PEP)	**£399.95**	C
AV-620	20-6m 1.5kW, 500W 6m (PEP)	**£299.95**	C
AV-14AVQ	40-20-15-10m 1.5kW PEP	**£179.95**	C
AV-12AVQ	20-15-10m 1.5kW PEP	**£139.95**	C
DX-88	80-10m 1.5kW, 250W 30m	**£395.95**	C

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	**£349.95**	D
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	**£249.95**	C

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

D-3W	12-17-30m dipole element 2kW	**£249.95**	C
D-4	10-40m dipole element 2kW	**£339.95**	C
D-40	40m dipole element 2kW	**£299.95**	C
TEN-3	10m 3 el. Yagi 2kW	**£219.95**	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	**£84.95**	C
CW-620	20-6m 9.7m (32ft) long	**£94.95**	C
G5RV PLUS	80-10m with balun 31m (102ft) long	**£64.95**	B

HF ANTENNAS

RADIO WORKS - Baluns and Isolators

T-4 Plus	Line Isolator1.8 - 54MHz 4kW	**£42.95**	B
T-4-500	Line Isolator1.8 - 30MHz 500W	**£32.95**	B

Use a line isolator to eliminate stray RF.

T-4G	Line Isolator 1.8-30MHz + gnd 4kW	**£42.95**	B
T-4G Plus	Line Isolator 1.8-54MHz + gnd4kW	**£45.95**	B

The **REM-BAL** is a 4:1 current type balun and is ideal for open wire to coax interfacing, especially external to the operating position. Unlike voltage baluns, current type baluns maintain output balance over a wide range of loads.

REM-BAL	Ladder line 4:1 balun 1.8-30MHz	**£49.95**	B
B1-2K Plus	1:1 current balun - for inverted V 's	**£28.95**	B
B4-2K	4:1 voltage balun loops/folded dipoles	**£42.95**	B
Y1.5K Plus	1:1 current Yagi balun 1.8- 54MHz	**£42.95**	B

Sundries

KEVLAR	200ft 400lb strain guy line	**£22.95**	A
LADDER	450 Ohm ladder line - per metre	**£0.90**	A

MOBILE ANTENNAS

HUSTLER

Standard Resonator 400W (mast sections not included)

RM-40S ***RM-80***

RM-10	10m 150-250kHz	**£19.95**	B
RM-11	11m 150-250kHz	**£19.95**	B
RM-12	12m 90-120kHz	**£19.95**	B
RM-15	15m 100-150kHz	**£19.95**	B
RM-17	17m 120-150kHz	**£24.95**	B
RM-20	20m 80-100kHz	**£24.95**	B
RM-30	30m 50-60kHz	**£26.95**	B
RM-40	40m 40-50kHz	**£26.95**	B
RM-80	80m 25-30kHz	**£29.95**	B

Super Resonator 1kW (mast sections not included)

RM-10-S	10m 250-400kHz	**£24.95**	C
RM-15-S	15m 150-200kHz	**£26.95**	C
RM-20-S	20m 100-150kHz	**£31.95**	C
RM-40-S	40m 50-80kHz	**£37.95**	C
RM-80-S	80m 50-60kHz	**£51.95**	C

Lower Mast Sections

MO-1	54" (FOLD @ 22")	**£33.95**	C
MO-2	54" (FOLD @ 27")	**£33.95**	C
MO-3	54" (NON FOLD)	**£26.95**	C
MO-4	27" (NON FOLD)	**£22.95**	C

Mobile Mount Accessories

SSM-1	Ball mnt stainless steel spring&stud	**£45.95**	B
SSM-2	Ball mount	**£28.95**	A
SSM-3	Stainless steel spring & stud	**£24.95**	A
HOT	Trunk lip mount	**£24.95**	A
RSS-2	Stainless steel resonator impact spring	**£10.95**	A
QD-2	Quick disconnect adaptor	**£19.95**	A
VP-1	Multi-band adaptor	**£7.95**	A

PORTABLE ANTENNAS

MIZUHO (FOR FT-817)

ATX-WBN	Walkabout 80-6m Whip 1.5mBNC	**£49.95**	B

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

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

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

AT-80	Single band 80m whip with BNC	**£24.95**	B
AT-40	Single band 40m whip with BNC	**£24.95**	B
AT-30	Single band 30m whip with BNC	**£19.95**	B
AT-20	Single band 20m whip with BNC	**£19.95**	B
AT-17	Single band 17m whip with BNC	**£19.95**	B
AT-15	Single band 15m whip with BNC	**£19.95**	B
AT-12	Single band 12m whip with BNC	**£19.95**	B
AT-10	Single band 10m whip with BNC	**£19.95**	B

ANTENNA TUNER UNITS

MFJ 989C VERSA TUNER V £379.95 C

High power tuner.*1.8-30MHz *3kW *6-way Antenna/ load switch *2 coax positions *Built-in 4:1 balun *X-needle meter *Peak & AV

MFJ 986 DIFFERENTIAL-T TUNER £349.95 C

Differential capacitor & Roller inductor.*1.8-30MHz *1.5kW *6-way Antenna/load switch *2 coax positions *Built-in 4:1 balun *X-needle meter *Peak & AV

MFJ 949E DELUXE VERSA TUNER II £159.95 B

Firm favourite with HF operators. *1.8-30MHz *300W *3-way Antenna selector *Dummy Load socket *Internal balun *X-needle meter *Peak & AV

MFJ 962D VERSA TUNER III £279.95 C

Ideal tuner for max UK legal power.*1.8-30MHz *1.5kW *6-way Antenna/ load switch *2 coax positions *Built-in 4:1 balun * X-needle meter *Peak & AV

MFJ 921 VHF DUAL BAND TUNER £74.95 B

This tuner helps you get perfect VSWR and offers some filtering as well.*144/220MHz *200W max *Power meter *Rear panel earth terminal

MFJ 906 6 METRE TUNER £89.95 B

Help match your 6m rig to your antenna.*50-54MHz *100W FM *200W SSB *X-needle meter, 0-60W & 0-300W *By-pass position for tuner

MFJ 931 ARTIFICIAL GROUND £94.95 B

Places rig near to actual ground potential.*1.8-30MHz *Ground current meter *Used where no earth ground is possible *Reduces TVI/RFI *Resonates random wire

MFJ 267 DUMMY LOAD/WATT METER NEW £129.95 B

Switch enables the dummy load to be by-passed*1.8-54MHz *300/3000W FWD *60/600W RFD *50 Ohms *3in X-needle meter VSWR/Pwr *reads PEP or AV *SO-239 x2 sockets *9-12V

MFJ 269 ANTENNA ANALYSER £349.95 B

Once you have used an antenna analiser you will wonder how you ever managed without one. The MFJ-269 covers 1.8 to 170MHz and 415 to 470MHz. The MFJ-259B 1.8 to 170MHz. Both operate as signal generators and frequency counters as well.

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THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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Limited by guarantee
Member society of the
International Amateur Radio Union
Patron: HRH Prince Philip, Duke of Edinburgh, KG, KT

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

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www.rsgb.org/membersonly Use your callsign in lower case as the user name, and your membership number (see RadCom address label) as the password.

RSGB Matters

RA AMATEUR RADIO FORUMS MARCH 2003

The RSGB was represented at both the RA Amateur Radio Forums in Leeds and Bristol by the President, Bob Whelan, G3PJT, and the General Manager, Peter Kirby, G0TWW. From the Radiocommunications Agency were Alan Betts, Head of Amateur Radio; Denise Carter, Amateur Radio Section; and Neil Marr, Enforcement and Interference Policy Unit. Managers from the respective RA Local Offices were also in attendance. Both forums were well attended, with just under 200 attendees at each. Alan Betts opened the meeting with a short presentation on a number of key activities after which the Open Forum began. This is a brief summary of the main topics of interest:

PHOTO: RICHARD CONSTANTINE, G3UGF

Progress and success of the **Foundation Licence**. As of 29 March, 6650 M3 licences had been issued. There was immense support for the introduction of the Foundation Licence as a 'stepping stone' into amateur radio, and from the various positive comments made from the floor it was seen that the Foundation Licence appeals to newcomers of all ages. Radio clubs were especially thanked for their invaluable hard work in running courses and examinations.

Power Line Technology. There was some concern among amateurs on the subject of tests on new PLT systems which were being conducted in Scotland. The RSGB informed the forum that the trials were to take measurements on levels of interference generated by PLT systems and that a Technical Working Group had been established which included representatives from the RA, RSGB, broadcasters and government users, together with potential providers of PLT systems. The RSGB reiterated that it would continue to work to safeguard the interests of radio amateurs by setting sensible emission limits.

Internet Links. Some time ago the RA announced a review of Internet linking and gateway stations, at which point a fair bit of information was collected. The RA has commissioned an engineer to carry out the review from which an interim report will be available shortly, at which point the RA will be able to move forward.

There was much discussion on the **World Radio Conference** which will take place during June-July this year and where it is expected the need for Morse testing as a condition of gaining an A licence will be removed. The RA intends to leave existing callsigns unchanged: amateurs will retain their present callsign and the concept of A and B class licences will disappear. Licences will simply be Foundation, Intermediate and Full, with all the existing privileges of the A class licence at that level of licence.

Written transcripts of both Forums will be available via the RA website at www.radio.gov.uk

ROBOT WARS RSGB SPONSORSHIP SCHEME

The Society is looking to form a team to enter the BBC's *Robot Wars* in an effort to promote amateur radio. If you would be interested in forming a team or becoming part of the team please send us an application outlining the skills you could bring to such an enterprise. Interest from those who have already worked on such a project or who have novel ideas for robots is particularly welcome. Apply to: Commercial Manager, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE or e-mail: mark.allgar@rsgb.org.uk

BAND PLAN CORRECTIONS

Following the publication of the band plans in the April *RadCom* a number of members and one special interest group have queried the status of the AM mode on HF which of course has a 6kHz bandwidth. Members are reminded that the band plan is a voluntary code of practice which recommends, through the International Amateur Radio Union, the way the bands should be used. Amplitude Modulation is permitted under the terms of the UK licensing document BR68 under the generic term of telephony and at this time no plans exist to change this. It has been mentioned that a similarity exists between users of AM equipment on the amateur bands and vintage vehicle enthusiasts who are permitted to use their vehicles on the highways. The IARU band plan is subject to continuous review in order to prepare for future developments in the HF spectrum and the RSGB is represented on the working group by Colin Thomas, G3PSM, the HF Manager.

While on the subject of band plans, a number of errors occurred during the preparation of the plans published in the April *RadCom*. On the 136kHz band the lower band edge is 135.7kHz not 135kHz. On 10MHz the QRP calling frequency is 10116kHz not 10106kHz and on 18MHz the QRP calling frequency is 18096kHz and not 18086 kHz.

Some emergency communications frequencies were omitted from the 2-metre band plan: 144.625 to 144.675MHz and 145.2MHz should be added as 'Emergency Communications Priority' frequencies. Any enquiries about amateur radio emergency communications should go to the RSGB's Radio Communications Voluntary Service National Coordinator, Paul Gaskell, G4MWO (QTHR) or e-mail: rcvs@rsgb.org.uk

DRRM VACANCY

Neil Savin, G0SVN, has decided that he would like to step down as Deputy RSGB Regional Manager for District 92 – Berkshire and South Buckinghamshire – although he has agreed to stay on until a replacement is found. There will therefore be a vacancy in that District and any member resident there who wishes to volunteer is asked to contact the RSGB Regional Manager for Region 9 – London and the Thames Valley – Paul Berkeley, M0CJX, e-mail: m0cjx@ntlworld.com

PRESSURE OF WORK AND INFLATION FORCES SUB RATE RISE

The Society has recently found itself in a *Catch 22* situation. Society policy is to be a cost-effective, not-for-profit, organisation which protects fully the interests of our members and the UK amateur community at large. It is also our policy to provide value for money but, like all organisations, we are subject to inflationary pressures and other issues. To continue to provide the level of service and representation that we do it has been necessary to review the level of the subscription rate paid by our members. Reluctantly, your Board has taken the decision to increase the rate by £2.00 from 1 July 2003. This is the first increase since 2001 and is based on the published inflation rate over the intervening period.

RSGB HQ FOUNDATION LICENSEES

A Foundation Licence course was recently held at HQ for RSGB staff members. All seven candidates passed the exam, two of them with perfect 20 out of 20 scores, and no resits were required. When they have applied for their M3 licences it will bring to a total of 16 out of the 26 part- and full-time members of staff at RSGB HQ who hold amateur radio licences. The yellow pass certificates were presented by General Manager Peter Kirby, G0TWW.

In the photo, from left to right: Lynn Wortley (Receptionist /Telephonist); Catherine Pearson (Amateur Radio Department); Jennifer Ward (Amateur Radio Department); Lead Instructor Steve Telenius-Lowe, G4JVG (RadCom Editor); Peter Kirby, G0TWW (General Manager); Anne McVicar (Advertising Production); Faye Millward (Accounts); Instructor George Brown, M5ACN (RadCom Technical Editor). Not in the photo: Alison Dixon (Sales Dept) and Hilary Whittington (QSL Bureau), who also passed the Foundation Course.

'FORESIGHT' REVIEW

Following the many visits to clubs, discussions with members and immersion in the current issues of the RSGB, RSGB President Bob Whelan, G3PJT, has been struck by the wide range of knowledge and expertise amongst the membership, as well as the challenges and opportunities that are present in the hobby. With this in mind the RSGB Board recently agreed to set in train a 'Foresight' study of the likely technology and related trends affecting amateur radio so that the Society can identify future opportunities and directions for the hobby and the support the RSGB gives to amateur radio. This is being done in conjunction with a review of the way the RSGB voluntary support is channelled so that the expertise is able to be more pro-active to future opportunities. In addition to increased flexibility the slicker way of working should also provide a greater sense of fulfilment to those volunteers involved – and encourage more amateurs to offer their expertise and ideas for the benefit of all.

John Gould, G3WKL, is leading a small 'Foresight' team drawn from within and outside the hobby that has just started the task of collecting data from the various RSGB committees, Honorary Officers, Regional Managers and staff at the RSGB HQ with whom they interface. The 'Foresight' team will also be looking for input from the RSGB membership and the amateur radio community as a whole. This will most likely be channelled through the RSGB and non-RSGB affiliated clubs. A further announcement will be made shortly. Any amateur who would like to input can do so via the following e-mail address: review@rsgb.org.uk

RSGB MORSE TEST SERVICE ANNIVERSARY

RSGB County Morse test teams will again be on the air during the 17th anniversary weekend of **10/11 May 2003**. For ease of identification, all stations will use a special event GB0 prefix, followed by the county code suffix; eg the Isle of Wight will use the callsign GB0IOW and London GB0LDN. The Chief Morse Examiner will use GB0CW and the Deputy Chief Morse Examiner GB0MTS. There will be a minimum of 27 stations active and a Morse Test 17th anniversary certificate will be available to any amateur who makes contact with at least 10 of the GB stations. The cost of the certificate is £2.50 (cheque or postal order made out to RSGB), $5 or 6 IRCs. Applications should be sent to the Chief Morse Examiner, David Waterworth, G4HNF, 116 Reading Road, Woodley, Reading Berks RG5 3AD. QSL cards are not required to claim the award, which is also available to listeners. Activity will concentrate on 80 and 40m. In order to encourage newcomers, each team will spend some time calling slowly above 3560kHz and examiners will be happy to reply at any speed.

AROS TALKS

The RSGB Amateur Radio Observation Service (AROS) coordinator, Barry Scarisbrick, G4ACK, is giving a talk on the work of AROS on **12 May** at the **Stratford-upon-Avon and DARC**. ◆

NEW FROM THE RSGB

QRP BASICS

By Rev. George Dobbs, G3RJV

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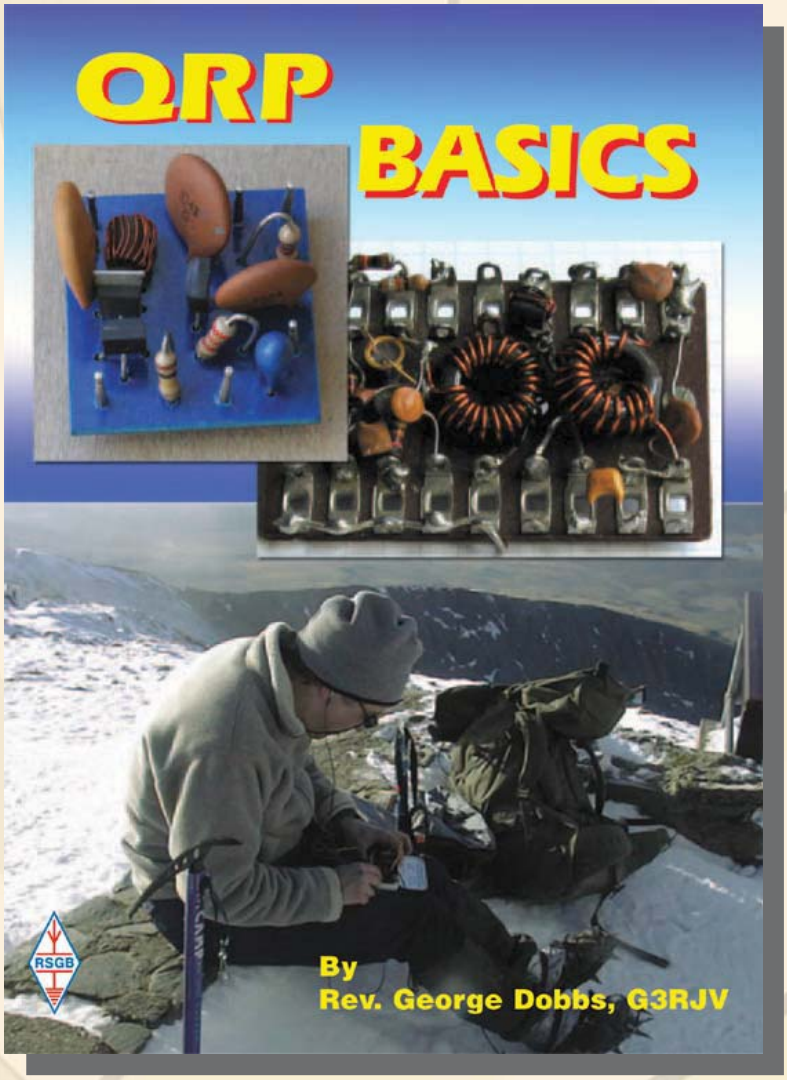

Written by the UK's QRP supremo Rev George Dobbs, G3RJV, *QRP Basics* tells of the fun to be had by operating with low power, both from home and in the great outdoors. Advice is given on how to how to get the best results from a QRP station, how to try out QRP if you haven't before. A large range of commercial QRP equipment and kits are described. Much of the book explains how to construct your own station, including complete transmitters and receivers, and accessories. Even the experienced constructor will appreciate the sections on toroidal coils, construction techniques and equipping a workshop. Finally, there are lists of contests, awards, books and organisations or interest to the QRP operator in the UK and the USA.

QRP Basics will enrich your amateur radio. It will inspire you to start building. It may even get you out in the open air. Quite simply, *QRP Basics* shows just what fun can be had from amateur radio.

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ML&S: £1199.00

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RRP: £2063.96

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Affiliated Societies (UK or Overseas)	£40.50

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Contents

MAY 2003

p63 A low-power ATU design suitable for M3 licensees

p22 Chris Lorek reviews the SGC 'Stealth' Antenna Kit

News and Reports

RSGB Matters 5
Society news and developments.

RadCom News 10

GB4FUN and National Science Week 15
A look at the activities of GB4FUN during Science Week in March.

Bringing Amateur Radio to the People 18
The Guides' 'Thinking Day on the Air' in February and National Science Week in March provided two ideal opportunities to present amateur radio to the public.

Win! G1MFG ATV Equipment 28
An exclusive competition for RSGB members.

SSB Field Day 2002 49
Alan Hydes, G3XSV, reports on last year's major HF SSB club event.

Reviews

The SGC 'Stealth' Kit 22
If you have restrictions to the HF antenna you can put up, this idea from SGC, reviewed by Chris Lorek, G4HCL, might be the answer.

A Modular 24cm ATV Transceiver 26
Simon Lewis, GM4PLM, reviews the low-cost, ready-built ATV modules from G1MFG.com

Book and Video Review 32
We look at QRP Basics by Rev George Dobbs, G3RJV; Practical Microwaves, edited by Andy Barter, G8ATD, and the WRTC Finland 2002 video, produced by James Brooks, 9V1YC.

Down To Earth – Amateur Radio From The Ground Up

Newcomers' News 55
Compiled by Steve Hartley, G0FUW.

Guide to HF Operating – Part 3: How to Work DX 56
... and how not to, by Colin Dollery, G3GAF.

Technical Features

Pulling a Quart from a Pint Pot... 60
Steve Ireland, VK6VZ/G3ZZD, describes how a highly-efficient earth screen can be made, even if you don't have the space for 120 quarter-wave radials.

A QRP ATU for the M3 Licensee 63
A design for a low-power ATU suitable for matching a G5RV antenna and other antennas on the HF bands, by David Littlewood, M3DCT.

PIC-A-STAR: a Software Transmitter and Receiver 68
Part 10 of the regular series by Peter Rhodes, BSc, G3XJP.

Technical Topics 72
Circularly-Polarised Twisted Loop ◆ Crystal/Ceramic Ladder Filters ◆ Signal-Frequency Crystal Filters ◆ Experimental RF Design ◆ Feedback – Feed-Forward

Whatever Next 78
Writing on the Wall ◆ Software Radio Arrives ◆ Ultra Wide Band ◆ The Next Must-Have Gadget? ◆ Australian Vehicle Tracking

In Practice 80
Ian White, G3SEK, answers readers' letters ◆ Loud and Clear

Regulars

Club & Regional News 12
GB4FUN Supporters'Honour Roll 15
HF, Don Field 33
HF Propagation, Gwyn Williams 35
IOTA, Roger Balister 36
SWL, Bob Treacher 37
Contest, Tim Kirby 40
VHF/UHF, Norman Fitch 43
WWW, Jeremy Boot 52
Space, John Heath 53
Antennas, Peter Dodd 82
QRP, George Dobbs 83
Microwave, Simon Lewis 87
LF, Dave Pick 88
ATV, Trevor Brown 89
Members' Ads 91
Congratulations 91
GB Calls 92
Rallies & Events 92
Silent Keys 93
The Last Word 96

Leicester Students Speak to Space Station Astronauts

Successful Contact with ISS made by UK National Space Centre Amateur Radio Society

Students of Rushey Mead Secondary School in Leicester had the experience of a lifetime on the evening of Friday 4 April when they made contact with the International Space Station, using the callsign NA1SS. 11 lucky students had the opportunity to talk directly to the astronauts on the ISS using the National Space Centre's Amateur Radio Society's (NSC ARS) club callsign GB2NSC.

One of the students from Rushey Mead Secondary School prepares to ask her question, supervised by John Heath, G7HIA.

Once the participants and press had arrived, the chairman of the NSC ARS, Andy Thomas, G0SFJ, introduced everyone to the event. He explained the timing of the contact with the help of an enormous 4m projection display of the ISS's real-time track as it orbited the earth. When the predicted AOS (acquisition of signal) came and the ISS was over the horizon, *RadCom* 'Space' columnist John Heath, G7HIA, was at the controls of GB2NSC's Yaesu FT-847. After a couple of nail-biting minutes contact was made: "GB2NSC, NA1SS. Got you loud and clear".

Watching the position of the ISS on the giant 4m screen.

The students then each asked their questions and had them answered individually by Ken Bowersox, KD5JBP, onboard the ISS. Howard Long, G6LVB, reports, "After the contact a spontaneous round of applause came from the audience as we realised just what had been achieved. We were overjoyed!" Audio and video of this contact is available on Howard's website at: http://www.g6lvb.com/issmedia.htm

Gaston Bertels, ON4WF, vice chairman of ARISS (Amateur Radio on the International Space Station), alerted the amateur community to the contact a couple of days before, and so it was possible for many across Europe to witness the event for themselves.

Arranging an ISS contact involves a significant amount of preparation and organisation, much of which is unsung. The NSC's own staff and resources were invaluable in helping with the contact and the NSC ARS, Rushey Mead Secondary School, ARISS and ARISS-EU are to be congratulated for their extraordinary efforts.

CB to be Deregulated?

On 25 March the RA published a consultation document on a proposal to deregulate Citizens' Band radio and withdraw the 40 UK-only CB channels. The consultation seeks views on a proposal to remove the need for individual licensing in 2004, while retaining the technical equipment requirements and the current operating rules. The consultation document also deals with a proposal to remove the 40 UK-specific CB channels from CB use in 2010, retaining only the 40 pan-European channels. A press release from the RA says that this deregulatory move is intended to comply with the lighter regulatory touch envisioned in the Communications Bill, to provide easier access to CB and to enhance enjoyment of the hobby. Copies of the document may be downloaded from the RA website www.radio.gov.uk/topics/cb/documents/condoc/index.htm or requested in hard copy from the RA information centre, tel: 020 7211 0502. Responses to the consultation should be sent to the RA by 18 June.

Windermere Steamboat Museum

GB2WSM will be on the air from the Windermere Steamboat Museum at Rayrigg Road, Bowness on Windermere on 18 May, 8 June, 13 July, 17 August and 6/7 September. If licensed visitors would like to operate the station on any of these dates, please contact Roy Walker, G0TAK, tel: 01539 738293.

2003 SWM Listening Contest

A short wave listening contest organised by *Short Wave Magazine* in conjunction with a day's operation of the magazine's amateur radio callsign G3SWM will be held on **4 May**. *SWM* will be running a station manned by editor Kevin Nice, G7TZC / M3SWM, 'Amateur Bands' author Clive Hardy, G4SLU, and other volunteers. Activity will be between 0500 and 1700, mainly around 7070kHz. The station's objective is to work as many other stations as possible so that listening contest entrants have as many logging opportunities as possible. The winner of the contest will have amassed the most points based on the stations they have logged during the 12-hour operating period. All loggings must include the report given to G3SWM and the serial number allocated by G3SWM. The full rules are on the SWM website at www.pwpublishing.ltd.uk/swm/contest/

Free Software!

RSGB member Dr Godfrey Manning, G4GLM, offers *free* software for Windows to all. The only condition is that the software is neither to be copied to anyone else nor sold. Applications include serial (COM) port access tester, MFJ-461 Morse

Radio Amateurs Awarded the MBE

As reported in the March 2003 'RadCom News', Jim Hicks, G4XRU, was awarded an MBE for services to Sussex business and the community in the new years honours list. Jim recently attended the investiture at Buckingham Palace, where he was awarded the MBE by HRH Prince Charles. He said, "It was a fantastic ceremonial experience which made me feel really proud to be British. I would have loved to have operated /P (for 'Palace') but of course, for security reasons, we had to leave all our communications equipment in the cloakroom!" Jim runs his own industrial electronics company Amplicon Liveline Ltd (www.amplicon.co.uk) which has operated successfully in Brighton for 30 years.

PHOTO: BRITISH CEREMONIAL ARTS

Jim Hicks, G4XRU, at Buckingham Palace receiving his award from Prince Charles.

And Stan Brown, G4LU, a former Mayor of the Borough of Oswestry and a respected RF engineer, has also received an MBE for his services to local government and the community of Shropshire. The investiture, by Her Majesty the Queen, was held at Buckingham Palace on 11 March. First licensed in 1939, Stan was a founder member of the Salop ARS. He started his career as an apprentice at the VLF transmitter at Rugby in 1936. Forty years later he became the Area Manager of the Central Group of Transmitting Stations, in charge of the Anthorn, Criggion, Leafield, Rugby and Ongar stations. Stan retired in 1983.

Stan, G4LU, with his wife and grandchildren at the Palace.

IARU Rules DF Competition

A second Direction Finding competition to the IARU rules was held at Kinver Million, west of Birmingham, on 23 March. The event was won by Dave Burleigh, G4WIZ, who found four of the five transmitters with three minutes to spare inside the two-hour time limit. The next such event is on 15 June, with registration at the Basingstoke ARC stand at the Newbury amateur radio boot sale, Cold Ash, near Newbury, on the day.

Ian Ashford, G8PWE, and his daughter Charlotte waiting for the start at the Kinver Million DF competition. Standing behind Charlotte is Richard Morrall, G8ZHA.

decoder interface, satellite orbit calculator, reactance calculation and much more. Send a blank floppy with return mailing facilities to Dr G L Manning, 63 The Drive, Edgware, Middx HA8 8PS.

LF to Laser – New Distance Records

Three amateurs have achieved the unusual feat of setting new UK distance records for bands at the opposite ends of the spectrum this week. Derek Atter, G3GRO, and Allan Wyatt, G8LSD, of the Crawley Amateur Radio Club teamed up with David Bowman, G0MRF, to set new records for 73kHz in the LF spectrum and for Laser communications at a wavelength of 670nm (nanometres). On the 73kHz band David, G0MRF, drove from London to operate from the QTH of RadCom columnist Simon Lewis, GM4PLM, near Ayr. Meanwhile Derek, G3GRO, and Jim Moritz, M0BMU, set up a temporary station at the Cable and Wireless Museum at Porthcurno near Land's End. The two groups had a QSO on the evening of 1 April over a distance of 610km.

Four days later, Allan, G8LSD, and David, G0MRF, took advantage of a cold, clear night to set up laser communications equipment on the cliffs near Dover in Kent and at Fairlight near Hastings in East Sussex. After three hours waiting for the atmosphere to clear and precisely locating each other, calls and reports of 559 and 579 were finally exchanged. The distance of 49.3km exceeds a previous record set in 1998. Both stations used modulated CW achieved by switching the laser on and off at 488Hz. In practice, when the lasers were aligned, even over nearly 50km, they were among the brightest objects on the horizon,

Living With Technology Launched

A new magazine called *Living with Technology* has just been launched which aims to help the average consumer cut through the jargon and make informed choices about the latest technology. Edited by Paul Beverley, a typical issue of *Living With Technology* might include articles on getting the most out of your Sky Digibox, choosing and using a DVD, the whys and wherefores of ADSL Broadband, solar hot water systems, avoiding eye fatigue from computer monitors, selecting the right digital camera, mobile phone safety and techno ice-cream scoops. *Living With Technology* is sold on subscription at £29 for 12 issues. It is published by Archive Publications /Norwich Computer Services. Visit www.livtech.co.uk for full details.

Australian Licence Proposals

According to a report from Peter, VK3YE, the Wireless Institute of Australia (WIA) has proposed that a Foundation-style licence with "access to all modes, a majority of bands (to be determined) but at low power" be introduced in Australia. Furthermore, they propose that the Full licence would require only a pass in the Novice exam and so there would no longer be any higher level of examination. All existing Australian Novices would be upgraded to Full licence privileges. It is expected that the WIA will approach the Australian licensing authority, the ACA, on these matters shortly.

Mills Weekend

The 'mills on the air weekend', run in conjunction with the SPAB (Society for the Protection of Ancient Buildings) National Mills Weekend will take place this year on **10/11 May**. More details can be found at: http://homepage.ntlworld.com/tony.g4llz/mills.htm

The Nunsfield House Amateur Radio Group (www.nharg.org.uk) from Derby will be operating as GB5HW (TBC) from Heage Windmill (www.heagewindmill.co.uk) during National Mills Weekend. Heage Windmill, located between the villages of Heage and Nether Heage in the Amber Valley district of Derbyshire, is over 200 years old and is a spectacular Grade II listed sandstone tower mill. It underwent a massive programme of restoration between 2000 and May 2002. It opened to the public in June 2002 and GB5HW will be the first amateur radio station to operate from the mill site since its restoration.

Heage Windmill

NEWS IN BRIEF

Shetland Museum

Anyone visiting the Shetland Isles this summer is invited to call in at the Hoswick Visitor Centre, where a large part of GM0EKM's radio collection consisting of vintage amateur, marine, military and domestic radio equipment is on display from 1 May until the end of September. Admission is free.

Old and New Communications

The question has been raised several times: how do you send the '@' symbol, eg in e-mail addresses, in Morse code? David Pratt, G4DMP, recommends the immediate international adoption of 'di-dah-dah-di-dah', which is the symbol used in French-speaking countries for the letter 'à' ('a grave'). In French, 'à' translates to "at" and is already used by French amateurs when sending e-mail addresses on CW.

IIE Presentation

Tony Sale, the first curator of Bletchley Park museum and an acknowledged authority on the Enigma Machine, will be giving an account of this instrument, describing its use and how the Enigma code was broken during WWII, at a meeting organised by the Institution of Incorporated Engineers (IIE) at Stockport College on **22 May** at 7.00 for 7.30pm. All interested radio amateurs are invited to attend. For further information, contact Stewart, G3PMJ (QTHR), or e-mail: stewart@revell62.freeserve.co.uk

Cancelled – and not Cancelled

The Spring rally which was scheduled to take place at the Metrodome Leisure Centre in Barnsley, South Yorkshire, on 4 May has been cancelled. Further information from the hamfest manager, Ernie Bailey, G4LUE (QTHR).

In the April issue of 'RadCom News' we reported that this year's Rugby Amateur Transmitting Society's rally had been cancelled because the venue was no longer available. Since going to press, a new venue and a new date have been found for this event. It will now take place on 9 August at Stanford Hall, close to Junction 19 of the M1.

Radio Fraternity Lodge No 8040

Jack Anthony, G3KQF, has been installed as the Worshipful Master of Radio Fraternity Lodge No 8040. All enquiries about membership are welcome from existing Freemasons and radio amateurs interested in joining. Tel: 01202 475048 (secretary).

Club and Regional

Club News is a service for clubs and societies affiliated to the RSGB. The announcements are intended to notify non-members and potential members of your club of specific events, therefore 'informal', 'committee meeting', 'natter night' and 'ragchew evening' etc will only be included if space permits. Basic, unchanged details about RSGB-affiliated clubs are published annually in the RSGB Yearbook.

Region 1: Scotland West & Western Isles

PAISLEY (YMCA) ARC
14, Vintage Morse keys. 28, AGM. Jim, GM3UWX, 01505 862817.

WEST OF SCOTLAND ARS
16, 80m DX, GM4TQQ. A M Fraser, GM3AXX, 01560 482720.

Region 2: Scotland East & the Highlands

COCKENZIE & PORT SETON ARC
2, 'Normal Club Night'. 30, First 144MHz DF Hunt, meet at 'Old Ship Inn'. Bob, GM4UYZ, 01875 811723.

LOTHIANS RS
12, Video. 26, Topband DF hunt. Peter, 0131 446 0155.

Region 3: North West

FYLDE ARS
1, Discussion on 'night out on air'. 15, Night out on air. Ken, G3RFH, 01253 407952.

MID-CHESHIRE ARS
5, Winsford Radio & Computer Rally at Winsford Civic Hall. 7, Rally debrief. 14, Activity night. 21, HF on air. 28, VHF on air. Niall, G0VOK, 01606 871413.

THORNTON CLEVELEYS ARS
5, No meeting. 12, Sale/auction silent key equipment. 19 On air. 26, No meeting. Jack, G4BFH, jack@jduddington.fsnet.co.uk

Region 4: North East

GOOLE RADIO & ELECTRONICS SOCIETY
9, Pub night (newsletters). 16, DF competition starting at Black Swan Asselby. 23, BBQ at Barmby Tidal Barrage (bring some food). 30, RSGB talk at Courtyard Centre. Richard, G0GLZ, 07867 862169.

GREAT LUMLEY R & ES
21, Magnetic loops, Bill Gleave, G8YWK. Nancy Bone, 0191 477 0036, nancybone2001@yahoo.co.uk

GRIMSBY ARS
1, Table top sale. 15, Weather sats, Dave, G0IIQ. Brian, G4DXB, 01472 231383.

HALIFAX & DARS
20, 'Let's Build Something', David Long, G3PTU. Tom, M0TKA, 01484 715079.

HORNSEA ARS
7, 'The Reluctant Operator'. 14, Imagine Studios visit at Market Weighton. 21, Commercial masts. 28, Activity. Andy, G0VRM, 01430 801122.

NORTH WAKEFIELD RC
8, Visit to police air support unit at Carr Gate. www.g4nok.org

RIPON & DARS
1, PSK night on air. 8, 'Sunspots', Neil Clarke, G0CAS. 15, Contest logging practice. 22, Video. 29, VHF propagation, M3XLT. Andy, G0HUC, 01423 507623, andy@aicuk.demon.co.uk

SCARBOROUGH SPECIAL EVENT GROUP
10, 11, GB2SW Scarborough Windmill. Andy, G0VRM, 01430 801122.

SHEFFIELD ARC
12, VHF radio. Nick, G4FAL, 0114 255 2893.

Region 5: West Midlands

BROMSGROVE ARS
13, AGM. 27, 2nd DF hunt (in car). Angus, G8DEC, 01527 875573.

COVENTRY ARS
2, 'Special' open evening, on air, with wider than usual range of activities. 9, Cheese and wine social. 16, Portable evening including contest (venue TBA). 23, Outdoor competition. 30, On air, Novice class, CW practice. John, G8SEQ, 024 7627 3190 johng8seq@ntlworld.com

GLOUCESTER AMATEUR RADIO & ELECTRONICS SOCIETY
5,/P VHF from escarpment site. 12, Bookshop visit. 19, Surplus component sale. 26, /P VHF from escarpment site. Tony, 01452 618930 office hours.

KIDDERMINSTER & DARS
6, 'DF Equipment and Techniques', Wayne Griffin, M0BRU. Tony, G1OZB, 01299 400172.

MID-WARWICKSHIRE ARS
13, Equipment & book sale. 27, 'Antenna Topics'. Bernard, M1AUK, 01926 420913.

ST LEONARDS ARS
1, Beacons, greyline and SSB pile-up working, Stan, G0BYA. Derek, G0EYX, 01785 604904.

SALOP ARS
1, Amateur Television, John, G0GTN. 8, Junk sale at Hare & Hounds, Cruckton, Nr Shrewsbury. 22, 1st 'foxhunt' starts at Abbey Foregate Car Park, Shrewsbury. 29, Visit to Woofferton transmitter site, Dave Porter, G4OYX. John, G0GTN, 01743 249943.

STRATFORD UPON AVON & DRS
12, AROS, Barry Scarisbrick, G4ACK. 26, Club equipment maintenance evening, G8HJS. Geoff, G4OHJ, 01789 773 286.

TELFORD & DARS
7, Open evening, on air. 14, 1st DF Competition. 21, 'Crazy ideas that made me a couple of shillings', Bob, M0RJS. 28, Used equipment sale. Mike, G3JKX, 01952 299677.

RSGB Regional Managers as of 2 April 2003.

	REGION	RSGB REGIONAL MANAGER
1.	Scotland West & Western Isles	Gordon Hunter, GM3ULP
2.	Scotland East & the Highlands	Position vacant
3.	North West	Kath Wilson, M1CNY / M3CNY
4.	North East	Geoff Darby, G7GJU / M3GJU
5.	West Midlands	Roy Clarke, G8AYD / M0RLY
6.	North Wales	Liz Cabban, GW0ETU
7.	South Wales	Ray Ricketts, GW7AGG (acting)
8.	Northern Ireland	Jeff Smith, MI0AEX
9.	London & Thames Valley	Paul Berkeley, M0CJX (acting)
10.	South & South East	Ivan Rosevear, G3GKC (acting)
11.	South West & Channel Islands	Barry Scarisbrick, G4ACK
12.	East & East Anglia	Malcolm Salmon, G3XVV
13.	East Midlands	Bryn Llewellyn, G4DEZ

Region 6: North Wales

DRAGON ARC
5, Informal. 19, 'Air Traffic Control at RAF Valley', Flying Officers Rachel Tubb & Rob Stallard. Stewart, GW0ETF, 01248 362229.

NORTH WALES RS
1, 8, 15, Foundation, Morse HF tuition, free meeting. 17, 18, Club field weekend, Colwyn Bay: experimental wires, delta loops and vertical antennas. 18, Drayton Manor rally, transport arranged. 22, 29 Foundation, Morse HF tuition, free meeting. Ted, GW0DSJ, edward@eshipton.fsnet.co.uk

Region 7: South Wales

ABERYSTWYTH & DARS
8, Visit to Blaenplwyf transmitter. 29, Club net S21 (call on S20) with GW7OZP. Ray, GW7AGG, no contact details provided.

Region 8: Northern Ireland

BANGOR & DARS
7, 'EMC', Jeff Smith, MI0AEX. Mike, GI4XSF, 028 4277 2383.

Region 9: London & Thames Valley

AYLESBURY VALE RS
14, Morse tuition, junk sale, Mike, M3FDL. Roger, G3MEH, 01442 826651, roger@g3meh.fsnet.co.uk

CHESHAM & DARS
7, General meeting, car boot sale planning. 14, Quiz night. 21, On air. 28, Contest planning. Terry, terence.thirlwell@ntlworld.com

COULSDON ATS
12, HF operating, PSK31. Steve, G7SYO, 01737 354271.

CRYSTAL PALACE R&EC
2, Morse practice, club projects. 16, Alternative energy sources, Martyn Berry. Bob, G3OOU, 01737 552170 or Victor, G1PKS, 020 86532946.

DORKING & DRS
27, Hernia Cup competition. John, G3AEZ, 01306 631236.

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.

News

SADARC at the Norbreck Rally on 16 March. Left to right: Don Atkins (club secretary) and members Keith and Nigel.

Higher Profile for Southport Club

SADARC, the Southport & District Amateur Radio Club (www.southportarc.org.uk) is upping its profile in an attempt to attract some of the new M3 operators in the Sefton & West Lancashire areas. The first evidence of this was SADARC's appearance at the Norbreck Rally held in Blackpool on 16 March. The stand was manned by at least two club members at all times and on show were RSGB and SADARC publicity material, a computer showing a SADARC-designed PowerPoint presentation on amateur radio and SADARC and a computer running a live SSTV demonstration. For the latter, a member of the club toured the exhibition with his Kenwood TH-D7E and VHC1 SSTV adapter and beamed shots of the various stands and activities back to the receiving station on the stand.

For further details about the club, please contact Don Atkins, M1BUL, on 01704 227726 or e-mail donatkins@lineone.net

EDGWARE & DARS
8, Informal, on air. 22, NFD briefing & constructors cup. Hank, G0FAB, 020 8205 1023.
MAIDENHEAD & DARC
1, 'Simple Laser Communications', Dave, G0MRF. 20, Field day preparations and video. John, G3TWG, 01628 525275.
NEWBURY & DARS
21, AGM. Richard, G3ZGC, 01635 46241.
RADIO SOCIETY OF HARROW
2, Informal. 4, GB2DHH Operating Day. 9, Newcomers programme: supervised HF operating session. 16, 23, Informal. Jim, G0AOT, 01895 476 933 or 020 7278 6421
READING & DARC
8, Talk, details TBA. Pete, G8FRC, 01189 695697.
SURREY RADIO CONTACT CLUB
12, Constructing evening. Ray, G4FFY, 020 8644 7589.
SUTTON & CHEAM RS
15, AGM and Constructional Contest. John, G0BWV, 020 8644 9945.
VERULAM ARC
12, Lightning protection methods. Walter, G3PMF, 01923 262180.

Region 10: South & South East

ANDOVER RAC
6, VHF Activity Night. 14, Slow Morse class with G0HKC on 145.250MHz. 20, 'The History of the Morse Key', Dennis, G3LLZ. Terry, G8ALR, 01980 629346.
BASINGSTOKE ARC
12, Oscilloscope training, Alan, G8FMH & Bruno, G6UZO. 18, 'Foxhunt', Janet, G6JDP. Peter, M1DGQ, 0118 983 6545.
CRAWLEY RC
5, Getting started with homebrew, Mick, M1MGD. 19, Contesting, Mick, M1MGD. 23, Annual dinner, 'The Mill' Ifield. Derek, G3GRO, 01293 520 424.
FAREHAM & DARS
7, On air. 14, The MFJ Antenna Analyser, Brian, G4ITF. Steve, G7HEP, 01329 663673.
FARNBOROUGH & DRS
14, Use of simple test equipment, Derek, G3HEJ. 28, FT817/FT897 demonstration, Chris, G3TUX. Norman, G0VYR, 01483 835320.
HASTINGS E & RC
21, Amateur Packet Radio Reporting. R C Gornall, G7DME, 01424 444466.
HORNDEAN & DARC
6, Social evening. 27, 'The Portsdown & Horndean Light Railway', Peter Rogers. Stuart, G0FYX, 023 9247 2846.
HORSHAM ARC
1, Talk on Dayton, repeater update. David, G4JHI, 01403 252221.
ITCHEN VALLEY RADIO CLUB
9, GB2HA The Hood Association, Malcolm, G0LMD. 10, Mills on the Air from Bursledon Windmill GB2BM. Sheila, G0VNI, 023 80813827 sheila.williams@ivarc.org.uk
RIDGEWAY REPEATER GROUP
7, AGM. All those interested in GB3TD, GB3WH & GB7NW repeaters are welcome. Rob, G4XUT, contact via www.rrguk.org
SWINDON & DARC
8, 'Controversial Aerials', Bob, G3IHR. 15, 144MHz contest preparation. 22, 'HF on the cheap, revisited', Ian, G3YGY. 29, DF hunt. Den, M0ACM, 01793 822705/
WORTHING & DARC
7, Recording & gramophones. 14, Discussion current topics. 21, Enigma machine, codes & cyphers. 28, West coast railway. Roy, G4GPX, 01903 753893.

Region 11: South West & Channel Islands

BOURNEMOUTH RS
2, Beekeeping, John Saunders, M1BAI. 16, Construction & Practice, PSK31. Chris, M5AGG, 01202 893126.
CORNISH RADIO AMATEUR CLUB
1, General Meeting. Production of the RSGB Yearbook. 5, Dartmoor Radio Rally (Bank Holiday). 12, Computer section. John G4LJY, 01872 863849
POLDHU ARC
13, Bring and buy / junk sale. Keith, G0WYS, 01326 574441.
SOUTH BRISTOL ARC
7, Computer clinic. 14, Website construction tutorial. 21, Annual maintenance of club aerials. 28, On air. Len, G4RZY, 01275 834282.
TORBAY ARS
23, DXpedition talk, Steve, G4EDG. Everyone welcome. G3HTX, 01803 663200, g3htx@tars.org.uk
WEST SOMERSET ARC
6, Talk by member of the Exmoor Search & Rescue team. Jean, G0SZO, 01984 633060.
YEOVIL ARC
1, Receiver performance, M5EVT. 8, The Somerton Wireless Station, G3PCJ. 15, Aerials and Earth, G3MYM. 22, Video (Getting starting in Amateur Satellites).29, On air. Derek, M0WOB, 01935 414452, m0wob@tiscali.co.uk

Region 12: East & East Anglia

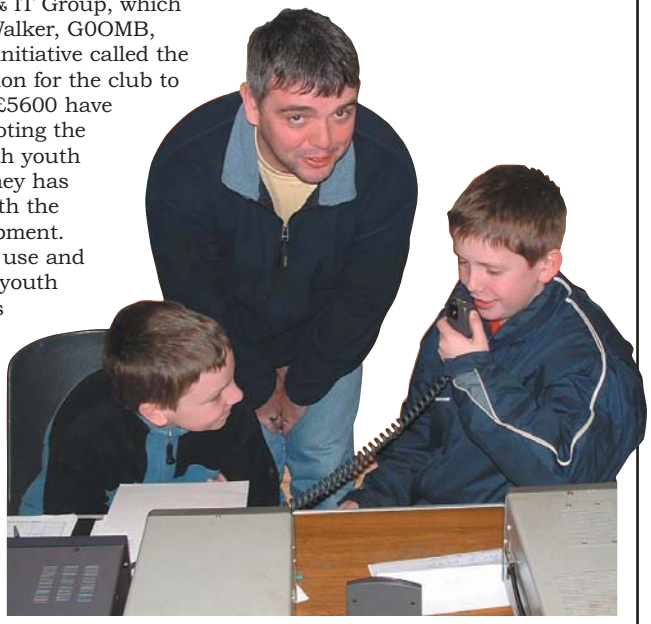
BRAINTREE & DARS
5, Operating evening. 10, 11, Mills Weekend. 19, AGM. John, M5AJB, 01787 460 947.
CHELMSFORD ARS
6, Preparing for DXpeditions, Neville Cheadle, G3NUG. David, M0BQC, 01245 602838.
FELIXSTOWE & DARS
11, National Mills Day, Woodbridge Tide Mill. 19, Buying and setting up used equipment. Paul, G4YQC, paul.whiting@bt.com
HARWICH ARIG
14, 'Grey Line Propagation', Steve Nichols, G0KYA. Eugene, G4FTP, 01206 826633.
LINCOLN SW CLUB
3, 4, UHF contest. 7, On air. 21, TBA. 25, Special event at Metheringham Airfield Centre. 28, Construction contest 2. John, G1TSL, 01522 793751.
NORFOLK ARC
7, Club dinner. 14, Police communications network, David Seelhoff. 21, Informal, CW instruction. 28, Fault finding in valve equipment, Arnold, G3PTB. Reg Pond, G0VDO, 01603 429269.
RAF WADDINGTON ARC
8, Radio-related video. Martin, M3MDF, 01522 752785.

Region 13: East Midlands

DERBY & DARS
6, Junk sale. 20, 'Restoring the Cromford Canal', Pat Morriss. 27, Video. Martin, G3SZJ, martin@martinshardlow.demon.co.uk
EAGLE RADIO GROUP
13, 'How to get the most out of your mobile equipment', Charles, G0CBM. G0SWS, 01507 478590.
LOUGHBOROUGH & DARC
6, 1st DF of 2003 on 2m. 13, On air. 20, Anything vintage night: bring something along. 27, 2nd DF of 2003 on 160m. Chris, G1ETZ, 01509 504319.
NORTHAMPTON RC
1, Video night. 8, Construction evening: loft antenna for 15, 20 and 40m. 15, 'VHF & UHF DXing', Bryn Llewellyn, G4DEZ (with buffet). 22, On air. 29, Visit to Open University ARS. Phil, M0CTC, 01604 406887, northamptonradioclub@hotmail.com
SHEFFORD & DISTRICT ARS
1, Members talk for 15 mins on their other hobbies. 8, Digital Imaging: 'You too can fix your pics!', Ken, G4YRF. 15, Extraordinary General Meeting. 22, GB7BED. The new services at BEDBOX, Ian Mclver, G0BKN. 29, Pedestrian DF hunt on 2m. Derek, G4JLP, 01462 851722.

New Club in North-West Spreads the Word

Club co-ordinator Brian Walker, G0OMB, working with some of the children recently at Harrington Junior School.



It's always good to hear about a new radio club being formed, particularly one making such good efforts to promote the hobby as the Workington and District Amateur Radio & IT Group, which came into being in October last year. Brian Walker, G0OMB, managed to secure funding via a local grant initiative called the Community Forum and this laid the foundation for the club to come into being. Grants totalling more then £5600 have been made available for the purpose of promoting the hobby in the local community by working with youth groups and other interested parties. The money has enabled the club to get off to a flying start with the purchase of a full range of HF and VHF equipment. The equipment has already been put to good use and events to date include visits to local schools, youth groups, Scouts and Guides, with more events planned for the future.

The club has been established at the Helena Thompson Museum in Workington, a fascinating place that generates a lot of interest when the club goes on the air as MX0WRC. It is of course also extremely useful when it comes to the Museums on the Air weekend!

Meetings are on alternate Mondays at the museum, starting around 7.00pm: contact club chairman Steve, G0MTD (QTHR) for further details.

RADARC's Youngest-Ever Member

David Morris, M3DKG, at eight years old, has become the youngest-ever member of the Reading and District Amateur Radio Club (RADARC). With expert guidance from Tom Cannon, G0VQR, David made 10 QSOs with seven countries during the club's entry in the CQ WW 160 SSB contest – not bad for 30 minutes and his first half-hour on the air!

From home David shares a station with dad Stuart Morris, M3XTN, and is active on 40m, 2m and 70cm, so please say hello if you hear him on the air. In recognition of his achievement RADARC chairman Min Standen, G0JMS, recently presented David with free membership of the club.

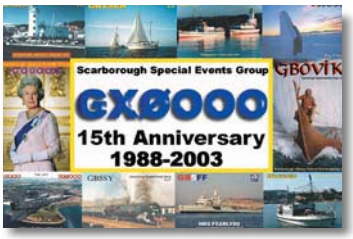
PHOTO: STUART L MORRIS, M3XTN

David Morris, M3DKG, receiving RADARC membership from club chairman Min Standen, G0JMS.

15th Birthday for SSEG

The first special event organised by the Scarborough Special Events Group (SSEG) was in June 1988, so the group is therefore celebrating its 15th anniversary this year. In that time it has operated more than 30 GB stations, dozens of unique portable stations and issued more than 40,000 QSL cards. SSEG celebrates its 15th birthday throughout the month of June, when GX0OOO will be active. The callsign will be particularly aired over the weekend of 21–22 June.

SSEG's activity this years kicks off on 10–11 May, when SSEG will be active from the Old Windmill, Scarborough, during National Mills Weekend.



This special QSL card has been issued for operations by SSEG this year.

An Entertaining Talk

The Chelmsford Amateur Radio Society was fortunate to have Rob Mannion, G3XFD, editor of Practical Wireless speak at a recent meeting. There was a packed hall to hear Rob and he kept members enthralled with his entertaining talk on the history of PW which was peppered with 101 anecdotes. Rob brought along the PW travelling archives for members to look at and they brought back memories for some of the club members who remembered buying their first copies of PW back in the 1930s or 40s. Although Rob travelled four hours from Poole to get to the meeting he refused to accept any travelling expenses, requesting instead that a donation be made to the Radio Amateurs Invalid and Blind Club (www.raibc.freeserve.co.uk).

Fire Interrupts Bredhurst Club Meeting

The Bredhurst Receiving and Transmitting Society's quiz night on 6 March was interrupted by what all members present assumed to be a power cut. However, club member Terry, G7MIM, went out to investigate and discovered that a fire had broken out in the room above the club. He calmly asked the members to leave the premises and the evacuation of the building took place in a swift, orderly and calm manner. Richard, G7PPE, tried to open the door of the flat above the club room where the fire had started as the occupant was still inside, but was unable to break down the door. Fire crews arrived in a matter of minutes and the occupant was rescued and taken to hospital.

Jean Darley, G1DLL, Secretary of the Bredhurst Receiving and Transmitting Society, commented, "It's never a dull moment if you're a member of our radio society." She is now trying to find alternative premises for the club to meet.

More MI3s to Take to the Bands!

There was 100% pass rate at the Antrim and District Amateur Radio Society inaugural Foundation Licence course held during Science Week at Antrim Grammar School. The two Johns, GI3YRL and GI4USX, did a great job as tutors: all 15 candidates passed the course and are now awaiting their MI3 callsigns. The majority of candidates were pupils of Antrim Grammar School and the youngest is 12 years old. Antrim Grammar School now hopes to form its own radio club.

WAB AGM

The Worked All Britain Annual General Meeting is to take place at the London Communication and Computer Show on Sunday 1 June at 2.00pm. The venue is the Stevenage Leisure Centre, which is two minutes walk from Stevenage railway station.

Peter Deans, MM3DCB, being presented with the Dundee Amateur Radio Club's SSTV Shield by club president George Duncan, MM1DSD. The club's SSTV competition is run bi-annually and Peter achieved a total distance of 29,564 miles for the reception of Slow Scan Television images.

GB4FUN and National Science Week

GB4FUN, the RSGB's mobile amateur radio demonstration vehicle, was out and about once again during the BA 'National Science Week', which this year took place between 7 March and 16 March

This year, GB4FUN visited the East Midlands, North-East England and South Wales during National Science Week. Its itinerary was:

9 March Rosliston Forestry Centre, Derbyshire
10 March Rishworth School, West Yorkshire
11 March Rotherham town centre
12 March John Beddoes High School, Presteigne (morning); Radnor Valley Primary School, Presteigne (afternoon)
13 March Builth Wells High School (morning); Llanelwedd Primary School, Builth Wells (afternoon)
14 March Murch Junior School, Dinas Powis.

GB4FUN joined the South Derbyshire and Ashby Woulds Amateur Radio Group for the Sunday of a weekend amateur radio demonstration at Rosliston Forestry Centre in Derbyshire. The group has run special event station GB4NSW during National Science Week for a number of years, but had decided from the beginning that this year they would not just be 'on the air', but would demonstrate to the general public what amateur radio is all about. GB4FUN, with its impressive array of antennas, was an added attraction that drew people's attention as soon as they arrived at the forestry centre. This year, the club's theme was the Foundation Licence and a display gave information on the licence and how to become a radio amateur. There was also a demonstration of weather satellite pictures being received and a Raynet display which attracted many people who did not realise the help radio amateurs can provide to the police and other authorities.

In Rotherham, GB4FUN was located outside the Central Library and Arts Centre in the town's centre (a less-than-ideal location that nevertheless allowed for a contact to be made with Bermuda). The visit of GB4FUN generated some new interest in amateur radio and, as a result, the club there now has dates for four more special event stations which will provide further publicity for the hobby. For example, in May the library is running an Adult Learning Week and, directly as a result of the visit of GB4FUN, the club has become involved with that enterprise.

On 14 March, GB4FUN wound up its Science Week tour by visiting Murch Junior School at Dinas Powis in the Vale of Glamorgan. There, GB4FUN was able to demonstrate amateur radio to headmaster Charles Davies, science master Ian Williams, other staff, and boys and girls aged between 7 and 11. Glyn Jones, GW0ANA, a member of the Barry ARS, operated GB4FUN from the school fields and playground while Dennis Egan, GW4XKE, Secretary/Treasurer of the Prudential ARS was operating GB2003SET ('Science, Engineering, Technology') from the school itself.

For more on National Science Week, see the report on pages 18–19. ◆

Above: Who says Morse is dead?! Carlos Eavis, G0AKI, demonstrates use of the Morse key on board GB4FUN to a youngster at Radnor Valley Primary School in Presteigne on 12 March.

Left, top: The less-than-ideal operating location for GB4FUN at Rotherham.

Left: Glyn Jones, GW0ANA (left), and Carlos Eavis, G0AKI (right), with pupils of the Murch Junior School, Dinas Powis, in GB4FUN.

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.

H C Kingsland	7Q7HK	R N Hall	G4XDV	P Nixon	M3VXZ
J P Bennett	G0NLF	N A Singer	G7HYM	W Aitken	MM0CNV
Rochdale & DARS (RADARS)	G0ROC	D T Cliffe	G8EQC	G Waters	MW0SWR
J Ogden	G0TRK	J L Simkins	G8IYS	A F Hunt	RS174706
K M Rogawski	G0UNU	D Taylor	GW0WQP	K Gardiner	RS178555
D A G Tait	G3AFB	J Clement	HB9AFD	T Spence	RS182767
J Hall	G3FJL	H Nasvik	LB9RE	J Bullard	RS184224
J P Traynor	G3HEL	R L Styles	M0BUI	A Simms	RS96658
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C A Webb	G4FWM	P Brown	M3AJY		
R J Howes	G4OWY	R D Owen	M3RDO		

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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Bringing Amateur

Two national events, in February and March, have reminded us once again how important the well-organised public demonstration station can be for generating good publicity for amateur radio. Those two events were the Guides' 'Thinking Day on the Air' and the BA's 'National Science Week'. We have reports from a number of contributors around the country…

The annual Guides' 'Thinking Day on the Air' (TDOTA) on 15/16 February was once again a great success with many special event stations representing Guides, Brownies and Rainbows on the air using GB and GX or similar prefixes.

CALDER VALLEY, YORKSHIRE

Around 100 Guides, Brownies and Rainbows gathered at the Mytholmroyd Methodist Church in West Yorkshire for TDOTA. They took part in a range of workshops, including the Communications activity, where more than 80 Brownies exchanged greetings messages and learned a little about the activities of other groups across the UK via the medium of amateur radio. GB2CVG (Calder Valley Guides) was operated by David Jackson, G4HYY; Derek Underwood, G4RCJ and Jennifer Jackson, G8WWO. Richard Constantine, G3UGF, said, "I was helping with the 'mega queue' which averaged more than 20 Brownies for two hours solid – it never seemed to get any smaller. They were very good and Jennifer, G8WWO, had to 'busk' the queue with an impromptu radio quiz, up and down the line: 'How do you get a message to an astronaut?' 'How does a mobile phone work?' 'How fast does a radio message travel?' She was terrific!"

The huge queue of Brownies at Mytholmroyd Methodist Church in West Yorkshire waiting to send their greetings message.

Mike Cotton (seated) and Howard Lee with four of the 2nd Hatton Brownies (see 'Burton upon Trent').

BURTON UPON TRENT

Members of Girlguiding Burton upon Trent took part in TDOTA using the callsign GX3NFC. The girls made contact with Brownies and Guides from all over the UK, including Aberdeen, Oxford, Powys, Swindon and Winchester. Staffordshire Trefoil Guild Chairman, Monica Roberts, was delighted to able to talk to a fellow Trefoil Guild member from Winchester. Local radio amateurs Howard Lee, G6FLY, the father of a local Brownie, and Mike Cotton, G4HBY, helped the Brownies and Guides to set up their station at Brook House Guide Headquarters.

BOSTON

Guides from the 2nd Boston Guides built the crystal set shown in the RSGB leaflet *Amateur Radio* as one of their TDOTA activities. Another activity was to design a QSL card for the special event station GB4BG. 14 Guides took part in the weekend camp during which GB4BG was operated by G4DDI, M0BSL and M3CDD (daughter of G4DDI). All of the Girl Guides passed greetings messages to at least three stations. Contacts were made to Algeria, Macedonia and Holland, despite poor conditions and electrical interference problems at the location.

Guides from the 2nd Boston Guides building a crystal set.

NORTHAMPTON

John Chisholm, M5TTT, sent in a long and detailed report on the TDOTA activities of the Northampton 77th Guides which unfortunately we do not have the space to publish in full. He writes: "We set up two large tables. The first had the visitors writing their message and spelling out their name in the phonetic alphabet. The second table was for fun Morse training; the girls would work out their name in Morse and under supervision be taught how to send it on a Datong Morse tutor.

"I had prepared certificates for any Guides or Leaders that sent a greetings message over the air, and also some self-adhesive badges with the Guides' logo and 'I've been on the air with the Guides' written on them. I had left a space on the badges to put on the country worked as well. Little did I know the esteem these would be held in and the number of badges I would have to hand over! The noise level was high with Guides arriving at regular intervals. I would give them a talk about amateur radio and the new developments and then get them ready them to go 'on air'.

Frank Gibson, M1BQS/M3FTG, passes the mic to the next Guide.

"The throughput of Guides was amazing and they came from many areas surrounding Northampton. The radio contacts we made kindly accepted messages as the Guides proudly collected badges and certificates. Some Guides started to collect badges

Radio to the People

for more than one country as they became hooked, wearing them like medals on their sweatshirts. The Morse table was also one of the biggest draws; it was run by Zoë, one of our Guides who is a natural on the key.

"By Sunday afternoon we had run out of certificates, and the badges were running low. It had been an unmitigated success. I cannot remember any visiting Guide not sending a greetings message: even the shyest managed it. One young girl was quite upset at only speaking to two countries and that was after we had coaxed her for the first greetings message, as she was very shy! The atmosphere at these events is electric and so fulfilling.

"The enthusiasm for amateur radio by the Guides is obviously going to see a lot of Foundation Licences being taken by them in the future. It is difficult to describe the wonderment the Guides show at this well-hidden hobby, and the fervour for them to use Morse, the phonetic alphabet and to speak on the mic. I can see with the recent developments in amateur radio that, in a few years' time, Scout and Guide groups will be communicating with each other on air, as part of weekly meetings, and starting to experience all the facets of this incredible hobby." ◆

National Science Week

THE BA (formerly known as the British Association for the Advancement of Science) National Science Week, between 7 and 16 March, provided another excellent opportunity to bring amateur radio to the wider public. The RSGB's mobile amateur radio demonstration vehicle, GB4FUN, was out and about during the week, visiting no fewer than eight venues, including schools, a town centre and even a forestry centre (see the report on page 15).

Here are details of just a few of the other events going on during Science Week.

LOUGHTON & EPPING FOREST

Members of the Loughton Amateur Radio Society set up special event station GB2EFC at Epping Forest College in Loughton, Essex. The station was on the air for two days and members of the club were able to provide information about amateur radio to both members of staff at the college and students there.

Illustrating just how important such events are for providing good publicity for amateur radio, the demonstration station was well covered in the Loughton Buckhurst Hill Chigwell Guardian on 20 March, with a short article accompanying a large colour photograph of Frank Butler, G0AWI, and Erin Dawson, from the Loughton ARS operating GB2EFC. The same issue of the paper also carries a congratulatory letter from Peter Sellars, physics co-ordinator at Epping Forest College, headed 'Thanks for radio hams' helpfulness' in which he says, "I believe those students who came along found the experience interesting and enjoyable, especially those who, under supervision, were able to talk to other stations."


Service is slammed for 'bullying culture'

Fans learn to make waves on the radio

Extract from the Loughton Buckhurst Hill Chigwell Guardian covering the National Science Week story.

SKEWEN, WEST GLAMORGAN

Carl Mason, GW0VSW, the RSGB Deputy Regional Manager for District 74 (the Vale of Glamorgan, Cardiff, Newport and Swansea), visited Coedffranc Infants School in Skewen, West Glamorgan, during National Science Week in order to put on amateur radio demonstrations for several classes. Carl reports: "The students were studying batteries as part of a science project. I was only allowed to operate with battery power due to health and safety regulations, but this tied in nicely with their studies. The afternoon went well and the children aged between 6 and 8 were able to hear several special event stations working on 7MHz via an FT-817 and a dipole erected in the classroom. They were also able to operate on VHF and talk to a few local amateurs. There was a selection of Morse keys for the children to use and they were able to send Morse code using practice oscillators. A few talked to each other between classes using PMR-446 handheld radios which went down well. The deputy head teacher, Joe Cudd, and all the children said how much they enjoyed the afternoon and I have already been asked to visit again." Carl donated three science books suitable for children of that age to the school at his own expense.

Children at Coedffranc Infants School in Skewen, West Glamorgan, display the RSGB posters, short-wave radios and other goodies brought by Carl Mason, GW0VSW.

SOUTHPORT

National Science Week also provided the impetus for members of the Southport and District Amateur Radio Club to present Bishop David Sheppard Primary School's Year 6 children with an introduction to radio. A total of 45 children took part in two groups, half of the children attending in the morning and the other half in the afternoon. The headmaster, Alan Marston, and deputy headmistress, Stephanie Tasker (who assisted with the presentation), said that the event had been a great success and that the children had thoroughly enjoyed it.

The presentation started with a slide show covering the history of radio and its uses today. The children then had four 'hands-on' sessions in small groups: building a crystal radio using a kit, operating and listening to a short-wave receiver, operating a pair of PMR-446 handheld transceivers using the correct protocol and spelling names and places phonetically, and, finally, talking to another member of the Southport club a few miles away using the special event station.

The afternoon session was attended by Sefton Education Authority's Science Advisor who was very impressed with the activities being run. The club gave each pupil a special commemorative certificate and a number of promotional items that had been kindly donated by the Radiocommunications Agency while the RSGB provided a pack of books for the school's library.

Don Atkins, M1BUL, of the Southport & DARC shows the children at Bishop David Sheppard Primary School how to use a short-wave receiver.

SUNDAY, 22ND JUNE 2003

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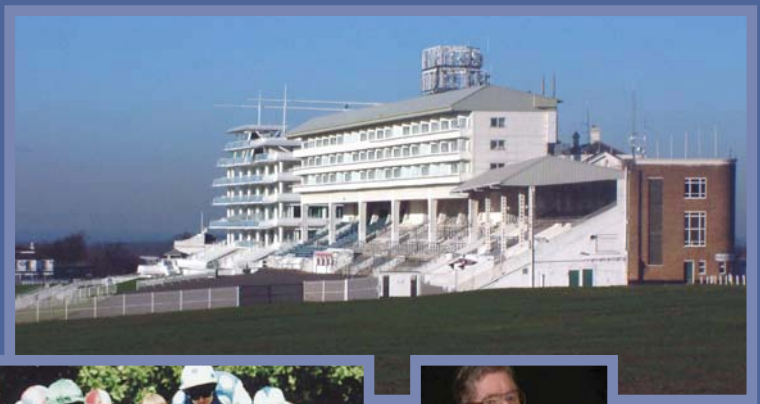
Our event at Epsom Racecourse will be officially opened by the RSGB General Manager, Peter Kirby. Come along to see this national event to enjoy a fun packed day.



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Radio Fairs.... Total commitment to the Hobby

The SGC

Many amateurs live in a property where outdoor antennas are at best 'frowned upon', or at worst totally prohibited. Others might want to operate from a temporary or portable location where it is impractical to spend a lot of time putting up an HF antenna. The solution in both these cases could just be the SGC 'Stealth' Kit, reviewed here by Chris Lorek.

The Stealth Kit user manual gives you a good idea of various antenna arrangements you can use. These range from a simple one-turn outdoor loop of wire, to more compact three- and four-turn loops for use in restricted spaces. You could, for example, have a two- or three-turn indoor wire loop arrangement around the wall edges of a room.

There are, or course, many types of loop installations which you could use, each of which would be unique to your specific location and available space, antenna supports and so on. A novel use of the system, however, would be for a compact yet quite directive four-turn loop hung from the ceiling for example. You could also construct a rotatable system using four brooms tied together at the middle, to provide a former for a single element quad loop.

SMARTUNER OPERATION

The heart of the SGC 'Stealth' Kit is the SG-237 'Smartuner' automatic antenna tuner. This is a fully waterproof unit measuring 230 x 180 x 40mm which contains a pi-network matching circuit using relay-switched capacitors and inductors, all operated under microprocessor control within the box. Inside the unit, an RF sensing circuit looks at the forward level of RF power, and as soon as it detects this, further sensors at the antenna connector monitor the system impedance, reactance, and the overall VSWR. Tune-up algorithms stored in the microprocessor's EEPROM memory implement the antenna matching.

The ATU circuit arrangement consists of seven shunt capacitors on the input arm, eight inductors on the series arm, and four more shunt capacitors on the output arm. These are all arranged in binary increments in value, and are selected by relays to switch in or out the various component values as needed. A quick bit of maths shows that you have 128 different values of input shunt capacitance, 256 values of series inductance, and 16 values of output shunt capacitance, overall a maximum of 524,288 matching combinations.

When you initially power-up the Smartuner, it places itself into 'bypass' mode, where the antenna is connected straight through to the coax connector leading to your rig, ie with the internal tuning elements switched out. As soon as it first detects RF from your transmitter, it goes into its matching cycle to reduce the VSWR appropriately. When it's done this, typically within a couple of seconds in my experience, it stores the settings together with the actual frequency segment of transmission in its memory. It keeps these settings switched in as long as the DC power is connected, until you start transmitting in a different frequency range when it undergoes this cycle again. The settings are stored in memory and recovered when you power back on and transmit again at that frequency. All you hear is a single 'click' from the ATU, and you're on the air, with your antenna matched within a few milliseconds. Even so, it continually monitors the VSWR while you're transmitting, and should this VSWR exceed 2:1, for example if you change your antenna configuration from what was connected before, it'll go into its tuning cycle again to re-match it. It stores 170 such different 'locations' in its memory for quick re-tuning, certainly enough for amateur band operation. Internal jumpers can be used to 'force' the tuner to re-tune each time should you wish, also to switch out the matching circuit when in receive mode.

The frequency range the Smartuner will operate over is 1.8 to 60MHz, ie topband to 6m. SGC say you'll need a minimum wire length of just over 2m for 3.5 to 60MHz operation, and a minimum of 7m for operation on 1.8MHz and above. The tuner needs to be powered from a 13.8V DC source, and a combined RF and DC lead, just under 3m in length, is supplied. The Stealth kit system claims a minimum frequency of 2.5MHz, I found some single loop arrangements worked fine on 80m and, with a bit of careful antenna positioning, on 160m as well.

THE SGC 'STEALTH' KIT CONSISTS OF:

- SG-237 'Smartuner' automatic tuning unit and pocket-sized manual
- Stealth Kit user manual, again a handy pocket size
- 25m length of black insulated wire for the antenna loop
- 9m nylon support rope
- Four antenna mounting clips and ropes
- Two spare antenna mounting clips
- Twelve reusable cable ties
- A cardboard carry case to put it all in

ON-AIR RESULTS

The Stealth kit manual gives you plenty of ideas for loop arrangements and positioning, and typical installations would be square or triangular single, two, three and four-turn loops. The best results you'll achieve will usually be with the loop outdoors and as much 'in the clear' as possible, although a loft-mounted arrangement could also work reasonably well as long as there aren't any other resonant lengths of electrical wiring or metal water pipes up there as well.

For most of the tests, I used the loop in a triangular configuration, with the Smartuner positioned at the bottom corner of the loop near to the ground and the two other corners of the loop positioned as high as possible. Here I used the supplied nylon rope to support the upper corners, stringing the loop alternatively between a couple of trees, a tree and the corner of the plastic rain gutter on my house roof, and as a test using my telescopic tower as a support. I found the installation was reasonably easy, although I did have to extend the DC power and RF coax connections: just under 3m really isn't enough in

Reviewed by Chris Lorek, G4HCL, PO Box 400, Eastleigh SO53 4ZF. E-mail: g4hcl@rsgb.org.uk

'Stealth' Kit

my opinion between the feedpoint and your rig and power supply for many typical installations. This naturally entailed weatherproofing the connections as well, good job I had a supply of self-amalgamating rubber tape handy.

Even though the system was acting almost like a full-wave loop on 20m in this configuration, I found the DX potential was limited, although plenty of European stations came romping in and with good signal reports received, as well as the occasional long-distance contact when conditions allowed. Likewise on other HF bands besides 20m, I found the results were quite similar to the 80m W3DZZ-type trap dipole I use which is also located above the garden. Not surprisingly, my three-element Altron compact HF Yagi on the tower outperformed the loop on 20/15/10m, but that's to be expected.

A check using *NEC4WIN* antenna modelling software did in fact confirm my on-air findings. The modelled results for 10m and 80m using the loop are shown in **Fig 1** and **Fig 2**, showing that it would indeed act as a good 'all-round' antenna system. If you're after more DX and less local contacts, you'll need to raise the feedpoint higher. With this and the intended covert application of the Stealth kit in mind, I arranged the system as a two-turn loop located in the loft of my house.

Positioned vertically (ie for directivity and low-angle radiation) it performed quite nicely on the HF bands, I couldn't complain at all bearing in mind the location. Positioning the loop horizontally gave me better all-around coverage, especially for high-incidence take-off on the low bands. But the RF certainly made its way into various domestic electronic products in the house, like PCs, stereos etc, especially in the upstairs rooms. But then, it shows its radiating the power! Rather than get even more RF chokes out, a reduction in transmit power level to around 10W reduced the breakthrough somewhat and restored normality to my household.

LONG WIRE

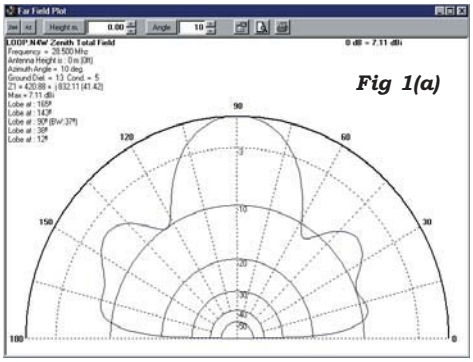
The Smartuner can of course also be used with whip and wire antennas fed against a ground. So I also tried the SG-237 Smartuner as a covert long wire tuner, with a black insulated wire going vertically up from the ground behind a black plastic rainwater downpipe at the corner of my house, and then horizontally along the black plastic gutter running along the side of the house. I was fortunate in having a substantial earth mat, consisting of around two miles of copper wire, beneath the rear garden and I used this for the SG-237's earth connection. Was I cheating here? No, I don't think so, as a buried earth system is certainly covert! I must say that, on the higher bands (20m upwards), this system worked far better for DX contacts than the earlier loop arrangements, no doubt due to the vertical radiator section at the feedpoint as well as being helped by the earth system. On the low bands, especially 80m, it performed very nicely for both local and European working, as well as getting my 100W SSB signal 'across the pond' at 59+ several times during grey-line path openings (eg early morning as the dawn is breaking). Compared with my 80/40m trap dipole with its feedpoint on the house chimney, this system was typically only a couple or so S-points down on the low bands, and did in fact work a little better in some cases on the higher bands when compared with the same trap dipole.

If you'd like an idea of 'who's worked what' around the world using the Stealth kit in various arrangements, just take a look at the SGC website on the Internet where there is a number of reports from various amateurs in different locations detailing their findings and what they've managed to work.

CONCLUSIONS

The SGC Stealth Kit can provide a useful multi-band HF antenna system, not only for covert use but also for a rapidly deployable system, for example for portable work. Using the antenna as a loop there's no need for a ground; as such the system can be erected very quickly. Indeed it could even be erected just when needed, and taken down at other times, the black insulated antenna wire being reasonably inconspicuous in itself. Strange goings-on in the middle of the night come to mind in covenant-restricted housing estates!

Thanks to Waters & Stanton plc (tel: 01702 206835) for the loan of the Stealth Kit reviewed. The cost of the kit has recently been reduced and it is now available from W&S for £349.95. ◆



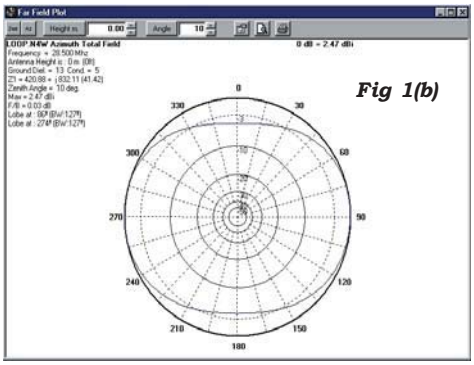
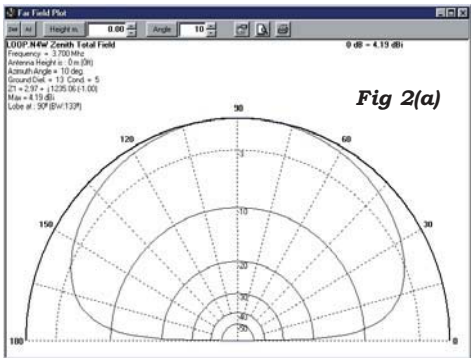


Fig 1: NEC4WIN modelled results for SGC Stealth Kit loop on 10m (a) in the vertical plane and (b) in the horizontal plane.



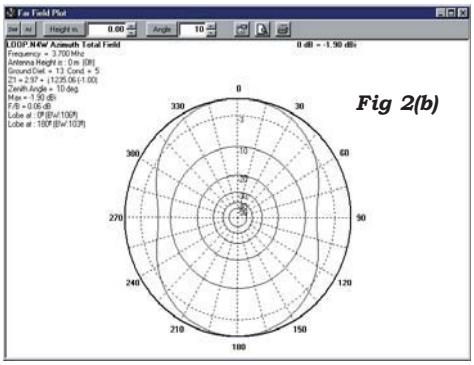
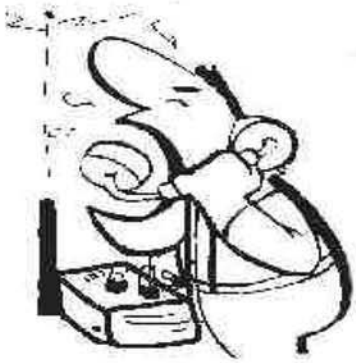


Fig 2: NEC4WIN modelled results for SGC Stealth Kit loop on 80m (a) in the vertical plane and (b) in the horizontal plane.

WEB SEARCH

SGC Stealth Kit user comments http://www.sgcworld.com/cgi-local/guestbook.cgi

Can YOU Find the Antenna?



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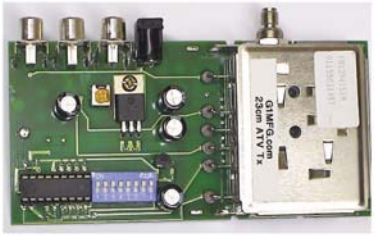

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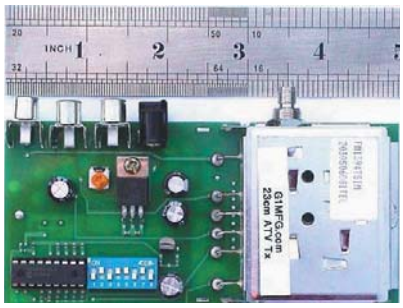
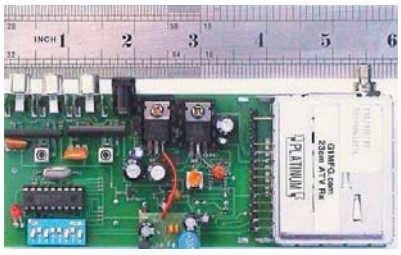
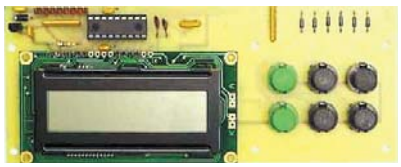
A modular 24cm







Right, top: Module 1 – the transmitter.

Right, middle: Module 2 – the receiver.

Right, bottom: Module 3 – the transceiver controller.

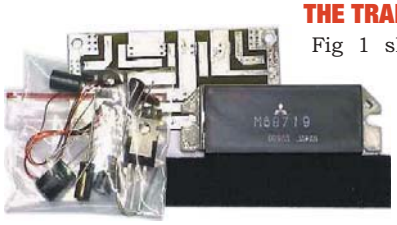
Amateur fast-scan television (ATV) has been one part of the hobby that has fascinated me since my early days in amateur radio. Over the years I have enjoyed numerous bouts of ATV activity on 70cm and 24cm, using both home-made and commercial equipment. My ATV activities in recent years were curtailed due to antenna problems at my small QTH, but a recent house move and access to wide-open space brought me back to ATV with a renewed enthusiasm to 'get going' again.

The British Amateur Television Club (BATC) magazine, CQ TV, has pages packed with readily-available equipment for 24cm, 13cm and even 3cm. The impact of satellite TV (SATTV) is also readily visible, with some vendors offering a variety of modules and surplus equipment from the SATTV market for use on the amateur bands.

A MODULAR APPROACH

I felt that a good start would be to build a new station using some of the modern components available, rather than try to resurrect some old equipment I had already. I finally decided that I would build a new transceiver for the 24cm ATV band using some of the ready-made modules available from the pages of CQ-TV. This would allow me to construct a new transceiver that would perform well, with the minimum of construction and alignment time. These modules certainly seemed to offer quick access to the band with the minimum of fuss, a far cry from a few years ago. After some deliberation, I finally decided to buy some of the products from Giles Read, G1MFG. Giles runs a small, but busy, Internet and magazine mail-order business specialising in amateur television products. He also has a great customer approach and a keen interest in home construction, and I was pleased he could answer all my queries quickly, and a set of modules was soon on its way to Scotland. Incidentally, Giles has a US-based presence as well, and has been featured in the American ATV magazine, and has become quite well known on the other side of the pond for his ATV activities.

The modules were delivered quickly and came safely packaged and included detailed instructions for each of the modules in the form of a small booklet.



Below: Module 4 – the transmitter PA.

THE TRANSCEIVER

Fig 1 shows a block diagram of the basic transceiver I constructed. It is configured around four modules from Giles – a receiver, transmitter, controller, and a solid-state power amplifier. The only module not supplied by Giles was the DC power supply, which is an external 13.8VDC supply. I decided from the outset that the modules would be built into a small desktop case so that it could live on one of the shelves on which I house a lot of my equipment. Of course, you don't have to follow this build pattern, you can house the modules into any suitable enclosure that meets your needs. It really does not need to be anything spectacular, but I would advise using a metal enclosure as it is an RF kit and should be screened.

Before describing how the whole unit fits together, it's worth looking at some of the features of each of the modules, as they will work as stand-alone units if required.

MODULE 1 – THE SYNTHESISED TRANSMITTER

This module comes built and working and the size of it is just amazing! It's simply a case of mounting the unit into the chosen enclosure. As the transmitter only runs low power at this point, I decided not to enclose the unit in a smaller screened housing and mounted it into the main chassis directly. The board measures 125 x 60 x 18mm and I was amazed at the very low component count – there really is hardly anything on this board! The biggest component is a screened tinplate unit that houses all the RF components. Other than input sockets for audio/video and DC power, there is not a great deal else on the board to talk about. RF output is fed via a small microwave-type SMA socket, which is a good choice as they are easily available at low cost, perform well at these frequencies and fit miniature low-loss PTFE coax nicely. Frequency selection is made via an 8-way miniature PCB-mounting, DIL-style switch which, in a stand-alone unit, selects the operating frequency from a PIC microprocessor. Frequency steps are selectable in 500kHz steps and will cover the whole of the 24cm amateur band. The board requires 12 – 18VDC and produces between 50 and 100mW RF output.

MODULE 2 – THE RECEIVER

The receiver module looks similar in style to the transmitter module, but is slightly larger measuring 150 x 60 x 18mm. Again, the board looks sparsely populated, although it has a few more components than the transmitter; it is also dominated by the metal screened RF module at one end of the PCB. RF input is again via an SMA socket. Audio and video outputs are via phono-style sockets, with sockets for 6 and 6.5MHz sound output, and the DC connector is also a 2.1mm DC-style item (tip positive). As with the transmitter, this unit also requires 12 – 18VDC. Frequency control is also in 500kHz steps, using an 8-way DIL PCB switch and a PIC microprocessor. A small on-board LED shows when the PLL is locked. This version of the receiver range is the 'Platinum' model, which includes a video de-emphasis filter on the PCB.

MODULE 3 – THE LCD TRANSCEIVER CONTROLLER

Although both transmitter and receiver units can act autonomously, it would be rather unwieldy, in a transceiver, to keep adjusting the internal DIL switches every time a frequency-change was necessary. To overcome this problem, a companion controller PCB has been introduced.

An easy-to-build design us

By Simon Lewis, GM4PLM, Creoch Farm, Ochiltree, Ayrshire KA18 2QH. E-mail: simon@creoch.freeserve.co.uk

ATV transceiver

This module contains a PIC microprocessor, which provides the frequency control signals directly to the transmitter and receiver synthesisers, instead of the on-board PIC processors (which are removed) and DIL switches. There are several benefits of using the controller module other than simply allowing easy control of both transmit and receiver modules.

Because frequency control is no longer limited by an 8-digit binary number programmed by the DIL switches, the frequency control step resolution can be increased to 125kHz steps. This can also be used to extend the receiver range, although the transmitter has been intentionally limited to the 24cm amateur band range. Frequency selection is achieved via a set of up/down tuning buttons and the transmit/receive frequency control is displayed on a two-line LCD display; a back-lit version is also now available for that added look and feel. Transmitter and receiver frequencies are controlled independently. Three VFOs are provided for both receiver and transmitter – these act independently also. One very useful function is an 'autonet' switch. This feature automatically retunes the receiver to the selected transmit frequency when the transmitter is enabled, allowing off-air monitoring of the transmitted signal. This is a particularly useful function when using ATV repeaters, for example.

To use the frequency controller module with the G1MFG receiver and transmitters, there are several small modifications that need to be made. These are detailed later.

The controller module is designed to be mounted close to both the receiver and transmitter modules. The modules can be remotely mounted by up to 3ft if required, and longer distances are possible by utilising Philips I2C bus driver ICs; again, details are included in the paperwork, and use of these ICs could allow the modules to be used in a masthead-mounted configuration.

MODULE 4 – THE TRANSMITTER POWER AMPLIFIER

Although the transmitter modules are usable as supplied, their low power output does tend to limit their capabilities to cover any significant distance. I therefore decided to build some additional power amplification into the transceiver in the form of the matching G1MFG 24cm solid-state PA. This module is designed around a Mitsubishi 'black brick' PA module. Unusually, the G1MFG PA does not use the M57762 that is normally selected for amateur 24cm use, but uses an M68719 instead. There a few minor electrical differences, but physically they are the same. The most important difference is their ability to provide around 18–20W of RF at around 1250–1300MHz when driven by the G1MFG transmitter module. The module in my unit was mounted on a hefty 0.5°C/W heat sink on the rear panel of the case. Make sure the module is well ventilated, as it does not like being run hot or supplied with more than 15VDC. If you treat them badly they tend to give up on life very quickly and in a most expensive fashion! You will need to feed the board with 13.8VDC at around 5A – remember to think about this in your DC wiring. The kit includes all the PCB-mounted components and the PA module, but not the heat sink, as these are heavy to post and are easily available at rallies.

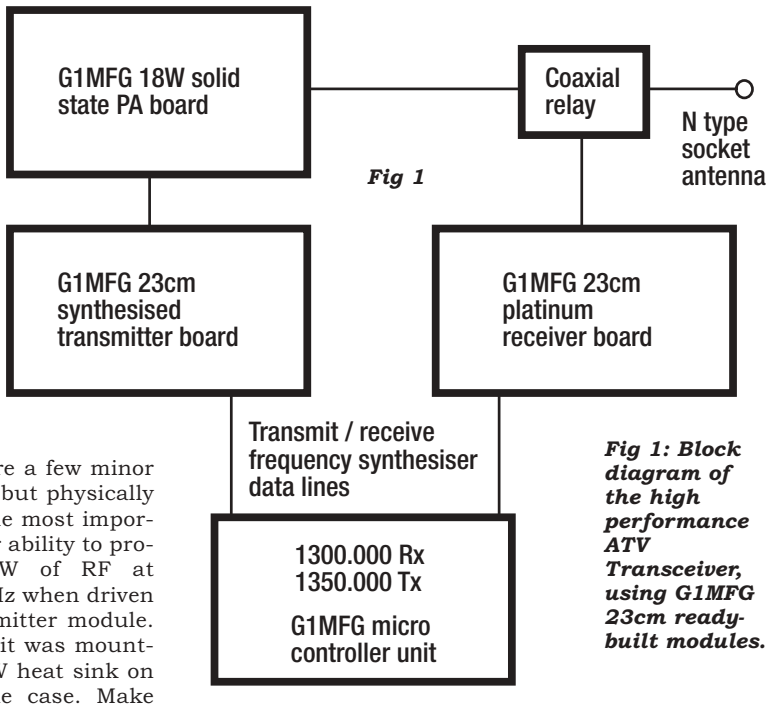


Fig 1: Block diagram of the high performance ATV Transceiver, using G1MFG 23cm ready-built modules.

BUILDING THE TRANSCEIVER

The modules are mounted into the chosen enclosure using small stand-off pillars; these should be high enough so that the metal case does not interfere with the base of the PCB. Connectors and switches, both RF and DC, are mounted on the case and wired using small gauge wire and miniature RF coax. Audio and video lines should also be wired using coax, to minimise the potential for interference on these signal lines. The PA DC lines are wired directly to the DC input connector using an in-line fuseholder, but using heavier gauge wiring as this module requires a much higher current supply.

Both transmitter and receiver modules are capable of operating independently but, in our case, we want the units to operate together as a unit using the controller as the central transceiver control module. To achieve this, the microprocessors of both transmitter and receiver need to be removed, and the controller's transmit and receive data lines are directly wired to the respective PCB pins of the RF modules. This is a relatively simple task and the PICs are easily removed from their sockets using a small screwdriver. The documentation supplied with the modules identifies the necessary pins that need connecting on the respective modules. The PICs can be reprogrammed for your projects as they are no longer needed unless you would want to use the modules individually again in the future.

In my unit, I wired miniature coax to the pins of the audio and video connectors and brought these out to connectors on the front panel, as this was the easiest method for my purposes.

Power was connected via small-gauge wiring except for the PA module, which uses much thicker wiring due to the higher currents involved. Switches for power, transmit/receive changeover and autonet functions were all panel-mounted. A fuseholder, DC power connector and N-type ▶

ing low-cost, ready-built ATV modules

antenna connector are mounted on the rear panel, as is the large heat sink for the PA module.

A small 12V RF relay is mounted internally to allow the single N-type connector on the rear panel to be switched between the transmit and receiver modules. This is switched using the transmit/receive control line. Make sure the relay you choose is capable of carrying the power you are running, and that it is also rated at 23cm, or you will find it becomes lossy and simulates an unwitting dummy load!

RF interconnections between the modules are made using miniature PTFE coax and small SMA connectors. These connectors are an excellent choice at these frequencies and allow good, reliable, low-loss connections to be made between the modules. This is particularly important where (a) low-power connections are made, or (b) high-power microwave transmissions through the wrong type of connector can cause heating due to high losses and potential damage to RF modules and connectors alike. Choosing the right connector and cables at these frequencies is very important. SMAs are easily-available these days and are quite cheap as well.

Connecting the units up is quite simply a matter of wiring the DC control lines and RF, audio and video connectors.

TESTING

Once the unit is wired, you can carry out the basic DC tests, and once the unit has passed the initial 'smoke' test, you can test the frequency controller. The two-line display should follow the up/down keys on the controller. With a suitable dummy load and power meter connected, you can test the output of the unit which should be approx 15–18W.

The VFO buttons and autonet functions can be checked, and that just about completes the testing. As all the modules are ready-built, there is no alignment to carry out! Now I can see why I chose these modules!

ON AIR

I used the modules over a couple of weeks' holiday and was very pleased with their performance. They certainly do the trick! Combining them using the controller module was a good plan and it was easy to programme-in a simplex channel and the ATV repeater channels, switching between both with a simple button-push. The frequency display using the LCD was bright and easy to read, and provided a simple 'at-a-glance' view of the operating frequency. Building the units into a transceiver was simple and, with a few nights' work, even a beginner can produce a quality unit that will work first time. That has got to be good for encouraging newcomers to the hobby! The transceiver was taken for a hill-top DXpedition and proved itself out in the wilds. With the addition of a small modern digital video camera or CCD camera module, a very compact ATV transceiver could be built for grid-hopping contests. Overall, I can highly recommend the modules as a good start and at a very good price. Giles, G1MFG, offers an excellent service and he certainly loves his ATV!

THE SOURCE

The modules are available from www.g1mfg.com and are priced at £42.40 for the transmitter module, £44.50 for the receiver module, £42.00 and £49.99 for the frequency controller (unlit and backlit display) and £99 for the 18W PA board. Giles can also supply a range of other accessories including cases and antennas. Please visit the website for details or contact him at G1MFG.com, l'Église, Durley Street, Durley, Southampton SO32 2AA, tel: 01489 860 318, fax: 01489 860 906. ◆

Win G1MFG ATV Equipment

Have you ever wanted to become active on amateur television, but thought it too complicated or difficult to get going on the mode? Well, thanks to G1MFG.com, it has never been easier to become active on ATV. The G1MFG ATV transceiver reviewed by Simon Lewis, GM4PLM, could be yours in our exclusive competition. You'll have read Simon Lewis's review on pages 26–28. Now, an ATV transmitter, receiver and controller, courtesy of Giles Read, G1MFG, could be yours in our free competition exclusive to RSGB members. Enter the competition – it could be you!

Competition time!

Look at the three questions below. Write your answers on **a postcard or the back of a sealed envelope** (no letters accepted) and send them to: G1MFG ATV Competition, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Don't forget to include your own name and address! The closing date is first post on **Friday 30 May 2003** and the winner will be announced in the July *RadCom*.

Questions

1. Which of the following modules is not supplied by G1MFG?
(a) Transmitter
(b) Power supply
(c) Controller

2. What frequency step is available in the transmitter module?
(a) 1MHz
(b) 125kHz
(c) 500kHz

3. What type of output socket is used for the RF?
(a) SO-239
(b) SMA
(c) SMC

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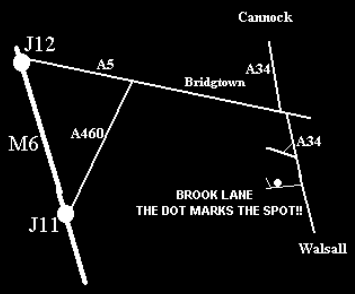

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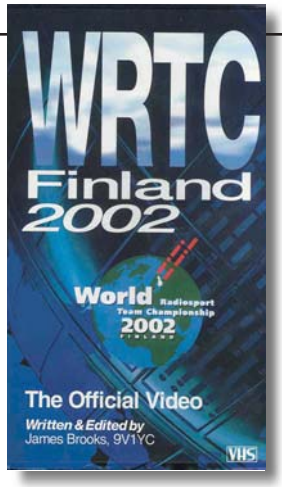
KENWOOD	TS-950SDX	HF 150W DSP FULLY LOADED LATE S.NUMBER	£1,700.00
KENWOOD	VFO-120	TS120 VFO	£50.00
KENWOOD	VS-1	VOICE SYTHESISER	£30.00
KENWOOD	VS-2	VOICE SYTHESISER	£30.00
KENWOOD	YG-455CN-1	270Hz CW CRYSTAL FILTER	£100.00
KENWOOD	YK-88A-1	AM FILTER	£40.00
KENWOOD	YK-88C-1	500Hz CW NARROW FILTER	£40.00
KENWOOD	YK-88CN1	270Hz CW FILTER 8.83MHz IF	£40.00
KENWOOD	YK-88S-1	2.4KHz SSB NARROW FILTER 8.83MHz IF	£40.00
KENWOOD	YK-88SN	1.8K SSB FILTER (TS-440 /R5000)	£40.00
KENWOOD	YK-88SN-1	1.8KHz SSB NARROW FILTER 8.83MHz IF	£40.00
KENWOOD	TS-2000	HF / VHF / UHF ALL MODE MULTIBANDER	£1,350.00
KENWOOD	AT-120	ANTENNA TUNER	£75.00
KENWOOD	TS-50	HF TRANSCEIVER	£425.00
MAGNUM	DELTA FORCE	10M MOBILE AM/FM/USB /LSB/CW	£149.00
MICROSET	RU-20	70 CMS AMP	£60.00
MICROWAVE MODULES	28/144	TRANSVERTER 28/144	£125.00
MIDLAND	MIDLAND 48	80 CHANNEL CB	£55.00
PACCOM	TINY 11	TNC	£99.00
PACCOM	TNC-320	TNC	£90.00
PLESSEY	PR-2250	HF RECEIVER BEST QUALITY CLASSIC!	£1,200.00
REALISTIC	PRO-394	HF RECIEVER	£99.00
REALISTIC	PRO-2006	400 CHANNEL SCANNER	£110.00
SGC	SGC-2020	HF TRANSCEIVER	£450.00
SOMMERKAMP	FT290R	2m MULTI-MODE TRANSCEIVER	£180.00
SONY	ICF-SW77	FM/SW/MW/LW PORTABLE AS NEW!	£250.00
SONY	SW-100E	FM/SW/MW/LW PORTABLE	£90.00
SYNCRON TOKYO	PS-1220VU	20 AMP POWER SUPPLY	£60.00
HY-POWER TOKYO	HL-30V	2M and 25W AMPLIFIER	£75.00
HY-POWER	HL-37V	LINEAR AMPLIFIER	£60.00
TONNA	7000E	TERMINAL	£130.00
TRANSVERTER	QM 70	28/144 TRANSVERTER	£100.00
TRIO	R-2000	RECEIVER + CONVERTER	£300.00
TRIO	TR-2300	TRANSCEIVER PLUS AMPLIFIER 2M	£99.00
TRIO	TR-9000	2M MULTI MODE	£199.00
TRIO	TR-9130	2M ALL MODE TRANSCEIVER	£250.00
TRIO	TS-780	DUAL BAND BASE TRANSCEIVER	£275.00
WELZ	AC-38M	200W MOBILE MATCHING NETWORK	£50.00
YAESU	FP700	POWER SUPPLY	£100.00
YAESU	FP-757HD	HEAVY DUTY POWER SUPPLY	£120.00
YAESU	FRG-100	HF RECEIVER	£300.00
YAESU	FRG-7700	HF RECEIVER	£220.00
YAESU	FRG-8800	RECEIVER INCLUDES CONVERTER	£399.00
YAESU	FRG-9600	RECEIVER	£200.00
YAESU	FT-1000MK5 £2,000.00	200W DSP HF TRANSCEIVER	
YAESU	FT-1000MP	BASE TRANSCEIVER	£1,300.00
YAESU	FT-1000MP AC	HF BASE DSP TRANSCEIVER (Late serial no)	£1,550.00
YAESU	FT-1000MP V	200W DSP HF TRANSCEIVER	£1,900.00
YAESU	FT-101Z	MINT CONDITION!!	£250.00
YAESU	FT-101ZD mkIII	HF TRANSCEIVER inc FM	£375.00
YAESU	FT-225RD	2M BASE MULTIMODE CLASSIC!	£399.00
YAESU	FT-23R	HANDY TRANSCEIVER	£180.00
YAESU	FT-2500M	MOBILE TRANSCEIVER	£190.00
YAESU	FT-290RMKII	2M ALL MODE TRANSCEIVER	£180.00
YAESU	FT-290RMKII	MOBILE 2M MULTIMODE TRANSCEIVER	£275.00
YAESU	FT-41R	HANDY TRANSCEIVER	£120.00
YAESU	FT-470	2/70CM HANDY TRANSCEIVER	£140.00
YAESU	FT-650AC	26-50MHz 100w BASE SAATION TRANSCEIVER	£599.00
YAESU	FT-690RMKI	6M MULTIMODE MOBILE TRANSCEIVER	£250.00
YAESU	FT-690RMKII	6M PORTABLE	£375.00
YAESU	FT-726R	2 / 70 / HF TRANSCEIVER	£400.00
YAESU	FT-726R	2 / 70 / 6m TRANSCEIVER	£575.00
YAESU	FT-730R	70CM MOBILE TRANSCEIVER	£120.00
YAESU	FT-736R	2m / 70cm TRANSCEIVER	£650.00
YAESU	FT-736R	2m / 70cm / 6m TRANSCEIVER	£750.00
YAESU	FT-747GX	TRANSCEIVER	£299.00
YAESU	FT-757GX MKII	TRANSCEIVER	£395.00
YAESU	FT-757MK1 GX	HF TRANSCEIVER	£375.00
YAESU	FT-767GX	HF BASE 100watt built-in ATU	£599.00
YAESU	FT-77	INCLUDES FM MINT!	£275.00
YAESU	FT-790R	70CM MULTIMODE MOBILE TRANSCEIVER	£225.00
YAESU	FT-80C	0-30MHz COMMERCIAL RANSCEIVER	£375.00
YAESU	FT-847	HF / 2 / 6 / 70cm BASE TRANSCEIVER	£900.00
YAESU	FT-920AF	HF/6M BASE WITH DSP	£899.00
YAESU	FT-ONE	HF BASE TRANSCEIVER	£450.00
YAESU	FTV-901	TRANSVERTER Inc 2m Mod	£165.00
YAESU	FV-707	VFO UNIT	£99.00
YAESU	MD-100A8X	DESK MICROPHONE	£80.00
YAESU	MH-34B4B	SPEAKER MICROPHONE For VX5R VX-1R	£15.00
YAESU	MH-35	SPEAKER MICROPHONE	£10.00
YAESU	MMB-16	MOUNTING BRACKET	£20.00
YAESU	NT-29	CHARGER	£30.00
YAESU	PA11U	PSU FOR FRG-100	£20.00
YAESU	VR-120	RECEIVER FM /WFM/AM	£99.00
YAESU	VR-5000	TOP RANGE SCANNER RECEIVER	£450.00
YAESU	VX-1R	HANDHELD TRANSCEIVER	£120.00
YAESU	VX-5R	2 / 70 / 6 HANDIE 5W	£220.00
YAESU	XF-114SN	2KHz SSB FILTER	£60.00
YAESU	YO-100	SCOPE VERY RARE!	£150.00
YAESU	FT-7100	2M / 70CMS DUALBAND TRANSCEIVER	£249.00
YAESU	FT-480R	2M TRANSCEIVER	£199.00
YAESU	FT-100	HF / VHF / UHF ALL MODE TRANSCEIVER	£599.00
YAESU	FT-840	HF TRANSCEIVER	£425.00
YUPITERU	MVT-225	AIRBAND SCANNER	£150.00
YUPITERU	MVT-7300	MULTIBAND HANDHELD SCANNER	£199.00
YUPITERU	OP-90	CASE	£10.00
YUPITERU	VT-125	AIRBAND SCANNER	£120.00

Please note, the equipment listed may have been sold / updated, please ring 01922-414796 to check availabilty

Book and Video Review

WRTC FINLAND 2002

A video written and edited by James Brooks, 9V1YC. Reviewed by RadCom Editor Steve Telenius-Lowe, G4JVG



The latest video release by James Brooks, 9V1YC, is a 60-minute record of last year's World Radiosport Team Championship (WRTC) held in Finland. It took place concurrently with the IARU HF Championship, held on the second weekend of July. I was lucky enough to be able to attend, albeit as a spectator rather than competitor (see *RadCom* September 2002), and so I was particularly keen to see this new video.

The film starts with a roll-call of the famous contesters who had gathered in Finland for WRTC and it is then that it becomes clear what a large-scale event this was. The action moves on to the lead-up events, held in Himos. Here, detailed coverage of the discussions over the arcane rules for the contest arguably goes on rather too long and would only be of real interest to those who actually took part. However, the passionate nature of the arguments certainly shows that the competitors and officials took this event very seriously indeed!

WRTC Finland 2002 is a documentary of what was, in effect, a sporting event. The 'sporty' theme is well to the fore throughout the video, with the voice-over narrated by one of ESPN's top sportscasters. Three separate camera crews, led by Dave Bell, W6AQ, were sent out and about and many of the teams are shown 'in action', including Team UK, Andy Cook, G4PIQ, and Fred Handscombe, G4BWP. During the contest, real-time scoring meant spectators could join in the excitement by following the leader board and watching as the top place changed when one team edged ahead of the next. This is particularly well covered in the video with some great graphics developed especially for the film. James told me, "the graphics took me an especially long time to create and their purpose was to give the video a 'pro-sports' feel". In this he has certainly succeeded.

WRTC Finland 2002 is an exciting amateur radio-sports documentary, with really professional production techniques, good 'tight' editing and even humour. Amateurs and non-amateurs alike will enjoy the travelogue part of the story, with beautiful Finnish lakeland scenery and enticing glimpses of Helsinki in mid-summer. As well as the video, a DVD version is available which has some interesting 'bonus' features including complete score breakdowns, past results, team line-ups etc.

WRTC Finland 2002, *60 minutes*
By James Brooks, 9V1YC
9V-Post Productions
VHS video (PAL or NTSC) or DVD
Price: *US$25, world-wide shipping included*
Available from:
http://home1.pacific.net.sg/~jamesb or by
e-mail: *jamesb@pacific.net.sg*

QRP BASICS

by George Dobbs, G3RJV Reviewed by RadCom Technical Editor, George Brown, M5ACN

Destined to sell like hot cakes, this book by the doyen of QRP in the United Kingdom has been eagerly awaited and is crammed with everything that QRP enthusiasts (and many others) need to know.

It begins with a personal profile of the author, and his progress in amateur radio through the years. His serious QRP interest began some 30 years ago with the Heathkit HW-7.

QRP and its implications are then discussed, followed by the QRP ethos – why should anyone choose to reduce power? Many reasons are given, not least being the RFI-friendly nature of the beast, and that it is a challenge which lends itself to home-construction.

The next chapters are dedicated to the comments of QRPers, what they have achieved and on what modes. You should need no more convincing about the viability of QRP operation!

Trying it for yourself is the theme of the next chapter, which is followed by descriptions of several QRP stations. Radio amateurs always take an interest in the stations of others, and QRP stations tend to be more individual than those of 'conventional' amateurs.

We now get into the 'meat' of the book, where we find information about operating QRP portable, operating tips, and ideas for antennas. Some older commercial QRP equipment is described, with the current ranges considered in more detail. Exhaustive chapters on available QRP kits follow, both from the UK and the USA. These chapters alone make the book a veritable *vade mecum* of commercial equipment aimed at QRP use.

On we go, through simple stations, accessories and home-made QRP, to the QRP workshop and constructional tips, to information on toroids, filters and inductors. Projects follow, on test gear, transmitters, accessories and receivers.

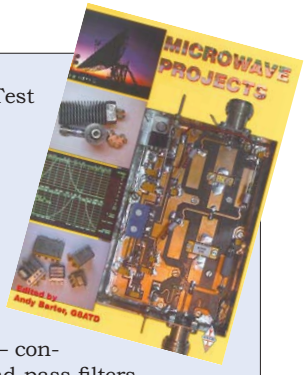
Appendices include valuable data on resistors and capacitors, QRP traders in the UK, USA and Europe, international QRP organisations, QRP awards and events, and a list of books on QRP.

The book ends, fittingly, with a tribute to Doug DeMaw, W1FB, whose enthusiasm and books on QRP have inspired many thousands of radio amateurs throughout the world.

QRP Basics
by George Dobbs, G3RJV
Published by RSGB.
ISBN 1-872309-91-7
Paperback, 208 pages, 340 x 174mm.
Members' price *£12.74*
(non-members' price £14.99) + p&p.
Available from: *The RSGB Shop.*

MICROWAVE PROJECTS

Edited by Andy Barter, G8ATD. Reviewed by RadCom Technical Editor, George Brown, M5ACN



This new book is a collection of microwave projects for the newcomer and experienced radio amateur alike. Not all the projects are simple; quite the opposite, in fact.

It goes without saying that the book is a valuable reference work and is presented clearly and concisely as source material for project work. It would be of little use to the reader for me to try to comment on each project in turn. The headings speak for themselves. Chapter 1 – 'Signal Sources' – includes a 144MHz transceiver and a micro-transmitter for L-band. Chapter 2 – 'Transverters' – covers building blocks for a 23cm transverter, a 10GHz transverter from surplus Qualcomm OmniTracks units, and a 'building-block' 5750MHz transverter design. Chapter 3 – 'Power Amplifiers' – includes a GH Quad linear for 23cm, a 10W PA for the 13cm band using GaAs technology, a 13cm PA using a GaAs MMIC, and an amplifier for 47GHz using chip technology. Chapter 4 – 'Test Equipment' – describes a sensitive thermal power meter, a GDO, a SINAD meter, a divide-by-10 5GHz pre-divider, made-to-measure directional couplers and a divide-by-10 10GHz prescaler using state-of-the-art ICs. Chapter 5 – 'Design' – concludes the book, with band-pass filters made from coupled lines, and using the TRL85 for synthesis and analysis of microwave problems. There is an index.

Microwave Projects
Edited by Andy Barter, G8ATD.
Published by RSGB.
ISBN 1-872309-90-9
Paperback, 200 pages, 340 x 174mm.
Members' price *£12.74*
(non-members' price £14.99) + p&p.
Available from: *The RSGB Shop.*

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

HF

Band conditions during March really started to suffer from the fall in sunspot activity. This was especially marked during the CQ WPX SSB Contest at the end of the month, when 10m was almost dead, whereas on 20m Pacific and Far Eastern DX was workable during much of the day, indicating relatively low absorption on that band.

The German ST0RY operation made a big impact on the bands during the month, and caused a little confusion in the process. The ST0 prefix used to be associated with Southern Sudan (a breakaway region of the country) until the ARRL dropped that DXCC 'entity' from the list. ST0 now appears to be used generally in Sudan by visiting operators. I was able to work the team on all HF bands, SSB, CW and RTTY, and I am sure many others did likewise.

NETS & LISTS

Those of you who spend any time at all on the HF bands will quickly run across list and net operations. If you want to participate but are not familiar with the conventions relating to them you can end up getting yourself into hot water.

Of course, there are a number of regular nets which exist purely for the purpose of 'rag-chewing' and keeping in touch with friends. Many are associated with a particular organisation, the Royal Signals Amateur Radio Society, for example. I am more concerned here with lists and nets specifically run for the purpose of enabling participants to work 'DX' (usually meaning a station which is rare in some way, rather than necessarily one which is a long way away).

I should start by getting one matter out of the way. Many DXers consider lists and nets to be a form of cheating, in that you are enlisting the help of a third-party (the Master of Ceremonies, or MC) to run the operation and keep other stations at bay while you make your call to the DX station. Sometimes it gets even worse, when the MC or one of the other participants, perhaps getting restless, 'helps' things along by passing all or parts of callsigns or signal reports. A 'contact' made in this way is surely not a true two-way exchange. But a well-run list or net will avoid these pitfalls (guidelines for lists and nets appear in a number of locations, see for example the RSGB *Amateur Radio Operating Manual*, p.38).

DX nets meet regularly on (or near – a DX net has no more 'right' to a particular frequency than any other amateur) frequencies that are usually well-publicised and at regular times. 20 metres is a particular favourite for such nets, as propagation is reasonably consistent, but you will find them on other bands too. Usually, at the beginning of the net, the MC will ask for DX check-ins, at which point everyone hopes that one or more rare stations will turn up on frequency. Then other check-ins will be called, sometimes by country or some other form of selection if things get hectic. This is your chance to call in, taking care to follow the MC's instructions carefully. The MC will then go round each of the participants in turn, asking them if they wish to call any of the DX stations. When your turn comes, make any calls you require, complete the contacts as quickly and efficiently as possible, and hand back to the MC. Of course, you will appreciate from the description that there may well be lots of sitting around awaiting your turn, by which time the DX station you were particularly wanting to call may have upped sticks and gone to work or whatever. But when things work well it means you don't have to compete in a howling pack with all those amateurs using linear amplifiers and stacked Yagis, who worked the DX yesterday but want to do so again just for some personal ego trip (yes, such amateurs do exist!).

Lists are similar, but tend to happen spontaneously, often at the request of a DX station. Let's suppose I was operating from North Korea as P5/G3XTT, using just low power and a dipole. The demand for North Korea is such that, when I come on the air, I am swamped by callers. I try the obvious solution and operate split frequency (more on this next month), but my signal isn't loud enough in Europe to compete with those causing interference on my own frequency and my rate of making contacts falls almost to zero. What I could do (though, I hasten to add, I have never resorted to this when operating from a DX location!) is to ask one of the louder, better-equipped European stations on frequency to act as MC, or "take a list". He will take maybe 20 callers at a time, and then indicate to each of them in turn as to when they should call. This way only one will be calling me at a time, so the frequency should remain clear and both callsigns and signal reports exchanged without problems from the screaming masses. It stands to reason that the MC should not pass complete callsigns to me, or assist the contacts in any way (for example by relaying signal reports) – if I cannot hear the calling station myself or he cannot hear me, then no two-way contact has taken place. Always with nets and lists, follow the instructions of the MC or chaos will result. One of the reasons I was prompted to address the subject this month, was listening recently to lists being run for SV2ASP/A (Mt Athos) on 40m. As lists go, quite a slick system was in operation, with two MCs taking it in turns to move up the band 10kHz, collect a list of potential callers, and then return to SV2ASP/A's frequency and give each of those callers an opportunity to try for the contact. However, despite clearly indicating every few minutes what was going on, an M3 station kept trying to call in on the working frequency, causing a great deal of unnecessary interference. I'm not singling out M3 stations here, but I do understand why a newly-licensed operator may well have been confused as to what was going on.

DX NEWS

Phil, G3SWH, reports that the call of Albert, 5R8GZ, is being pirated on 80 and 160m. Phil says that Albert has no antennas for these bands.

Tim, M0FGC, writes that he is now fully operational as A45WG from Muscat, capital of the Sultanate of Oman. He can be contacted via deepstar@omantel.net.om and has already worked many UK stations. He should be there for at least another 18 months.

Dov, 4Z4DX, will be active as 9N7DX from Nepal starting 22 April for four weeks. Activity is expected to be on all bands, CW and the digital modes. QSL via 4Z4DX.

Johnny, G3LIV, will be back in Malaysia this month, operating as 9M2/G3LIV from the mainland from 6 to 16 May, from Penang Island (AS-015)

Ron Smith, 5N0/G3SVW, with two of his local staff during a survey of a new cell-site transmitter for Nigeria's GSM mobile phone network.

Rank#	DX Magazine	425 DX News
1	VU4 – Andaman	VU4 – Andaman
2	BS7 – Scarborough	BS7 – Scarborough
3	VU7 - Lakshadweep	VU7 – Lakshadweep
4	P5 – North Korea	3Y/P – Peter I Island
5	7O – Yemen	FR/J – Juan de Nova & Europa
6	FR/J – Juan de Nova & Europa	KP5 – Desecheo Island
7	3Y/P – Peter 1 Island	KP1 – Navassa Island
8	KP5 – Desecheo Island	YV0 – Aves Island
9	KP1 – Navassa Island	7O – Yemen
10	YV0 – Aves Island	FT8X – Kerguelen Islands
11	FT8X – Kerguelen Islands	KH7K – Kure Island
12	KH7K – Kure Island	P5 – North Korea
13	FR/G – Glorioso Island	ZS8 – Marion Island
14	FT8W – Crozet Island	FT8W – Crozet Island
15	ZS8 – Marion Island	3Y/B – Bouvet Island
16	3Y/B – Bouvet Island	FR/G – Glorioso Island
17	VK0/H – Heard Island	ZL8 – Kermadec Islands
18	SV/A – Mount Athos	VP8/O – South Orkney Islands
19	ST – Sudan	3C0 – Pagalu Island
20	VP8/O – South Orkney Islands	VK0/H – Heard Island

from 16 to 30 May, and from Langkawi Island (AS-058) from 30 May to 9 June. Mainly CW, but he also expects to make some contacts on PSK31.

Jean-Baptiste, F8DQL, will be active as FO/F8DQL from Tahiti (OC-046) from 3 to 25 May, CW only. QSL to his home call.

If any of you are still awaiting QSL cards for SSB contacts with last year's K1B expedition, please note that, due to problems with mail to Russia, a US manager has now been appointed. My own cards appeared quickly when I tried this new route: Stephen Grose, K4YL (ex W4SMG), PO Box 183, Flat Rock, NC 28731-0183, USA.

Finally, there should be plenty of interesting activity for the WPX CW Contest at the end of the month (24/25 May). Among those operations already notified are EA9LZ by N6TJ (QSL via VE3HO), AL5A/NH0 by JH0MGJ, BW4/UA3VCS by UA3VCS, D4B by 4L5A, and VP5MM by YT6A.

IOTA ACTIVITY

9A3FO/P and 9A3KB/P will activate various locations and lighthouses as follows: 31 May Sv Marko Isl (CI 117), 31 May/1 June Krk Isl (CI 046), 2 June Susak Isl and Lighthouse (CI 108, LH 0444, CRO 011), 2/3 June Losinj Isl (CI 058), 3/4 June Cres Isl (CI 021). All count for IOTA as EU-136, but separately for the Croatian Islands award. Activity will be on all bands, CW only. QSL direct or via the bureau to the respective home callsigns.

JI3DST/6 will activate Miyako Island (AS-079) from 26 April to 5 May on 40, 17, 15, 12 and 10m. QSL via the bureau to his home call, or requests, questions etc can go via e-mail to: ji3dst@jarl.com

Andre, GM3VLB, is off to the Pacific, and has been reissued with his old Fiji call 3D2LB. Look out for him from Beachcomber Island (OC-121) from 26 to 30 May then, en route to Canada, as KH6/GM3VLB/M from Hawaii 30 May/1 June. He will then team up with Alex, GM0DHZ, and Niall, VP8NJS, to activate several Canadian islands (signing VE7/home calls) as follows: Denman Island (NA-036) 4/5 June, Malcolm Island (NA-091) 5-7 June, Campbell Island (NA-061) 8/9 June, Denny Island (NA-061) 9-11 June and Thetis Island (NA-075) 12-14 June. All these operations are with hand-carried equipment, so don't expect huge signals.

Members of the United Radio Amateur Club will use the callsign K6AA/P to operate CW and SSB on 10-80 from Santa Catalina Island (NA-066) over the weekend of 17/18 May. QSL via K6AA. Further details are on the club's website.

There will be a large operation from Mexiana Island (SA-042, DIB-69), from 21 to 25 May. The callsign and QSL route will not be announced until just before the expedition takes place. Check their website for details.

Those of you with Internet access should keep an eye on the RSGB IOTA web pages for an extensive list of forthcoming IOTA operations.

MOST WANTED

Results of two of the annual Most Wanted Countries surveys have appeared recently, those by the Italian *425 DX News* and the US-based *DX Magazine*. The results are very similar, despite one having more of a European bias in terms of respondents, and the other being slanted more to the needs of US amateurs. The table to the left shows the top 20 from each list.

It looks as though, apart from Mt Athos which, of course, is in Europe anyway, North Korea is the country that differs most between the two lists, presumably because P5/4L4FN was much easier to work from Europe than from the US (or certainly from East Coast USA). It is notable that several high-ranking countries are actually quite easy to travel to. For example, there are luxury tourist hotels on the Andaman Islands. The problem is with licensing. I continue to be surprised, for example, that the French Indian Ocean islands (Juan de Nova, Glorioso) are so tough, as one might expect licensing to be covered by the CEPT agreements, but it appears that special conditions apply to these outlying territories. Scarborough Reef is a rather different kettle of fish. The reef is disputed between China and the Philippines and the last operation almost set off an international incident, so I doubt we will see that one active for a while, if ever. Navassa, Desecheo and Aves Island are also curious ones, in that they are in the Caribbean and, while uninhabited, theoretically easy to reach. However, they are all either designated nature sanctuaries or off limits for other reasons (which are understood to include security issues related to drug running). I would expect Peter 1 Island to be on someone's target list for an expedition in the not-too-distant future, possibly even Bouvet or Heard Island too, while Sudan has already been heavily activated. Mt Athos does, of course, have a resident amateur, but just the one, while Crozet and Marion Islands are usually only active when one of the weather station personnel, from France and South Africa respectively, happens to be an amateur.

AWARDS

Award Georgia is for working stations in Georgia (4L). European amateurs need five QSOs to qualify (or just two if on digital modes). Contacts can have been made any time since 1/1/94. The charge is $10. Send a certified log extract and fee to G Bonisch, Breite Strase 12B, 16727 Velten, Germany. Further details if required from Shalva Beridze, 4L1BR, 4l1br@mailcity.com

The San Marino Castles Award is for working at least four stations in San Marino. The wording of the press release I received is a little ambiguous but it appears that each should be in a different Castle (equivalent to UK counties, nine in all) with contacts with T70A or T7IARU counting as a 'joker', usable once only. Contacts should be made since 1/1/01. Send a certified log extract plus the fee of 8 Euros, $8 or 15 IRCs to Diploma of San Marino Castles Award Manager, PO Box 77, 47890 San Marino City, Republic of San Marino. Endorsements are available for additional QSOs.

COUNTRIES WORKED, 2003

(sorted this month by SSB totals)

CALL	CW	SSB	DATA	MIXED
M3CLY	0	138	0	138
G3XTT	168	122	87	190
M3RDX	0	122	68	140
G4WXZ	90	110	0	153
M0AWX	0	107	0	107
M0CNP	5	104	36	112
GU4YOX	102	93	0	139
G0GFQ	0	88	0	88
G3YVH	129	87	0	158
ZC4DW	85	71	74	116
G4YWY/M	0	69	0	69
GI0NQC	0	52	56	81
G0LGJ/M	0	52	0	52
M5AEF (1W)	27	50	0	58
M3FSI	0	50	0	50
G4FVK	29	49	0	59
MU0FAL	67	46	0	79
ZC4VG	75	35	3	75
MM0BQI	14	12	72	78
G3LHJ	76	11	58	105
G4DDL	21	4	1	23
G4OBK	85	3	39	94
G4ZPL	0	2	61	62
G0NXX	172	0	0	172
G4KFT	147	0	0	147
G3VDL	131	0	0	131
G0ARF	0	0	110	110
G3YMC (QRP)	105	0	0	105
GU0SUP	0	0	98	98
G0URR	0	0	75	75
GW4ALG (QRP)	39	0	0	39

I actually receive details of quite a lot of awards, but it's always hard to know what to include here. Many seem to be created for the sole purpose of publicising a local radio club or, dare I say it, raising a few dollars for club funds. It's sometimes hard to judge which ones are really worth pursuing, and from time to time I get feedback from readers that they have sent off for an award some months ago and nothing has been forthcoming. This latter situation is often the result of a club changing its committee and the new Awards Manager not doing his job as effectively as his predecessor. To that extent, it's probably best to restrict your award collecting to those awards issued by well-known organisations (like *CQ* Magazine) or IARU National Societies. But it's certainly nice to have a few attractive certificates on the shack wall to impress family and friends! By far the best web site for awards information is that run by K1BV, though you will need to subscribe to gain full access.

CONTESTS

With the redesign of *RadCom*, the editor has quite reasonably decided that the time has come to bring all contest information, both UK and international into the one location, in Tim Kirby's 'Contest' column. I have passed on to Tim any international contest results I had outstanding (including WPX CW 2002) and no doubt he will squeeze them in as space permits. I want to thank Les, G4OGB, and others for keeping me posted with UK results from overseas contests over the past few years.

CORRESPONDENCE AND TABLES

Ian, M3RDX, reports, among others, contacts with VA7VR and VA7XX who both gave him 53 reports while he was running just 500 milliwatts! Using his FT-817 on 'high' power (ie 5 watts!) he made it with R1ANF (Antarctica), DU9/G4UNL (Philippines) etc, all this despite the distraction of the recent birth of his son. A warm welcome to John, G3VDL, who is running a classic station, including a homebrew transmitter with 807 PA (that's a venerable transmitting valve, for the youngsters among you!) running about 60 watts and an Eddystone 888A receiver, a model which I recall lusting after as a newly-licensed teenager. Robin, M0AEF, continues to get some excellent results with his 1 watt. Recent contacts include JY9NX (Jordan) on CW and 9Y/IV3IYH/P (Trinidad and Tobago) on SSB. The trick seems to be getting there before the European pile-up gets too large, which often happens when the DX station concerned gets spotted on the *PacketCluster* system. Finally, welcome to yet another M3 participant, John, M3CLY, who starts the year with an excellent score, all SSB.

THANKS

Special thanks go to the authors of the following for information extracted: *OPDX Bulletin* (KB8NW), *The Daily DX* (W3UR) and *425 DX News* (I1JQJ). Please send items for the **July** issue by **17 May.** ◆

WEB SEARCH

4z4dx	www.qsl.net/4z4dx
K1BV Awards Page	www.dxawards.com
K6AA/P	www.k6aa.org
Mexiana Island expedition	www.mexianaisland2003.hpg.ig.com.br
RSGB IOTA Pages	http://www.rsgbiota.org/dx.htm

QTH Corner

A35WE	Janusz Wegrzyn, SP9FIH, PO Box 480, 44-100 Gliwice, Poland.
A35XM	Reinhard Mueller, DL8YRM, Froebelstr 14, D-04567 Kitzscher, Germany.
F8DQL	Jean-Baptiste Jacquemard, 241 Boulevard Voltaire, F-75011 Paris, France.
HQ8V	Cesar Pio Santos Andino, HR2CPS, PO Box 747, 21105 San Pedro Sula, Cortes, Honduras.
J5UDX/J5UCW	Simone Candotto, IV3NVN, PO Box 4, 33050 Castions di Strada UD, Italy.
ST0RY	Chris Sauvageot, DL5NAM, Guttenburg 19, D-91322 Graefenberg, Germany.
ST2CF	Claudio Fabbro, IV3OWC, Via Casale Coloset 3, 33030 Moruzzo UD, Italy.
V60A	Gasperin Giuseppe De, I2YDX, Via Trento, 21020 Brebbia VA, Italy.
V60Z	Roberto Zanchin, IK2WXZ, Via Case Nuove 3, 21020 Brebbia VA, Italy.
XF2IH	Enrique Garcia Munive, XE1IH, PO Box 118-481, 07051 Mexico - DF, Mexico.
YE8A	Prof Dr Ramli Rahim, YB8BRI, Komp Unhas Tamalanrea K-7 (PO Box 73 Tr), Makassar 90245, Indonesia.

HF F-Layer Propagation Predictions for May 2003

Time	7.0MHz 000011111220	10.1MHz 000011111220	14.0MHz 000011111220	18.1MHz 000011111220	21.0MHz 000011111220	24.9MHz 000011111220	28.0MHz 000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	861. . . . 13889	874222336888	3676766788 74	467898889876	256777778753	. . . . .	. . . . .
*** Asia							
Yakutsk	. . . . .	5321 .112 5677	777666777888	23677776 4353	. . 356653 2 . 2 .	. . 23 4432	. . . 2222. . . . .
Tokyo	. . . . . 5 . .	. . . . . 37. .	. . . . . 13 471 .	. . . . .233 36 . .	. . . . . 222 . 3. .	. . . . 3332 . 3 . .	. . . . .
Singapore	. . . . . 155 .	 6771	. . . . . 3 7862	. . . . . 26875 .	. . . . 125 762 .	. . . . . 12464 . .	. . . . . 23 . . .
Hyderabad	 123	1. 2677	5. . . . . 3 7887	3552126 8 8885	. 2655578886 .	. . 567678 77 . .	. . 3555565 . . .
Tel Aviv	881 5888	8872 . . 25 8999	9377667788 79	3.3327735485	. . . 2288. 326 .	2 . . . 277. 32 . .	. . . . . 66 . . . . .
*** Oceania							
Wellington	. . . . .	. . . . . 1. . .	. . . . . 121 2 . . .	. . . . .	. . . . .	. . . . .	. . . . .
Perth	 1321	 3313	. . . . . 11. 2	 4	. . . . .	. . 2242	. . 223 . . . . .
Sydney	. . . . . 24. .	. . . . . 55..	. . . . . 1 321.	. . . . . 1233 . 3 .	. . . . 1. . . . 2.	. . 233	. . . 2. . . . .
Honolulu	. . . . .	. . 1	. . 22 21.	. . . 22	. . . . .	. . . . .	. . . . .
W. Samoa	. . . . .	. . . . .	. . 12 221.	. . . 2222	. . . . 222.	. . . . .	. . . . .
*** Africa							
Mauritius	3 355	2 3665	 6762	. . . . . 3663 .	. . . . . 353 . .	. . . . . 3 3 . . .	. . . . . 1 . . . .
Johannesburg	88. 7999	36 8988	. . 2. . . . 2 9863	. . 41 . . 14 73 . .	. . 42 21266 . . .	. . 77 6778 7. . .	. . 566777 3 . . .
Ibadan	45. 334	885 1778	8785 2114 6888	559887789987	339767888965	. . 876677 8 . . .	. . 8655667 . . .
Nairobi	2 111	53 234	761. 2467	67511 . 13 6788	2365433 67886	. . 567677 7 . . .	. . 2257788 . . .
Canary Isles	887. 2888	88741 . . 26788	8887445 68888	65788888 9997	3258888888975	. . . 3 3345	. . . 2 . . 224 . . .
*** S. America							
Buenos Aires	887. 38	788 67	667. 277	767. 1. . . 2888	325. 1222 4887	. . . . . 223 5 7. .	. . . . . 2224 . . .
Rio de Janeiro	561. 46	673 367	652. 676	763. 3111 4998	43. . 5333 6987	. . . . 4344 68 . .	. . . . 33336 . . .
Lima	542 3	545 25	2242 45	4367 21. . 1487	. . 26. 211 2575	. . . 3 . 211 25 . .	. . . . . 2 . . .
Caracas	11. 2	222 23	4452 44	.. 25 31. . . 255	. . . 242222 451	. . . 23233 46 . .	. . . . . 2 . 2 . . .
*** N. America							
Guatemala	22	221 2	1.11 1	 11	. . . . .	. . . . .	. . . . .
New Orleans	21	221 1	2.2 12	222. . 666 6675	 3577753	. . . . . 234 5 . . .	. . . . . 22 3 . . .
Washington	431. 2	7762 15	7442 4111 1267	21. . 3634 6676	. . . . 3. . 7763	. . . . . 2 . . .	. . . . .
Quebec	882 38	663 146	. . . 4 2 .12 2454	2.234345 6754	. . . 222333532	. . . . 2 . 23 3 . . .	. . . . .
Anchorage	. . . . .	1	1.22 2.11 2133	2.22 . . 23 4463	. . . . . 2223 .	. . . . .	. . . . .
Vancouver	. . . . .	. . . . .	. . 1	. . 2 . . . 2 2452	. . . . . 2 .	. . . . .	. . . . .
San Francisco	.1	.1	. . . . .	 222	. . . . .	. . . . .	. . . . .

Key: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 29% 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 the signal is expected to be strong.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated monthly. The provisional mean sunspot number for March 2003 issued by the Sunspot Data Centre, Brussels, was 61.5. The maximum daily sunspot number was 112 on 29 March and the minimum was 8 on 22 March. The predicted smoothed sunspot numbers for May, June and July are respectively: (SIDC classical method – Waldmeier's standard) 70, 67, 65 (combined method) 68, 66, 64.

By Roger Balister, G3KMA, La Quinta, Mimbridge, Chobham, Woking, Surrey GU24 8AR. E-mail: g3kma@dial.pipex.com

IOTA

Right: Typical transport and accommodation for an IOTA DXpeditioner on some of the remoter Pacific islands: photos from the Rev Bill Burton, T88BA (G4CWA), on his visit to Hatohobei (Tobi) Island, OC-248, target for another trip in late April.

The last 12 months have seen activity from 22 new IOTA groups, including five in the period under review. With the prospect of another three or four groups hitting the airwaves by the time you read this, the momentum created by the major list revision of year 2000 seems set to continue. The time will surely come within a few years when the only unnumbered groups left will be prohibitively expensive to reach, extremely difficult to land and survive on, or impossible to operate from for licensing, environmental or security reasons.

More than ever before, intending DXpeditioners should not dismiss the idea of reactivating rare and semi-rare numbered groups. Nor should we, as island chasers, think less of these operations. They invariably put the organisers to just as much cost, effort and paperwork as that which accompanies the putting on of a 'new one'. While not attracting the same cachet, a second operation often provides more contacts than the initial operation. And yes, it's uncanny sometimes how working it seems easier.

ACTIVITY ON THE BANDS

Last time we mentioned the current activity by Bernhard, DL2GAC, operating as P29VMS from the remoter PNG islands. As expected, after the operation from the Tulun Islands (OC-256) he moved on in late January to the Nuguria Islands (OC-257) for a few days. Just when we thought that he would be satisfied this trip with giving out two new ones, he slipped in a third in mid-February with an operation from Muschu Island in PNG's Coastal Islands North group (OC-258). Although Bernhard's signal was not always very strong, it was workable here in the UK including by long path on 20 metres around 0800UTC. QSLs to DL2GAC.

Mid-March saw another new one when, somewhat unexpectedly, Simone, IV3NVN, took the opportunity of a visit to Guinea-Bissau to slip across to Pecixe Island in Guinea-Bissau's Coastal region group (AF-093) to activate J5UCW. QSLs to IV3NVN. Then, just as this was being written, two further new ones came up. A team from the Radio Club of Honduras operated HQ8V briefly from Cayos Vivorillos in the Gracias a Dios Department group (NA-223). QSLs to Cesar Pio Santos A, HR2CPS, PO Box 747, Zip 21105, San Pedro Sula, Cortes, Honduras. Then, as scheduled, Enrique, XE1IH, and a group of Mexican amateurs hit the bands with XF2IH from Enmedio Island in the Veracruz State South group (NA-224). QSL to XE1IH, Enrique García Munive, PO Box 118-481, 07051 México, DF, Mexico.

VALIDATION

Enquiries continue to be received from DXpeditioners about the need to provide validation (supporting paperwork) to ensure their operations will be accepted for IOTA credit. If you plan to operate from a currently unnumbered group or from a 'rare' numbered group (defined as one that is credited to less than 10% of members on the central IOTA database), you will need to provide supporting paperwork in the form of evidence of presence on the island, and copies of any permits required and of the licence if a special callsign is used. Validation may also be required in the case of operations where it is known that licensing or operating/ landing permission is required.

You can check whether or not the group is unnumbered by referring to the *IOTA Directory – 11th Edition* [available from RSGB Sales – *Ed*], updated by the list alongside. And as regards 'rare' IOTA groups, you can obtain a listing of these also from the *IOTA Directory* (Annex K, 'Most Wanted IOTA groups') or from the IOTA Manager's website. Later available data shows that no numbered EU IOTAs fall into the 'rare' category. So, in the case of operations from any European group, you can take it that we do not normally need to see supporting documentation. This does not mean that you can dispense with getting permits and proof of presence, since you may be asked for them should there be a challenge. Don't be surprised, such challenges do occur!

For operations outside Europe, check the Most Wanted listing if you suspect that the IOTA group might be sufficiently rare to require validation – the vast majority of IOTAs are not –and send validation only where it is shown as required or is requested by us. Please do not send a wodge of paperwork 'just in case it's needed'. We are running out of storage space… and we frankly do not have the time to check more cases than the rules require! ◆

IOTA REFERENCES ISSUED SINCE PUBLICATION OF IOTA DIRECTORY – 11TH EDITION

AF-092	3V	Sousse / Monastir / Mahdia Region group
AF-093/Pr	J5	Guinea-Bissau Coastal Region group
AS-162	3W	South China Sea Coast North group
AS-163	R0Q	Laptev Sea Coast East group
AS-164	R0Q	East Siberian Sea Coast West group
AS-165	XZ	Arakan Region group
AS-166	EP	Hormozgan Province group
NA-222	KL	Southern Alaska Peninsula West group
NA-223/Pr	HR	Gracias a Dios Department group
NA-224/Pr	XE1	Veracruz State South group
OC-249	YB8	Aru Islands
OC-250	YB3	Masalembu Islands
OC-251	VK3	Victoria State West group
OC-252	YB7	Kalimantan's Coastal Islands West
OC-253	V63	Hall Islands
OC-254	V63	Mortlock Islands
OC-255	VK4	Queensland State (Gulf of Carpentaria) North group
OC-256/Pr	P2	Kilinailau (Tulun) Islands
OC-257/Pr	P2	Nuguria Islands
OC-258/Pr	P2	Papua New Guinea's Coastal Islands North
SA-092	PZ	Suriname group
SA-093	HK4	Choco Division North / Antioquia Division group

Pr = PROVISIONAL

WEB SEARCH

RSGB IOTA Programme	http://www.rsgbiota.org
IOTA Manager's website	http://www.eo19.dial.pipex.com/index.shtml
IOTA Contest rules	http://www.rsgbhfcc.org

RSGB IOTA PROGRAMME, PO BOX 9, POTTERS BAR, HERTS EN6 3RH; E-MAIL: IOTA.HQ@RSGB.ORG.UK

By Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ. E-mail: brs32525@compuserve.com

SWL

The 2003 edition of the World Radio Television Handbook (WRTH) has now been published. The 57th edition has undergone much updating in both the national and international sections and has many receiver reviews. WRTH 2003 also includes articles on the future of digital radio and the politics of broadcasting. Although of greatest benefit to broadcast listeners, the World Radio Television Handbook is an extremely useful source of reference. This edition has listings of hour-by-hour broadcasts in Portuguese as well as French, German and Spanish, and the reference section includes standard time and frequency transmissions, Internet resources and broadcast programmes for DXers and short wave listeners.

CQ160 SSB CONTEST

With no SWL section this year because of the previous lack of support, David Whitaker, BRS25429, still spent a large chunk of his listening time on the band. He was rewarded with some excellent conditions considering the stage of the sunspot cycle. He monitored the first seven hours of the contest "absolutely enthralled". He heard 46 DXCC entities in those seven hours. Best DX was D4B who was audible for most of the time. He even had time for a 'ragchew' with CN2R: both stations were received at 59 at David's station. Other DX heard included 5B4, EA8, V47, KP2, KP4 and XE. About 50 stations from USA and Canada were also heard. David's best DX from that direction was K0HA in Nebraska.

ARRL SSB CONTEST

A further report from David, this time noting his low-band achievements during this contest. David did not bother with the higher bands as they were so poor! He monitored the low bands from 0430 to 0800UTC on both days and came away with the following:

7MHz: 9Y4TBG, 8P2K, WP2Z, JY9NX, CN2R, D4B, VP5B, YV5OHW, TO1A, WP3R, PJ2T, KH7X, HU1A, 8P1A, V47KP, V31JP, ZF2DQ, 9Y4VU, OA4O, ZX3S, LU2FA, J88DR, NK7U (Oregon), FY5KE.

3.8MHz: FM5GU, HU1A, PJ2T, CN2R, V47KP, 8P1A, ZF2DQ, 9Y4TBG, FY5KE, J88DR, D4B, TO1A, V31QQ, WP3R, YV3AZC, CO8ZZ, VP5B, OA4O, YV5FSM, WP3R, TI8/K4UN, 6D2YFM.

1.8MHz: HU1A, FY5KE, V47KP, VP5B, D4B, EA8AH, VE1ZJ, VY2ZM, VE3PY, CN2R.

SWL CARD COLLECTION

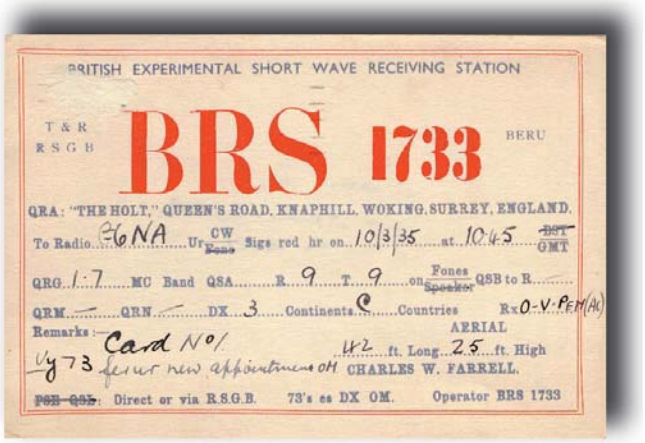
Peter DeStoop, ONL5923, updated the situation regarding his quest for SWL QSL cards. Thanks mainly to Tony, G4UZN, and The QSL Collection [1], Peter now has over 5000 SWL cards. The oldest dates back to 1923 and there are 50 DXCC entities represented – some of the cards are from SWLs in YK, LU, ZS, 4X, 9H and VK. Thanks to his friend ON1AYH, he has them all catalogued and available electronically.

THE BANDS

Robert Small, BRS8841, provides the news this time around. He felt that radio-wise the month went very quickly as not a great deal found its way into his log, and there were no new countries to report. He did, however, get his IOTA update score confirmed as 948, and had since logged a few more references for new ones. He received a few interesting QSLs – in particular, 5B4/UA9MA on 1.8MHz, 9M6NA on 3.5MHz CW, PJ7/ND5S on 7MHz CW, and C56/G4IRN – who says he likes to send SWL cards back direct as he used to be an SWL himself!

Robert had logged some interesting DX on 10MHz, including HH6/DL6CM, XT2SX and 9N7YJ, while 18MHz had produced D88S (South Shetland Islands) and J3/DJ7RJ. His best band this time was, perhaps surprisingly, 24MHz, where he found XW6KM, 5H9IR, 9Y4/DL6LAI, VQ6DT, S07V, and 5X1DC.

Robert considered that the HF bands were starting to stay open longer in early March, and with the sun reaching the equator later in March was confident of a better April – we will see!



Below, left: SWL card from BRS1733 dated 1935 from Peter DeStoop's, ONL5923, SWL QSL collection.

GB QSLs – AGAIN!

This topic looks set to run and run! This month, I heard from Peter Cain, BRS36554, a respected SWL for many years, but one who is dissatisfied with one aspect of the hobby – the apparent lack of interest shown to SWLs who send reports to special event stations. Not just a lack of interest in reports, but of more concern was the fact that he had applied for several British awards available to SWLs but had received only one – the GB50 Jubilee Award.

It seems that a number of special event stations do not QSL. If that is the case, perhaps the stations should announce that during QSOs? A large number of listeners have written to me on the subject of GB stations since last summer. I hope that this year's crop of 'specials' play the game. If the event is worthy of a special callsign, surely it is worthy of a QSL card (and to SWLs, too)?

Peter had also forwarded a number of QSL cards from YC9BU (OC-210 and OC-241) to a number of British amateurs. He hopes they were all received safely.

AND NOW, ANOTHER VIEW!

David Ansell, RS184720, says that he sends QSL cards giving reception reports to UK stations if they are 200 or more miles from his QTH in Sussex. He also sends cards to QRP, /M or /P stations and special event stations. David hand writes all his cards using picture postcards of Horsham, Sussex. He does *not* use the bureau – every card is sent direct with an SASE, and he reports an almost 100% response. [Several useful tips there – *Ed*]. ◆

WEB SEARCH

The QSL Collection www.qsl.at

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RadioSport NEWS

Goodbye Picketts Lock, Hello Stevenage

EXPANDING HORIZONS

Now that the future of the London Show is certain to be outside of metropolitan London, it is appropriate to change its name. Look out for the new name, you'll be seeing more of it.

The RadioSport
Communication & Computer Show

EASY TO GET TO, EASY TO PARK AT

Stevenage Leisure Centre is a very easy place to get to from practically anywhere in Britain. It is less than two miles from the A1M (junctions 7 and 8) and surrounded by acres of secure car parks (for which a small charge is levied by the local council). See the web site closer to the date for detailed parking arrangements. By train it is probably the easiest event to get to - ever! Stevenage mainline station is linked to the venue by footbridge. From the north, most trains on the GNER line call at Stevenage. From the south, WAGN trains from Kings Cross call at Stevenage. Full travel details can be seen on www.radiosport.co.uk

The venue has all the facilities you would expect. The two large halls are brightly-lit, there is a bar, a good sized catering outlet, facilities for the disabled and a passenger lift.

WHO AND WHAT YOU'LL SEE

With an exhibitor list including the RSGB, the Radiocommunications Agency, Waters & Stanton, Martin Lynch & Sons, Linear Amp UK, UBM, W H Westlake, Sycom, Sandpiper, Rigs of Distinction, Moonraker, bhi, Radio Swap, Timestep and Taurus, you'll find no shortage of stands to see. There'll also be computer hardware, software and consumables, a host of Special Interest Groups (the WAB Award Group's AGM takes place on Sunday) and Southgate ARC's Bring & Buy.

WHEN IS IT?

On Saturday 31 May and Sunday 1 June. What's more, for all you early birds who want to grab an early bargain, we're opening the doors at 9am on the Saturday! On Sunday the doors open at 10am, but we'll be admitting disabled visitors a little earlier each day.


Stevenage station, as seen from the venue. Close, isn't it.

Admission £3.00

Presented by RadioSport Ltd, 126 Mount Pleasant Lane, Bricket Wood, Herts AL2 3XD. Web: www.radiosport.co.uk Tel: 01923 893929 Fax: 01923 678770

CONTEST

This month we have so many results to publish that there is very little space for any editorial comment. Thanks, though, to Don, G3XTT who was kind enough to forward some very encouraging feedback on the activity created by Foundation Licensees during contests, which appeared on the *CQ* Contest reflector from Stu, KC1F: "I was impressed, during the recent ARRL Phone DX Contest, by the number of UK Foundation Licence holders, with their 10-watt limit, and by the relatively good operating style most of them practised. I think this is a really good thing. We work bunches of these guys from New England. I think they are able to pick their callsigns, which M3RAY confirmed for me. Some of them do seem a little unclear about only working us once per band, but what the heck…"

What encouraging feedback! If you're a Foundation Licensee and you've been on during the ARRL contests, well done! Just to pick up on Stu's comment about "working us once per band", remember that you should only work any station once per band (and if it's a multimode contest, per mode). So, if you work VE3EJ on 14MHz SSB, don't work the station again on the same band, but of course it's fine to call VE3EJ again on 21MHz SSB or even 14MHz CW, if it is a multimode contest.

CONTESTS THIS MONTH

The VHF contesting season starts in earnest this month, especially for those who enjoy going portable. 3/4 May sees the 432MHz–248GHz event with both the 432MHz and 10GHz Trophies running concurrently with this event. A great opportunity to try out the microwave gear that you've built over the winter and make some interesting contacts. 11 May brings the 70MHz CW and then on 17/18 May there's the May 144MHz contest with the first of the ever-popular 144MHz Backpackers events on 18 May.

On HF, the main event is the *CQ* WW WPX CW contest held on 24/25 May. Modest stations can fare well in this contest with many multipliers within easy reach in Europe and the USA. The CQ-M DX Contest is held on the 10/11 May which often brings a good amount of activity, particularly from Russia and the former Soviet bloc. The contest is unique in that I note it has a section for WWII veterans! More conventionally, there are single and multi-operator categories – which include multi-mode categories. ◆

PHOTO: MM0AOT

The MM0CPS/P 40m Zepp at sunset in the 2002 SSB Field Day.

CONTEST CALENDAR

HF CONTESTS

Date	Time	Mode	Contest	Bands	Exchange
3-4 May	*2000-2000*	*ALL*	*ARI International*	*1.8 – 28*	*RST + SN*
10-11 May	*2100-2100*	*ALL*	*CQ-M International*	*1.8 – 28*	*RST +SN*
24-25 May	*0000-2359*	*CW*	*CQ WW WPX*	*1.8 – 28*	*RST + SN*

VHF CONTESTS

Date	Time	Mode	Contest	Bands	Exchange
3–4 May	1400-1400	ALL	RSGB 432MHz–248GHz	432-24G	RST+SN+Locator
3 May	1400-2200	ALL	RSGB 10GHz trophy	10G	RST+SN+Locator
3 May	1400-2200	ALL	RSGB 432MHz trophy	432	RST+SN+Locator
6 May	2000-2230 Local	ALL	RSGB 144MHz Activity	144	RST+SN+Locator
11 May	0900-1200	ALL	RSGB 70MHz CW	70	RST+SN+Locator+Postal Dist
13 May	2000-2230 Local	ALL	RSGB 432MHz Activity	432	RST+SN+Locator
17–18 May	1400-1400	ALL	RSGB 144MHz	144	RST+SN+Locator+Postal Dist
18 May	1100-1500	ALL	RSGB 144MHz Backpackers # 1	144	RST+SN+Locator+Postal Dist
20 May	2000-2230 Local	ALL	RSGB 1.3 - 24GHz Activity	1.3 –24G	RST+SN+Locator
27 May	2000-2230 Local	ALL	RSGB 50MHz Activity	50	RST+SN+Locator

MICROWAVE CONTESTS

Date	Time	Mode	Contest	Bands	Exchange
25 May	0900-2100	ALL	1st 5.7/10GHz Cumulative	5.7/10G	RST+SN+Locator

The full rules of RSGB HF, VHF/UHF and Microwave contests were published in the 'RSGB Contesting Guide' in January 2003 *RadCom*. Brief rules for non-RSGB contests, which are listed in italics above, can often be found in the 'HF' and 'VHF/UHF' columns. The HF and VHF Contest Committees both have websites from which comprehensive details are available. These are www.rsgbhfcc.org and www.blacksheep.org/vhfcc RSGB Microwave Contest rules can be found on the Internet at: http://www.g3pho.free-online.co.uk/microwaves/calendar2003.html

1st 70MHz, 2002

SINGLE OPERATOR FIXED (SF)

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km	Power	Ant
1 *	G4OBK	IO94OF	38	8943	G6EED/P	392	75	5 ele
2 *	G3MEH	IO91QS	50	6514	G3JYP	334	160	2*5 ele
3	G3TCU	IO91QE	40	6298	G3JYP	395	150	6 ele
4	G0DDQ	IO91NQ	39	5414	G0HYP	366	100	5 ele
5	G4DEZ	JO03AE	26	4576	G6EED/P	324	150	5 ele
6	G3JYP	IO84SN	18	4291	G4RFR	423	10	8 ele quagi
7	G3LVP	IO81WV	30	3800	G4CAY	308	150	7 ele LPY
8	G3XPU	IO92HM	31	3416	GD0EMG	282	50	3ele
9 *	G3HYH	IO92JO	23	2949	G6EED/P	220	25	dipole
10	G0GCI	JO01ED	15	2726	G4BWW/P	337	100	7 ele
11	G1KHX	IO81MI	18	2486	G4OBK	351	90	5 ele
12	G0UPU	IO91AX	17	1982	G6EED/P	134	50	5 ele

SINGLE OPERATOR OPEN (SO)

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Km	Power	Ant
1 *	M0AFC/P	IO84SA	43	8654	G4JXK	343	20	5 ele
2 *	GW8ASA/P	IO81FP	36	4818	G4BWW/P	228	80	3 ele
3	G4BWW/P	IO83RO	27	4720	G0GCI	337	12	3ele
4	G4XRV/P	IO91QT	26	3246	GD0EMG	374	10	5ele
5	G0WJR/P	IO83SO	19	2399	M0YYY/P	227	15	2 ele
6	G4WVD/P	IO70NL	6	975	M0YYY/P	217	25	3 ele

MULTI OPERATOR (M)

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Km	Power	Ant
1 *	GD0EMG	IO74QD	62	19205	S51DI	1673	160	2*8 ele
2 *	G0VHF/P	JO01GN	46	8112	G8FWE	447	120	8 ele
3	GW5NF/P	IO81KR	44	6634	G3XDY	300	80	5 ele
4	G4RFR	IO90AS	36	5385	G4CAY	432	100	24 ele

70MHz CW, 2002

Activity for this event was far higher than in 2001 with twice the number of entries received. In all, 25 stations in G, GW and EI were active. Six stations in Slovenia conducted their own parallel event, but the lack of Sporadic E or meteor scatter prevented any contacts with the UK. Conditions were rated as average to poor with deep QSB. The conditions caused a number of logging errors and a number of entrants will see large reductions in their scores due to lost multipliers. Equipment used was generally standard but G4ENA enjoyed the event using a 30cm magnetic loop antenna.

This year sees a new winner with Phil, G3TCU, demoting Martin, G3UKV, into second place. Rupert, G4XRV, provided some welcome portable activity and won the open section. Congratulations and certificates go to these entrants together with G3HYH as the highest placed low power fixed station.

Roger Dixon, G4BVY

SINGLE OPERATOR FIXED (SF)

Pos	Callsign	Locator	QSOs	Score	Multiplier	Total	ODX Call	ODX Loc	ODX	km	Power	Ant
1 *	G3TCU	IO91QE	18	2792	16	44672	G3JYP	IO84SN	395	150	6	ele
2 *	G3UKV	IO82RR	15	2433	15	36495	EI3IO	IO63WF	246	100	5	ele
3	G3MEH	IO91QS	15	2025	14	28350	EI3IO	IO63WF	406	120	2*5	ele
4	GW3HWR	IO71XN	12	1846	11	20306	EI3IO	IO63WF	233	150	5	ele
5	G3NKS	IO81XU	13	1535	13	19955	EI3IO	IO63WF	316	100	6	ele
6	G3JYP	IO84SN	7	2193	6	13158	G3TCU	IO91QE	395	10	8	ele quagi
7	G4OBK	IO94OF	8	1668	6	10008	G4ENA	IO81VR	294	75	5	ele
8	G4ENA	IO81VR	11	1024	8	8192	G4OBK	IO94OF	294	50	30cms	magnetic loop
9 *	G3HYH	IO92JO	9	572	7	4004	G3LVP	IO81WV	100	25	dipole	
10	G0UPU	IO91AX	5	496	4	1984	G3JYP	IO84SN	289	50	5	ele
11	S52SK	JN76XI	6	307	1	307	S59F	JN65TX	184			

SINGLE OPERATOR OPEN (SO)

Pos	Callsign	Locator	QSOs	Score	Multiplier	Total	ODX Call	ODX Loc	ODX	km	Power	Ant
1 *	G4XRV/P	IO91RU	15	1626	13	21138	G3JYP	IO84SN	328	10	5	ele

By Tim Kirby, 11a Vansittart Road, Windsor SL4 5BZ. E-mail: tim@g4vxe.com

1st 50MHz, 2002

The DX was plentiful for the leading stations in this contest. QSOs with South Africa (ZS) were almost routine during the extensive Sporadic E openings that for once coincided with a contest. However, you had to be in the right part of the country to benefit from the openings: stations in the east of the UK generally missed out on the more distant DX.

Some stations appeared to find it difficult to copy QSO information accurately during this contest and many points were lost due to logging errors. However, four stations managed to turn in perfect logs: congratulations.

The DX PacketCluster was used by several of the competitors to help locate DX stations. This is allowed under the contest rules. However, what is not allowed during the contest is any active use of the DX cluster (ie spotting, talk messages, announcements etc) by the entrant or any close associate. There is evidence that during this contest a few entrants were actively using the DX cluster to confirm QSO details: action has been taken against these stations!

Congratulations to Daniel Lee, MW1MFY, for winning the Single Operator (Fixed) station section. Congratulations to Tim Boon, M0AFC, for winning the Single Operator (Others) section. Finally, congratulations to the Northern Lights Contest Group for winning the Multi-operator section.

Ian Pawson ,G0FCT

MULTI OPERATOR

Pos	Group	Callsign	Locator	QTH	QSOs	Score	Multiplier	Total	ODX Call	ODX km	Power	Ant	Equipment
1*	Northern Lights CG	GD0EMG	IO74QD	IM	180	134595	109	14670855	ZS6Y	9458	400	2x7el	FT650
2*		G0RMG/P	IO91EX	OX	112	68194	72	4909968	ZS6Y	9151	400	5el	IC746
3	Colchester CG	G0VHF/P	JO01GN	SS	106	18312	74	1355088	EH6VQ	1344	300	8el	FT847
4	Avon Valley ARA	M0RAD	IO92AC	WR	63	16260	55	894300	ZS6WB	9154	100	7el	TS2000
5	G4TSW Radio Club	G4TSW	IO80FV	EX	71	13424	61	818864	EH6VQ	1348	100	5el	IC746
6	Take Flight	M5AHQ/P	IO80WP	BH	70	11348	64	726272	GD0EMG	424	100	5el	FT847
7	Herstmonceux Megacycles CG	G3YNN	JO00EU	BN	78	10912	62	676544	F6CHT	421	400	5el	IC736
8	SDARC	G8SRC/P	IO91CL	SN	62	8435	53	447055	IS0GQX	1599	120	5el	FT736
9	Newquay & DARS	G4ADV	IO70LK	TR	20	2807	22	61754	M0CTP	488	100	4el	DX-70
10	Salop CG	M5WJF	IO82OR	SY	28	1879	25	46975	G1YLE	281	100	2el	FT847

SINGLE OP FIXED

Pos	Group	Callsign	Locator	QTH	QSOs	Score	Multiplier	Total	ODX Call	ODX km	Power	Ant	Equipment
1*		MW1MFY	IO81FL	CF	93	48403	80	3872240	ZS6WB	9144	400	5el	IC706
2*		G4DEZ	JO03AE	PE	80	18008	65	1170520	EH6VQ	1528	400	7el	FT847
3		G6FQZ	IO91JR	OX	68	17825	60	1069500	ZS6WB	9093	150	5el	FT736
4		G8ZRE	IO83NE	CH	30	15046	37	556702	ZS6WB	9289	10	5el	FT690
5		G0ODQ	IO91NQ	OX	41	4454	44	195976	GD0EMG	371	10	5el	FT736
6		G0GCI	JO01ED	TN	30	3021	33	99693	GD0EMG	474	100	4el	IC729
7		G1KHX	IO81MI	BS	21	3074	31	95294	GD0EMG	330	90	5el	FT101ZD/FTV901
8		G3FIJ	JO01KV	CO	19	2994	28	83832	GD0EMG	445	15	4el	FT847
9		M1SIN	IO83QE	CW	26	1919	23	44137	MW1MFY	200	100	7el	FT100D
10		G1WAC	IO92BJ	BM	10	970	15	14550	GD0EMG	267	10	5el	FT736
11		G7RAU	IO90IR	PO	7	844	14	11816	MW1MFY	178	2	indoor	FT757+Mutek

SINGLE OP OTHERS

Pos	Group	Callsign	Locator	QTH	QSOs	Score	Multiplier	Total	ODX Call	ODX km	Power	Ant	Equipment
1*		M0AFC/P	IO84SA	LA	79	24882	61	1517802	ZS6WB	9359	25	5el	FT847
2*		M0BAO/P	IO80LV	TA	34	3938	29	114202	GD0EMG	377	100	4el	IC706
3		G0WJR/P	IO81PH	BS	15	1631	20	32620	GD0EMG	340	5	dipole	FT817

1st 144MHz Backpackers, 2002

After the cancellation of all but the last of the 2001 Backpackers events most entrants commented that it was good to be out portable again. The standard of logging was generally good with three entrants not losing a single point. However, more than half the competitors lost over 7.5% of their score due to logging errors. The most common cause of error was incorrect recording of locator with errors in the report and/or serial number a close second. Some callsign errors were also found.

One final point, please check the rules carefully before setting out to operate in the contest. One competitor managed to get the start time of the contest wrong by one hour and consequently lost the points from several QSOs.

Congratulations to Tim Boon, M0AFC, for winning the 10W Single Operator section by a very large margin. Congratulations to Neill Taylor, G4HLX, for winning the 3W Single Operator section. The 10W multi-operator section was won by the One Man and His Dog contest group, G8NWM/P. The 3W multi-operator section was won by GW5NF/P. Congratulations to both multi-operator section winners. All winners and runners-up will receive certificates. Thank you to G4APJ for his checklog.

Ian Pawson, G0FCT

10W MULTI-OPERATOR

Pos	Group	Callsign	Locator	PC	QSO	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1	One Man and His Dog CG	G8NWM/P	IO92TR	PE	49	9623	59	567757	F4AZF	652	10	2x10el	FT736R
2	Wigan Douglas Valley ARS	G3BPK/P	IO83PN	WN	56	9066	56	507696	ON4ZN	561	10	11el	IC706
3	Barpackers Contest Group	M1BAR/P	IO83XH	SK	50	6608	48	317184	ON4ZN	509	10	14el	TR751E

10W SINGLE OPERATOR

Pos	Group	Callsign	Locator	PC	QSO	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1		M0AFC/P	IO84SA	LA	101	21885	81	1772685	ON1LPA	686	10	13el	IC706
2		GW8ZRE/P	IO83JA	LL	81	14344	75	1075800	F6CBH	555	10	7ZL	TR751E
3		G4RQI/P	IO94MJ	YO	55	13299	67	891033	F6CBH	603	10	10el	IC746
4		G0PQF/P	JO01AX	SG	46	7141	49	349909	GI7JYK/P	500	10	9el	IC251E
5		M0BAO/P	IO80LV	TA	33	5780	42	242760	G4RQI/P	414	10	8el	IC706

3W MULTI-OPERATOR

Pos	Group	Callsign	Locator	PC	QSO	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1		GW5NF/P	IO81KR	NP	42	7441	50	372050	PA5KM	484	2.5	2x9el	FT290
2		G0HDV/P	IO93UK	LN	38	4780	41	195980	GI6ATZ	386	3	13el	TR751E
3	The Mighty Potters	M1LOL/P	IO93AD	ST	24	2942	30	88260	PA5KM	438	2.5	6el	FT290

3W SINGLE OPERATOR

Pos	Group	Callsign	Locator	PC	QSO	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1		G4HLX/P	IO82NN	SY	51	7892	56	441952	PA5KM	477	3	13el	K2+Downeast Tvtr
2		GW0PZO/P	IO83ID	LL	56	6872	47	322984	DK3BU	692	2.5	5Q	FT290
3		G1ATZ/P	IO82KV	SY	43	6888	44	303072	G1WKS/P	309	2	5el	FT290
4	West Kent ARS	G1WKS/P	JO01ED	TN	34	4895	41	200695	M0AFC/P	373	3	9el	FT290
5		GI7JYK/P	IO74BS	BT	23	6112	32	195584	G0DLR	564	3	9el	IC211E
6		G0BVW/P	IO92RA	MK	35	4143	38	157434	PA5KM	310	2.5	9el	FT290
7		M5CSM/P	JO01GP	SS	27	3714	36	133704	M0AFC/P	332	2.5	5el	FT290
8		GM4LPJ/P	IO85PF	TD	11	1821	19	34599	GW6YB/P	367	3	5el	IC202S
9		G1RVK/P	IO92TR	PE	15	1085	16	17360	M0AFC/P	199	2.5	9el	FT290

CHECKLOG G4APJ/P.

By Norman Fitch, G3FPK, 40 Eskdale Gardens,
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VHF/UHF

Experimentation is probably the most fascinating aspect of amateur radio and much of it, such as on antennas, can be carried out at little cost. When amateur radio restarted in most of the world after WWII, communication was basic AM and CW. We had a great time converting all that wonderful surplus military equipment for use on our LF, HF and VHF bands.

Since then we have seen some amazing developments, the first revolutionary one I remember being the arrival of single side band, suppressed carrier (SSSC) mode now known as SSB. Although the principle was recognised well before WWII, it wasn't until the pioneering article 'Exit Heterodyne QRM' appeared in the ARRL journal *QST* in 1948 that we exploited the concept.

The next innovation was the arrival of the transistor and we were quick to experiment with these intriguing devices. As the semiconductor industry took off, we were able to take advantage of the huge number of integrated circuits that were produced and to incorporate them in electronic keyers, for example.

The launch of the first Russian Sputnik in October 1957 saw the dawn of space age communication as envisaged by Arthur C Clarke in *Wireless World* in the late 1940s. Amateur-built satellites followed and for many of us Oscar-6 and Oscar-7 provided us with our first real experience of space communication.

The arrival of the computer heralded a new era and now no self-respecting operator would be without one in their shack. We routinely use them for logging our contacts, submitting contest entries, controlling our equipment, designing circuits, calculating the positions of orbiting satellites and digital communication. The computer has revolutionised the designing of antennas. It used to be claimed that the more elements there were, the more gain you would get. But thanks to computer programs, many written by amateurs such as Günter Hoch, DL6WU, and Rainer Bertelsmeier, DJ9BV, to name just two, we are now able to get the last fraction of a dB gain for a given boom length.

Terrestrial communication relies on what we call 'conditions', meaning the state of the troposphere and the ionosphere. With favourable weather conditions it is possible to make long distance tropo contacts. When there is enhanced E-layer ionisation we can enjoy excellent Sporadic E (Es) propagation, sometimes multi-hop on 6m.

By contrast the regular meteor showers, which create enhanced ionisation in the E-layer, enable us to communicate with distant stations regardless of tropo conditions. Similarly the Moon is always there and, thanks to computer programs, we can calculate its exact position. Given suitable equipment, moonbounce (EME) contacts become possible regardless of terrestrial conditions. But these are weak signal modes presenting a challenge for VHF/UHF operators.

The most recent example of amateur experimentation must surely be Joe Taylor's, K1JT, *WSJT* software programs specifically written to aid weak signal working and freely available on the Internet. Until they appeared, serious EME work required a better than average station - several hundred watts from the transmitter, low loss feeder, an efficient gainy antenna array and a low noise receiving system. While these are desirable, moonbounce QSOs are now being completed with quite low effective radiated power (ERP) when the received signals are well below the noise and undetectable by the human ear. So, long may we continue experimenting and learning.

John Eley, G3LMR, replacing the tower carrying his 6m 4-ele, 2m 5-ele and 70cm 8-ele Yagis. John says that the old tower (right) was installed 20 years ago but had rusted through at the base. In the photo (left) the new tower is being used as a crane to lower sections of the old tower to the ground.

VALE F9FT

By now many readers will have learned of the passing of Marc Tonna, F9FT, on 2 March. He was a pioneer of EME work but probably best known as the manufacturer of Tonna antennas, starting with the 9-ele Yagi in the early 1960s, followed by the 16-ele model. For some years Antennes Tonna has been run by his son Franck, F5SE, also a keen VHF DXer and EME operator.

PUBLICATION

The front cover of the 1/2003 issue of *DUBUS* magazine features the impressive 2m EME antenna array of Franco Giorgi, I2FAK (JN45), which comprises six stacks of four 19-ele long loop Yagis. In the quest for accurate frequency counting Luis Cupido, CT1DMK, has an article on locking VXOs to a 10MHz reference source followed by another on locking such VXOs to a 1pps output of a GPS receiver.

There are the regular news sections devoted to EME, FAI, tropo, meteor scatter (MS), aurora and 6m topics along with the meteor shower calendar for April-June. Editor Joe Kraft, DL8HCZ, seeks volunteers to edit the MS and FSK/WSJT columns and for someone who, from time-to-time, can help with English/German and German/English translations. E-mail him at DUBUS@web.de if you can help. The UK agent for *DUBUS* is Roger Blackwell, G4PMK, whose e-mail address is dubus@marsport.demon.co.uk

EXPEDITION NEWS

LA6K will be operational (QRV) from JP43 on 2-5 May and from JP33 on the following two days. Listen for them (DH3YAK, DL8EBW, LA4XGA and LA7DFA) on 2m HSCW, SSB and FSK. Janne Harakka, OH5LID, will be

▶ QRV from KP51 during the Arietids meteor shower on 7 June working only random WSJT; e-mail him at oh5lid@saunalahti.fi for details.

Frank Hobelmann, DL8YHR, announces a DXpedition to Mauritania (IK28), from 27 June to 7 July as 5T6M on 2m and 6m with QRO gear and will try EME on 144.070MHz. In the first half of June Derek Gilbert, G0NFA, and Chris Rudge, G0WYF, will be QRV on 2m for 2-3 days from Gibraltar. On the way there they will be operating mobile from different locations in France and Spain. Matti Müller, DK5KK, will be QRV from northern Norway for about three weeks from 5 June. Operation will be on 2m and 6m MS from grids such as JQ90. The above news taken from *DUBUS* 1/2003.

MEETINGS

The 25th Nordic VHF meeting is scheduled for 6-8 June at the Hotel Gavelstad (JO49XI) which is located about 45km north of Larvik in Norway. There is accommodation for about 90 people and a caravan park is available. There will be the usual lectures, flea market and barbecue. For further information visit the websites in the list. This year's Weinheim VHF meeting will on 30-31 August in the same venue as last year but please note the much earlier date. Again, thanks to *DUBUS* 1/2003 for these data.

CONTEST NOTES

The VHF-DX-Group DL-West has forwarded details of this year's 144MHz VHF Activity DX Contest, which runs for the whole year. The basic aim is to work as many stations and grids as possible that are more than 499km from your location. The rules occupy an A4 page and originated from DL8EBW, e-mail dl8ebw@web.de

Dave Toombs, G8FXM, the Secretary of the UKSMG, advises that this year's 24-hour UKSMG Es contest on 6m will start at 1200 on 7 June and is open to non-members of the group. The contest manager is PA7FM, e-mail: contest@uksmg.org - and the website has all the details, see the list.

ANNUAL VHF/UHF TABLE - JAN TO DEC 2003

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	**Dist**	**Ctr**	**Dist**	**Ctr**	**Dist**	**Ctr**	**Dist**	**Ctr**	**Dist**	**Ctr**	**Points**
G4DEZ	38	10	3	2	62	10	26	7	15	3	176
G4APJ	–	–	–	–	5	3	14	4	–	–	26
G6TTL	3	1	–	–	2	6	5	3	–	–	20

The District Codes are the 124 listed on page 56 in the January 2003 RadCom. Up to 6 different GI stations and up to 3 different GM stations in each Scottish district may be counted. Countries are the current DXCC ones plus IT9. The deadline for the next issue is 20 May.

SOLAR AND GEOMAGNETIC ACTIVITY

Solar activity continued to decline and in the 30 days to 18 March the 10.7cm radio flux averaged only 129.1 units per day. The maximum of 153 occurred on 9 March and the minimum of 102 was on 24 and 25 February. On 17 days the SESC sunspot number was well below 100 with the maximum of 224 recorded on 9 March. The number of new sunspot regions recorded was also lower at 28.

In the 29 days to 18 March the geomagnetic A-index at Fredericksburg was in the quiet range on 13 days, the rest being unsettled. The lowest value was 2 on 25 February and the highest was 19 on 17 March. However, at College in Alaska, it was much more lively with three storm days, the highest A-index being 78 on 17 March. This was due to the Earth having been inside a high-speed solar wind stream flowing from a large coronal hole on the Sun, which commenced on 14 March. Consequently auroral activity was prevalent at these higher latitudes.

METEOR SCATTER

The next significant meteor shower is the Eta Aquarids, which should peak around 1830 on 5 May with a zenithal hourly rate (ZHR) of 60 according to the OH5IY MSSOFT program. However, this is a long lasting shower and can provide useful reflections for about three weeks either side of the maximum. The radiant is above a mid-UK horizon in the 0200-1330 period. May is a good month for MS operators and the Meteor Shower Calendar in *DUBUS* 1/2003 mentions a further five showers which could prove useful for northern latitude stations.

BAND REPORTS

50MHz

Oh, what a dismal story! Looking through Ted Collins', G4UPS (IO81), report for the period 11 February to 18 March, it's day after day of nil to report with the only beacons heard being GM3MCB and GB3RMK. Even his long running morning skeds with John Stace, G3CCH (IO93), have had to be stopped due to John still being unwell. Ted writes, "Most surprising are the results of the morning sked with SM7AED; a 100% result over 1200km, bearing in mind that I only have a 4-ele Jaybeam with 100W from the IC706-MkII. On several occasions there was just a normal extended tropo path."

On 1 March he says that 9L1BTB, V51E and 5N6NDP/9 were reported working into Europe in the afternoon but that nil was heard in his area. Next day for a few minutes from 1057 SP7EXY* and SP6GWB* were heard and at 1427 F6FHP (IN94) was copied calling CQ on 50.110MHz.

144MHz

Chris Ploeger, PA2CHR, has compiled a list of the most wanted DXCC entities on 2m based on the input from 69 operators from all over the world. The top ten are ZA, 3A, 7X, OD, 1A, HV, C3, SY, 5A and ZB2. Activity remains very low. During the evening of 15 March Bryn Llewellyn, G4DEZ (JO03), worked 13 Dutch and German stations on SSB as far as JO41, 42 and 43, a GI off the

Moonbounce

DURING THE 23cm SSB Contest over the 15/16 February weekend, "Conditions were not bad, but were certainly not the best I have seen for SSB on 1296. Despite this fact, I think this was one of the best SSB contests thus far. Everyone seemed to be in the right spirit and having fun operating the contest." So reports editor Al Katz, K2UYH, in the March *432 and Above EME Newsletter*. The fields are in parentheses and * denotes a CW contact.

Peter Blair, G3LTF (IO91), was QRV for about 3.5 hours and completed with HB9BBD (JN), F6KHM (IN), F2TU (JN), K2UYH (FN), W2UHI (EN), K0YW (DM), HB9Q (JN), OE9XXI (JN), G4CCH (IO), GW3XYW (IO), K5JL (EM), OZ6OL (JO), W5LUA (EM) and W7BBM (DM) for a total score of 224 points. He was also on 70cm on the 15th and worked UA3PTW and KE2N for initial (#) number 365.

In spite of having over 500W at the feed on 23cm, he is still having problems with stations that he can copy fine but who can't seem to hear him. He has been doing some measurements on radio stars and gets 1dB from Cygnus and 0.5dB from Taurus. The figures on 13cm are 0.35dB and 0.4dB respectively from the same constellations. This calculates back to a system temperature of 40-47K on 23cm and 50K on 13cm.

Howard Ling, G4CCH (IO93), was QRV in the 23cm event but didn't start till 1830 on the 15th due to trees blocking his dish's view of the Moon. He completed 27 QSOs worth 561 points with IK2MMB, F6CGJ, F6KHM, HB9Q, F2TU, IOUGB, ZS6AXT (559/55), HA5SHF, HB9BBD, GW3XYW, DL1YMK, LX1DB, HB9BHU, OZ6OL, OE5EYM, IK3COJ and N2UO on the 15th. Next day he worked OE9XXI, W2UHI, KU4F, K0YW, G3LTF, K5JL, K2UYH, W7BBM, W5LUA and N7AM. K7XQ* didn't count as CW/CW.

Stuart Jones, GW3XYW (IO81), was QRV on 23cm on 8 February and worked ZS6AXT* and K5JL*. In the contest he completed 17 QSOs with HB9Q, HB9BBD, F6KHM, LX1DB, ZS6AXT (599/44 in KG), F2TU, G4CCH, DL1YMK, OE5EYM, OZ6OL, F6CGJ, OE9XXI, K2UYH, W2UHI, K0YW, G3LTF and K5JL for a score of 297 points.

The sked weekend for May is 10/11 when the 48-hour ARI I2COR Memorial Contest takes place. This is an all-band event from 50MHz up. London latitude stations will have 27.6 hours of Moon time. The declination varies from +18.08° at the start to +7.19° at the end. The 144/432MHz sky temperature range is 212/15K to 255/19K and the signal degradation referred to perigee varies from -0.65dB to -0.27dB.

Warren Butler, W2WD, has posted the latest 432 and Above EME Group e-mail address list on the Internet. You can check your entry at the website in the list and can e-mail updates to tklaus@snafu.de Graham Daubney, F5VHX (JN04), has finally got around to tidying up his pages for his Ulti-track project and all documents are now in his library. Again, check the listed website.

back of his beam and just one G. It was much the same on the previous night with mainly DL and PA stations worked as far as JO59, but with few Gs on.

Steve Bunting, M0BPQ/P, has antenna restrictions at home so only operates portable from his car during contests and activity periods when there are more stations to work. He lists 39 QSOs made at the beginning of March in the contest on 1/2 from JO01DH and in the 4 March Activity session from IO91XL. He uses an FT-847 with 160W to a 9-ele Yagi 6m AGL.

Clive O'Hennessy's, GM4VVX (IO78), report just missed last month's deadline and his contacts are nearly all via aurora. There was a strong event on 2 February, 1400-1845, in which he worked CW stations in 15 grids. Afterwards OH6KTL (KP02OJ) told him that it was the first known auroral QSO between GM and KP02. There were auroras on the next four days and the one on the 6th was remarkable for the 4kHz upward Doppler shift. He made CW QSOs with stations in IO53, 63, JO59 and 86 in low activity. In four hours on the 9th he only managed 10 contacts into IO75, 83, JO22, 32, 59, 62, 65 and 89.

430MHz

The only report on 70cm was from M0BPQ/P, who made 11 QSOs in the Activity session on 11 February. His ODX was PA5KM (JO11) at 249km. The March 1/2 144/432MHz contest was 'a slog' so much so that after only 10 contacts in four hours he gave up and went home as a storm was approaching. During the Activity session on 11 March he completed another 14 QSOs. He reckons that these sessions suffer from a lack of stations calling CQ.

1296MHz

M0BPQ/P (JO01DH) made his first real foray onto the band for the 18 February Activity session making 11 QSOs with G stations. ODX was G4DEZ at 209km. Steve was only using 8W from a transverter to a 35-ele Yagi with a preamp on receive.

David Dodds, GM4WLL, points out that GM6CMQ reported as worked on 2m in the March VHF/UHF was actually a 23cm QSO – sorry for the misunderstanding. He has been working on his water-cooled 7289 amplifier in an LMW cavity, which now produces 100-150W. Coupled with his WiMo 67-ele Yagi he reckons, "It should make quite a bit of noise from IO85NR this year!" Most of his operating this year will be out portable during contests or big openings on this and other bands.

SIGN OFF

I do really need some photographs for this column, ideally of people operating their rigs under portable conditions, putting up antennas and so on. Preferably these should be sharp colour prints but if you have a decent scanner a good JPEG image would be welcome.

Thanks to Neil Clarke, G0CAS, for the January copy of *SunMag*, to Dr Steve Reed, G0AEV for the January *Six and Ten Report* and to the UKSMG for the March issue of *Six News*. The deadline for copy for the July issue is **20 May** and for August it's **17 June**. The telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk. ◆

WEB SEARCH

Nordic meeting info	http://www.qsl.net/la3r (follow link to 'VUSHF Meeting 2003')
Nordic meeting hotel	http://www.hotellgavelstad.com
UKSMG Es contest rules	http://www.uksmg.org/sporadic.htm
EME e-mail list	http://dl4eby.de
F5VHX	http://www.rfham.com/newulti/index.htm

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The R.A.I.B.C. produces a Quarterly Journal called 'RADIAL', which goes out to all of our members and supporters in either printed or cassette form. The photograph shows our Editor, Peter Hunter, GOGSZ in his shack chatting on the much loved FT-8900 which - of course - was supplied by Martin Lynch & Sons.

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The very latest 100W H.F. Base Station to come out of Yaesu with a built in PSU, Auto ATU, Class A SSB Transmission (25W).

RRP: £2299.00

ML&S: £1899.00

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- SP-8 Matching Desk Speaker
- MD-100 Desk Microphone
- Full compliment of filters (5 in total)

RRP: £2912.65

ML&S: £2449.00

ZERO DEPOSIT 36 x £89.04

FT-920AFC

Offering 100 watts HF and 6metres this radio is a delight to operate. Fitted with FM,6kHz AM filter and 500hz CW filter plus simple to operate DSP this is an excellent base radio. (Requires 25a 13.8v PSU). Built in ATU

ML&S: £1099.00

ZERO DEPOSIT 36 x £39.96

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VX-7R

Submersible Tri-Band Handie

The worlds very first Tri-Band Handie that you can actually fully submerse! Tough construction (to MIL Spec 810). 5W on 6/2/70, RX 500kHz-999MHz, plus Dual RX.

RRP: £359.00

ML&S: £299.99

Package Deal

- VX-7R TriBand Submersible Transceiver
- CD-15A Rapid Charger (needs NC-72U)
- NC-72U 5Hr Charger
- CN-3 BNC to SMA Adapter
- CSC-88 Soft Case
- E-DC-5B Cigarette Lighter DC Adapter
- FNB-80Li Spare 1300mAh Lithium Battery
- CMP-460A Waterproof Speaker Mic
- SU-1 Bar Pressure Sensor Unit

RRP: £578.60

ML&S: £499.00

ZERO DEPOSIT 36 x £18.14

FT-817

Still the only truly handheld all band transceiver, 160m-70cm, 5W.

RRP: £799.00

ML&S: £579.00

ZERO DEPOSIT 36 x £21.05

Package Deal

- FT-817, c/w Nicads, Charger, Whip, Mic, Strap
- HL-50B 160-6M Linear Amp
- CSC-83 Case
- Miracle Whip Antenna

RRP: £1248.85

ML&S: £925.00

ZERO DEPOSIT 36 x £33.63

FT-897

At last the new 160m-70cm Transportable is available from stock. This compact package offers all mode operation with 20 Watts output from its optional internal batteries or a full 100W (on HF/6M) from its own internal PSU. (Optional)

ML&S: £989.00

ZERO DEPOSIT 36 x £35.96

- FT-897 All Band Transceiver
- FP-30U Internal 240V PSU
- FC-30 Bolt-on Auto ATU
- YF-122S Collins SSB Filter
- YF-122C Collins CW Filter
- MH-36E8J DTMF Mic
- MD-100 Desk Microphone
- MMB-80 Mobile Bracket
- ATAS-120 Active Tuning Antenna System
- 2xFNB-78 Twin Internal Ni-MH Battery Packs
- PA-26 & CD-24 12/240V chargers
- Miracle Whip Antenna (max 20W)
- TCXO-9 Hi-Stab Unit. (0.5ppm)
- CT-39A Packet Cable
- CT-62 PC Interface Cable

RRP: £2816.20

ML&S: £2529.95

ZERO DEPOSIT 36 x £91.98

The Ultimate 'Get a Divorce' Package

Portable Package

- FT-897 All Band Transceiver
- 2xFNB-78 Twin Internal Ni-MH Battery Packs
- PA-26 & CD-24 12/240V chargers
- Miracle Whip Antenna (max 20W)

RRP: £1598.75

ML&S: £1449.00

ZERO DEPOSIT 36 x £52.68

Mobile Package

- FT-897 All Band Transceiver
- MMB-80 Mobile Bracket
- ATAS-120 Active Tuning Antenna System
- MH-36EHJ DTMF Mic
- SP-4 Mobile Speaker

RRP: £1449.80

ML&S: £1317.99

ZERO DEPOSIT 36 x £47.92

Base Package

- FT-897 All Band Transceiver
- FP-30U Internal 240V PSU
- FC-30 Bolt-on Auto ATU
- YF-122S Collins SSB Filter
- YF-122C Collins CW Filter
- MD-100 Desk Microphone

RRP: £1870.75

ML&S: £1699.00

ZERO DEPOSIT 36 x £61.77

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By Alan Hydes, G3XSV,
1 Robinson Close, Backwell, Bristol BS48 3BT.

SSB Field Day 2002

There were 31 entries for SSB Field Day 2002, which is well up on the 2001 event that had been badly affected by the Foot and Mouth outbreak. The standard of entries was also high this year and it was great to see such healthy competition for the top places in both the Open and Restricted sections. There were a couple of new appearances near the top of the Open section table this year. The Gravesend Radio Society, G3GRS, moved from their familiar leading position in the Restricted section to have a very good shot at the Open section. And Northern Lights, GD0TEP, well known for their VHF exploits, made an impressive first entry.

BAND CONDITIONS

Entries were up, but QSO totals were clearly down. This was due to awful propagation conditions, especially on the higher bands. In fact only the top four stations managed more than 20 QSOs on 10 metres. We might have expected this as the sunspot cycle showed some decline, but the real culprit was an aurora, which developed on the Saturday. This took out the northern path to Japan and the western USA for much of the contest, and the HF bands closed early in the evening. We have become accustomed in past years to working many JAs who have the All Asia contest at the same time. Sadly it wasn't the case this time, though a few stations did figure out that the long path to JA and Oceania was open on the Sunday morning. The result was a higher dependence on the low bands and a high proportion of portable stations in the logs.

LOGS

Logs were of a good standard. All were submitted electronically so there were no paper logs to deal with and only one log was not in a prescribed format. Remember that in 2003 we will be looking for Cabrillo format logs wherever possible. (The Cabrillo format is a straightforward text format for the submission of logs, where both the summary data and QSO data are in a single file. It is already supported by several popular contest logging programs, including EI5DI's *Super Duper*. Definitions of what is required appear on the RSGB HFCC website, where there is also a short article 'A Cabrillo Primer' which gives further information. See also the 'RSGB Contesting Guide' *RadCom* January 2003, page 55 para 9b.)

All logs were first re-scored to make sure they were all judged using correct scoring and multipliers. They were then crosschecked against others from the UK and other IARU Region 1 countries – thanks to the German national society DARC who supplied 165 logs. The table shows the re-scored totals and the number of errors found during adjudication, plus of course the final totals.

RESULTS

Once again congratulations go to the Lichfield Amateur Radio Society, G3WAS/P, which takes the first place in the Open Section and so retains the Northumbria Trophy. Their QSO total was not the highest, but their multiplier tally was. Following close behind was the Gravesend Radio Society, G3GRS/P, which had an admirably low error rate. Third were Northern Lights, GD0TEP/P, a newcomer to SSB Field Day and one to watch for the future. They had an almost identical QSO tally to the Bristol Contest Group, G6YB/P, who

Left, top: HF and 40m beams at G3WAS/P.

Right, top: Gold at the end of the rainbow for G3WAS/P. ▶

Left: The two towers at G3WAS/P.

Right: GM4ZRR operating MM0CPS/P.

had a slightly lower multiplier total in fourth place.

The Restricted Section was very close indeed. The top three were within 5% of each other and the logs had to be checked several times. Congratulations to the Granta Contest Group, M0CAM/P, which came out marginally on top of the Wisbech Amateur Radio Club, M5ARC/P, in what seems to be the war of the double-extended Zepps. The Wisbech team were all M0 and M1 calls, so it's good to see newer licensees doing well. The Echelford Amateur Radio Society, G3UES/P, was very close behind in third place sporting their 'Field Day Special' 40m loop. The Stratford upon Avon and District Radio Society, G0SOA/P, was fourth.

SOAPBOX

The summary sheets showed that there were 176 operators in the 31 teams that entered. Of these there were 18 M3 callsigns listed, including six with the Stockport club, G6UQ/P. The most popular rigs were the FT-1000MP and FT-1000. In fact seven of the top nine Open section stations were using one of these.

Some clearly had better luck with the weather than others. M0CMU/P: *"A good weekend despite poor wx and atrocious band conditions... Arrived back on site at 0830 Saturday to find it water-logged"*; while G4SJM/P reported *"Weather good, conditions lousy!"* The poor conditions were confirmed by many, including M0CAM/P, *"Truly awful band conditions! Like some others, we wondered what was wrong with our antenna as G3GRS/P apparently raced ahead! We confirmed they had switched sections when we finally asked them!"* and G6YB/P *"as the HF bands were so good the evening before the contest we decided not to trouble with putting the 40m beam together. Big mistake ! 40m was very noisy..."*

Location often plays an important part in a station's performance, as shown by GD0TEP/P: *"We operated from a small plateau around half-way up South Barrule Mountain, which gives us a reasonable shot to both JA and W. The antenna space was restricted so we had to mainly make do with vertical antennas."* At the other end of the scale G0SOA/P wrote: *"we had several other activities in the field on Sunday morning such as football, athletics and archery. Quite a risky location for both the ops and the antenna system."*

As usual there were a few teams challenged by time, including G3UES/P: *"Locked out of field until 0930. Managed to get everything up and running by 1230."* But most seem to have had a fun weekend, including G3GRS/P: *"Plenty of booze Friday evening celebrating one of our team reaching the grand old age of 50"*. Some may be wishing they'd had a bit more! ◆

WEB SEARCH

RSGB HF Contests Committee www.rsgbhfcc.org

PHOTO: MM0ANT

OPEN SECTION

Pos	Group	Call	3.5 Qs	3.5 Ms	7 Qs	7 Ms	14 Qs	14 Ms	21 Qs	21 Ms	28 Qs	28 Ms	QSOs	Total Pts	Mults	Final Claimed	Errors	Score
1	Lichfield ARS	G3WAS/P	292	41	319	46	219	59	85	43	50	26	965	3542	215	754446	70	689640
2	Gravesend RS	G3GRS/P	225	26	276	48	180	60	184	51	37	25	902	3397	210	713370	33	679536
3	Nothern Lights	GD0TEP/P	236	35	180	37	451	62	101	40	60	21	1028	3714	195	724230	69	656884
4	Bristol CG	G6YB/P	261	27	377	48	304	57	64	34	21	20	1027	3699	186	688014	52	645656
5	East Notts CG	G3TBK/P	252	33	246	33	263	58	99	32	19	11	879	3311	167	559559	47	524062
6	Contest Cumbria	M0CMU/P	210	28	208	31	232	53	39	25	4	4	693	2710	141	382110	31	355006
7	Harlow & District ARS	G6UT/P	257	27	379	40	145	36	32	13	1	1	814	3053	117	354148	36	331626
8	Ipswich RC	G4IRC/P	227	27	266	28	149	45	11	9	4	4	657	2447	113	276511	29	256410
9	Melton Mowbray ARS	G4FOX/P	200	21	178	28	119	40	63	27	7	7	567	2095	123	257685	17	244560
10	Horsham ARC	G4HRS/P	217	30	118	15	136	36	51	21	18	11	540	2087	113	237918	30	215166
11	Clifton ARS	G3GHN/P	161	17	170	23	148	41	98	18	2	1	579	2281	100	228100	25	213542
12	Oxford & District ARS	G5LO/P	175	24	99	19	110	39	65	27	7	5	462	1895	114	225505	23	197780
13	Hornsea ARC	G4EKT/P	180	24	164	30	55	24	59	17	14	13	472	1895	108	204660	20	196992
14	South Notts ARC	G8DD/P	268	25	110	15	114	36	37	18	4	3	533	1967	97	190799	33	171399
15	Reading & District ARC	G3ULT/P	213	20	151	22	54	24	5	5	1	1	424	1777	72	127944	23	117363
16	Ripon & District ARS	G4SJM/P	104	18	73	17	81	32	34	16	10	9	302	1060	92	97520	6	110160
17	Taunton and District ARC	G5JJ/P	84	14	72	21	78	28	2	2	0	0	236	1062	65	69030	15	65000

RESTRICTED SECTION

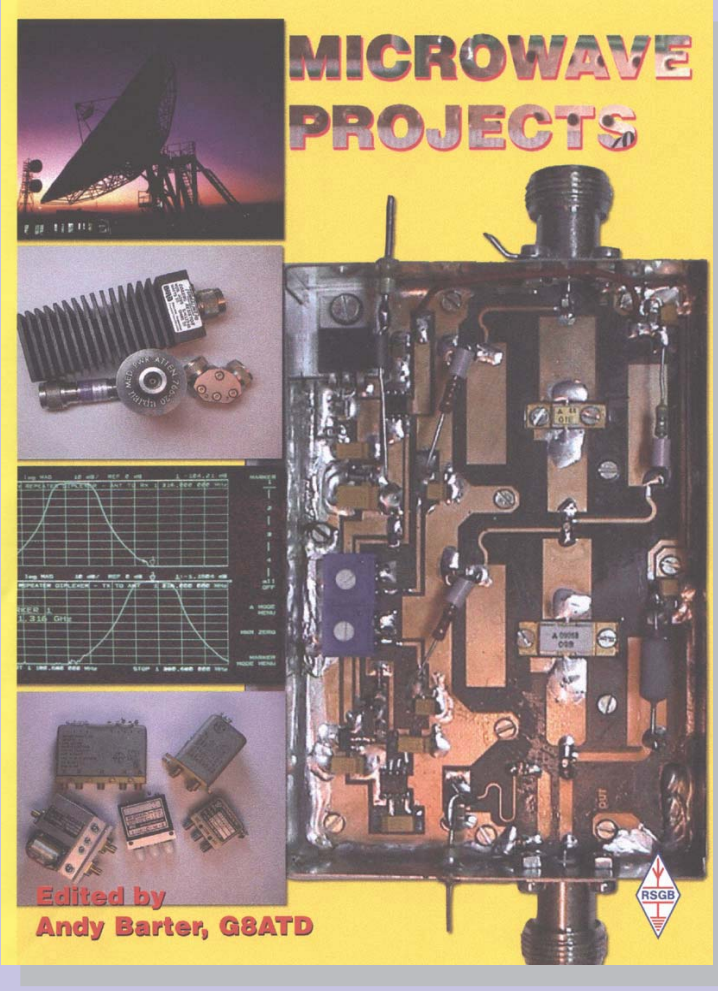
Pos	Group	Call	3.5 Qs	3.5 Ms	7 Qs	7 Ms	14 Qs	14 Ms	21 Qs	21 Ms	28 Qs	28 Ms	QSOs	Total Pts	Mults	Final Claimed	Errors	Score
1	Granta CG	M0CAM/P	134	17	177	31	110	38	36	22	11	11	468	1930	119	229670	14	223125
2	Wisbech AR & EC	M5ARC/P	255	27	177	26	84	38	19	15	6	3	541	2089	109	227701	19	214862
3	Echelford ARS	G3UES/P	208	22	206	25	77	32	44	18	11	7	546	2231	102	232024	30	212807
4	Stratford upon Avon & DRS	G0SOA/P	200	24	115	18	105	36	35	18	18	15	473	1941	111	215451	11	207900
5	Addiscombe ARC	G4ALE/P	125	17	120	25	83	35	45	21	8	5	381	1579	103	162637	19	155142
6	RAF ARS	G8FC/P	209	23	91	14	80	35	19	10	2	2	401	1700	84	142800	8	139944
7	KLADC	GM0ADX/P	136	20	157	19	90	32	8	7	0	0	391	1586	78	123708	24	112936
8	Itchen Valley ARC	G0IVR/P	98	13	106	16	75	33	33	20	6	4	318	1342	86	115412	17	106080
9	Chesham & Maidenhead ARS	G3MDG/P	154	16	32	9	89	35	61	22	13	9	349	1402	91	127582	39	105060
10	Havering & DARC	G4HRC/P	189	22	115	17	42	23	25	15	0	0	371	1553	77	121134	36	104192
11	Stockport RS	G6UQ/P	137	19	70	17	93	31	17	10	1	1	318	1363	78	106314	21	98406
12	Kidderminster & DRS	G0KRC/P	95	11	105	18	47	26	8	6	0	0	255	1165	61		19	60990
13	South Essex ARS	G4RSE/P	23	6	147	16	56	27	15	9	0	0	241	874	58	50692	38	40095
14	Cockenzie & Port Seton ARC	MM0CPS/P	12	7	55	10	74	27	5	4	0	0	146	610	48	29280	3	28106

CHECKLOGS RECEIVED WITH THANKS: DL/G4XFD, VK2CZ

MICROWAVE PROJECTS

Edited by Andy Barter, G8ATD

NEW FROM THE RSGB



Microwave Projects is aimed at those who are interested in building equipment for the amateur radio microwave bands.

Packed full of ideas from around the world this book covers the subject with a variety of projects. The book has many contributors who have a wealth of experience in this area and they have produced many projects, design ideas, compete designs and modifications of commercial equipment, for the book.

This title provides much useful information as to what can be achieved effectively and economically. Aimed at both the relative novice and the "old hand" the book also covers useful theory of designing microwave circuits and test equipment for the projects. The book includes chapters covering:

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- Design

Microwave projects is a must have book for all those who are already active on the microwave bands and those looking for interesting projects to embark on.

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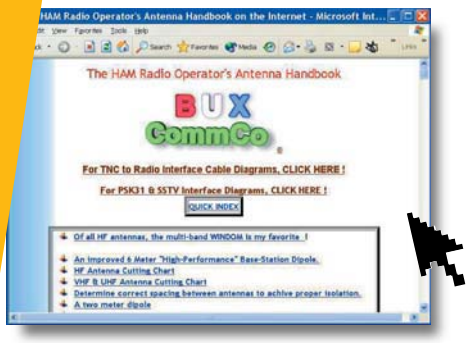


Right, top: The Ham Radio Operator's Antenna Handbook on the Internet (see 'Reference').

Since we are now in spring with the hope of approaching summer, the season for maintenance of equipment inside and out is again upon us. So clean up that rusting set of ironwork on the tower or roof or replace those fraying wires. Do people curse your wide packet signals or that linear? Is the old antenna system leaning dangerously after the winter storms and the cable waterlogged? Does your VSWR vary according to the rainfall? Get it sorted before the season well and truly begins.

Somewhere in the vast kingdom of Internet there must be pages that are of use to us in these tasks, if only to sharpen up our knowledge of how antennas work or what kind of shack maintenance we might usefully engage in. So I went to find out.

DEVIATION

The first stop was the question of deviation and I came across a useful article in the Wyrepack Packet Group 'Newsletter'. Not a recent article, but no less useful for that. There doesn't seem to have been any publication since spring last year. A pity. I thought it was very well written. Another well-written article on the Cushcraft X7 Beam Antenna appears tucked away by John Cramond, GM4NHI, in his home pages. These reviews, which are written entirely from a personal point of view (not commercial) are particularly valuable.

GENERAL AND ANTENNAS

Then I drifted to a very good page I had not seen before – 'eham.net'. Up to date, with articles on all sorts of things, plus opinions and some news. There are also many forums, quite a notch above the somewhat unpredictable nature of the newsgroups many of us no longer visit these days. I found an interesting forum on mobile working – types of antennas, which is best, etc. There is lots to interest just about everyone on these pages. There is a marked US bias, but this is not a big deal. Much of the impetus for our hobby these days comes from our friends across the pond. Speaking of general and useful reference pages, do check out 'DX Zone' for useful lists.

In fact, it was while using that very page that I found the sort of reference to amateur antennas and their performance and theory that I was looking for. One page was the 'Unofficial Archive of the Signal Integrity Mailing List'. It "contains past message traffic from si-list. Si-list is a Signal Integrity mailing list dedicated to the technical discussion of high-speed digital and RF phenomena as they apply to computer and communications systems. Participants include experts in industry and academia from around the world." It is highly technical and probably beyond the scope of many of us. This is all in the same list as 'Antennas Tech Reference', by K1TTT The URL quoted below is long because of its cgi-bin system. It is easier just to follow the link from the main 'DX-Zone' page.

The pages of L B Cebik, W4RNL, give an insight into antenna modelling programmes with a host of similar links. This would be a good starting point for this sort of interest. 'Using Moxon Rectangles for WARC-Band Antennas Part 1: Some 17-12 Metre Ideas', is a good example - detailed, exact and technical. The less-able amongst us might be happier with doublet and birdcage antenna articles, vertical doublets, lazy-H etc, all of which are dealt with at some length.

REFERENCE

'The Ham Radio Operator's Antenna Handbook', on the other hand, is far less daunting, with clear diagrams and a folksy style, but none the less useful. In his article 'The Windom', by G E "Buck" Rogers Sr, K4ABT, we read as an opener "In September of 1949, I was tired of climbing poles and trees to move, remove, add, or change my single-band HF antennas. In those younger years of my ham radio career, I had used single band dipoles and doublets for almost every HF amateur band." Then came his conversion to the Windom... "To be able to use it without an antenna tuner was icing on the cake. For a kid without extra funds, an antenna tuner was a luxury that I could not afford. Even my transmitter was a single 807 rig I homebrewed on an old Atwater-Kent radio chassis my grandfather had given me." And that is how the West was won. You'll be up all night reading this – very engaging.

GW0RTP's page has a good, brief article on antennas, and is good reading. I mention also 'Army Radio Sales Co' in the US. I avoid commercial links generally for these articles, but there is a fascinating set of topics from Vietnam War radios, to specific radios abroad and Russian sets and radios by country (and conflict). It also includes, strangely, a Russian-to English Electrical/Electronic Dictionary should you ever need one.

REVISION

I was looking specifically for amateur links to safety and you will find some reference on the 'Amateur Radio Courses on CD-ROM' pages. There is mention of mobile safety in particular, but the pages are a little gem for revision of all sorts of reasons. I commend them to you. Licensed or not, it is never a bad idea to revise some of the things we think we know from the RAE, but may have forgotten. The site tries also to clarify and spell out the new licences and their syllabuses. Don't fail also to visit 'M0BXR's Amateur Radio Notes', which cover a huge variety of subjects. I wish the text was not so unnecessarily large through. It makes reading difficult for all but the myopic. His safety notes are excellent though, and ought to be pasted on the shack wall.

So, fired with new ideas, and perhaps some revision, get those jobs done and the shack made safe before it's too late. Many of the pages above contain links within links. I have touched on just a few, but do please do some exploring for yourself on a given theme. ◆

WEB SEARCH

Wyrepak Packet Radio Group Newsletter	www.g8pzt.pwp.blueyonder.co.uk/wyrepak/nwsltr02.htm
GM4NHI homepage	www.gm4nhi.freeserve.co.uk
Eham.net	www.eham.net
DX Zone	www.dxzone.com
K1TTT	www.dxzone.com/cgibin/search/frame/FrameIt.cgi?Url=http://www.dxzone.com/cgi-bin/search/jump.cgi?ID=471&ID=471
L B Cebik, W4RNL	www.cebik.com/nec.html
Ham Radio Ops Antenna Handbook	www.packetradio.com/ant.htm
GW0RTP	www.radiohamsontheweb.co.uk/index.html
Army Radio Sales Co	www.armyradio.com
ARC on CD	www.ukradioamateur.org
M0BXR's Amateur Radio Notes	www.brightbell.com/radio/contents.html

By John Heath, M3BBX, Chestnuts, Desford Lane, Kirkby Mallory, Leicestershire LE9 7QF. E-mail: g7hia@amsat.org

SPACE

Saudisat-1C is now operational and has been designated Saudi Oscar 50 or SO-50. There are several experiments on board including an FM transponder with a downlink on 436.800MHz and an uplink on 145.850MHz, the same frequency pair as AO-27. With only 250mW on the downlink, signal strength is about 6dB down compared with AO-27 and UO-14, so a masthead pre-amp will certainly be an advantage.

Will it be possible to work SO-50 with a 5W handheld and a small 2m/70cm Yagi? No reports so far. Fed by a quarter-wave whip on top of the spacecraft, the receiver seems very sensitive. Robert, G8ATE, recently worked SO-50 with just 1W to a turnstile antenna. Like many terrestrial repeaters, a CTCSS (continuous tone-coded squelch system) sub-audible tone is needed to access the satellite. The tone required is 67Hz, programmable on most modern rigs. If you don't have CTCSS, help is at hand. JAB Electronics (0121 682 7045) supplies an excellent mini-kit with a quality PCB and all components to make the tone generator. It costs £14.70 including postage. Designed by Chris Lorek, G4HCL, it uses the FX315 IC and a 1MHz resonator to give accurate tones. It was originally featured in Ham Radio Today (September 1998), and a photocopy of the article is provided with the kit. Mine went together in about 30 minutes and worked first time. By setting the jumpers, all the standard CTCSS tones from 67 to 250.3Hz are available. If you do need to inject the tone, don't do it at the microphone socket. The input filtering on your rig will probably do a good job of removing it.

Here's a tip for using CTCSS with the Yaesu FT-847. For SO-50 you must set up the CTCSS tone whilst in SAT mode, otherwise you won't be able to access the satellite. The rig will revert to its default setting of 88.7Hz. This caused me much frustration, until I was given this tip.

Go into SAT mode and set up the transmit and receive frequencies in the usual way. Use the lower of the two AB buttons to put the transmit frequency in the main display/VFO.

Press 'Tone' (3) on the numeric pad. Press 'Menu' and select option 12, which sets the tone; dial up 67Hz, press menu again. You should see the letters 'ENC' above the frequency. Use the 'AB' button to swap the VFOs back. 145.825MHz should now be in the transmit VFO, still with the 'ENC' legend.

FIRST WOMAN IN SPACE

Planning is well underway for a special event to mark the 40th Anniversary of Valentina Tereshkova's historic space flight in June 1963. Following a format similar to the Gagarin event, Robert Turlington, G8ATE, and I will be active on as many analogue satellite passes as possible during the month of June. The special call will be GB1WIS, first 'Woman In Space'. Some of the activity will also take place on HF from the National Space Centre in Leicester, at the invitation of the NSC-ARS. For more details e-mail g7hia@amsat.org or visit the NSC-ARS website. If you hear us, please give us a call; you will qualify for the special commemorative QSL card which will be issued with a picture of Valentina, taken from a rare contemporary Russian post card shown here. Thanks to Andy Thomas, G0SFJ, for the loan of this valuable item.

Centre: Valentina Tereshkova, the first woman in space (1963).

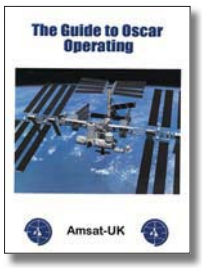
AMSAT-UK BOOK

The latest Guide to Oscar Operating has been published by AMSAT-UK and comes at an excellent time to coincide with the Intermediate Licence, which gives satellite access to those who want to progress from their Foundation Licence. Edited and compiled by Richard Limebear, G3RWL, this book contains a wealth of knowledge and experience. Its 62 A4 pages are packed with essential information on all aspects of amateur radio satellites, analogue and digital. It is a high-quality print, with plenty of graphs, charts, and explanations in clear English. This is an ideal reference source for the beginner, and the experienced operator. Priced at £6 plus £1 post and packing, AMSAT have deliberately kept the price as low as possible to make this reference work accessible to beginners. Order from AMSAT-UK, Badgers, Letton Close, Blandford, Dorset DT11 7SS or visit the website.

SATELLITE DX

If you have been lucky enough to work one of the major DXpeditions you will know how exciting it is. I worked AH1A (Howland Island) by satellite in 1993, and the QSL card ranks as one of my all-time specials. Very few of these expeditions have satellite capability and, as a service to members, AMSAT-UK has come up with a very imaginative plan to provide sponsorship to expeditions to encourage the use of satellite as an additional mode. The main criteria to qualify are: a good prospect of AMSAT-UK members making contacts; a location that features high on the 'wanted list'; the expedition should consist of at least four operators, one of whom must be experienced in amateur radio satellite communications. Expedition organisers please contact AMSAT-UK via its website. ◆

AMSAT-UK book, ideal for Intermediate Licensees, and others new to satellite operation.



WEB SEARCH

JAB Electronics	www.jabdog.com
National Space Centre	www.spacecentre.co

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ALL MODE HF/VHF/UHF
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Internal battery 20W (10W 70cms)

Visit us on the internet! http://www.yaesu.co.uk

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

Newcomers' News

I have been asked by several readers "what is the point of taking the Intermediate Licence exam?", so I thought it might be useful to set out my reply through the column.

It has to be said that, at the moment, the additional licence privileges that come with a pass in the Intermediate exam do not appear too great, especially as you still have to pass the five words per minute Morse test to upgrade your high frequency (HF) capability.

However, there are additional privileges that are well worth having, indeed some only came about as a result of strong lobbying from the amateur community; 50 Watts of RF power, more UHF bands, access to amateur satellites and the transmission of fast scan television. The ability to build your own transmitters is another privilege that is much sought after by many M3s. Once the Morse requirement is removed later this year (assuming that it is) enhanced HF licence conditions will add even more to the package.

It is also worth noting that the Radiocommunications Agency has indicated that, after December this year, a pass in the Intermediate exam will be a requirement for entry into the full RAE. Now that's what I call an incentive!

The final point to make is that the learning experience itself is another good reason for the Intermediate training. After all, every amateur radio licence is intended for "self-training in wireless telegraphy". A number of my Intermediate pilot students have only decided to continue on to the full RAE having gained more knowledge and confidence by working through the Intermediate course. The Intermediate is an excellent stepping stone between the Foundation and the Full Licences. Have a go, you have nothing to lose and much to gain.

YEOVIL COURSES

George Davis, G3ICO, of the Yeovil Amateur Radio Club, recently guided John, M3JRI, from Kettering through the Foundation course. George also led one of the first Intermediate Licence pilot courses in January.

Five local M3s attended the Yeovil Intermediate course and were eagerly awaiting their results at the time of writing. Once the pilot courses are completed, it is intended that Intermediate results will be issued on the spot, as for the Foundation Licence exam, although the pilot candidates have had to wait a while. Let's hope it was worth the wait!

Having completed the Intermediate course, George is considering running a weekend Foundation course in one of the village halls in the area. There is nothing definite at the moment but if anyone is interested in spending a weekend in the heart of Somerset and possibly coming home with a Foundation Licence pass slip they should contact George, G3ICO, or Derek Bowden, M0WOB, who are both QTHR (listed in the current *RSGB Yearbook*).

AWARDS

There are many operating awards available to radio amateurs, including newcomers. The RSGB has a wide range of awards for VHF and HF contacts. Full details can be found on the Society's website or in the *RSGB Yearbook*.

Richard Cairns, G7GLW, suggests the Worked All Britain (WAB) and Worked All Ireland (WAI) awards for newcomers to HF operating. As I understand it you buy a record book and mark off the various locations of stations that you work. You then gain certificates for specific numbers of locations worked. The awards do not cost much but the proceeds go to charities. Details can be obtained from the WAB and WAI websites (see below) or from the respective secretaries: Kate Wragg, G0FEZ, 11a Fall Road, Heanor, Derby, DE75 7PQ and Noel Mulvihill, EI6HW, Hillquarter, Coosan, Athlone, Co Westmeath, Ireland.

The much sought-after DXCC certificate is an operating award gained by operators who have contacted 100 different countries (or 'entities') by the American Amateur Radio Relay League (ARRL). Neil Clarke, M3WKR, is, to the best of my knowledge, the first Foundation Licence holder to achieve the DXCC and our hearty congratulations go to him.

David Cutter, G3UNA, Chairman of the Ripon Amateur Radio Society, reports that Neil started his log with GB2FB on 15 September 2002 and 8Q7VR (Maldives) on 26 February 2003 brought up the 100 country score. Not bad with 10 watts and a wire doublet antenna!

NEW TO CONTESTS?

As the lighter nights and warmer days approach I usually start to think about portable operating from sites away from home. I often take part '/P' in VHF contests as the centre of Bath, being surrounded by hills, is not a particularly good VHF site.

However, I continue to be surprised at how few newcomers take part in radio contests and wondered if a few words of encouragement here might prompt one or two to have a go this year. I would strongly recommend the 50 or 144MHz Backpackers contests as starters. Theses are quite short and friendly affairs but they can throw up some good long distance contacts.

One word of warning, though. Most of the activity is on SSB and you will not score many points, or win any friends, by calling "CQ Contest" on the FM calling channels!

Tim Kirby, G4VXE, who writes the 'Contest' column in *RadCom*, agrees that the Backpacker contests are quite simple to get involved in, but notes that some operators struggle with the exchange of locators. Tim suggests that getting involved in VHF National Field Day or the HF SSB Field Day contests [see the report in this issue – *Ed*] through your local club is a good first step. That way you can learn the ropes under the guidance of some older hands. Full details of all RSGB contests were published in the January edition of *RadCom*. It would be great to see some more M3 and 2E callsigns in the contest results tables. Whatever you decide to do please let me know how you get on. ◆

The Yeovil Intermediate hopefuls. Left to right: Brian Rendell, M3AIH; Cinzia Street, M3LVK; Len Edwards, M3LGE; Mike Wheeler, M3BXH, and John Loader, M3JKL (see 'Yeovil Courses').

WEB SEARCH

WAB	www.worked-all-britain.co.uk
WAI	www.clubi.ie/wai
Yeovil Amateur Radio Club	www.yarc.freeserve.co.uk

By Colin Dollery, G3GAF,
101 Corringham Road, London NW11 7DL.

Guide to HF

PART 3 HOW TO WORK DX. . .

If you read Parts 1 and 2 of the 'Guide to HF Operating' by Ian Poole, G3YWX, in the March and April issues of RadCom, you may be ready to discover the joys of HF DXing. In this two-part article, Colin Dollery gives us the benefit of his half-century of 'DXperience' with some tips on how to work DX – and some light-hearted warnings on how not to do it!

Right: Two QSLs from Macquarie Island almost 50 years apart. Note that signal reports were more accurate in the old days!

Below: G3GAF is very lucky to have a purpose-built shack, the result of a house extension. The builders left a brick out of the wall high up in the shack to allow entry for the cables to antennas and let the operator bury about 20 metres of copper water pipe in the foundations as an earth system.

In these days of risk management this article must begin with a health warning. DXing may seriously damage your health. It's not just that dazed look in the morning when you have been up half the night trying to work DX on 80 metres or even those countless warmed-up meals when you thought you might just work VK0MM on Macquarie Island if you hung on for another half hour. No it's worse than that. Let me give an example.

It's the winter of 1949, in bed in Lincoln is a teenager recovering from pneumonia. His life may have been saved by an early sulpha drug, M&B 693. The teenager is a ham and his pride and joy is a very long-wire antenna stretching over a neighbouring farmer's field to a distant tree. Outside a gale is blowing and it has just begun to snow. The teenager's mother comes up to his bedroom to report that the long-wire is down, the rope over the tree across the field has snapped. Despite the strident protests of his parents this foolish teenager rises from his bed, dresses and crosses the field in the snow to throw stones and ropes over the tree to haul his antenna back up. Now I am sure that none of you good readers would want to have such a stupid son, but that's what you might land yourself with if you have a DXer in the family. As you may have guessed I and my parents survived the incident.

I ought also to confess I am not a big DXer like the late Al Slater, G3FXB, but I have worked all the current DXCC countries save two (Scarborough Reef and Desecheo Island) both of which are uninhabited. My DXCC (No 1988) is dated August 6th 1954, perhaps I should update it? So what follows is an irreverent account of over 50 years of DXing. Let's start with the antenna.

ANTENNAS

Most hams who take up DXing spend a thousand pounds or two on a fancy transceiver and a tenth of that, or less, on an antenna. Wrong priority folks, big iron in the shack is of little use if you are a wimp in the sky. Attach your dipole to the chimney not the gutter, get a rope over the top of that tree, not to a low branch, reach for the sky!

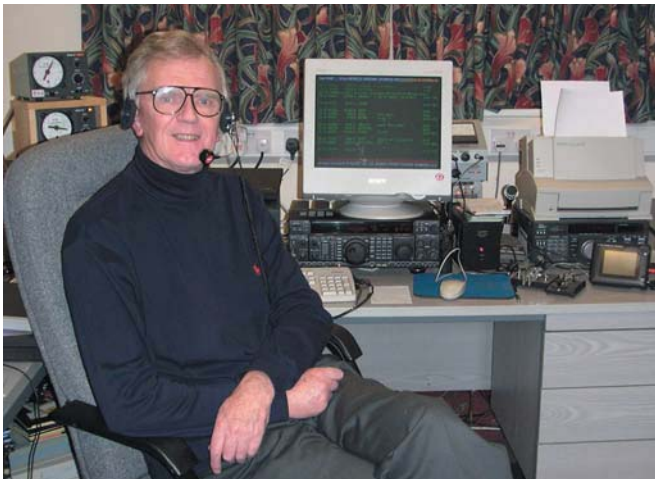
If you are in very restricted location a multi-band vertical is the best, but it has two problems. First it scatters your scarce RF power in every direction and second it acts as a good receive antenna for powerful local European stations, that you might rather not hear so well when you are trying to fish out some weak DX. But it's a lot better than nothing. If you have the space, a dipole or two with the wire running north-south (most DX is east-west). But do buy some decent quality antenna wire and even more important some good quality coaxial cable (from someone like Henry Westlake). The cheap coax intended for TV reception is very lossy.

Use good quality rope from a yacht chandler to suspend your dipole not polypropylene from the DIY stores. Polypropylene rope abrades quickly over tree branches and disintegrates in strong sunlight. Use a pulley on the end of the rope and a counterweight (I use plastic orange juice jars full of water) to tension the antenna. That way the tugging of a tree in a gale will not destroy your antenna. Remember that tree bark keeps growing and will quite quickly entrap your rope. I have several good pieces of rope stuck in trees that I forgot to keep running back and forward to keep a tunnel in the bark.

If you are feeling grand a rotary dipole or quad loop makes a remarkably good and fairly inconspicuous DX antenna and they are not too big on 21 and 28MHz. Once you graduate to a tower and a multi-element rotary beam you no longer need advice from me. Low band DXing (1.8 and 3.5MHz) is another story, big antennas and lots of real estate are needed for consistent DXing on those bands.

TRANSCEIVER

Assuming the transmitter works all you might want as an extra is that it has a speech processor to give your signal more punch. The receiver is much more critical. It must allow split operation, ie the ability to listen to the DX transmit frequency and to the stations he is working 5 to 20kHz away. It should have good strong signal performance and if you intend to work on the low bands (1.8, 3.5 and 7MHz) a built-in attenuator is handy. Most transceivers come with 2.4kHz SSB filters but I have replaced mine with 1.8kHz filters from International Radio (see 'Websearch' below). If you going to do a lot of CW work 250Hz filters will help.



Operating

There are some excellent used rigs available going right back to the TS-940 that was my main DX rig for years. Late models of the FT-1000MP are as good as the current FT-1000 MkV and Field models. But if you buy a used rig privately take a great deal of care (see below).

COMPUTER

This is the place to economise. Try to borrow or beg an old discarded 486 computer. Many households seem to have one. Offer to relieve them of the old 15in monitor at the same time. You need a machine with at least two serial ports (for the transceiver and the packet) but the processor speed is immaterial and 32MB of memory is quite adequate (16MB will do). I run the computer under DOS as I use *Turbolog* as the main logging program and *CT* for contests. Both are very stable in a pure DOS environment. You can create a DOS partition with *Partition Magic* if you want to keep the Windows set-up that is probably already on the machine. Use *PQBoot* to switch between partitions.

HANDS-FREE

Have you dreamed about one of those gleaming chrome and gun-metal grey desk mics you see in the ads? Forget it, no real DXer uses them. You *must* have a headset with a boom microphone (Heil headsets are excellent but pricey) and a footswitch

(Radiospares) to operate the rig. My first boom headset was home-made using a piece of coat hanger wire glued to the left hand earpiece and a Tandy microphone insert taped to the boom end. It worked OK but did not look pretty. You can see from the photo of my shack that I use the cheapest version of the Heil headset, the BM-10.

PACKET RADIO

For DXing nowadays you must have packet radio to connect to the DX Cluster. My packet station didn't cost much and consists of an old Pye MX290 PMR transceiver modified for 70MHz and a second-hand PK-88 controller. The antenna is a home built 3-element Yagi mounted vertically.

BUYING USED KIT

Much of my station was built using second hand purchases found in the Members' Ads section of *RadCom*. I've met some lovely people and got some excellent bargains. But I have also come across one crook and learnt, sadly, that possession of an amateur callsign does not always guarantee that someone's morals can be distinguished from those of a used car salesman. The worst case was when someone cashed my cheque but made no attempt to supply the goods despite multiple letters (including from the RSGB). In another case the gear had a fairly serious fault that looking back on it I think the vendor knew about.

So take care. Don't buy unseen. Take a friend who is more expert than you are. Test every function. Ask for a formal declaration of known faults and don't buy if the vendor cannot produce the receipts from when he purchased the equipment. But if you buy well this is the way to build a good station cheaply. ◆

Left: An extract from G3GAF's log for March 1952. Those two KG6s were on Guam Island (now KH2), and there's a couple of KL7s and a W6. Now can you see why I was so fond of that very long wire across the field?

NEXT MONTH: Colin Dollery brings more tips on how to snag the rare DX and, yes, how not to do it.

WEB SEARCH

International Radio (narrow filters)	www.QTH.com/inrad
Turbolog station logging program	www.turbolog.de
CT contest logging program	www.K1EA.com
Heil headsets and boom microphone	www.heilsound.com

. . . AND HOW NOT TO

Aaaaaaah!

This means that the owner of the signal has (a) a big linear he is tuning, (b) laryngitis and (c) is too mean to buy a dummy load. When you buy a linear amplifier, and as a budding DXer most likely one day you will, buy an oil-filled dummy load from a firm like MFJ at the same time. Even with a dummy load don't tune on a DX frequency. I once worked a very weak east coast US station who suddenly became S9+. That was when he switched from his dummy load to his beam!

Oops...

The DXer in question has hit the wrong button on his rig while trying to transmit split and has instead blotted out the DX (yes, I know: I've done it).

The originator of the 'goo' in question has just worked Central America on 50MHz and is using a general packet cluster announcement to advise his friend across town of his achievement.

Bingoo!

LooFerS

Lack Of Off Switch (LOOFerS). This refers not to the equipment but the operator. LOOFerS have a genetic defect that makes them unable to stop repeating their callsign incessantly in a pile-up. They rarely work anything but often prevent others doing so.

Not In Log (NIL). You sat up for hours, called repeatedly and at last you got him. Your return envelope flutters through the letter box but instead of a nice picture QSL

NIL

from a rare Pacific island there is your own card with a handwritten scrawl across it "Not In log". What went wrong?

You may have worked a pirate. They are common at the time of well-advertised DXpeditions. I am suspicious of unusually loud signals from a south-easterly direction, particularly when I do not expect propagation from the area indicated by the callsign. Or the DX may simply not have got your call. Did you give your call twice, slowly, with standard phonetics when he came back with only two letters of your call?

He may not have been working you at all! Some DX operators are terrific in the way that they will ward off the megawatt breakers to pull out the full callsign of a weak station, but others give up easily which simply encourages the aforementioned.

Sadly, DX stations sometimes make logging errors (we all do). I once worked a very rare station. I know it was a good QSO, there was little QRM and I recognised the operator's voice. But it still came back NIL. Grin and bear it.

Jamming

Jamming. Deliberate jamming with a continuous carrier, playing music etc, is on the increase. You will never descend to that, but what do you do when you are jammed or, more likely, the DX station you are trying to work is jammed? The answer is to ignore it and try to continue with the QSO. The jammer is hoping he will provoke you and if he succeeds he has won. Don't let him. Keep quiet and pretend he is not there.

Q u a l i t y • I n n o

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- SSB, CW, AM, FM and digital modes
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- Speech processor standard
- Narrow filters fitted as standard

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ALINCO DX77E *HF Transceiver 'GREAT VALUE'*

The DX-77 is a design achievement that puts a HF desktop transceiver within your reach! And this is no 'bare bones' radio, nor is it a converted 'channelised' adaptation. The DX-77 was designed from the beginning to be a quality Amateur Radio, full of features to enhance its performance and your enjoyment.

- 100W HF transceiver
- General coverage RX 500kHz - 30MHz
- All modes, FM, LSB, USB, CW & AM
- 100 memory channels
- Built in speech compressor
- Front mounted speaker, loud clear audio
- Optional keyer

~~£599.00~~
SPECIAL £499.00

EDX2

Auto Tuner

An automatic antenna tuner that matches a transceiver to a random wire antenna of over 3m in length (3.5MHz and above), or over 12m in length (1.6MHz and above). It comes installed with 5m of coaxial and control cables for instant operation with Alinco DX-70.

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

£289.00

HFM-1

A stainless steel, heavy duty HF mobile antenna complete with spring base. Covers 3.5 to 30MHz when used with the Alinco EDX-2 Automatic Tuner. Alternatively it may be base matched with any type of tuner for mono band or multi band use. Power handling with the EDX-2 is 150W.

- Covers: 3.5 - 30MHz (when used with EDX-2 auto ATU)
- Length: 2.7 metres

£59.95

ALINCO DR-605E *Dual Band Mobile*

The DR-605E is a no-nonsense twin-band mobile transceiver that delivers power and performance with user-friendly features. The command keys are simply laid out to enable intuitive operation.

- Ready for 9600 bps packet
- Extended RX capability 136 - 174MH, 420 - 470MHz
- 50W (2m) - 35W (70cms)
- 100 memory channels (+ CALL Channels)
- Cross band full duplex
- Tone search function
- Cable cloning function
- Channel indication mode
- CTCSS encoder fitted

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- 8 channels at 446 MHz
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Large selection of accessories available including:

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DJ-SR1

Single Unit £79.95

DR135E

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  RX: Expandable 118 - 174MHz
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- 100 memory channels
- Frequency Steps:
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- Optional internal TNC
  operates 1200, 9600bps
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- Rear panel DSUB9 computer connection
- Ignition key on/off feature
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- Theft alarm feature
- AM airband receive
- Ten auto dial memories
- Size: 142 x 40 x 174mm

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- CTCSS + DCS enc/dec fitted
- 40 memory channels + 1 call channel
- Alphanumeric display
- DCS, Tone burst and DTMF
- 13.8V DC direct input facility with battery charge feature
- THEFT ALARM!
  Emits a tone when disconnected from power
- S Meter with easy to read display
- Audio dialler
- Call cloning facility
- Comp. programmable 3rd party software
- Experimental insect repellent feature!
  Can the DJ-193 actually repel mosquitoes?
  Activate the special tone and decide for yourself!

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A feature packed dual bander - yet simple to use, with the capability of Digital Voice operation (where permitted - using optional digital voice board).

A nickel metal-hydride (NiMH) battery is supplied as standard, for added power and convenience.

VHF/UHF TX/RX including cross-band split operation

- 100 memory channels, any mix of VHF/UHF
- Alphanumeric channel labels
- Direct frequency input from keypad
- Large backlit display and keypad
- CTCSS, DCS encode+decode
- DTMF tones and autodial memories
- Tone bursts
- Three scan modes
- Theft Alarm feature
- Wide and narrow FM TX/RX
- 12VDC direct input (5w output)
- High-power NiMH battery (4.5w output VHF/4w UHF)
- Busy Channel Lock Out
- Mosquito Repelling feature (experimental)
- External Terminal Control
- Wire cloning capability
- Optional digital mode *(where permitted)*

£199.95

DJ 195E

2 mtr Handheld with Keypad

Alinco has created a new 2 meter HT that sets new standards in features, convenience and easy operation. The DJ-195 sports an alphanumeric display for easy memory management. It has an ergonomic design that's "user friendly" and the 5 watt output battery is standard. You'll be ready to travel the world with CTCSS encode+decode, DCS and European tone bursts, all included at no extra cost.

- New 2 metre (144-146MHz) handheld
- Easy to use, direct entry keypad
- Wide RX possible (typical 135-173MHz)
- Up to 5 watts output (0.8W low power)
- 40 memory channels + 1 call channel
- Large range of accessories available

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DJV5E

Compact Dual Bander

Alinco introduces an exciting new VHF/UHF handheld-transceiver that will change the way you think about communications. The new Alinco DJ-V5 can fill a variety of roles and it does them all well. Loaded with technical features, 5 watts of output power and a wide array of operator conveniences, the DJ-V5 is an attractive radio in a compact package.

- New dual band handy transceiver
- 5W/1W/0.5W output power
- Super wide receive (76-999MHz)
- Includes wide FM mode
- CTCSS Encode+decode, DTMF squelch and 4 different European Tone Bursts
- 200 memory channels +2 call channels
- Alphanumeric Display, up to 6 characters
- Autodial memories
- Up to 6 character alpha-tagging
- 4 scan modes, 5 programmable scan banks
- Input voltage display with over voltage warning
- Automatic high temperature protection feature

£225.95

DJ-S40 CQ

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Alinco has created a new UHF FM Hand held Transceiver that sets new standards in features, convenience and easy operation packed in a compact pager-size package. The DJ-S40T has an ergonomic design that's "user friendly" and capable of 1 watt output with optional Ni-MH battery pack. You'll be ready to travel the world with CTCSS encode/decode and European tone bursts, all included at no extra cost.

- Up to 1 W output (with 13.8V supply)
- Large illuminated display
- Loud clear speaker horn system
- 100 memories+1 call channel
- Multi Scan functions
- 38 CTCSS tones for selective calling
- S-meter
- Cable Cloning
- External device control feature (outputs 3Vdc 5mA signal from an accessory port when squelch opens)
- Additional features, including anti-theft alarm and experimental mosquito repelling tone!
- Huge selection of accessories available

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Ultra modern scanning receiver

- 100kHz - 1300MHz
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- 700 memory channels
- Steps: 5/6.5/8.33/10/12.5/ 15/20/25/ 30/50/100kHz
- Auto descrambler
- Bug detector
- Stereo FM (with headphones)
- Attenuator
- SMA Antenna
- Battery saver cct
- Size: 56w x 102h x 23d mm
- Weight: 14.5g (without batteries)
- Supplied c/w: 3 AA dry cell battery case carrying strap

with 8.33kHz for airband

Optional extras

- Lithium ion battery pack
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By Steve Ireland, VK6VZ/G3ZZD,
PO Box 55, Glen Forrest, WA 6071, Australia.

Pulling a Quart

It's spring time – time to start thinking about your antenna farming! Steve Ireland describes how to build a cheap and efficient ground screen for the low bands that will fit in a suburban garden.

Perhaps the biggest problem for those of us who are interested in the 1.8 and 3.5MHz bands and want to use a vertically-polarised antenna lies underneath our feet. Engineering a large vertical antenna is looked on by many 'low-banders' as being a breeze compared with the construction of the ground screen to prevent the antenna from coupling to the lossy earth beneath its base and thus reducing the near-field efficiency of the antenna.

The electrical conductivity of the soil/rock/sand beneath you will determine how much of a ground screen your antenna requires for the lowest ground losses and maximum efficiency. As this conductivity can vary considerably over a small area and is relatively difficult to measure, the best solution is to put down a ground screen that will produce maximum efficiency *whatever the type of soil that lies under the antenna.* For those lucky low-band enthusiasts with lots of land, time and money, this has traditionally meant laying down or burying 120 quarter-wave (or longer) pieces of wire [1], equally spaced at their tips, in a radial (bicycle-wheel spoke) fashion around the base of the antenna, electrically connected together at the antenna base (ie at the wheel's hub). This is not only a lot of hard work and expense, but for most of us is impossible, given the practicalities of suburban living. Instead, we usually try to get away with burying relatively few pieces of wire and sundry bits of metal as an earth system for our vertically-polarised antennas (resulting in earth losses and poor antenna system performance) or give up the whole idea and instead put up a horizontally-polarised antenna, often with mixed DX success. The author had tried both of these approaches, ultimately settling on the latter as the best compromise, but still longed to have an efficient vertical antenna.

Below: A trench with the radial lying to its side waiting to inserted using the 'radial needle'.

Bottom: The aluminium disk at the centre of the earth screen. The W2FMI unun is placed inside an empty swimming pool chlorine bucket mounted on top of the disk.

When I analysed why I had settled for a 'second best' earth system (and as a result had almost given up on vertical antennas) it came down to three practicalities:

- The space required for a full-sized ground screen
- The cost of a full-sized ground screen
- The physical energy required for a full-sized ground screen.

Whilst it was difficult to do much about the first of these, I had some good ideas about the second and a few inklings about the third. Firstly, even though I did not have the room for one, I worked out how much wire would be needed for 120 quarter-wave radial screen for 1.8MHz, the lowest frequency band of interest (see **Fig 1**). This came to almost 5km of wire – a very large and potentially expensive amount.

A few years ago, in the process of building an elevated ground system, in the manner of the W3ESU Mini-poise [2], for a 3.5MHz vertical antenna, I had learnt the cheapest way to buy copper wire was by weight, from either an electric motor re-winding company or direct from a wire maker. What I had also learnt was that thin wire was as good as thick wire for ground screens when there were relatively large numbers of radials involved.

As a result, I decided to work out how much it would cost to buy enough 22 gauge copper wire – which had proved to be quite durable for my version of the Mini-poise – for a full-sized 1.8MHz screen. This wire would cost around £3.50 per kg, plus tax and from my previous purchase of this wire, I knew that about 0.625 of a mile (1km) of it weighed just over 3.5kg. After getting out the calculator and doing a couple of simple sums, my maths showed that a full-sized 1.8MHz 'broadcast station-style' ground screen would cost over £60. Although the cost of 5km of wire was painful in financial terms, actually burying it sounded even worse, in terms of the huge physical effort involved.

The VK6VZ location, some 30km east of Perth in the Darling range of hills, is a beautiful place to live but the soil is a very tough mixture of gravel/red clay, interspersed with granite boulders. Planting anything in the earth – trees, shrubs, flowers or ground radials – requires the use of a pickaxe. What this meant was digging a trench and burying a mere 20m-long radial took up to an hour of hard labour – meaning that burying the 5km or so required for a full sized 1.8MHz ground screen could take up to 240 hours or about a month's worth of hard labour! My back was aching just at the thought of it.

Of course, there was also the other snag to frustrate me further – I didn't have the room for the 5km of wire anyway, so all this pain was strictly in my head. Maybe I should just stick to my inverted-Vee dipole?

A PRACTICAL SOLUTION

What followed was several months of reflection and reading a large number of articles on the theory and practice of building ground screens. There were two sources of encouragement in particular – a series of articles written by Jerry Sevick, W2FMI, during the 1970s [3] and the more recent work by Eric Gustafson, N7CL, and John Devoldere, ON4UN, featured in the latter's *Low-band DXing* book [4].

What I discovered was that to make

from a Pint Pot...

a wholly effective near-field ground screen, using wires connected together at a single central point, the ends of the radials making it should be spaced around 0.015 of a wavelength (around two metres on 1.8MHz, or around one metre on 3.5MHz). However, if the spacing between the ends of the radial spacing were doubled to 0.03-wavelength, substantially fewer radials were required but the ground screen was only around 0.5dB lower in effectiveness from a full-density one (ie the ground losses would increase by 0.5dB). Even more significant was the assertion that if the radius of a ground screen was reduced from a quarter to an eighth of a wavelength, the smaller ground screen was only around 0.3dB down on the larger one.

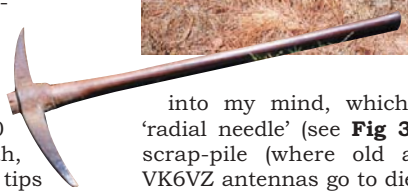
At this point, I purchased some graph paper and made plans for the radial system using a compass and ruler. What this meant was a mere 30 radials of 20m in length, spaced around 4m at their tips would be less than 1dB down on a full-size quarter-wave-radius ground screen - good news for me as this would fit within the VK6VZ backyard and also cut-down on the backache and expense (see **Fig 2**).

Although I only needed around 600m of wire for my pint-sized ground screen, I decided to buy at least a third more than this (about 1km) to give myself the latitude to put down a few more radials if I got energetic. After all, 1km of 22 gauge wire for £12.80 sounded much better than paying £64 for 5km!

The 1km of 22 gauge wire was purchased from an electric motor wire supplier. At the same time, I bought a 1m diameter disk of 4mm-thick aluminium for £6.60 from a local scrap yard, to serve as the centre of the ground system. As aluminium screws are hard to find in Western Australia, 30 M6 diameter stainless screws were purchased to fasten the radials to the aluminium disk, along with a similar number of Bosch 6mm ring terminals to which the radials could be soldered.

There was still something bothering me. Burying 600m of radials was a lot better than 5km, but was still a lot of work, particularly in the 30°C heat of Perth. Some kind of tool was needed to speed up the process and stop VK6VZ from expiring.

After some thought, an idea came into my mind, which I called a 'radial needle' (see **Fig 3**). From my scrap-pile (where old and broken VK6VZ antennas go to die), I selected a 1.2m length of 15mm diameter aluminium tubing. Using a small rat's-tail file, all the sharp edges at one end of the tubing were carefully rounded. Then, using a wooden mallet, about 10cm of the aluminium tubing at the filed end was *almost* flattened, so as to reduce the circular hole at the end to a long slit, about 2.5 mm wide. This meant that this end of the aluminium tubing could be dragged easily along the bottom of a slit cut into the earth/grass with a pickaxe, allowing a piece of wire threaded through the needle to be dragged/deposited neatly at the bottom of the slit.



A test run was carried out using the radial needle on a 20m-long piece of 22 gauge wire. The trench took about 15 minutes to dig using the pick axe and the wire took only a further 15 minutes to bury in the trench, cutting the time to bury each radial by at least half from the previous method using just a pickaxe and trowel. Not only was the time cut in half, but the strain on the VK6VZ back and knees was cut by about 80%, as I could place the wire on the bottom of the trench using the radial needle while hardly having to bend at all. There was another bonus: placing the wire on the very bottom of the trench using the needle, and covering it over by pressing the earth back into the trench with my foot at the same time meant that the wire tended to stay buried much better than when I was using the pickaxe-and-trowel method.

RUNNING THE RADIALS

To speed up laying down the ground screen further, I fabricated a couple more mechanical aids, the first of which (see **Fig 4**) was the VK6VZ 'wire unwinder' [5]. This simple device, made from scrap timber and a piece of 2.5cm diameter aluminium tube, allows the wire used for radials to be easily pulled off the drum without kinking.

The second aid was even simpler, made from a 2m length of dowel. As each of the radials was to be spaced about 4m at their far ends, this made measuring the distance an easy two-step process; much simpler than continually having to extend a tape measure.

My radials were laid out, one at a time, working in a clockwise direction from where the centre of the ground system was to be sited, in the fashion described earlier. The aluminium hub, drilled with 30 6mm holes for the radials around its rim (see **Fig 5**), was placed on a square support made of four house bricks mounted around a shallow hole in the ground filled with pebbles (see **Fig 6**), preventing grass growing over the hub and allowing drainage.

After six or so radials had been laid (ie after around three hours hard graft), I would stop work, have a long drink and a short rest and then rub the varnish off the hub-end of the radials (using emery paper) and solder a terminal to each one. This meant a half day's work for every six radials – and, believe me, half-a-day burying radials is as long as you want to do at a time.

The process of laying a ground screen is a laborious one, in this case about six full working days in total, but seeing it take shape is very satisfying. The secret is to do no more than one half-day a weekend at a time and if you get fed up, come back and do some more another day.

The radial needle proved an excellent tool and the more I used it, the quicker I became. By the time I had done the last of the 30 x 20m-long radials, the 'burying time' had been reduced to around 20 minutes per radial.

Some of my radials cross a raised area of rocks, covered in honeysuck- ▶

Left: VK6VZ using his 'radial needle' to lay a radial into a 10 - 15cm deep trench which has been dug using a pickaxe.

Fig 1: VK6VZ pint-sized 1.8 MHz ground screen.

Fig 2: The VK6VZ 'radial needle'.

Fig 3: The VK6VZ 'wire unwinder'.

Fig 4: Hub for radial system used at VK6VZ.

Fig 5: Mounting the radial hub over a hole filled with pebbles (to prevent grass growing over the aluminium hub and to allow drainage). The aluminium hub is mounted on the four bricks, above the ground surface.

Fig 6: 1.8MHz Marconi-T quarter wave antenna used at VK6VZ.

le, involving threading the wires under the vine. To my pleasure, I discovered I could use the radial needle in the manner of a sewing needle and use it to thread radial wires underneath the vines. In a matter of minutes, I could thread a wire under six to nine metres of matted undergrowth, a few centimetres below its surface.

CONNECTING UP

The radial wires were attached to the centre aluminium hub, using 6mm ring terminals and stainless steel screws/nuts after these had been liberally coated with aluminium oxide inhibiting compound (Aluminox or Burndy Penetrox A). A connection was made from the centre of the hub to the earth side of the antenna matching unit using a 10mm ring terminal/stainless steel nut/screw combination. As a final touch, the soldered connections between the ring terminals and the radials were weather-proofed using bitumen roofing compound bought from the local hardware store.

After some thought, a wire 1.8MHz Marconi quarter-wave T-antenna with a 21m vertical section was erected above the earth system, suspended between my telescopic tower and a nearby pine tree. Assuming that my ground screen was working in an efficient manner, with very little earth losses in the near-field of the antenna, its impedance should be close to the theoretical figure of about 22 Ω (for this shape of antenna).

To match the RG213 feeder to this impedance, I decided to use an Amidon multi-output 'unun' (mounted inside an old sealable chlorine bucket). The unun provides the facility to match unbalanced antennas, such as the Marconi, with impedances varying from about 12.5 to 38Ω. In the past, my vertical antennas had often had feed impedances that were considerably higher than the theoretical figure, indicating large earth losses and an inefficient ground screen/earth system.

To my surprise the antenna was a perfect 1.0:1 match at resonance using the 22.5Ω tap on the unun and only needed trimming a metre or so to be resonant on my favourite frequency of 1.830MHz. The Marconi-T displayed a narrow 2:1 bandwidth of 80kHz, only two-thirds of the bandwidth of my inverted-Vee dipole with its apex at 27m, also indicating the ground screen was working efficiently and the 'Q' of the entire system was high.

The on-air results confirmed the good match and efficiency of the ground screen, with the Marconi-T being competitive with the inverted-Vee dipole after sunset when working into North America. A few weeks later the Marconi-T and ground screen netted 3D2CI on Conway Reef for a new 1.8MHz country which was unreadable on the inverted-Vee dipole.

The Marconi-T is also the noisiest 1.8MHz antenna I have ever used. A good sign that a vertically-polarised antenna system is working well is the amount of noise it receives, as noise is, in general, vertical in polarisation.

Ground screen of 30 radials	Length of each radial	Distance from one tip of a radial to another tip of a radial
3.5MHz	10m	2m
7MHz	5m	1m

Dimensions of the VK6VZ pint-sized ground screen scaled for 3.5 and 7MHz.

CONCLUSIONS

The ground screen of 30 one-eighth wavelength radials, spaced 0.03 of a wavelength at their tips, is the best 1.8MHz earth system that has been used so far at VK6VZ. This screen can easily be scaled down for those who are interested in 3.5 or 7MHz DXing (see the table below) and is, of course, totally invisible.

Future plans include feeding a 3.5MHz quarter-wave wire vertical over the same earth mat and replacing the ferrite-cored unun with a series matching coil, made from copper brake pipe.

One day, I'll move to a five or 10-acre block where there is room for a full-sized quarter-wave ground screen, but for now I am very happy with my pint-sized one that gives a quart-sized performance.

Don't forget, when it comes to the low-bands and verticals, what you put underneath the soil is at least as important as the antenna you put over it.

REFERENCES

[1] The classic work on buried ground radial systems was carried out by Dr George Brown in 1937 and became the basis for engineering vertical broadcast station antennas around the world, up until today. Brown's research led him to believe that a broadcast station should use at least 120 radials, at least one quarter-wavelength long. As a result, for many years, the dream of those radio amateur interested in 1.8, 3.5 and 7 MHz bands was to have a 120-radial ground system…

[2] 'An Elevated Earth System Made Easy' by Steve Ireland, VK6VZ, *Radio and Communication*, December 1998, published in Australia. W3ESU's Mini-poise was originally described in *CQ* magazine, April 1984.

[3] Jerry Sevick's articles are collected in *The ARRL Antenna Anthology*, published in 1978 by the ARRL.

[4] *ON4UN's Low-Band DXing* by John Devoldere, ON4UN, published by the ARRL in 1999.

[5] Originally described in the article [2] above. ◆

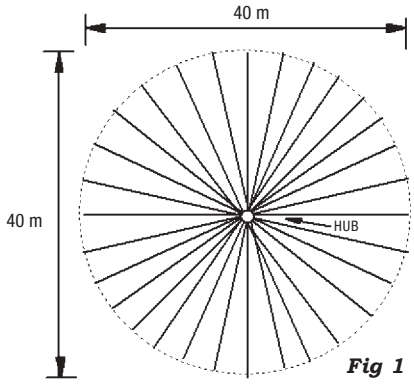


Fig 1

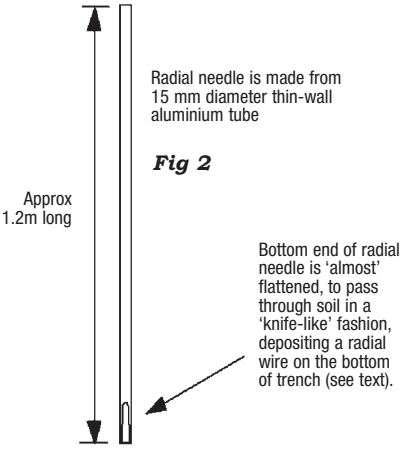


Fig 2

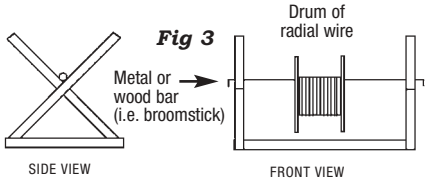


Fig 3

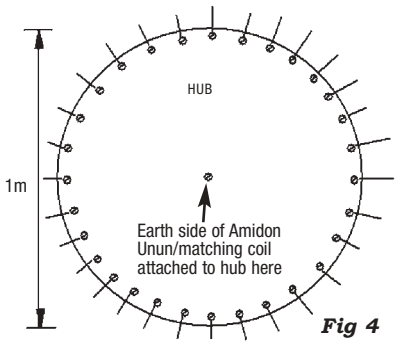


Fig 4

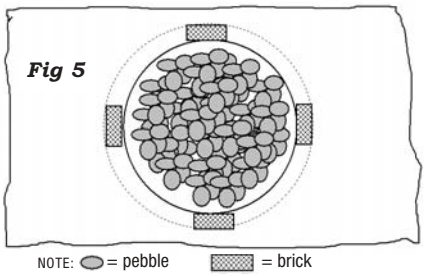


Fig 5

Dotted line shows the position of the aluminium plate, used to attach the radials

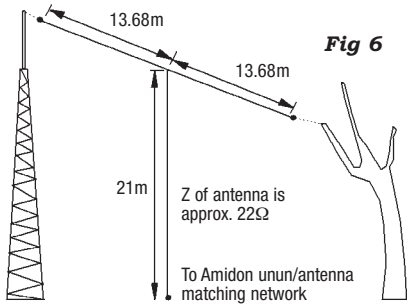
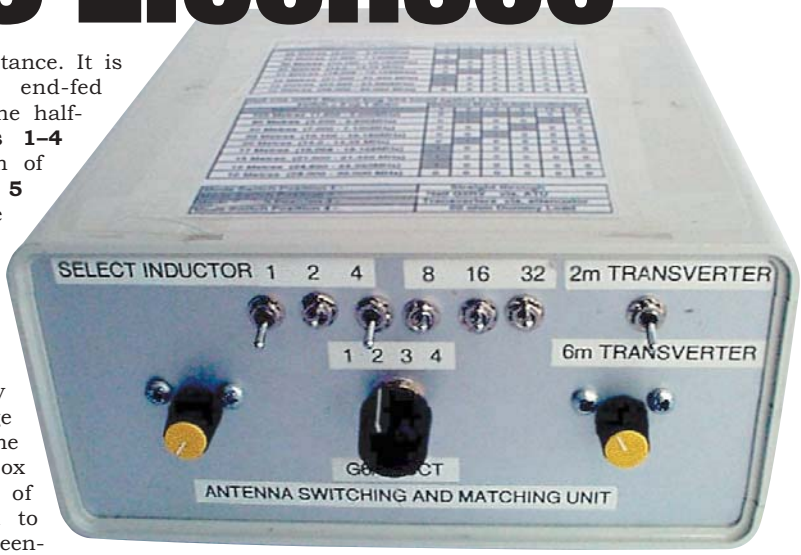


Fig 6

By David Littlewood, IEng, MIIE, M3DCT, 572 Herries Road, Galsworthy, Sheffield S5 8TR. E-mail: david.littlewood@scomagg.com

A QRP ATU for the M3 Licensee

Having been a Class B licensee for many years, I finally decided to take the Morse Assessment to obtain my M3 callsign and get on the HF bands. I already had an HF transceiver, which I had been using to drive VHF transverters, so all I needed to become operational on HF was a suitable antenna. A half-size G5RV satisfied both cost and space constraints, but was found to suffer from high VSWR on some bands. The π-configuration ATU described in this article was built to deal with the VSWR problems so that I could operate on all bands from 80m to 12m. It can cope with a wide range of load impedances, from a few tens of ohms up to several kilohms, even when these include significant levels of reactance. It is thus suitable for end-fed wires as well as the half-size G5RV. **Figs 1–4** show the operation of the ATU, and **Fig 5** gives the complete circuit.



The completed tuning unit.

CONSTRUCTION

The construction is not too critical, and the unit can be mounted in any suitable box large enough to house the components. The box should ideally be of metal construction to provide some RF screening, although my prototype was housed in a discarded computer network switching box of ABS plastic construction with aluminium front and rear panels. The wiring between the components should be kept as short as possible, and the use of short lengths of coaxial cable from the input and output sockets to the selector switches, etc will provide RF screening.

As the six coils are wound on six separate T68-2 iron dust toroids, each of which provides its own closed magnetic path, very little RF radiation is emitted from the cores. The input/output sockets on the prototype were BNC type, but SO-239 could be fitted instead. A table of the switch settings for each band was fixed on the top of the ATU for quick reference for band-changing.

Since I still wanted to use my two-metre and six-metre transverters with the HF rig, I decided to mount a suitable 30W/1W (15dB) attenuator and selector toggle switch in the same ATU box. The attenuator also doubles as a dummy load since it provides a good match to the transceiver 50Ω output. The attenuator was fitted for my convenience, but is optional and could be omitted if not required.

THE ATU INDUCTORS

From various π-tank calculations, carried out over several HF bands, a worst-case inductance value of 30μH was determined.

The inductors comprise six separate coils wound on Amidon T68-2 iron dust toroids of 0.68in diameter and colour-coded red. The T68-2 cores were used since they were at hand and worked satisfactory over the entire HF band.

The A_L value for the T68-2 core is 57μH per 100 turns, therefore the number turns, N, required for an inductance of value L (in μH) is

$$N = 100\sqrt{\frac{L}{A_L}}$$

The calculation of the number of turns for the first inductor of 0.5μH thus becomes

$$N = 100\sqrt{\frac{0.5}{57}} \quad 9.36$$

Therefore nine turns are used.

The number of turns for the other inductance values are calculated as above and detailed in Table 1.

The total inductance value required for the ATU is approximately 30μH and this is made from six coils increasing in a binary sequence with a incremental value of 0.5μH. This sequence gives a range from 0.5μH to 31.5μH in 0.5μH steps. This range of inductance is more than adequate to match the range of antenna impedance values that are likely to be encountered.

Coils 1–4 are wound with a single-layer 0.8mm-diameter (21SWG) enamelled copper wire. Coil 5 and 6 are wound with 0.5mm-diameter (25SWG) wire with coil 6 requiring two layers.

In the prototype, I mounted the ▶

TABLE 1

Coil	Number of turns	Inductance (μH)
1	9	0.5
2	13	1
3	19	2
4	26	4
5	37	8
6	52	16

TABLE 2

Band(m)	S1	S2	S4	S8	S16	S32
80*	1	1	1	0	0	0
40	0	1	0	0	0	0
30	0	1	0	0	0	0
20	0	0	0	0	0	0
17	0	1	0	0	0	0
15	1	0	0	0	0	0
12	1	0	0	0	0	0
10†	0	0	0	0	0	0

* THE SWITCH SETTINGS SHOWN FOR THE 80M BAND ASSUME THAT THE HALF-LENGTH G5RV IS USED WITH THE NORMAL COAXIAL CABLE CONNECTION, AND RUN AS A QUARTER-WAVE DIPOLE. THIS MODE OF OPERATION IS NOT VERY EFFICIENT AND IT MAY BE BETTER TO USE THE G5RV AS A MARCONI LONG-WIRE ANTENNA TUNED AGAINST A GOOD EARTH OR, BETTER STILL, TO USE THE FULL-SIZE G5RV. † NOT FOR USE WITH THE FOUNDATION LICENCE.

TABLE 3

Band(m)	S1	S2	S4	S8	S16	S32
160	0	1	1	1	0	0
80	0	1	0	0	1	0
40	0	0	0	1	0	0
30	0	0	1	0	0	0
20	0	1	0	0	0	0
17	1	0	0	0	0	0
15	1	0	0	0	0	0
12	1	0	0	0	0	0
10†	0	0	0	0	0	0

† NOT FOR USE WITH THE FOUNDATION LICENCE.

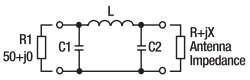


Fig 1: The π-tank circuit. L – ATU inductor; C1 – input capacitor; C2 – output capacitor.

completed inductors close to each of the associated switches and soldered them directly to the switch solder tags. The ATU is only intended for relatively low powers of 10–25W maximum, and saturation or overheating of the core may take place when running at higher power. If the ATU is to be used at higher power (eg 100W), I suggest that larger iron dust cores or several cores stacked together should be used to avoid any problems, in which case the iron dust core colour-coding and A_L value would need to be selected to provide similar values of inductance.

TOGGLE SWITCHES

I used six small DPDT changeover toggle switches to select any combination of the six coils in a binary sequence. An input tuning capacitor, C1, tunes the input circuit of the inductor to match the transceiver 50Ω impedance and the output tuning capacitor, C2, tunes the output of the inductor to match the antenna. The switches are arranged such that in the UP position (switch = 0, bypass coil) they open-circuit the associated coil winding and in the DOWN position (switch = 1, connect coil), they connect to the associated coil winding.

TUNING CAPACITORS

The input and output tuning capacitors were fitted with normal knobs and no slow-motion drives were used since, although useful, they would have added a large additional cost to the unit. The positions of the input and output capacitors were not recorded on the table because, once the correct switch settings were found for each band, adjustment of the input and output capacitors for correct matching was a fairly simple task.

The tuning capacitors used in the prototype were air-spaced AM tuning capacitors of 500pF capacitance range (30–500pF). Any air-spaced capacitor of around 500pF value should be suitable, although it may be better to use dual- or triple-gang input and output capacitors of 365pF or 500pF, with all sections in parallel to provide a total capacitance of 730–1500pF; this would provide a larger range of impedance matching. Because the ATU is intended only for low-power operation of around 10W (possibly 25W maximum), the above types of capacitor should be suitable but, if the unit is built to handle higher powers of up to 100W or greater, higher voltage variable capacitors with wider plate spacing should be used.

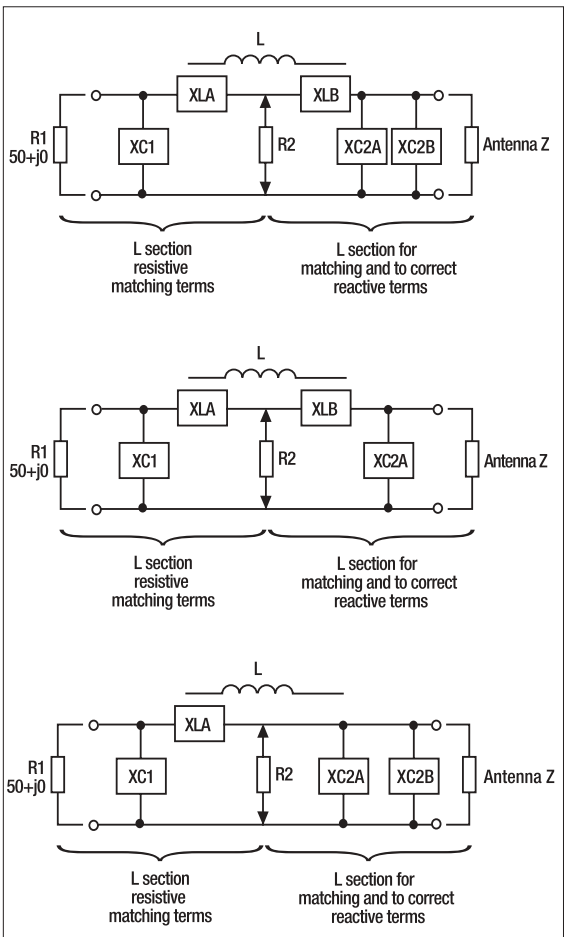


Fig 2: Equivalent circuit of the π-tank. XC1 – C1 reactance; XLA – matching reactance; XLB – loading reactance; XC2A – C2 reactance; XC2B – C2 reactance; R1 – source resistive component (50W); R2 – antenna resistive component.

Fig 3: Matching antennas shorter than resonance (capacitive). XLB provides loading inductance to bring antenna to resonance.

Fig 4: Matching antennas longer than resonance (inductive). XC2B provides capacitance to bring antenna to resonance.

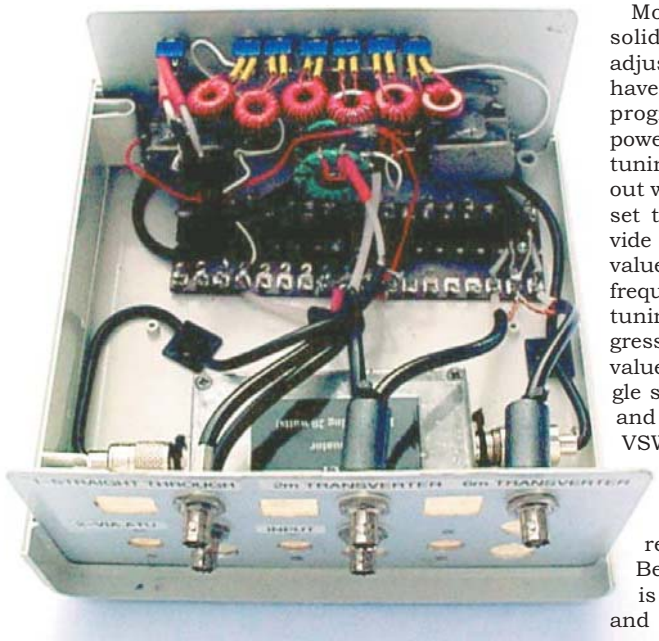
SWITCH SETTINGS AND OPERATION

For a quick reference for band-changing, I made up a table for each HF band which recorded the setting of the binary toggle switches.

Table 2 and **Table 3** show the typical switch settings for each of the HF bands for the half-size G5RV itself and the half-size G5RV used as a Marconi antenna tuned against earth, respectively. The switch settings are only typical, and will vary depending on feeder length and antenna height, etc.

Most modern transceivers have solid-state output stages with adjustable output power and also have VSWR sensing circuits which progressively reduce the output power as the VSWR value rises. The tuning of the ATU should be carried out with the transceiver output power set to the minimum which will provide reasonable display of the VSWR value and should be carried out on a frequency which is not in use. The tuning-up procedure involves progressively increasing the inductance value by operating the associated toggle switches and adjusting the input and output capacitors for the lowest VSWR reading. Finding the correct switch setting for a particular band can at first be a tedious process but, once found and recorded, can be easily repeated. Because the tuning up procedure is carried out at low output power and the fact that the power is automatically reduced further with a high VSWR value, the transceiver output stage should not be damaged during the setting procedure.

Below: The component layout inside the box.



CONCLUSION

This very cheap and quickly-constructed ATU, together with an end-fed long wire or half-size G5RV, should provide a good match (VSWR £ 1.5) on all the HF bands from 80m to 10m. In the period since I obtained my M3 callsign, I have worked 35 countries on these bands. I found that the Foundation Licence power limit of 10W provided no great restriction, and many contacts were made with good signal reports. Note that 10W is only 10dB down on the 'normal' 100W output power used by most amateur stations, and this represents a loss on the received signal of only 1.5 to 2 S-points.

FURTHER READING

Radio Communication Handbook, RSGB, sixth edition.

USA Ferrite and Iron Dust Core Catalogue, Micrometals Inc. ◆

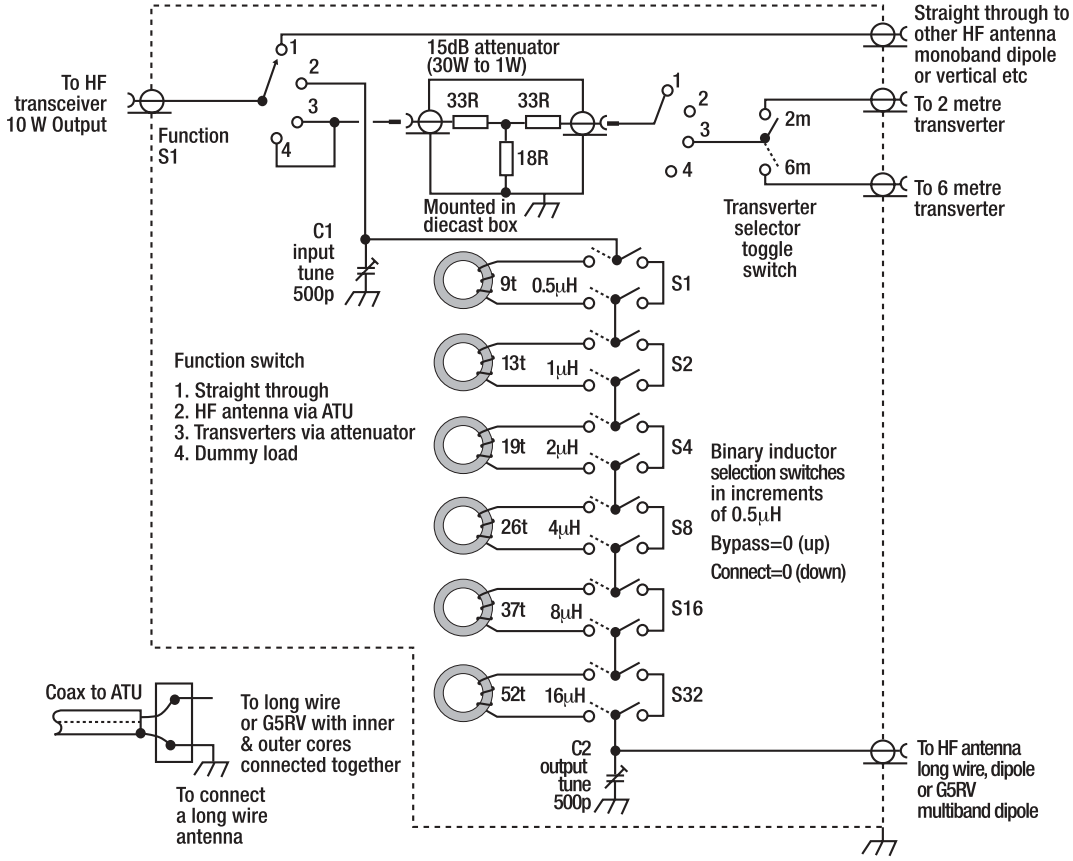


Fig 5: The complete circuit of the QRP antenna tuning unit.

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PIC-A-STAR

PART 10 SOFTWARE TRANSMITTER AND RECEIVER

This covers integration of the IF board with the DSP board to make the DSP Assembly.

Testing of this assembly is also covered, as is the adjustment process for the Timer board.

DSP ASSEMBLY – ASSEMBLY

This process starts when the IF board and DSP board are fully built, and the latter has been tested using the test program. The required DC supplies come from the Timer Board (or some equivalent arrangement).

Make off all the leads between the boards as shown in **Fig 14**. With the two boards at right-angles (but preferably less), trim their lengths and make off the other ends to their respective feedthroughs. Ground the braids to the adjacent ground-plane.

Mate the two boards, and in the process, perhaps trim some excess lead lengths.

Fit diodes D12 to D14 – outside the housing – to drop the 10V rail to a nominal 8V.

COMMISSIONING

The DSP Assembly is first proved in isolation and then crudely integrated with some existing transceiver for verification. The idea at this stage is to demonstrate hardware functionality, not system performance.

BASIC DC TESTING

As a preliminary, set RV1, RV2, RV5 to mid-travel and RV3, RV4 fully clockwise.

On the end-plates, connect up 10V, +12V Tx (grounded on receive), +12V Rx (+12V on receive) – and the stereo outputs, typically to some domestic amplifier.

For the first few seconds after power-on, a voltmeter on the S-meter feedthrough should show definite activity on a 5V range. Check that the T/R Status line is near +5V.

On the IF board, check all the power rails and then get the X1 oscillator working. Adjust its frequency to the centre frequency of FL1 + 15kHz.

LOADING TEST SOFTWARE

Connect the serial cable from your PC COM port to the DSP Assembly. Also, a microphone (both audio and PTT). Load the test program as previously described and re-verify operation.

Speaking into the microphone should produce audio from one stereo channel. Adjust RV5 for maximum undistorted output – but, in any event, no more than 2V peak-to-peak on C17.

LOADING OPERATIONAL SOFTWARE

Reset the DSP board (ie press and release S2) and load in the operational software as per the loader on-screen instructions.

Loading is complete when you are looking at user controls on the screen as in **Fig 15** – and the DSP board LED is out. If the LED remains – or reverts to – flashing, this indicates a comms failure during loading.

At this stage the DSP Rx should be operational. To verify this, feed a sniff of RF at your IF frequency into the IF in/out coax. Just tack a few inches of wire to the coax inner and put it near some suitable signal source eg the DDS or a GDO. As you tune across the IF, you should hear the beat note – and the LED on the DSP board should light in the presence of signal.

Turn the RF gain up and down on the PC to verify that you are in control.

If you speak into the microphone, this should also light the LED. Grounding the PTT line should mute the Rx – and the T/R Status line should go to near 0V.

On the PC, switch to CW. Grounding the KEY line should then produce sidetone.

The T/R Status line may now be connected to the Timer board and its operation verified. Under no circumstances be tempted to connect T/R Status to some external PTT line, say on your transceiver.

Getting to this point is a major milestone. But if any of the preceding fails, stop and correct the problem before going further.

INTEGRATION TESTING

This stage is not strictly necessary. You could wait until you have a completed transceiver. But I commend this as the better approach - not least because any problems will be confined to the new-build DSP hardware.

RECEIVER

Connect a short fat ground strap from your transceiver to the DSP Assembly.

Locate a suitable bi-directional 50Ω point on your transceiver; after the mixer, after any post-mix amplifier, after any pad is best – but the 50Ω IF port on your mixer will suffice for test purposes. Patch in the IF in/out coax via a series 100nF instead of your existing IF strip.

Arrange to be able to switch your transceiver between transmit and receive. Turn the AF gain down on your transceiver – and any other Rx gain controls to maximum; and Tx gain controls to minimum.

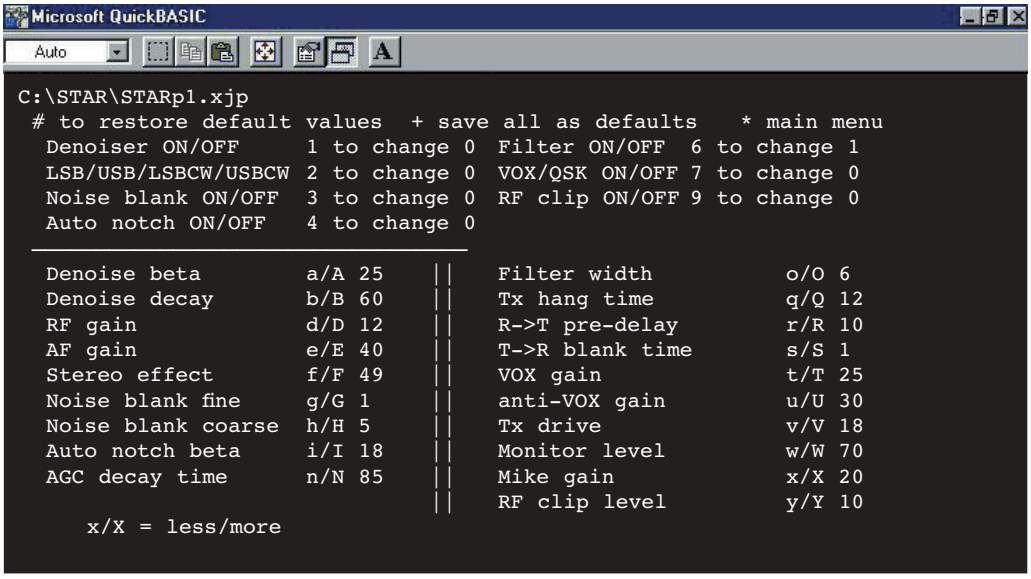

Fig 15: The PC screen running under QBASIC. Illustrated are the STAR parameters for the SSB mode. For development and proving purposes only this user interface is designed to be rather more functional than beautiful.

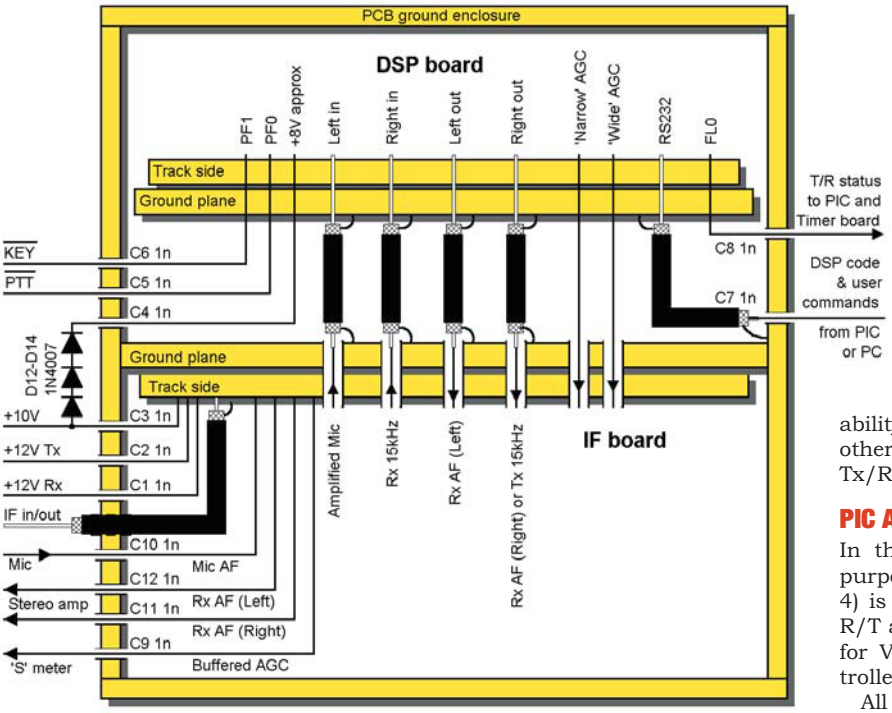

Fig 14: DSP sub-assembly. The IF board is bolted back-to-back with the DSP board using nuts, bolts and spacers. Both their ground planes form a screen to isolate the two halves of the box. Feedthrough capacitors are used to route between the two halves of the box - and to the rest of the transceiver. C11 and C12 may be replaced with a stereo jack socket.

Power up on an LF band and then load the operational software as previously. Inject signal frequency plus FL1 centre frequency into your transceiver mixer – and you should hear resolved LSB signals from both speakers. On a quiet frequency (LED is out), peak VC3 for maximum band noise. Then peak RV1.

Connect a CRO (DC, 1V/cm) to the S-meter output. This should show about 4V on weak signals and progressively less as AGC action occurs. Find a signal giving about 2.5V and adjust RV2 until it is slightly less. While listening on a noisy band, adjust RV6 until the AGC loop is clearly unstable and hunting – and then back it off until it is smooth. That completes a crude setting up of the AGC system, enough to verify that the hardware is working.

At this stage, with the DSP Assembly unscreened, there may be evidence of white noise on the higher bands.

TRANSMITTER INTEGRATION TEST

With your Tx drive level well down, set Tx Drive on the PC to 10. With your transceiver connected to a dummy load, and preferably monitoring on another receiver, set up to observe the Tx output on a CRO for flat topping etc.

Put your transceiver on transmit. When you ground the DSP PTT line, this will put the DSP assembly onto transmit as well. The mic gain on the PC should be increased as far as possible – but only so long as there is no evidence of any clipping, compression or distortion.

If all is well, bring up the drive on your Tx to its normal setting. Then increase the Tx Drive on the PC, ensuring the output remains clean – up to your normal power level.

Now would be a good time to screen the crystal oscillator and add the other screens on top of the IF board. The fully-screened enclosure is best left until the very end.

PC CONTROL OPTION

This is a timely opportunity to outline the behaviour of the PC control panel. Fig 15 shows the screen of the loader after the DSP code and the controllable parameter values have been downloaded to the DSP assembly – at 9.6KB.

Adjustment and use of the various DSP features themselves follows later. Here, I am concerned only with the mechanics. Simply key the appropriate number to change a switch state, the upper-case letter to increase a parameter value – and the lower-case letter to decrease it.

SYNTAX

The BASIC control software has been optimised for simplicity. That is, only the most basic syntax has been used – and if you have ever written any software in any language (very nearly, English will suffice) – then you will have no trouble following it or editing it. Equally if you want to build some controller other than Pic 'N' Mix – either in dedicated hardware or on your PC – then this acts as a model. If you have the background to undertake this, then equally you will have no issues following the code.

CONTROL PARAMETERS

These are held in a separate file, param01.xjp. It is the controller's responsibility to handle parameter values and to constrain them to be within maximum and minimum values – and in any event, within an 8-bit byte. The value 255 is assigned to any parameter that does not apply in a given mode.

Following any user change, the new parameter value is sent to the DSP as three bytes. The first is always a tilde '~', the second is unique and identifies the parameter, and the third is the new value. Nothing could be simpler.

FREQUENCY CONTROL

One of the virtues of controlling the whole transceiver from Pic 'N' Mix is that it can handle the injection offset needed when switching between SSB and CW and transmit and receive. Obviously, the PC has no intrinsic ability to do this, so you need to make other arrangements – eg operate your Tx/Rx split when on CW.

PIC A TIME

In the STAR environment, the sole purpose of the Timer board (see Part 4) is to provide click- and spike-free R/T and T/R transitions. Hang times for VOX or QSK operation are controlled by the DSP.

All the switching times may be independently set between 1ms (very fast) and 63ms (incredibly slow). In general, it is best to start with the times set to incredibly slow, and then reduce them progressively until there are any signs of switching spikes on the transmitted output – or clicks on reverting to receive. Having said that, if your transceiver has inherently noisy switching, a click on reverting to receive is inevitable. The DSP code has a feature for blanking any such click – but it is obviously best avoided by design.

ADJUSTMENT PROCESS

The process for altering the timing is as follows, starting with all the switches OFF, ie away from the adjacent PIC:

1. Set the More/Less switch as required to increase or decrease the time delay. (More is towards the PIC).
2. Set the switch(es) for the time(s) you want to alter to ON, ie towards the PIC
3. Key the T/R Status line down and up once for each required millisecond of change.

The altered time(s) will be implemented immediately – but not stored. When all the required changes have been made, put all the switches to ON, key the T/R Status line down/up one final time – and all the new times will be stored and retained. As evidence of success, this particular R/T/R transition sequence will not occur. Conversely, to abort all changes since power-on simply miss out this stage completely, power off and wait 20 seconds before powering on again.

Finally, set all the switches to OFF.

Note that this process can be used to change several (but not all) of the time delays simultaneously though you may wish to avoid this practice unless gross changes are required. Note also that the PIC cannot be programmed via the programmer interface if the switches are ON. ◆

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CIRCULARLY-POLARISED TWISTED LOOP

It is widely recognised that the radiation of circularly-polarised signals can offer useful benefits at HF and VHF, reducing fading and multipath distortion problems (particularly when the receiving antenna is also circularly-polarised). Dr Brian Austin, G0GSF, has drawn my attention to a paper by Rong-Lio Li and Dr Vincent F Fusco, both of Queen's University Belfast: 'Circularly-Polarised Twisted Loop Antenna' (IEEE Transactions on Antennas and Propagation, October 2000, pp1377 – 1381). Interestingly, as G0GSF points out, the basic element is in the form of the VK2ABQ two-element HF array developed empirically by the late Fred Cator, VK2ABQ/G3ONC, and first featured in 'TT' as long ago as 1974. Since then, it has been turned into all sorts of shapes by Les Moxon, G6XN, and others, and is usually known in the USA as the 'Moxon Rectangle'.

VK2ABQ turned a 1λ horizontal loop into driven and parasitic elements by introducing small gaps in the loop; he originally used buttons as insulators bridging the small gaps. The evolution of the circularly-polarised twisted loop is shown in Fig 1. To start, the Queen's University team took the basic 1λ horizontal square loop, Fig 1(a); then, in Fig 1(b), introduced the VK2ABQ form of gapped 1λ loop (though the team appears to have been unaware that this technique had been devised by VK2ABQ some 30 years ago). Finally, the gapped loop is twisted into the form shown in Fig 1(c), making the radiating sides '1' and '2' perpendicular to each other, and introducing an over-pass connection at the intersection to prevent an electrical short circuit. This results in a quasi-planar structure with the phase relationships indicated.

The authors write: "Considering the additional radiation from sides '3' and '4' in (c), the geometry and sizes of the twisted loop sides have to be optimised to obtain circularly-polarised wave characteristics. The idea of obtaining a near 90° by introducing capacitive gaps [the VK2ABQ technique] was discovered [by others in 2001] during a numerical analysis for the purpose of beam steering... The arrangement in (c) may be thought of as behaving in a fashion analogous to a two-element Yagi array with a driven element and a suitably-phased parasitic element but, theoretically, the antenna now generates nearly-ideal circular polarisation at broadside (perpendicular to the loop plane)."

The paper presents detailed information and radiation patterns based on a 1GHz model antenna mounted above a flat ground plane. Construction would be possible on HF or VHF although the structure would be more complex with its vertical and horizontal sections than a VK2ABQ array.

It is pointed out in the Abstract: "The antenna yields nearly-ideal circular polarisation at broadside as well as excellent input impedance properties near the design frequency. The radiation pattern has a broad beamwidth and good rotational symmetry about the axis. For a demonstrator operating at 1GHz, a 3dB axial ratio was maintained over ±30°."

The Queen's University team certainly seems to have given the easily-constructed monoband VK2ABQ array a new twist! A twist that seems worth taking further at both HF and VHF.

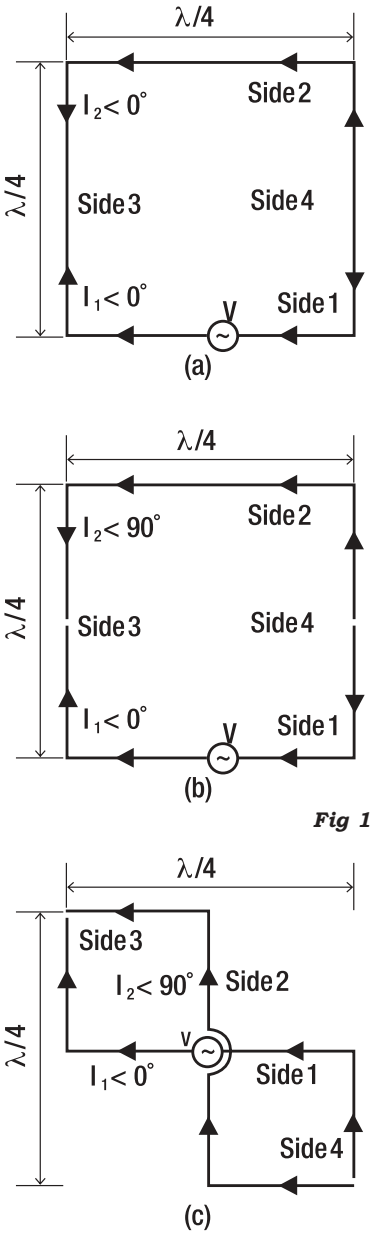

Fig 1

Fig 1: Evolution of the Queen's University Belfast circularly-polarised twisted loop antenna. (a) Conventional 1λ square loop antenna. (b) The square loop antenna with two gaps (as in the VK2ABQ antenna developed in 1974). (c) The new twisted loop antenna as described in IEEE Trans Ant & Prop (October 2000) radiating a circularly-polarised signal.

CRYSTAL/CERAMIC LADDER FILTERS

The use of crystal filters in communication receivers and SSB transmitters has a long history. Even after the development of digital signal processing (DSP) at audio or low-IF, the crystal or ceramic-resonator filter remains the unique means of obtaining high-performance filtering at HF (the mechanical filter is limited to frequencies below about 500kHz). In the 1930s, the single-crystal filter (usually with a phasing control to shift the notch) was widely used in high-performance receivers, although professionals also used the bridged-T form of crystal filter. The bandpass half-lattice crystal filter, using two or more crystals, was introduced to UK amateurs in a series of articles by E L Gardiner, G6GR, in this journal just as the 1939 war loomed (and was soon adopted, for example, by Eddystone).

In the 1950s, the symmetrical half-lattice 455kHz IF filter using crystals of slightly- but accurately-spaced resonant frequencies was soon established for the early amateur SSB transmitters, and progressively at frequencies extending up to 9MHz. It was soon found that home-construction of high-performance half-lattice SSB crystal filters at HF compared to 455kHz was significantly more difficult. Good factory-built units were (and remain) expensive.

It was not until 1976 that I noted in 'TT' that J Pochet, F6BQP, had described in Radio-REF (May 1976) an HF crystal filter based on a ladder

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

Topics

form of filter that was much simpler to build than a lattice filter, since it required only identical crystals and a few capacitors. Apart from the notes in 'TT', I was so impressed with the French article that I prepared a complete translation that was published in Wireless World (July 1977). But it later emerged that the crystal ladder filter had been described in greater detail in professional journals and had already attracted the attention of Jack Hardcastle, G3JIR, who wrote a series of articles in Radio Communication: 'Experiments With Ladder Crystal Filters', December 1976, January, February and September 1977. Later he wrote 'Ladder Crystal Filter Design', February 1979, reprinted in QST, November 1980 – apparently the first article to appear on this topic in an American amateur periodical, though soon followed by numerous other articles and 'TT' references in many parts of the world. Bill Doyle, G4CUE, wrote 'Systematic Design of Crystal Ladder Filters' in Ham Radio, February 1982. Jack Hardcastle, G3JIR, contributed 'Computer-Aided Ladder Crystal Filter Design' in this journal, May 1983.

'TT' also provided a boost to amateur-radio use of ladder filters when Hans Kreuzer, DL1AN, wrote to 'TT' (June 1977) that effective ladder filters could be made using low-cost colour-TV receiver crystals (PAL 4.4336MHz, NTSC 3.5795MHz). More recently the use of ceramic resonators has attracted attention for both home-built and factory-built receivers.

In 'TT' (December, 1980) Dave Gordon-Smith, G3UUR, described a novel ladder filter with switched bandwidths. Wes Hayward, W7ZOI, contributed a number of articles in QST May 1983, July 1987, QEX June 1995 and, most recently, brought together much information (including the G3UUR method for measuring quartz crystal motional parameters) on ladder crystal filter design in his QEX, June 1995, article 'Refinements in Crystal Ladder Filter Design'. This, with many other 'classic' articles, is now available on the CD-ROM issued with the excellent new book "Experimental Methods in RF Design" (ARRL, 2003).

The history of crystal ladder filters stretches back a long way. The idea had been mooted by Bell Telephone Laboratories in 1934, but the first academic study linked with practical designs of both upper- and lower-sideband filters was undertaken at the ITT Federal Laboratories, Nutley, NJ in the 1960s. A detailed paper (brought to my notice in 1976 by Bill Pechey, G4CUE) was written by Milton Dishal ('Modern Network Theory Design of Single-Sideband Crystal Ladder Filters' Proc IEEE, September 1965, pp1205-1216). This was followed by articles by Amstutz and Colin in the ITT / STC house journal "Cables & Transmission" (April, 1967 and April 1968).

The above summary is based partly on information supplied by G3JIR who has continued investigating various aspects of ladder filters using crystal and ceramic resonators ('TT', June 1999 and March 2000) with the aim of developing practical, low-cost filters for 12.5kHz channel spacing at VHF). One result of his 1999 / 2000 items was a very long letter from G3UUR. I passed it to G3JIR and put it aside for publication when space was available; unfortunately I accidentally put it into what amounted to a 'file and forget' folder, until recently reminded of it by G3JIR.

G3UUR wrote "The March 2000 report on 12.5kHz channel spacing filters using ceramic resonators led me to pull out the notes of my experiments in the late 70s on wideband ladder filters using quartz resonators. I had in mind a particular configuration for G3JIR's application, but also found another that I had forgotten – both had been discarded in the drive for the 'perfect' filter. Both had limitations, but all configurations have some merits; these two may be just what someone is looking for to solve a particular problem.

"The first configuration is not specifically intended for wide bandwidths, since it is limited by the same reduction in ultimate attenuation and symmetry at wider bandwidths as the LSB configuration on which it is based, although not to the same extent. It was an attempt to improve the symmetry, while also increasing the bandwidth of the LSB ladder configurations. It was partially successful in both these aims.

"As shown in Fig 2, it is a modified LSB ladder filter, where every other coupling capacitor has been replaced by an inductor which has the same reactance at the filter centre frequency as the capacitor it replaces. This causes the passband to spread down as well as up in frequency, and each pair of resonators coupled by an inductor has a phase-shift across it which, when bridged by a capacitor, creates nulls both above and below the passband. This reduces the asymmetry of the filter, but it cannot be made perfectly symmetrical, owing to the fact that the static capacitances of the two resonators are also coupled through the inductor; these cause the upper null to be closer to the passband than the lower one at all settings of the bridging capacitors. The use of inductors as coupling elements also reduces the ultimate attenuation of the filter and introduces extra spurious responses. Despite these limitations, the configuration may suit certain applications where the improved symmetry and lower centre frequency compared with the capacitor-only LSB configuration outweigh the loss of ultimate attenuation.

"The filter configuration that may fulfil G3JIR's desire for symmetry at wider bandwidths is shown in Fig 3. It is capable of bandwidths as great as 60% of the separation between the series and parallel resonances of the resonators. Thus bandwidths of 12kHz at 9MHz can be produced using quartz resonators and 10kHz at 450kHz using ceramic resonators. In ▶

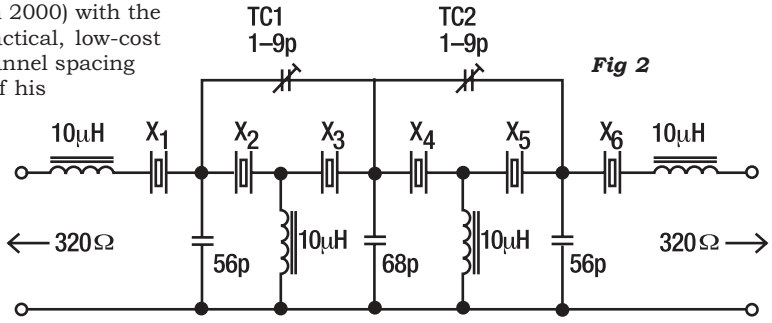

Fig 2

Fig 2: G3UUR's modified LSB ladder filter, with nulls above and below the passband (3.6kHz bandwidth, 1dB ripple, Chebyshev design). X1 to X6 nominally all 6.144MHz quartz crystal. The 10µH inductors are Cumbrian RF chokes. TC1 and TC2 are adjusted to give best symmetry.

Fig 3

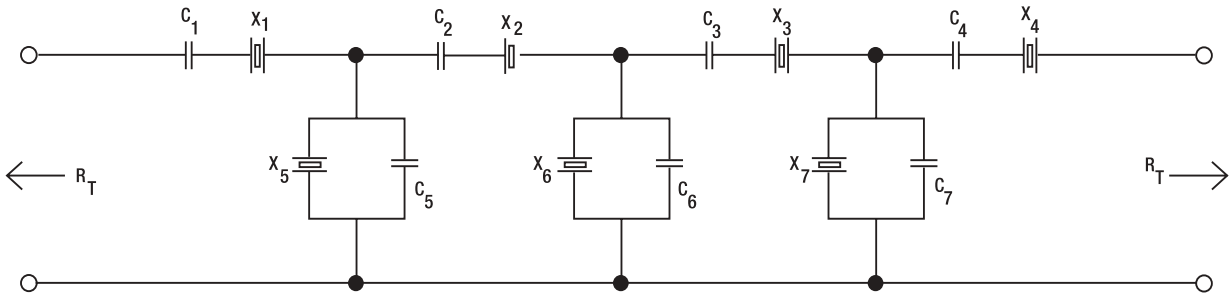

Fig 3: G3UUR's symmetrical bandpass ladder filter with 1dB ripple, Chebyshev response. X1 to X7 nominally identical crystal resonators. C1 to C7 nominally equal to crystal C0 (selected to adjust associated crystal to filter centre frequency). R_T is $3.6\pi B.L_m$ where B is the -6dB bandwidth and L_m is motional inductance at series resonance.

the 70s, I christened this approach 'The Symmetrical Bandpass Ladder (SBL)' configuration. It is not an optimal design and the bandwidth is only weakly influenced by the motional inductance of the shunt arms of the filter. The ultimate attenuation is also limited, but can be increased by using higher-order filters.

"The filter is very easy to set up, and produces a beautifully-symmetrical response; see Fig 4 for the plot of the response of an SBL filter I put together using Murata CSB455E ceramic resonators. The circuit is shown in Fig 5 and has 600Ω input and 2.3kΩ output impedances. The shunt arms of the filter have two resonators in parallel to achieve the 8kHz bandwidth and these have to be treated like one resonator of half the motional inductance and twice the motional capacitance. Each capacitor-crystal pair, whether they are in series or parallel, are selected to resonate at the same frequency exactly halfway between the series and parallel resonances of the crystals. This requires capacitor values that are nominally equal to the static capacitance (C0) of the resonators in series with the resonators in the signal path and in parallel with the ones in the shunt arms. Where the shunt arms have multiple resonators in parallel, the value of the tuning capacitor has to be increased to reflect the larger value of C0. Capacitor-crystal pairs can be checked for resonance using the crystal test jig shown in the March 2000 'TT'."

G3UUR provided further information on the setting-up and results that could be achieved with 6-, 7-, 9- and 10-pole filters using CSB455E resonators. He comments ironically "Back in the 60s, I would have given anything for a McCoy Golden Guardian 9MHz filter which is actually inferior to one produced using the SBL configuration that I discarded a decade later! Funny how our expectations and standards change with technology."

The SBL configuration discarded was a 10-pole 4.433MHz 2.8kHz SSB filter with one crystal in each shunt arm. It had a 1.2 shape factor and 70dB attenuation. "Using two identical 10-pole SBL filters at different points in the IF could provide around 140dB ultimate attenuation with a sensational 6 /130dB shape factor of around 1.3 – that would be some selectivity!"

Further notes by G3UUR and some relevant comments by G3JIR on the SBL by G3JIR will have to be held over for a future occasion.

SIGNAL-FREQUENCY CRYSTAL FILTERS

Jack Hardcastle, G3JIR, writes: "Inspired by the experiments of Peter Haylett, G3IPV, with front-end SF crystal filters ('TT' February 2003), I have been carrying out some experiments of my own. I have chosen to employ a circuit that makes use of the series- rather than parallel-resonance of the crystals. It has the advantage of working at low impedance, making it easy to match to both the antenna and the receiver. I had available 3579kHz crystals and, after checking their characteristics, I calculated that, when used in a 50Ω circuit, the passband would be a mere 50Hz wide. However, by operating at 200Ω, the passband becomes a more manageable 180Hz. The 4:1 impedance match is easily arranged using 2:1 turns-ratio ferrite toroidal transformers at the input and output.

"To check the distance that the centre frequency can be 'tuned', the circuit shown in Fig 6 was constructed and, for the purposes of these tests, fixed capacitors were fitted at C1 and C2. In an operational practical filter, a continuous tuning range would be provided by a two-gang variable capacitor with its frame isolated from earth.

"Fig 7 shows three typical frequency responses. The -3dB bandwidths were found to vary between 185Hz at the low end and 145Hz at the highest frequency. As the centre frequency is increased, the response becomes more asymmetric. The low-frequency side becomes shallower while the high side gets steeper. The three measurements span a range of some 630Hz. Not a lot, but sufficient to allow a significant number of CW, or other narrow-band modes, to be accommodated. [Pulling range would be increased with a 7MHz filter.]

"The ultimate limit to the amount by which the crystals can be pulled higher is limited by the parallel resonant frequency of the crystal. However, a practical limit is reached much sooner, because the filter's insertion loss increases as it is pulled higher. The centre-frequency insertion loss in the three examples shown varies between 1.7 and 2.2dB. It would be possible to extend the low end of the range by adding inductance in series with each crystal. However, it is not possible to go far down this road before the finite Q of the inductors takes its toll, and it no longer becomes worthwhile.

"While testing this filter between my ATU and the receiver, I noticed that there was dramatic reduction in the noise level. Some of this is due to the reduction in bandwidth, but I think some part must be due to reduction of the noise produced by reciprocal mixing with the local oscillator noise. This is a benefit that you cannot get by adding selectivity later in the receiver."

EXPERIMENTAL RF DESIGN

Since 1977, the ARRL book "Solid State Design for the Radio Amateur" co-authored by Wes Hayward, W7POI, has been acclaimed worldwide as the classic guide to working with solid state devices. But the technology has progressed and it is timely that a new, even more authoritative, comprehensive and up-to-date handbook has just been published. This is "Experimental Methods in RF Design" by Wes Hayward, W7ZOI, Rick Campbell, KK7B, and Bob Larkin, W7PUA (ARRL, 2003), which runs to 509 pages, plus a CD-ROM containing 60 complete articles from

Fig 4

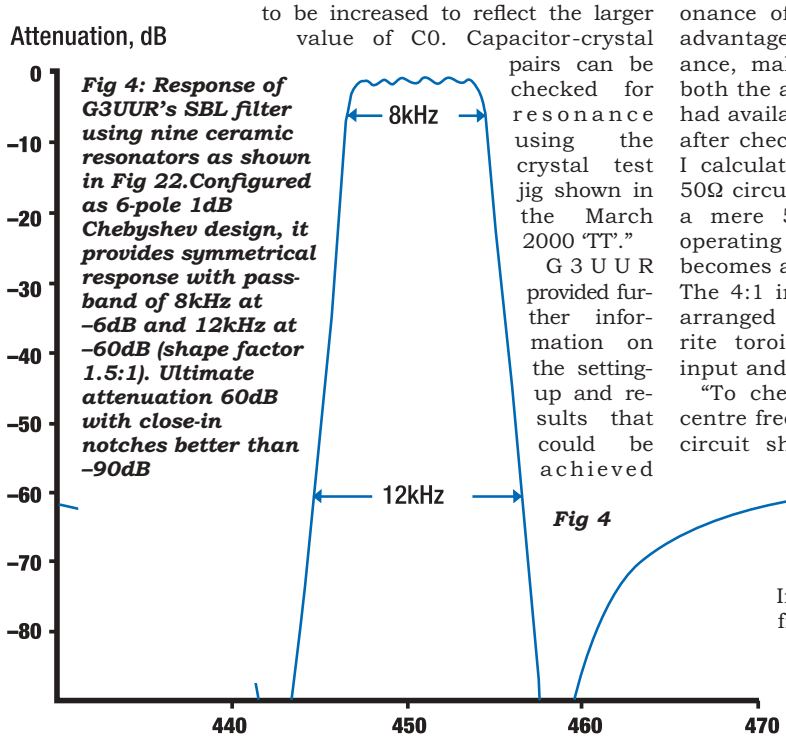

Fig 4: Response of G3UUR's SBL filter using nine ceramic resonators as shown in Fig 22.Configured as 6-pole 1dB Chebyshev design, it provides symmetrical response with passband of 8kHz at –6dB and 12kHz at –60dB (shape factor 1.5:1). Ultimate attenuation 60dB with close-in notches better than –90dB

QST, Ham Radio, Communications Quarterly and QEX, plus software and DSP programs etc. Unlike so many American publications, the compilers show a welcome awareness of work stemming from this side of the Atlantic, including G3SBI's H-mode mixer, PA0KSB's frequency stabiliser, G3UUR's method of measuring quartz crystal motional parameters (the 1995 QEX article by W7POI is on the CD),

At the risk of appearing unduly influenced by a flattering reference to 'TT' (p5.15), this new book deserves high marks, combining up-to-date and well-structured design information with practical designs. The 500-pages of text comprises 12 sections: getting started; amplifier design basics; filters and impedance matching circuits; oscillators and frequency synthesis; mixers and frequency multipliers; transmitters and receivers; measurement equipment; direct conversion receivers; phasing receivers and transmitters; DSP components; DSP applications in communications; and field operations, portable gear and integrated stations. There is also a listing of the contents of the CD-ROM and a good index. With a US price of $49.95, it may appear expensive for an amateur radio publication but, by any publishing standard, it is worth the money!

FEEDBACK – FEED-FORWARD

A couple of errors crept into the notes on Grote Reber, W9AFX, and the birth of radio-astronomy.('TT' March 2003, pp75/76). The radar 'jamming' occurred during February 1942, not 1943. More important, the special radio-astronomy issue of Proc IRE was in Volume 46 (not 48) and did, in fact, contain an excellent account by Grote Reber of 'Early Radio Astronomy at Wheaton, Illinois' (pp15 - 22) including full details of his building the 30ft steerable dish antenna. His introduction began: "My interest in radio astronomy began after reading the original articles by Karl Jansky. For some years previous I had been an ardent radio amateur and considerable DX addict, holding the call sign W9GFZ. After contacting over 60 countries and making WAC, there did not appear to be any more worlds to conquer." By today's standards 60 countries and WAC would not be regarded as remarkable as they did in the early 1930s! Such is progress, but remember, as Grote pointed out in 1958, "It is interesting to see how the mystifying peculiarities of short-wave communications of 1930 gradually have been resolved into an orderly whole."

G3BXS has asked me to point out that the article on the Blue Train and Golden Arrow ('TT' February, 2003, p73), ascribed to a Cable & Wireless house journal, in fact came from the "Friends of the PK Newsletter" (Issue 15, July 2002, pp8/9). This is published by the Friends of the Porthcurno Museum of Submarine Telegraphy. This unique museum tells the story of the undersea telegraph cable network that spread out around the world from Porthcurno, Cornwall. It is housed in secret underground tunnels built during WW2. The Museum is open to the public all the year round (November to end of March Mondays only; April to end of October Sunday to Friday (closed Saturdays); and July and August seven days a week.

Alfred S S Low, GM4UZP, noted the reference by G3RUH to the hands-free magnifier offered by Modern Originals ('TT', March 2003, p76). He writes: "I saw the Modern Originals but, at the same time, saw one in the Healthhouse UK catalogue priced at £5.95 (postage & packing, £2.95; optional insurance to cover loss or damage, £1), the specification of this magnifier (made in China) seems similar to the Modern Originals one. I purchased one and found you can use the small lens which flips down to give about the same magnification as a jeweller's loupe. As for using glasses with the magnifier, I found with reading glasses or bifocals a slight blurring but, if using normal distance glasses, it should be OK. The lights can be adjusted up or down to suit the specific task, I found they were set a bit high, but by removing the front self-tapping screw, it is possible to file the slot to lower the light (replace the screw). The high setting appears to be the fault of the pre-focus bulbs. This 'Magnifying Head Strap With Light, No J32130', can be ordered from Healthhouse UK, Harrington Dock, Liverpool, L70 1AX; the telephone order line 0151 702 8858. ◆

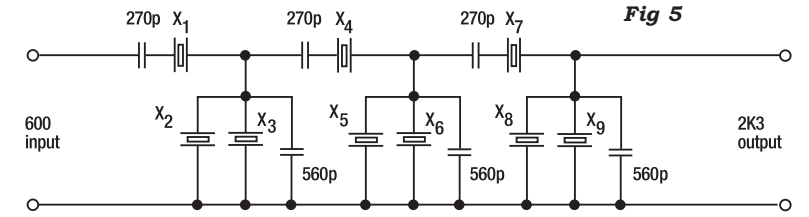

Fig 5: Circuit diagram of the SBL filter using Murata CSB455E ceramic resonators. X1 to X9 Murata CSB455E resonators. Q is 1100 to 1300. 6/60dB shape factor 1.5:1.

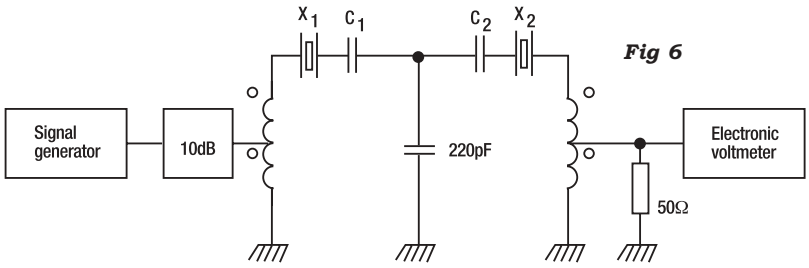

Fig 6: Circuit diagram of G3JIR's experimental 3579kHz signal frequency crystal filter. T1 and T2 10 + 10 turns of 27SWG wire wound bifilar on FT37-43 ferrite toroid. In practical 'tunable' filter C1, C2 would be a variable gang-capacitor.

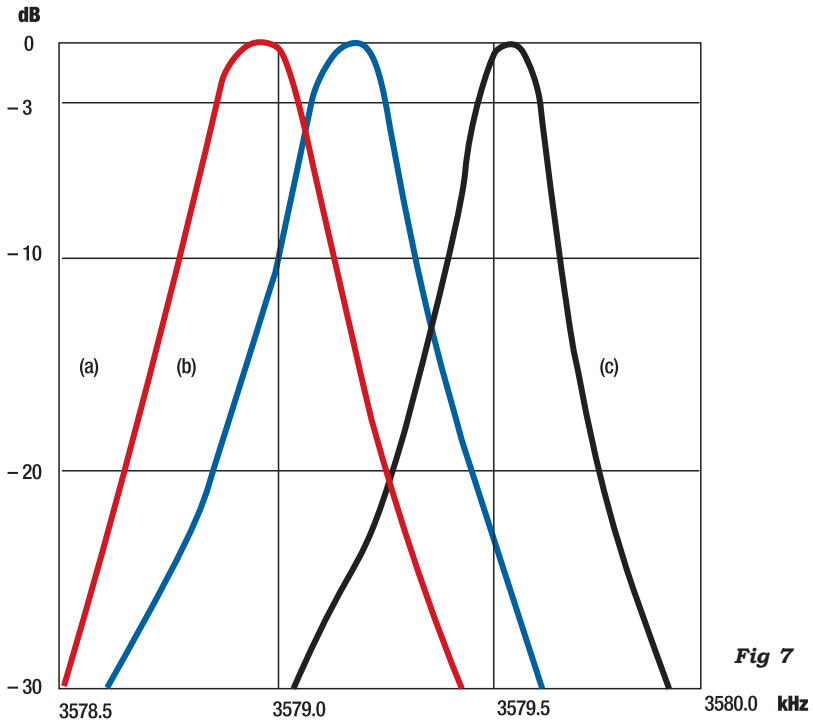

Fig 7: Response curves of the experimental filter for three values of C1, C2.
C1, C2 - 220pF. Insertion loss 1.7dB (at passband centre);
C1, C2 - 50pF. Insertion loss 1.9dB;
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Whatever

Right: Written in Visual Basic 6.0, the SDR-1000 console software is easy to learn, modify and test.

WRITING ON THE WALL

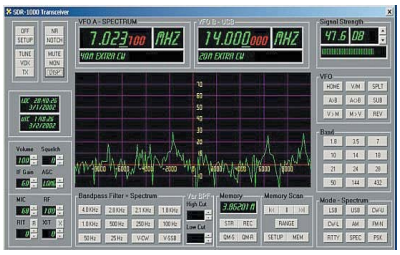
I learned recently that Sony have ceased production of their 14in and 15in Trinitron tubes. Henceforth, if you want to buy a small Sony TV or screen for your computer, it's going to be a flat panel.

If the demise of even part of the Trinitron range doesn't spell the beginning of the end for the cathode ray tube, I don't know what does.

SOFTWARE RADIO ARRIVES

Some time back, I recall Erwin David, G4LQI, featuring the subject of Software Radio in his Eurotek column. Now, in the shape of the SDR-1000 from Flex-Radio, the first truly open Software Defined Radio platform for general use and experimentation by radio amateurs and SWLs has become a reality. The SDR-1000 is a complete Software Defined Radio transceiver that is interfaced to a PC sound card. It provides everything needed to convert a personal computer into a high performance, 0 to 65MHz general coverage receiver with 160m-6m amateur band transmit capability. Software Defined Radio and the SDR-1000 were described at length in a four-part series of articles by Gerald Youngblood, AC5OG, in ARRL's bi-monthly magazine QEX (between July/August 2002 and March/April 2003).

The SDR-1000 consists of a set of three printed circuit boards that sandwich together without the need for interconnecting cables. They exist externally to a personal computer. The first board contains the receiver, exciter and Direct Digital Synthesiser; the second a filter array and 1 watt Power Amplifier; and the third the parallel port interface and power regulators. The complete package (not including 13.8V DC power supply) measures just 3in x 4in x 2in. Connection to the PC is via the parallel printer port; plus the line input, line output and microphone input of the sound card.



There is insufficient space here to fully describe the design of the SDR-1000 or give the circuit diagrams, but the series of QEX articles may be read online or downloaded as PDFs. In summary, the frequency synthesiser is built around the Analog Devices AD9854 quardature DDS, which exhibits a very small amount of phase jitter. This enables high dynamic range and low IMD figures to be obtained, which are highly desirable (especially for many modern digital modes). The minimum tuning step of the synthesiser is an almost unbelievable 1μHz. The Quadrature Sampling Exciter (QSE) and Quadrature Sampling Detector (QSD), as AC5OG refers to them, are modified forms of the Tayloe Detector. An array of low-pass filters are commonplace to remove harmonics when transmitting, but in this instance high-pass characteristics are also required, to prevent signals at half the receive frequency passing from the antenna to the detector. Consequently, the 6-bank filter array of the SDR-1000 consists mainly of bandpass filters.

In his QEX article, AC5OG says, "SDRs truly offer opportunities to reinvigorate experimentation in the service and attract new blood from the ranks of future generations of computer-literate young people. It is encouraging to learn that many readers see the opportunity to return to a love of experimentation left behind because of the complexity of modern hardware. With SDRs, the opportunity again exists for the experimenter to achieve results that exceed the performance of existing commercial equipment." To this end, open source software is made available for users to experiment with and adapt.

The SDR console features a real-time spectrum display with a maximum bandwidth equal to the sampling rate of the PC sound card. Both CW and SSB signals may be tuned visually, by clicking on the desired signal with the mouse. The frequency axis automatically re-sizes for maximum resolution for a given bandpass filter selection. There are some nice touches, with the frequencies of the dual VFOs having supplementary band-plan information derived from a user-programmable database. Being software defined, an almost infinite number of filter shapes and bandwidths can be applied to the received signal. The number of memories is only limited by the computer.

ULTRA WIDEBAND

The Federal Communications Commission (FCC) in the United States has recently taken the controversial step of approving the commercial use of Ultra Wideband (UWB) technology, the purpose being to alleviate the 'spectrum drought' to which FCC Chairman William Kennard has referred. UWB had been caught up in regulatory and patent battles for years, but perhaps the 'explosion' of wireless devices that the Americans are anticipating in the next few years has served to concentrate the minds of those concerned.

Right: William Kennard, Chairman of the Federal Communications Commission.

UWB works by spreading a transmission out across a vast swath of the radio spectrum, but at such low power that it cannot be heard above the noise level on a conventional receiver. It is a technology that works best as short distances, so is ideal for transferring data, audio and video around the home. Transmission rates of 100 megabits/second are being quoted. The uses of UWB also include non-communication devices, such as 'seeing' through walls, to detect people hiding or trapped behind them; and precise positioning and distance measuring.

Of course there's nothing particularly new about very wideband (spread-spectrum) transmissions. The military have been using

WEB SEARCH

UWB	http://news.com.com/2100-1033-837683.html
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Quiktrak	www.quiktrac.com.au
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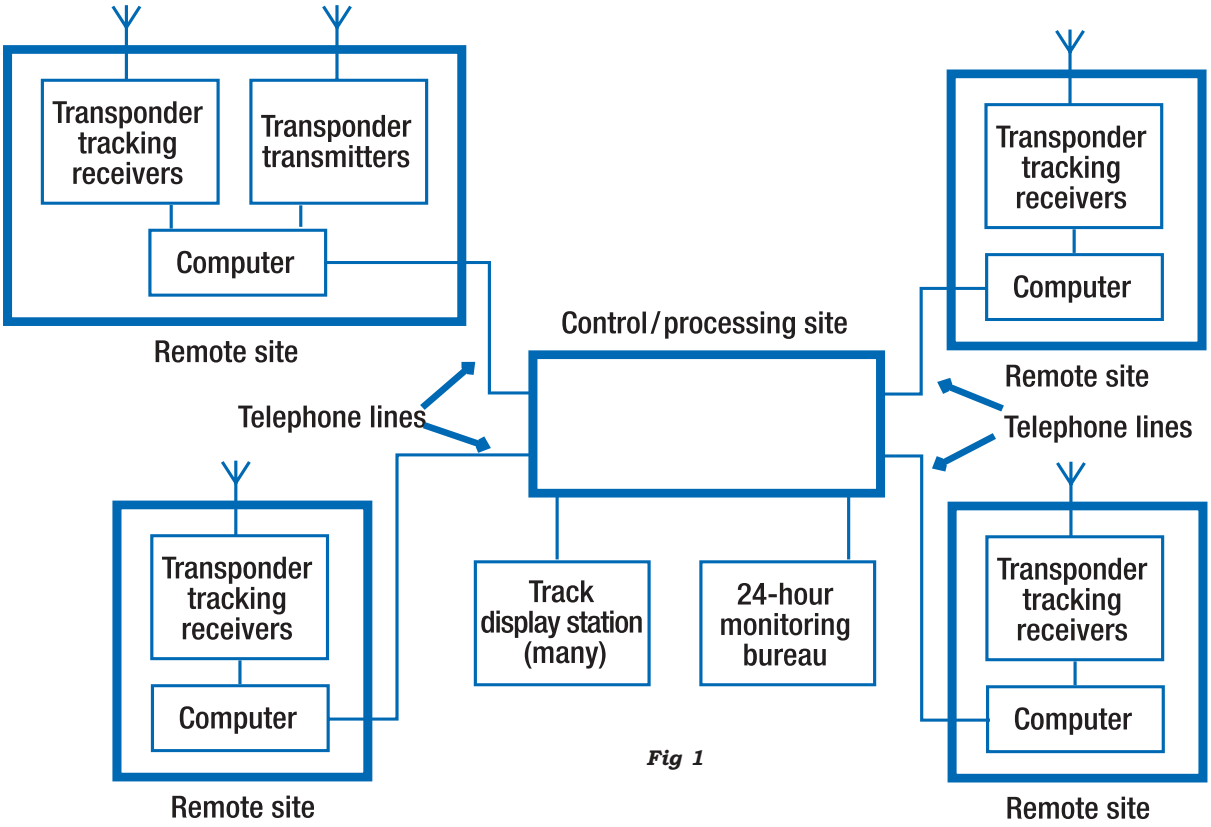

Fig 1

Fig 1: Simplified layout of the Quiktrak system. The control centre 'pings' transponders and remote receivers accurately log the time when they receive the resultant response. From this the location of transponders can be determined.

spread-spectrum for years, as it offers a good deal of security against eavesdropping and jamming. What is new is that the bandwidth of the proposed system is very wide indeed. This has made the US military and mobile phone companies decidedly nervous, as they see UWB as potentially disruptive to existing methods of communication. To pacify worried parties the FCC has applied strict limits to the power and frequencies that can be used, but this in turn has angered the developers of UWB devices because it is likely to limit their effectiveness. You just can't please everyone!

THE NEXT MUST-HAVE GADGET?

At the Consumer Electronics Show (CES), which took place in Las Vegas a couple of months ago, Bill Gates, Chairman of Microsoft, demonstrated a new technology "intended to make everyday objects much smarter". He feels that devices incorporating Microsoft's 'Smart Personal Objects Technology' (SPOT) are about to take the market by storm.

SPOT devices are small, inexpensive receivers with digital displays, not totally unlike radio pagers. However, unlike pagers, SPOT devices can take the form of wristwatches, alarm clocks, fridge magnets, etc. The so-called SPOT chips receive a signal which has been 'broadcast', and display that information. The uses include traffic news, weather forecasts, watches that automatically adjust themselves when moving between time zones, sports results, games, puzzles, diary functions and stock market updates. Supermarkets could even send details of special offers to a SPOT device built into a fridge magnet.

The key difference with SPOT is that it displays personalised information, that personalisation having been undertaken via the Internet. For example, a SPOT alarm clock could display your schedule for the day when it wakes you; that schedule having been amended overnight by your secretary. A SPOT device for traffic news could be personalised to display the state of the roads only of the route you take to work.

I'm tempted to think that GPRS technology could also provide SPOT-like functionality, and more, but SPOT could well have the edge price-wise. In any case, Mr Gates thinks SPOT has a future and he seldom backs a loser.

AUSTRALIAN VEHICLE TRACKING

Further to the recent discussions on tracking stolen vehicles, John Chapman, G6PGT/VR2YDI wrote to inform me of the services offered by Australian company Quiktrak. They offer a vehicle security service with some interesting aspects. For example, when John locked himself out of his car, all he had to do was call the control centre, confirm his identity, and the car was then unlocked remotely. The system also permits the control centre to immobilise and lock the doors of a stolen car that is on the move, making the job of the pursuing police somewhat easier.

Above, left: Available soon, the Fossil SPOT watch.

As **Fig 1** shows, the Quiktrak system employs transponders on vehicles (or individuals), plus a network of monitoring stations. The transponders don't transmit continuously, they are 'woken up' by a command from the control centre. When activated they still only make brief transmissions and they do this sequentially so that many can share the same frequency. Employing spread spectrum technology, the system is said to be very difficult to jam. All the monitoring stations are time-synchronised very accurately, timing being the key to the accuracy of the system. Transponder transmissions are received by monitoring stations and the precise time logged. The propagation delay to each monitoring station that is able to receive a signal enables the location of a transponder to be calculated by triangulation to within a few tens of metres. ◆

next

By Ian White, G3SEK, 52 Abingdon Road, Drayton, Abingdon OX14 4HP.
Website: www.ifwtech.co.uk/g3sek E-mail: g3sek@ifwtech.co.uk

In practice

LOUD AND CLEAR

Q I have just bought a desk microphone for my HF transceiver, but it has made no difference to the loudness of my audio. What should I do next?

A From the way you ask the question, I think you must already understand that the maximum available RF output from your transceiver is limited by what the transmitter will deliver without distortion (or limited by your licence conditions). The 'loudness' problem is all about working within that PEP output limit, and trying to enhance your voice signal so that you *sound* louder and clearer, and actually *are* easier to copy.

There are two separate issues here. The first is about making your voice sound clearer. Human speech contains a wide range of frequencies, but it is generally accepted that the range from about 300Hz to 3000Hz contains almost all the components required for intelligibility (as distinct from hi-fi quality). For amateur communications where we want to be understood at weak signal levels, 300-2700Hz is sufficient for most adult male voices. The extended bandwidth to 3000Hz is mostly required by the higher-pitched voices of women and young people. However, within this range there is a lot we can do to enhance intelligibility by optimising the frequency response to our own individual voices.

To understand what is needed, let's look at the frequency content of speech in more detail (Fig 1). The lower frequencies up about 700Hz are mainly the 'voiced' vowel sounds that use air driven from your chest cavity through your voice-box. The higher frequencies above about 1500Hz are mainly the consonant sounds - the clicks, hisses and pops that you make at the front of your mouth with your tongue, teeth and lips using very little air. For intelligible speech, we need both. We need the lower frequencies to provide vowel sounds such as 'ee', and the higher frequencies to provide the articulation that transforms that basic sound into different and recognisable words such as 'beef', 'feet' and 'speech'. The gap between about 700Hz and 1500Hz contains relatively little information in most adult male voices. The voices of women and young people have the same basic frequency structure, of course, but everything is shifted upwards.

For optimum clarity, we need to emphasise the higher frequencies that provide the articulation, while maintaining a good balance with the lower frequencies that contain the voice power. It's also important that the processed signal continues to sound like *your* voice, only louder and clearer. Individual voices vary, so there is an optimum balance for each person.

Most of the microphones we use were not really designed for communications, and have too much low-frequency response and not enough emphasis of the 'highs'. To make matters worse, the low frequencies are always boosted by close-talking, which we generally need to do for communications purposes (see later). Therefore we need some bass cut below about 400Hz, and some treble boost around 1.5-2.5kHz. This response tailoring can be achieved either by changing the microphone (for example by using one of the Heil inserts recommended in the October 2001 column) or electronically in the audio amplifier stages of the transmitter, or by a combination of both techniques. Fig 2 shows a very simple modification to introduce some bass cut for dynamic microphones (not Icom electrets) and it's well worthwhile experimenting with capacitors in the range from 0.1 - 0.47µF. Some microphones have this series capacitor as a switch-selectable option and, for a modern all-band, all-mode transceiver, this is a very good idea. You're not going to want the same audio response for FM ragchewing as you do for SSB DXing!

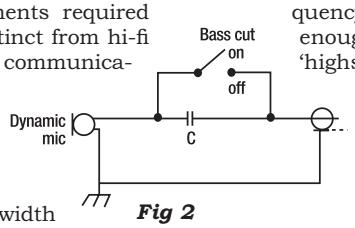

Fig 2

Fig 2: Simple method of introducing bass cut. Depending on the voice and the impedance, C may range from 0.1µF to about 0.47µF.

The second major issue is about increasing the average level of the important parts of the speech waveform, but without increasing the peak level. A so-called 'compressor' is not the best way to do this, because most simple compressors are nothing more than an automatic gain control based on the peak level – if you try to speak louder, the compressor automatically reduces the overall gain and you're back where you started. Many mid-range transceivers offer fast-acting audio compression, which will boost the quieter parts of the speech waveform and make a soft voice sound a bit louder, but not dramatically so.

The more effective way to increase the average level is by peak limiting or 'clipping', where you symmetrically limit the positive and negative peaks of the waveform. If you increase the level of the signal going into the clipper, the average output level increases but the clipper ensures that the peak level stays the same (Fig 3). The problem with peak clipping is that it also creates a lot of distortion, and too much distortion will decrease intelligibility and defeat its own purpose. The trick is to find a method that does two things at the same time: allows heavy clipping but also minimises the accompanying distortion. The first makes the signal loud, and the second makes sure it stays clear.

The frequency content of speech is varying from moment to moment, and clipping creates harmonics and mixing (intermodulation) products between the speech frequencies that are present at the time. In particular, the harmonics of the lower-frequency components fall inside the audio frequency range so you can't get rid of them. For example, if you are clipping on a 500Hz component of your speech, the harmonics fall at 1000, 1500, 2000, 2500Hz – and none of those can be filtered out of a typical 300-2700Hz audio bandwidth. The result of too much audio clipping is that your processed voice sounds 'loud', but nobody wants a QSO with you!

There are two main ways around this. One is the so-called 'split-band' audio clipper, which contains a bank of filters to divide the audio spectrum into smaller frequency bands, very much like you do in a split-band audio equaliser. If each band has less than a 2:1 frequency ratio, it means that when you clip the signal in that band, the harmonics fall outside the band and can be filtered out (Fig 4) [1]. Then you recombine the separate clipped and filtered sub-bands to give the

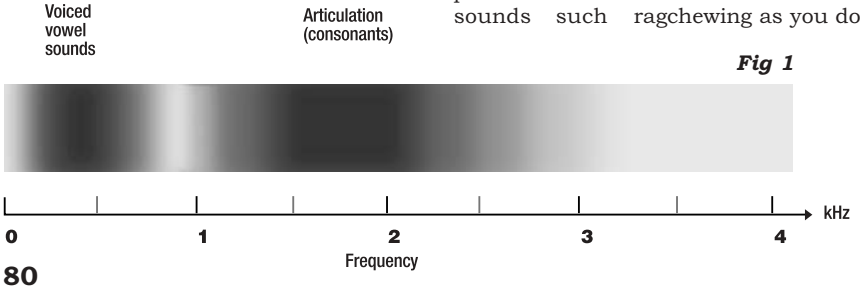

Fig 1

Fig 1: Speech contains two different types of sounds, in two different frequency bands.

complete audio signal. Another advantage of this approach is that you now have all the facilities of an audio equaliser, so you can adjust the frequency response by recombining the sub-bands in different ratios.

The other major technique is to do the clipping on an SSB signal at RF. Then the harmonics generated by clipping will be at multiples of the RF frequency, which are easily removed by a second SSB filter (Fig 5(a)). This allows you to clip much harder before the audio starts to lose intelligibility. RF speech clipping obviously requires an extra SSB filter and some complication, so it is generally a feature of up-market transceivers. In the most modern rigs, speech clipping is done by DSP, working either on the digitised audio or within the digital SSB generator.

However, there is another class of RF clipper that can be conveniently inserted between the microphone and the audio input to the transceiver. This is effectively the SSB clipper of Fig 5(a) followed by a product detector (Fig 5(b)) to convert the clipped RF signal back down to audio. This is an excellent way of adding RF speech clipping to a transceiver that has no built-in provision for it. A typical design was described in *RadCom* for October 1998, and Datong RF clippers are available second-hand at bargain prices. I found the Datong clipper very effective indeed with my old FT-221. DX stations on 144MHz often gave reports like "You're not moving the S-meter at all, but you *sound* very loud" – which of course is *exactly* what you want!

But all forms of speech processing have their limitations. Even though we've seen some clever ways of preventing harmonic distortion within the audio passband, clipping also causes intermodulation distortion (IMD) which unavoidably falls within the audio passband. Very heavy clipping will increase the level of IMD until readability starts to suffer. It is quite well established that the largest improvements in loudness appear with the first 6dB of clipping [3] and beyond that you're into diminishing returns – loudness increases relatively slowly while intelligibility is rapidly eroded by distortion. 10–15dB of clipping is usually regarded as the practical maximum.

The other major limitation on clipping is the background noise when you're not talking. Every decibel of clipping (or of compression) brings up the background noise by a decibel too, so when you stop talking it's very easy to find that the RF power output remains well above zero due to the background noise. Common sources are blower noise from the transmitter, other operators and background conversations in club stations... and various other 'noises off' that you might prefer not to broadcast. A strong station with high background noise is very unpleasant to listen to, so don't expect too many replies to your CQs. The cures for background noise are: don't be too greedy about clipping, and always close-talk the microphone so that you can keep the pre-clipper audio gain down. As a general rule, you shouldn't be able to see any RF output on the meter unless you - the operator – are deliberately talking into the microphone.

One final point: by limiting your peak drive signal, speech clipping should also ensure that you *never* overdrive your transmitter, and never 'splatter' onto adjacent frequencies. Regrettably this isn't always so, because most people habitually overdrive their transmitters on occasional speech peaks – but if you overdrive when using a clipper, you'll be doing it all the time! The solution is to follow the setup procedure on my 'No More Splatter' web page, and then your signal will sound louder, clearer and *cleaner* than ever before.

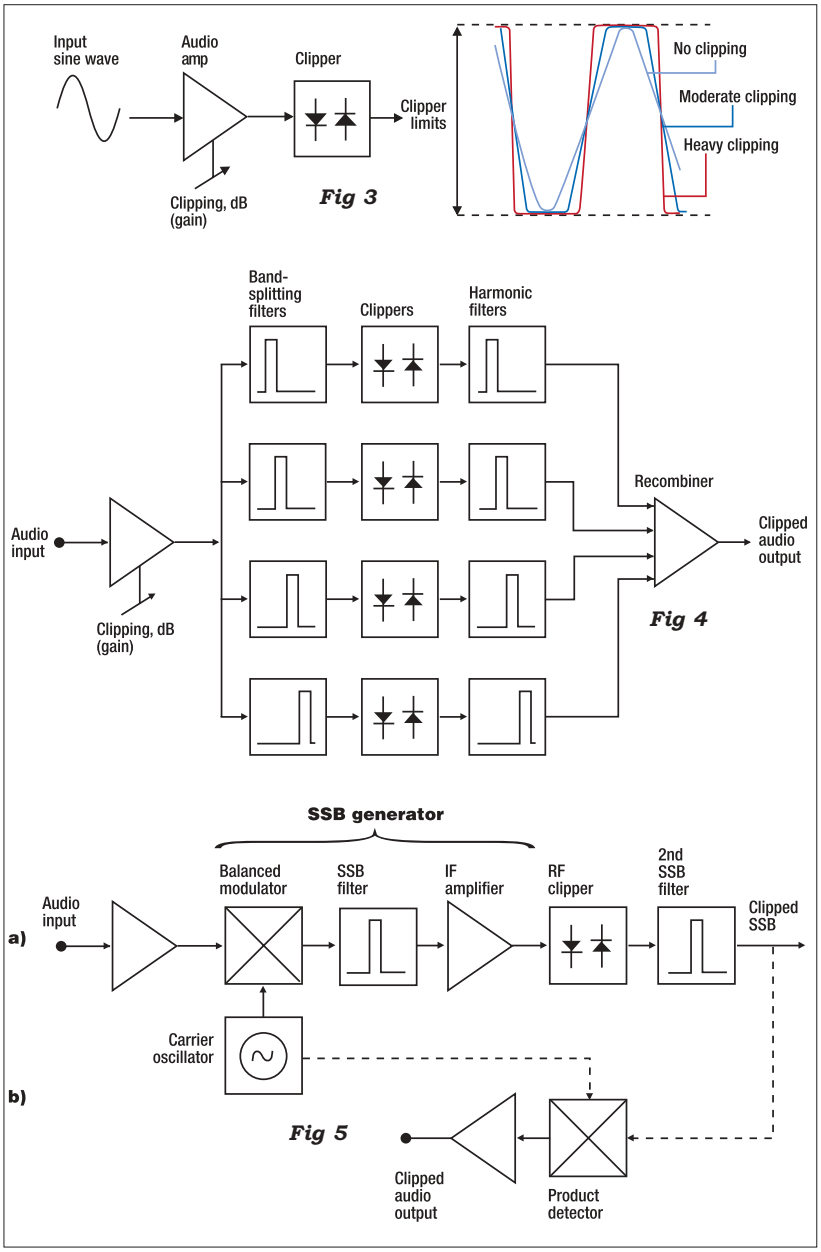

Fig 3: The clipper stage limits its peak-to-peak output signal. The higher the gain ahead of the clipper, the more heavily clipped the output waveform will be.

Fig 4: Split-band audio speech clipping reduces harmonic distortion.

Fig 5: (a) RF speech clipping can be built into an SSB transceiver, or (b) with minor additions becomes an external audio-SSB-audio clipper.

NOTES AND REFERENCES

1. The filtering requirements are not quite as stringent as they might seem, since a symmetrically-clipped signal will have very little second harmonic content. Therefore the third harmonic of the lowest frequency in the sub-band represents the worst case for the filter that follows the clipper. In practice, processing can be achieved quite well with only four sub-bands as shown in Fig 4.

'Split-band Speech Processor' by Wes Stewart, N7WS, *Ham Radio*, September 1979 (see link on the 'In Practice' web page).

2. The amount of clipping is defined in decibels. If the reference level (0dB) is where audio peaks just reach the clipping threshold. 6dB of clipping occurs when the input voltage swing is increased by 6dB but the peak-to-peak output from the clipper doesn't change. Since we're dealing with voltage levels here, dB = $20\log_{10}(V_2/V_1)$ so $V_2/V_1 = 2$. In other words, 6dB of clipping removes the top 50% of the input waveform and makes you sound about twice as loud.

3. 'Performance of RF Speech Clippers' by Les Moxon, G6XN, *Ham Radio*, November 1972. ◆

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ANTENNAS

Right: TV shack at Amberley, with the video camera used to create the test card and 'Stooky Bill' images. 'Stooky Bill' was the ventriloquist's dummy used in the original Baird transmissions of 1928. In the foreground is Peter, G4JNU, on the SSB link, with Vic, G3SDQ, and Ted, G3GMZ, in the background.

I don't often get the chance to play with 'big' antennas, so when the opportunity arose of being involved with making a big V-beam I accepted with alacrity. The Narrow Band Television Association was to make an attempt to transmit 40-line, mechanical scan television pictures from Amberley museum across the Atlantic. This was to commemorate the Baird transmission on 8 and 9 February 1928 (see 'RadCom News' April 2003).

The existing shack and antennas of the museum club station, GB2CPM, were unsuitable because of the lack of space. The Amberley museum authorities made a Portacabin available as a temporary home for the television equipment. A fairly high ERP was required to ensure the TV signals would get through, so a high gain antenna was required. The Amberley museum is located in what used to be a chalk quarry for the production of lime so most of the buildings, including the proposed Portacabin, are surrounded by chalk cliffs caused by years of quarrying activity. Fortunately, at this particular location within the museum, the ground is open to the northwest.

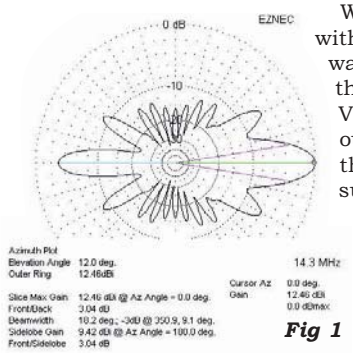

Fig 1

Fig 1: Prediction of the performance of the V-beam using EZNEC. The antenna is bi-directional because it is not terminated. The rear lobe would probably be smaller than shown because of the presence of the chalk cliff, which could not be modelled.

We had plenty of space, with a 30m-high sloping wall of chalk at the rear of the proposed antenna. A V-beam seemed an obvious choice. The apex of the antenna could be supported by the chalk cliff to the southeast and the ends of the wires supported by trees to the northwest.

The distance from the antenna apex to the trees was over 350m so we needed a lot of wire. Fortunately Dave Rudram, the museum telephone and radio curator, had a good supply of twin drop telephone wire (as used between a house and a telephone pole). This material comprises twin steel copper-plated wire with a plastic insulation and is very strong. This was split to make the two wires of the V-beam.

We settled on a leg length of 120m, around six wavelengths a leg on 14MHz. An *EZNEC* model of this antenna, see **Fig 1**, with the ends of the elements some 60m apart gave us a calculated gain of 12.46dBi, or just over 10dBd. This is about the same as a five or six element monoband Yagi.

Feeding the antenna was a challenge. The V-beam is a balanced antenna, so 450Ω twin ladder line seemed the obvious choice. However, the transmission line also had to cross a road from the Portacabin. Coax cable, fixed under a wooden protector to prevent damage from vehicle wheels, was used for this part of the feeder run.

BALANCED ATU

The solution was to use a balanced ATU located part of the way between the Portacabin and the antenna apex and located at the base of the chalk cliff. An ATU was built specially for the project by Ted Hardy, G3GMZ, a member of the Narrow Band Television Association. This unit covered the bands 14 to 21MHz and used breadboard construction as shown in the photograph. Because the ATU was to be situated outside it was built on to the lid of a plastic storage box; the box itself providing a weatherproof cover. The ATU was placed on a small wooden table to make it easier to connect and set up. The length of feeder from the ATU to the antenna apex was 50m.

Because I had already installed an antenna for 136kHz on the site and I knew where all the best fixing points were, I was elected to fix the apex of the antenna in position. Access to the top of the cliff is through a wood-covered hill at the back of the museum grounds. A wire, with a suitable weight, was thrown down from the top and the two wires and the feeder, pre-constructed to form the apex, were attached to the draw rope and raised into position. The ends of the wires, with suitable insulators, were then fixed to two trees. Although this sounds fairly simple it took three separate weekends to get the antenna into position.

ANTENNA PERFORMANCE

The antenna was tested using the G3GMZ ATU on 14MHz using my mobile rig. Although the antenna loaded up without a problem the first tests were disappointing, not much better than my mobile antenna! Not only that, we were not working with the additional 40m of coax from the ATU to the Portacabin. In the event the antenna proved to be a winner: it was just that we were not used to fixed high-gain antenna. When the band opened up to the USA on the nose of our beam it was a different matter. Over several weekends trans-Atlantic tests were done using the television transmitting equipment. These indicated that the SSTV allocation on 21MHz would give superior results on the day. Predictions using *EZNEC* showed that the gain distribution was very similar to that in Fig 1, except that the main lobe was only 10° wide.

On the weekend of the test we were dismayed to find an SSB contest in full swing, with several heavyweights around the SSTV calling frequency. We needn't have worried. When we fired up with either the SSB communications link or the television transmission everyone else moved off.

Pictures were received Ed Gable, K2MP, at the Antique Wireless Association museum in the USA. You can see information on the AWA Museum at www.antiquewireless.org We wish to thank the Amberley Museum authorities for allowing us to use their site to conduct these historic television tests. ◆

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QRP

The American QRP ARCI is once again hosting the 'Four Days in May' QRP event at the Dayton Hamvention 2003 on the 15–18 May. It begins with an all-day seminar on Thursday 15 May, featuring well-known QRP speakers.

Speakers include: Rex Harper, W1REX, and Darell Brehm on 'Quartz Crystals and their Implementations in QRP circuits'; Stephen E Brown, W9HC, on 'Restoring and Installing a Multi-Band Trap Vertical for a QRP Field Day'; George Dobbs, G3RJV, on 'Yet More Minimalist Radio (Philosophy and Practical)'; Peter Zenker, DL2FI, on 'News of German QRP'; John Cumming, VE3JC, on 'Making Waves' (a QRP celebration of spectrum analysis); and Jim Kortge, K8IQY, on 'The K8IQY 2N2/30 Transceiver'.

The Thursday evening includes a 'Buildathon', hosted by the Flying Pigs Amateur Radio Club International and the North Georgia QRP Club, to construct and calibrate a NOGA Wattmeter. The same group will also run a free 'Test Equipment Clinic' with all types of test equipment set up and ready to use. They say, "If you are interested in learning how to use a VOM, an oscilloscope, a spectrum analyser, or other devices, please stop in". The QRP Recognition banquet will be held on Saturday night, beginning at 7pm. This is a full meal and the price is $25.00. Tickets for any paid function or item (Banquet $25, Seminar registration fee (including a copy of the Proceedings), $15) may be ordered from Tom Dooley, K4TJD, 4942 Dock Ct, Norcross, GA 30092, USA (tdooley@attbi.com). Please include your e-mail address. Details of the event can be found at www.qrparci.org/fdim64.html

RED ROSE FESTIVAL AND CHALLENGE

The 7th annual West Manchester Radio Club Red Rose QRP Festival takes place on Sunday 1 June 2003, in the Formby Hall, Alder Street (off High Street), Atherton, Manchester. It is organised as 'a friendly get-together intended to promote low power amateur radio operating and home construction'. The event includes trade and individual stalls, sales of new and surplus equipment and components, club stands, including RSGB, G QRP Club and a 'Low-Cost Bring-and-Buy". Further details can be obtained from Les Jackson, G4HZJ, g4hzj1@ntlworld.com.

The festival also offers a technical challenge. Following the 'Sardine Tin Challenge' of last year, this year there is 'The QRP Optics Challenge – 'Let There be Light!'. Entrants must construct a device useful to the QRP enthusiast centred on the use of opto-electronics. The device need not be complicated, or even original, but should include a brief description and construction details. Bring it along to the Red Rose QRP Festival at Atherton, Manchester, on 1 June. Judging will take place at 1pm with a prize and certificate for the winner. Details of all entries will be forwarded to George Dobbs, G3RJV, for consideration for inclusion in the G QRP Club journal SPRAT. Entry into the challenge is free with no restriction on the number of entries per person.

THE CHELTENHAM LOW-POWER CHALLENGE 2002

G QRP Club member, Derek Thom, G3NKS, drew my attention to an interesting QRP project by the Cheltenham Amateur Radio Association; the information comes from Tom Morgan, G3XMM, Editor of CARA News.

"Each year members of the Cheltenham Amateur Radio Association are invited to take part in a year-long activity on the air. In 2002, we decided to encourage people to switch off their linears, 'turn the wick down', and have some fun on low power. In essence, the rules required that a maximum power of 10W be used on a single pre-chosen band. Modes allowed were CW, PSK and RTTY, and the object was to work as many DX entities (countries) as possible in the course of the year. The 10W limit was chosen to accommodate rigs with a switched 10W low-power position, but most people used an output of five watts or less. The modes chosen were those for which measuring the peak output power with the equipment available in the average shack was straightforward. Certificates of achievement were offered for working countries in multiples of 25. Thus, we hoped that everybody who had a go would receive at least one certificate to reward the effort involved.

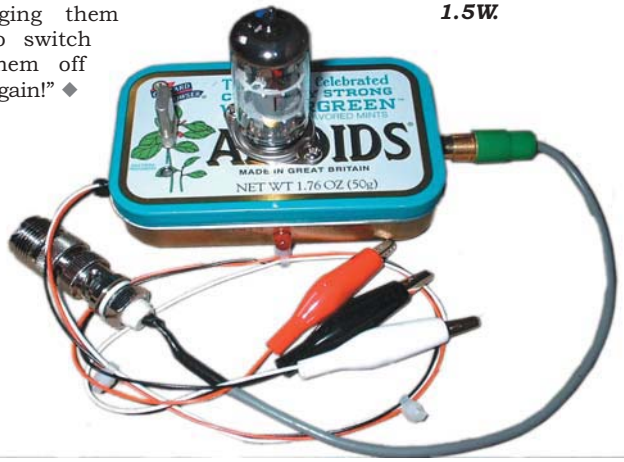
"In spite of some initial doubts, the response was good. Eighteen club members stayed the course, producing some impressive results along the way. The star of the show was undoubtedly Dave, GM3COQ, who worked 52 countries on 15m using an indoor loop aerial. Almost as impressive was Neil, G4BRK, who worked 100 countries on 10m using an indoor dipole. Tom, G3XMM, worked 102 countries on 40m with a 100ft doublet at 20ft, and John, G4PDQ, managed to bag a hundred on 20m. CW was the dominant mode, but Ron, G3SZS, demonstrated the effectiveness of the data modes by working 75 countries on 20m with a simple wire antenna.

"As to the equipment in use, most people just turned down the power on their main rigs but there were some notable exceptions. Derek, G3NKS, worked 30 countries on 80m using 1W from the tranmitter section of a Lake DTR3, with a Drake 2-C as the receiver. He then went 'high power' at 10W with his main rig, to boost the score above the 50 mark. David, G4RFU, used an Index transceiver and a variety of short and low aerials from a noisy urban location to work 90 countries on 40m. Peter, G4ENA, used his FT-817 to good account on 17m; no contests to boost the score on that band, of course, but he managed to work 73 countries nevertheless. Loops, doublets, dipoles, verticals and assorted bits of wire were used as aerials by most, but one station did make use of a Yagi on 20 metres.

"So was it all worthwhile? I think the answer must be 'yes'. Most of those taking part had rarely, or perhaps never, restricted themselves to low power before and were surprised and delighted by the results they achieved. Many also admitted that they would not have thought of trying or persevering with low power without the club challenge to spur them on. We have allowed everyone to switch their linears back on for this year's club activity, but it will not be too long before we are encouraging them to switch them off again!" ◆

Left: Unusual construction. The Epiphyte is a no-frills, simple SSB transceiver designed by Derry Spittle, VE7QK. This version is built by Tim O'Rourke, KG4CHX, in a handsome wooden cabinet.

Below: Unusual construction. A one-valve (5EA8) CW transmitter for 40m and 30m built by Hidehiko Komachi, JA9MAT, in a small 'curiously strong' mint tin. With a 200V supply, the transmitter delivers about 1.5W.



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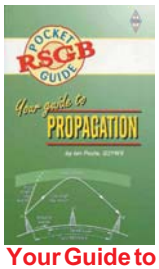

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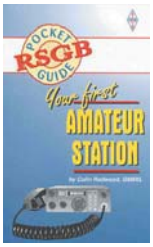

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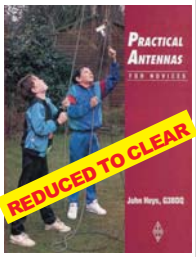

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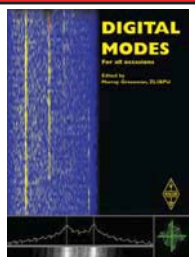

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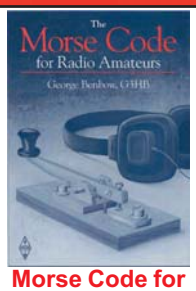

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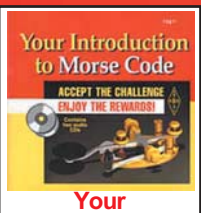

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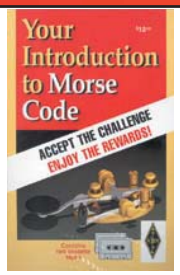

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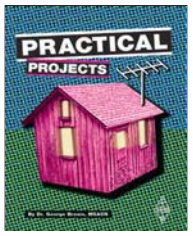

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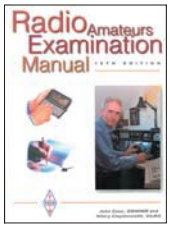

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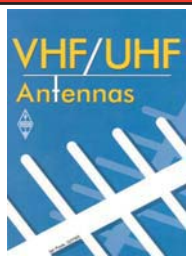

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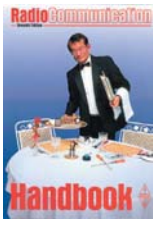

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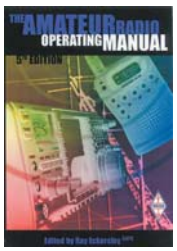

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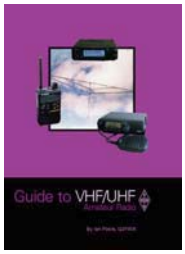

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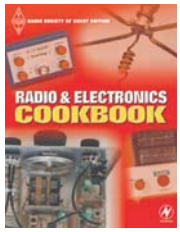

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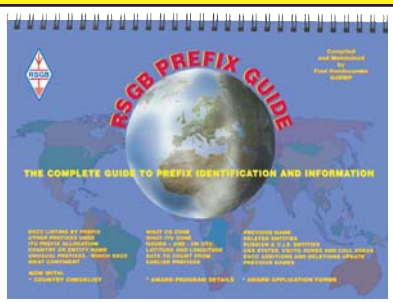

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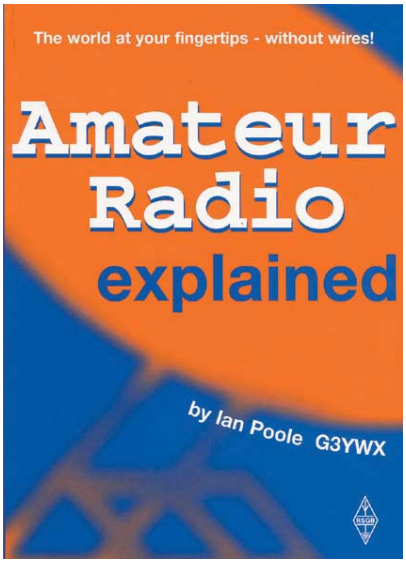

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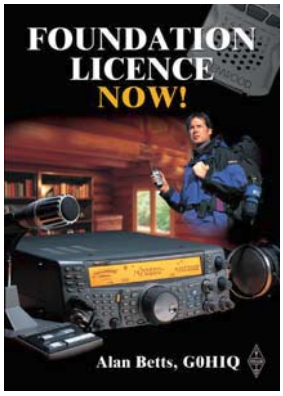

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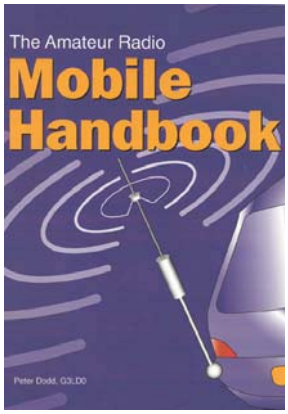

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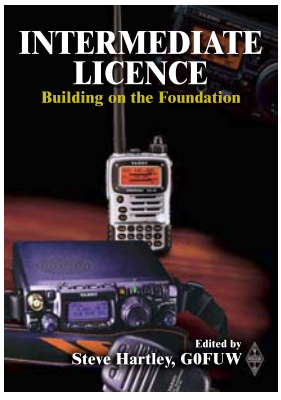

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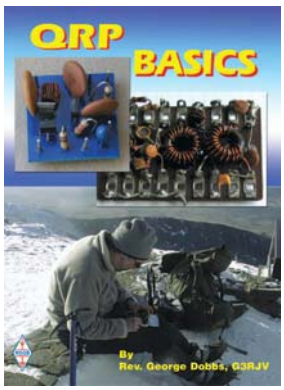

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By Simon Lewis, GM4PLM, Creoch Farm, Ochiltree, Ayrshire KA18 2QH. E-mail: uwave.radcom@rsgb.org.uk

MICRO WAVE

The weather over the past month or so has been much better and has even produced some tropo openings for those located on the East coast of the UK into Scandinavia, so things are looking up. Hopefully we may see some better openings this year if the weather patterns will comply! Quite a lot to report this month, so on with the news.

The URL of the Peter Day, G3PHO, website has changed to www.g3pho.org.uk Peter is the editor of the RSGB's Microwave Newsletter, which is an excellent monthly publication containing a vast array of technical and operating information. It's a very worthwhile newsletter to which to subscribe and is certainly number one on my list for any newcomer to the world of amateur microwaves in the UK. You can subscribe to the newsletter via RSGB sales.

It is with sorrow that I received an e-mail from Marius, F8DO, informing me that F9FT went silent key on Sunday, 2 March 2003. He says "We have deep sadness to tell you of the death of Marc, F9FT. He was a pioneer for EME and manufacturer of the famous Tonna nine-element Yagi in the earlier 60s and then the 16-element. He was passionate about antennas and the ham hobby till the end of his life. We lost a friend and a great OM." I have passed condolences to Franck, his son, on behalf of this column and the many readers who will have used his antennas over the years. Marc made a huge contribution to the hobby and will be sorely missed.

MICROWAVE UPDATE

This is an annual event held in the US and can probably be described as the world's top microwave meeting. It truly is international and draws microwavers from the four corners of the globe! This year is going to be no exception and the Microwave Update 2003 organisers and the Pacific Northwest VHF Society are joining forces to host a joint conference in the Seattle, Washington, area on 25 - 28 September 2003.

Registrations for the joint conference will be accepted beginning 1 April 2003. The cost of the registration will be $40 prior to 12 September 2003, and covers all three days. Single-day or single-event registrations are not available. Late registrations, including at the door, will be $50. Registration forms can be downloaded at www.microwaveupdate.org or send an SASE to John Price, N7MWV, at 12026 81St Ave NE, Kirkland, WA 98034, and a form will be mailed to you. Joint conference sessions and the Saturday evening banquet will be held at the Everett Holiday Inn and Conference Center, a short drive north of downtown Seattle. Special rates have been arranged with the hotel for conference participants. Rooms are $69 per night plus tax – a real bargain for the Seattle area! It is suggested that early reservations be made directly with the hotel at (425) 337 2900. Be sure to mention 'Microwave Update' to get this rate, and make your reservation by 21 August.

'White papers' are currently being solicited from potential authors and speakers for publication in the 2003 Conference Proceedings. Topics specifically of interest to Microwave Update attendees, as well as those on VHF and UHF subjects usually associated with the annual Pacific Northwest VHF Conference are solicited. Papers will be accepted until 1 July, to allow enough time for printing. White papers should be sent directly to Jim Christiansen, K7ND, via e-mail at k7nd@att.net. MS Word format is preferred. Microwave Update 2003 and the Pacific Northwest VHF Society respectively will be the sole judges of whether presentation requests and white papers are accepted. If you are interested in making a session presentation, please respond to NU7Z (nu7z@aol.com); for presentations at the Pacific Northwest VHF Conference sessions, contact N7CFO (n7cfo@ix.netcom.com). LCD projection equipment will be available for those using PowerPoint presentations. Slides and video presentations can be accommodated with advance notice. Contact: Rick Beatty, NU7Z, via nu7z@aol.com or (425) 775-9196; Jim Aguirre, W7DHC via w7dhc@arrl.net or (425) 222-6149.

BEACON NEWS

The 10368.860MHz F5XAD beacon, constructed by F2SF, is now located at 2400m ASL in JN12BL (in the Pyrenees) with 2W EIRP. The takeoff is very good from 340° to 65° (the 432.978MHz beacon at same location has been heard from G and DL). Might it be the highest 3cm beacon in Europe? Please send reception reports to Michel, F6HTJ, balises@refunion.org

The GB3MCB 1296MHz beacon, located near St Austell in Cornwall, is off the air following the theft of equipment at the transmitter site. It is not known when the beacon service will be resumed. If anyone has any information on the theft, please contact the repeater keeper, J W Birkbeck, G3IGV, whose address is correct in the RSGB Yearbook.

A new group dedicated to the amateur radio bands 1GHz and up for UK/EU microwavers has been established on Yahoo. The group is open to discussions on all modes and bands, ie not just narrowband terrestrial modes. Please feel free to pop in and say hello.

You can join online at http://groups.yahoo.com/group/ukmicrowaves/ or by sending an email to ukmicrowaves-subscribe@yahoogroups.com

Finally, with a new 3.4GHz record in the US over the past few weeks and the first 14GHz VUCC awarded, things have been busy on the opposite side of the pond! Congratulations to all involved – the envelope keeps getting pushed! In particular, well done to that ex-G microwaver, Dave Robinson, WW2R/G4FRE, who keeps showing them how it's done UK style! ◆

Below, left: The record-breaking millimetric equipment of WA1ZMS.

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

LF

A moose puts a stop to aerial work!

Conditions across the Atlantic continued to be quite good through February and March, with signals regularly being received. Brian, CT1DRP, near Porto, recently rejoined the activity and has put out the most consistent signal from Europe. These tests have all used 60-second QRSS, which is more likely to be received than the 10- or 30-second modes used for the first tests so it's difficult to compare conditions, but I'm not convinced that things have been as good as they were in previous years.

UA9 ON 136kHz

From 11–16 March, Ed Lesnichy, RU6LA, and the RU6LWZ team took a trip into Asiatic Russia to a site near Novosibirsk (locator MO94TK), where they had access to a 230m tower. During the dark path to New Zealand, they tried some tests with ZL6QH, the Quartz Hill club station near Wellington. Things got off to a promising start with Bob, ZL2CA, also near Wellington, getting an excellent 'O' copy of UA9OC on the Thursday night. On Friday, signals from UA9OC were copied at Quartz Hill, but no QSO took place and, unfortunately, it was the same story on Saturday.

The UA9 team had more luck to the West on Friday night when Jim, M0BMU, made contact just before midnight. This was the expedition's best DX at about 5000km and Jim reported that, although both stations were using slow CW with 30-second dots, signals were so good that he could have copied UA9OC on 3-second dots.

On both Friday and Saturday nights the 'window' to UA9 seemed quite short to those of us well inland, with the signal not copyable before 2230 and fading out after midnight. On the East coast things seemed better, with G3KEV in Scarborough reporting that he had good copy for most of the evening.

Trans-Atlantic watchers reported that conditions were not good over the period that Ed and company were in UA9, so perhaps more could be achieved if they ever make it back there?

Laurence, KL1X, with the big LF receiving loop.

73kHz ACTIVITY

It'll soon be the end of our time on our first LF band as the 'Notices of Variation' for 73kHz expire on 30 June this year. At the time of writing, it seems that the big signal in the middle of the band has moved from Rugby to its new site in the North, and the band is much quieter as a result.

During the March maintenance shutdown, a few 73kHz stalwarts appeared on the band and were able to witness the first appearance of G3WKL. Better late than never John!

Several other events are likely to take place on the band before the end of June, including portable trips and trans-Atlantic tests. Keep an eye on the LF news pages for details and, if you've got an NoV gathering dust in the filing cabinet, now's your last chance to make use of it!

KL1X

As mentioned last month, Laurence, G4DMA, has set up shop as KL1X near Anchorage, Alaska, and has an excellent LF receiving system. So far he has received G3AQC, G3LDO and CT1DRP on 136kHz. The best reception was of G3AQC's signal at a distance of 7267km.

Laurence is constantly working on the station and hopes to have a Beverage aerial working soon. He has plenty of space to play with, but has to beware of the local wildlife when aerial rigging!

S57A

Boris has been active on 136kHz for a couple of years now from JN65TW. Recently, he has been having quite a few QSOs using QRSS and has been seen regularly on our Argo screens in the UK. In the last couple of months, he has worked DL2HRE, G3LDO, G3XDV, RU6LA, YU7AR and OK1DTN, many being firsts with Slovenia.

G3LNP LOOP IMPROVEMENTS

Jim, M0BMU, has sent this information regarding the popular G3LNP loop as published in the Low Frequency Experimenter's Handbook:

"To remove the need to use carefully-matched FETs and to use more easily-available BF245s, remove the 1kohm/1µF between the output transformer centre-tap and ground (C4 and R5), and ground the centre-tap directly. Fit 2kΩ resistors in parallel with 0.1µF capacitors in the emitter leads of the two output transistors (TR3 and TR4). The output transistors are now independently biased, so small differences in FET characteristics will only unbalance the output stage slightly. The output stage current will be quite low, about 3mA in each transistor, which will lead to distortion products if large signals are present at the output. Reducing the 2kΩ resistors will increase the bias current. 470Ω will give about 12mA per device, which would increase the available output by about 12dB before distortion occurs. The drain voltage of the FETs will depend on their Idss, and the FETS should be selected for a drain voltage of about half the supply voltage (Idss ~ 3mA)."

OUT TO DRY

Those of us whose loading coils are out in the garden should take heed of G3LDO's recent experience. Peter had been noticing variations in aerial current. Current would rise during a period of operating, and he was at a loss to explain it. During a visit from Laurence, KL1X, Peter fired up the transmitter and Laurence noticed some sparking inside the insulation of the Litz wire. This was suggested to be due to moisture which had to be dried out before full current could be achieved. Peter brought his loading coil inside, dried it thoroughly and was rewarded with a large increase in current. I wonder if I can extend the central heating system to my coil? ◆

By Trevor Brown, G8CJS.
E-mail: chairman@batc.org.uk

ATV

SM6CKU's well-equipped ATV van.

February saw another ATV milestone, with Ben, SM6CKU, up-linking digital ATV to a geo-stationary satellite from Sweden.

It started with an announcement on the GB2RS News to monitor Astra 1A, currently located at 5.19° east, for a digital ATV transmission on 9 February at 0900UTC. The down-link frequency was detailed as 11.323GHz, on horizontal polarisation, a symbol rate of 6667Kb/s and forward error correction of 1/2.

Colour bars appeared only moments before 0900UTC, followed by close-ups of Ben's HF transceiver, an Icom 751, inter-cut with an exterior view of the satellite up-link truck.

I watched the transmission, from a location in Yorkshire, Northern England, on a 1.5m prime focus dish feeding a Nokia 9200 Mediamaster. No corrective provision was made for the 1.41° (maximum) inclined orbit of Astra 1A, thus accepting the very infrequent picture 'blocking' that occurred.

Numerous reception reports soon started coming in regarding both the satellite and the terrestrial 20m transceiver signals. Walt, G3NYY, of Gloucester, and Phil, G4EEU, using a 90cm dish in London, reported the same excellent signals. Paul, M3PGS, in Bristol, reported that GB3ZZ (the local ATV repeater), was also relaying the pictures, and Adrian, G4UVZ, confirmed this.

Other reception reports from Germany, Italy, Belgium and Holland, gave an idea of the coverage of this satellite and the number of radio amateurs involved in this unique test. This was an interesting experiment, and for the HF operators there was no doubt as to their signal reports, with Ben's S-meter clearly visible via the satellite.

German hams, watching via a terrestrial ATV repeater in Cologne, commented on the very noticeable propagation and MPEG-2 processing delay when watching Ben's Icom transmit and receive lights via satellite and comparing it with their near-instant direct HF radio reception.

I look forward to Ben's next satellite up-link and I hope that it progresses beyond a test transmission, perhaps the basis for a regular ATV news service.

DUTCH MAGAZINE

The Dutch ATV Magazine Repeater arrived this month. In it there is an excellent article by Henk Medenblik, PE1JOK. Henk's article is written from the viewpoint of a DATV user. He explains three current digital broadcast systems, DVB-S, DVB-T, DVB-C and their relative merits.

DVB-S is designed for weak signals due to the long signal paths from space, and DVB-T is designed to combat multi-path reflections. DATV fits somewhere in between these two, as it will probably suffer from both. Henk goes on to enthuse about DATV as the solution to the wide bandwidth that current analogue systems use, which are anti-social to other band users and result in the poor signal-to-noise that many of us endure. He points out two major pitfalls, the first being linear amplification to avoid spectrum re-growth, and the second as signal delays in the Codecs, resulting in headphones being essential when working duplex via repeaters.

Henk finishes with "However, if you finally experience your first live DATV transmission, you'll never want anything else again!"

Repeater is an excellent ATV magazine, published in both English and Dutch, and is well worth a subscription. Repeater has allowed BATC to re-print this article in CQ-TV 202.

DATV IN GERMANY

Professor Uwe Kraus, DJ8DW, is working hard to develop a practical DATV transmitter at Wuppertal University in co-operation with the AGAF.

The research and development are finished, and he is about to produce 100 units. BATC has ordered several units for evaluation, and I will include a report in a future ATV column when they arrive. Uwe is proposing a dual system of GMSK (Gaussian Minimum-Shift Keying) and QPSK (Quadrature Phase-Shift Keying).

GMSK can be treated like FM. On the transmitter site, highly-efficient non-linear power amplifiers can be used; at the receiving end, a simple FM demodulator is sufficient. The other system that his units support is QPSK

QPSK requires a highly-linear power amplifier; this is due to the fact that QPSK contains 100% amplitude modulation, which results in splatter when amplified non-linearly. Unfortunately, this splatter (or spectrum re-growth) does not stop the ATV signals from being received and decoded without any problems (unless you are operating on an adjacent channel). QPSK is interesting for use on 23cm, as numerous cheap digital satellite set-top boxes are available, thus avoiding the need to build a receiver.

When the transmitter is complete, Uwe intends to start on a GMSK receiver, which will have its own FEC and MPEG decoder. ◆

SM6CKU's HF transceiver, shown during the satellite test.

WEB SEARCH

BATC	www.batc.org.uk
Ben Jockert, SM6CKU	www.parabolic.se
German DATV	www.von-info.ch/hb9afo/datv_e.htm

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BRAND new 10.5m Tennamast with cage, winch plus Hygain Ham-IV rotator and control, £650 ono. PK232 MBX TNC cables, mans, £80 ono. 01202 891 770 (Ferndown). E-mail: nick@g0eov.freeserve.co.uk

BXI tower, 40ft 2-section with ground post, requiring no concrete, plus two hand winches and all wire. Dismantled and ready to collect. For quick sale, best cash offer over £100. 01832 273 123 (Peterborough). E-mail: g3xfa@aol.com

COLLECTION: Military NASA radios W/J - VLF. Multicoupler. Nems-Clark AR-88, HRO, RA117, R1155, BC348, BC312NK, KW202 APR-4Y. APR-25 Marconi Atlanta, Eddystone 940, Hammarlund 600. Collins spares mechanical filters, RT-512/3TF7 tubes Millen GDO. Antenna bridge PRM-10 GDO variable electronic filter. ZM-4B resistance bridge. Sig gens URM-268, TS-497, TS-382, 608, National Velvet vernier dial, Yaesu LP filter USA valves etc 2C59, also some ceramic valves SAE. 01942 255 948 (Wigan).

COLLINS 30S1 linear amp, absolutely pristine, £2500. Racal RA1772 rcvr in brand new case, this rcvr is superb not a surplus unit, £500. Yaesu YO-901 monitor scope with bandscope option, exc cond, £200. TMC GPR90 rcvr c/w GS81 SSB adapter, pristine and very rare, £800. SSB adapter for B40 type rcvr, very scarce and brand new, £300. Marconi CR100 transmitter – fits on lid, brand new, never wired, £200. Buyer collects or pays carriage. Simon, 01434 633 913 (Corbridge). E-mail: simon@nomis.co.uk

DATONG RF clipper, £20. Trio SP-5 speaker. BC221, AF with built-in PSU, £25. Woden UM2 and UM3 mod transformers, £3 each. 2 x 3in meters, 20mA and 50mA, £5 each. Drake C-line inlays, £1 each, various Collins mans. 01379 783 657 (nr Diss).

FT-1000MP & IC-775 DSP with SP-3 also an Alinco DJ-G5 twin-band FM, all exc cond, genuine reason for sale. GM4UBF, 01698 424 311 between 9am-1pm, then 1.30pm – 10pm 07951 361 991.

FT-290 MkII plus 25W linear, gwo with man, power leads and mic, £180. Emotator 105TSX lightweight rotator, gwo with man and lots of cable, £100. MFJ-204B antenna bridge, £50 ono. Prefer buyer collect or p&p extra. G0RNF, QTHR, 01895 635 839 (Ruislip). E-mail: g0rnf@aol.com

FT-736 with desk mic, £500. FT-757 with matching PSU and ATU, £500. FT-290 MkII with matching 25W linear and mobile mount, £220. Cushcraft HF vertical AP8, £50. PK-232MBX, £100. G0MCE, QTHR, 01902 785 599 (Wolverhampton).

HY-GAIN super 3-ele Thunderbird beam antenna TH3 MkIII with beta matching for 10/15/20m, £105. Osker Bloc SWR 200 2kW meter, £35. 01202 747 756 (Poole).

ICOM 706, separation cable, box, man, exc cond, £400. Alinco DR-130, 50W 2m mobile, man, vgc, £75. John, G0WUU, 01778 590 152 (Stamford). E-mail: jg.purcell@btopenworld.com

ICOM 728 HF tcvr, 100W, narrow CW filter fitted, exc cond, mans, original packing, £350. GM0VMV, 0131 447 2575 (Edinburgh). E-mail: e.kennedy@btinternet.com

ICOM 746, 160 - 2m tcvr, £700. Icom desk mic SM-8, £50. Daiwa SWR / power meter NS660, £40. All in exc cond. Going QRT. G3OUQ, QTHR, 01827 880 719 (Atherstone). E-mail: harry@bbird.fsworld.co.uk

ICOM IC-728, exc cond, in original packing, complete with mans, mic, power cable and 500Hz CW filter, features inc PBT, RIT, audio compression, pre-amp, noise blanker, attenuator, dual VFOs, 100W PA, £350 ono. GM0VMV, 0131 447 2575 (Edinburgh). E-mail: e.kennedy@btiternet.com

ICOM IC-737 100W tcvr with both optional 500Hz CW filters fitted. Similar block diagram to 737 but no internal ATU, £270. Both in exc cond with original boxes, mans and fist mics. P40 Strumast complete but less ground post, £200. Dave, G3KLH, 01425 638 542 (Bournemouth area).

ICOM IC-746 HF/6m/2m tcvr, HM-36 mic, fitted narrow SSB filter, £785. Matching PS-52 PSU, £85, and PS-31 loudspeaker unit (with audio filters), £40. All above boxed with mans and mint cond. Yaesu FL-2100Z 500W HF linear amp inc WARC bands, vgc, man, £315. Tokyo 20 / 200 / 2kW twin-meter ATU, 9-band HF, man, mint, £210. G3ZTZ, QTHR, 01276 507 785 (Camberley). Email: pete.howell@ntlworld.com

ICOM IC-765 HF tcvr, late serial number, just serviced by Icom UK, c/w box, mans, HM-36 mic, non smoker, £700. 01227 738 520 (Canterbury). E-mail: g3xaq@hotmail.com

ICOM IC-R7000 rcvr, good cond with mains lead and man. Offers by e-mail please. E-mail: tomy2@ntlworld.com

ICOM U-101 12ch UHF simplex /repeater, £70. Kenpro KR-400RC rotator, wire, control/man, vertical load 200kg, £125. Jaybeam 8-ele 2m with masthead pre-amp, £20. HF ATU 1.5k, £50. Callers only, cash only. Derek, 01270 668 111 (Nantwich).

INDEX QRP Plus, £220. Collect or plus postage. G0CEQ, 020 8368 5681 (East Barnet).

ISOTERM PSK-31 isolated interface by G3LIV with necessary paperwork. Leads attached, £25 post paid. Also Icom SSB filter FL-96 removed from rig, £50. Ken, G3RDG, 020 8455 8831 any time. E-mail: kennethb@btinternet.com

KENWOOD 870, pristine, mint cond, boxed, mans, little used, mainly CW, selling due to illness, bargain, £980. G0WAS, QTHR, 01525 841 182 (Maulden). E-mail: 402smith@whsmithnet.co.uk

KENWOOD TL-922 2kW amp, new Eimac 3-500S fitted, £995. Kenwood TS-940SAT base station, auto ATU, late model with Lowe's mods, £625. Icom IC-765 base station, auto ATU, voice synth, CTCSS tone board. All above in A1 condition, original packing and mans. MFJ-989C 3kW ATU, £250. KR-400RC rotator, £150. Icom SM-8 desk mic, £75. SP-901 speaker, £45. Filters YK88C, YK88SN, YK88CI, YG455C, £45 each. Items A1. 07970 214 039 (Thetford).

KENWOOD TS-4405 tcvr, HF bands plus gen coverage, built in ATU, £360. Matching PS-50 PSU, £75. Kenwood MC-60 desk mic, £60. Yaesu YS-2000 pwr/SWR meter, £50. RAF type Morse key, £25. All items, good cond and appearance, carriage extra. Realistic offer for the lot considered. 01732 833 807 (Hildenborough). E-mail: billcrossan2@aol.com

KENWOOD TS-570DG, mint cond, boxed, £525 - offers considered. G3MQU, QTHR, 01379 642 875 (Diss).

KENWOOD TS-9130 2m multimode, boxed, £200. Kenwood TS-9500 70cm multimode, boxed, £200. Cushcraft R7000 multiband vertical ant, boxed, £150. Fibreglass 10m ?-wave vertical ant, £25. Yaesu FC-902 HF ATU, £80. 2m/70cm dual-band fibreglass ant, £20. Philips PM3217U

CONGRATULATIONS to the following, whom our records show as having reached **50** or **60** years' continuous RSGB membership this month:

60 years

G3CAQ Mr W Moorwood
RS6464 Mr E Valentine

50 years

G3JSF Mr A W Baker
G4ONP Loughgton & Epping Forest ARS
GW4BYA Mr P A Braham

Our apologies to Mr D F Willies, G3HRK, who was omitted from previous lists, and who joined the Society in July 1952.

50MHz d/b scope, £50. Tektronix D755 d/b scope, £50. Preselector unit type 5420A (HF bands - R217), £20. Collins 180L auto ATU, £20. 2m X-Y Yagi Jaybeam, boxed, unused, £20. Gould AF sig generator, £40. Acorn A3010 computer, £40. HP 690 inkjet printer, £30. Star LC2410 printer (+ box paper), £20. Tonna 9-ele 70cm Yagi, boxed unused, £10. Coax LDF 4-50 2x30m, £30, (Newmarket). E-mail: john.mullin4@btopenworld.com

MAST – pneumatic Hilomast 3m to 12m, just pump it, in full working order; to buy new, £1700, open to offers. RS177650 (MM3?), 01880 820 918.

MFJ-1025 exc noise reduction. Redundant, re-sited aerial, £130. MK704 twin paddle, brass and ply base. Ready. Global AT2000 SWL ATU not Tx, £60, new. PSU 12V 3A reg, £15. 01404 850 461 (nr Exeter).

MFJ-1798 vertical antenna, 80 to 2m including WARC bands, still in use, £175, cost £300 five months ago. Easy to tune, buyer inspects and collects. Derek, G4VOH, 01606 862 382 (Winsford).

R1155 ex-WWII bomber receiver, housed in its original wooden box. Offers, please. 01276 858 612 (Chobham).

RCA AR88D, clean cond, £75. Hallicrafters S27 VHF set, needs work, £40. Eddystone 358 wartime set, £60. Many other valve rcvrs. M1SAB, 01434 681 469 (Northumberland). E-mail: armatagestuart@aol.com

RS UV exposure unit, no timer, £50. Elements for Bird 70–156MHz, 25W, 70–156MHz, 100W, both by Coaxial Dynamics, 50–125MHz, 100W by Bird, each, £20. TR dip meter, £20. Postage extra. Pascal, GI0SFT, 028 7135 2804 after 5pm (Londonderry). E-mail: pascalmcd@aol.com

SATELLITE equipment: Yaesu G-5500 rotator/controller, almost new, £450. Icom IC-820H, £500. UEK-3000 downconverter, £250. UEK-2000 downconverter, £200. G3RUH S-band antenna with patch feed, £80. Other equipment free to purchaser of either one of first two items. Buyer must collect. G3SBP, 01822 870 266 (Lifton). E-mail: rd.gynn@btopenworld

SILENT key sale G3XBB. Trio tcvr TS-700G 2m all-mode unit, offers? Yaesu tcvr FT-101ZD HF SSB, offers? RadCom magazines all back copies to 1980, buyer collects. Martin, 01332 880 511 (Derby).

SPECTRUM analyser Hameg HM8028, tracking generator, HM3038, coupled to Topward 20MHz, double-beam oscilloscope, £350. G3PTN, QTHR, 0113 265 4644 (Leeds).

TEN-TEC Century 22 tcvr complete with PSU and Howes ATU, £300. Alinco DJ-5E, spare battery and speaker mic, £200. Kenwood AT-230 ATU, £100. Will deliver or pay carriage. Stan, G0BYA, QTHR, 01785 612 106 (Stafford). E-mail: stan.houlding@ntlworld.com

WINDOM 80m special, £70. 50MHz dual-beam scope, Philips PM3217U, £150. Triband beam Mustang, £150. Tennamast tilt-over 40ft, £150. 01621 868 347 (Colchester).

YAESU FT-101ZD tcvr with matching Yaesu FL-2100, 600W amp, including service mans, £350. Kent Electronic iambic keyer with MFJ paddles, £70. Ray, G0UMA, 01482 649 361.

YAESU FT-225 RD with Mutek front end and memory unit. 9 fixed channels, £350 ono. Phone any time, G8WXU, QTHR, 01277 623 019 (Billericay).

YAESU FT-767GX with 6m & 2m modules, mic, man, box, spare internal ATU, £425. MM0BPO, 01546 830 134 (Argyll). E-mail: mckinney@mistral.co.uk

YAESU FT-8100R dual-band FM tcvr. Detachable head, as new, c/w box, man, supplied accessories, £215. Roger, G0KDR, QTHR, 01728 663 476 or 07799 473 374 (Saxmundham). E-mail: g0kdr@btinternet.com

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?

May	GB5PM: Piles Mill. West Somerset. LH2 (G0NKZ)
2 May	GB0HMT: Her Majesty Tugs. Cardiff. LH2 (MW0DHF)
	GB0HMT: Her Majesty Tugs. Cardiff. TLH2 (GW0PUP)
	GB0HMT: Her Majesty Tugs. Cardiff. LH2S (GW0ANA)
3 May	GB100MAS: Montrose Air Museum. Montrose. TLHV2 (GM0JZV)
	GB100MAS: Montrose Air Museum. Montrose. TLHV2 (GM4OAQ)
	GB100MAS: Montrose Air Museum. Montrose. TLHV2 (GM0TWB)
	GB100MAS: Montrose Air Museum. Montrose. TLHV2 (GM0RRU)
	GB100MAS: Montrose Air Museum. Montrose. TLHV2 (MM0BIX)
	GB2WWT: World War Two. Wigtown, Dumfries & Galloway. LH27 (GM4LQS)
5 May	GB2TSD: Training Ship Dulverton. Burnham on Sea. L (G3WNG)
	GB5PC: Perton Carnival. Perton, Staffs. LH (M0SRB)
9 May	GB0WSM: Whitchurch Silk Mill. Whitchurch, Hants. LH2 (G0WQS)
	GB4YOU: Youlbury Scout & Guide Radio. Oxford. (G0REL)
	GB4YOU: Youlbury Scout & Guide Radio. Oxford. (G0RJX)
10 May	GB0ARM: Armagh. Co. Armagh. L (GI4SRQ)
	GB0ATM: Co. Antrim MTS. Carrickfergus. L2 (GI3YRL)
	GB0BFD: Bedfordshire MTS. Bedfordshire. TLH (G4CEO)
	GB0CW: CW operation. Reading, Berks. (G4HNF)
	GB0DGW: Danzey Green Windmill. Bromsgrove, Worcs. LH2 (M0COP)
	GB0FWM: Ford Water Mill. Ford, Salisbury. LH2 (M0BVO)
	GB0GRN: Grampian MTS. Aberdeen. LH2 (GM3WIJ)
	GB0HLD: Highland. Ross-shire. TLH (GM3WED)
	GB0HWR: Hereford & Worcester MTS. Malvern, Worcs. L (G4BVY)
	GB0LDN: London MTS. Enfield, Middx. LH (G3KTZ)
	GB0LEC: Leicestershire. Leicestershire. LH (G4ARI)
	GB0MSY: Merseyside. Liverpool. LH (G3XSN)
	GB0MTS: Morse test Service. Thatcham, Berks. (G3RVM)
	GB0NLW: North Leverton Windmill. North Leverton, Notts. LH2 (G4YRZ)
	GB0SOM: Somerset MTS. Ilminster, Somerset. L (G4KJD)
	GB0SPE: Shropshire MTS. Telford. L (G3JKX)
	GB0SX: Stone Cross Mill. East Sussex. TLHV27 (M0RJO)
	GB0YSE: Yorkshire East. Hull. LH2 (G4ASA)
	GB0YSN: Yorkshire North MTS. Scarborough. LH2 (G4ZGP)
	GB2BM: Bursledon Mill. Southampton. LH27 (G0VNI)
	GB2BWT: Boking Windmill Trust. Essex. LHV27 (G0EMK)
	GB2GG: George Green (the miller). Sneiton, Nottingham. TLH2 (M0RMJ)
	GB2HBF: Horsington Beer Festival. Horsington, Somerset. LH (G0ENW)
	GB2HUM: Humberside. Hull. LH2 (G4VHM)
	GB2MMW: Marsh Mill in Wyre. Thornton, Lancs. LH (G4BFH)
	GB2NW: Nutley Windmill. East Sussex. LH (G3TXZ)
	GB2PW: Polegate Windmill. East Sussex. TLH2 (G3DQY)
	GB2PWW: Pakenham Water Wheel. Pakenham, Suffolk. LH (G4DHU)
	GB2SW: Scarborough Windmil. Scarborough. LH2 (G4SSH)
	GB2TMI: Thwaite Mill Island. Stourton, Leeds. LH27 (G0BFJ)
	GB2UW: Upminster Windmill. Upminster, Essex. LH2P (M0MAC)
	GB2WMS: Water Mill Shepshed. Shepshed, Leics. L (G3KQU)
	GB5HW: Heage Windmill. Heage, Derbyshire. H2 (G0IYZ)
11 May	GB0ATM: Co. Antrim MTS. Newtown Abbey, Co. Antrim. (GI4BTG)
	GB0HSM: High Salvington Mill. Worthing, West Sussex. LH2 (G3NDJ)
	GB0LEC: Leicester MTS. Loughborough. L (G4KGG)
	GB2WTM: Woodbridge Tide Mill. Woodbridge, Suffolk. LH (G4YQC)
15 May	GB617SQN: 617 Squadron. Lincs. LH2 (M0CBN)
	GB617SQN: 617 Squadron. Lincs. LH2 (G0DAM)
16 May	GB8GS: Glansford Scouts. Scawby, North Lincs. LH2 (M0AUS)
17 May	GB2HLM: Himley Lifeboat Marathon. Dudley, W. Midlands. LH27P (M0SJV)
23 May	GB2RCC: Radio Caravan & Camping. Stoke Bruerne, Northants. TLHV27 (G0VEP)
24 May	GB2ACW: American Civil War. Preston, Lancs. LHV27 (G3UCA)
	GB2HA: Hood Association. Winchester, Hampshire. LH27 (G0LMD)
26 May	GB0NTC: National Trust Charlecote. Warwick. LH2 (G0MRH)
29 May	GB0ATS: Great Boats. Northants. LH27 (M0CKP)
30 May	GB8NC: Northern College. Barnsley, S. Yorks. LH2 (G0SSC)

WANTED

2000 OHM HEADPHONE wanted, any make in good cond welcome. John, GW3DDY, QTHR, 029 2075 3914.

ANY RACAL AND WATKINS Johnson rcvrs, accessories, mans or just spares wanted by enthusiast. WHY? Especially looking for the following – Racal RA137 LF converter for the RA17, a WJ8888 (Quad-8). Also want a JRC NRD535 rcvr, 19in equipment racks, HF multicoupler to feed several rcvrs. Distance to collect no problem. G8WKA, QTHR, 01252 795 234 (Surrey). E-mail: richardrich@aol.com

CIRCUITS for Telequipment D31 scope. Advance sig gen 5G62. Heathkit 82U sig gen. Rapid Electronics scope 7020. Monitor ZNM 1240E. Trio rcvr M 9R 59. Scopex 4010A. Monitor Compaq 472. Zenith monitor ZNM 1240E. Grundig rcvr. Compact Centre M340. 020 8374 9070 (London). E-mail: dennis@whsmithnet.co.uk

COLLINS R390A rcvr wanted for my own private collection. A good home assured. I will collect and pay in cash. 01254 822 222 (Clitheroe). E-mail: g3yfg@btconnect.com

EARLY valve and crystal wireless wanted, especially interested in early Marconi items. Also looking for good top-end valve comms rcvr and early valve test equipment. G4ERU, 01202 510 400 (Bournemouth).

EBONITE, especially 3/8in and 1/2in thick panels. WHY? Also early wireless gear especially Marconi, Sterling and AJS. 07973 502741 (Ely). E-mail: john@g4fit.com

HAS ANYONE AN ICOM FL-80 for sale, as described under www.mods.dk mods for my IC-765 page 3. Cash waiting. Ken, G3RDG, 020 8455 8831 any time. E-mail: kennethb@btinternet.com

KENWOOD TS-830 or TS-530 wanted, must be in good condition. 0118 378 6256.

SIGNAL R-535 air band rcvr, must be in mint condition. GI3YDH, QTHR, 028 9050 3203. E-mail: gi3ydh@ntlworld.com

SILENT key clearout or just not needed, I collect QSL cards for their historic interest and a research project, especially from periods before 1970. Can collect or arrange collection. 0113 269 3892 (Leeds). E-mail: g4uzn@qsl.net

YAESU MH-1B8 scanning hand mic, FP-757HD or FP-700, 12V PSU, KW109 ATU. Chris, G4AJA, 01793 762 439 (Swindon). E-mail: chris.hoare@zeronet.co.uk

RALLIES & EVENTS

4 MAY 2003

SOUTH YORKSHIRE RG Spring Great Northern Hamfest – Metrodome Leisure Complex, Queen's Road, Barnsley. Less than 2 miles from jn 37 M1. Five minutes' walk from train and bus station (follow the brown 'Metrodome' signs from all directions). OT 10am, £2.50. DF, TS, SIG, B&B. Ernie, G4LUE, 01226 716 339 or 07787 546 515.

5 MAY 2003

DARTMOOR RC Dartmoor Radio Rally – Pannier Market, Tavistock, Devon. OT 10.15 / 10.30am. TS, B&B, C, CP within five minutes' walk, DF, TI on 144.550MHz, picnics – bring family. Ron, G7LLG, 01822 852 586.

MID-CHESHIRE ARS Rally – Civic Hall, Winsford. OT 10.30/11am. C, CP. David, G4XUV, 01606 77787.

11 MAY 2003

DUNSTABLE DOWNS RC 20th Amateur Radio Car Boot Sale – Stockwood Park, Luton. OT 9am. Access via M1 jn 10. [www.ddrcbootsale.freeserve.co.uk]

16–18 MAY 2003

52nd DAYTON HAMVENTION – Dayton, Ohio, USA. [www.hamvention.org]

18 MAY 2003

MIDLAND ARS Drayton Manor Radio & Computer Rally - Drayton Manor Park, Fazeley, Tamworth, Staffs, on A4091 near jn 9 & 10 of M42. OT 10am. TS in 3 marquees, FM, SIG, CBS, clubs. Norman, G8BHE, 0121 422 9787 or 07730 132 726. [http://midam radio.members.beeb.net]

31 MAY – 1 JUNE 2003

LONDON COMMUNICATION & Computer Show – *** New venue *** – Stevenage Leisure Centre, Lytton Way, Stevenage. One minute's walk from mainline station. OT 9.45 / 10am. TS, B&B, TI (2m & 70cm), CP

close by, SIG, MT, MA, LEC, LB, C, DF. RadioSport 01923 893 929. [www.radiosport.co.uk]

1 JUNE 2003

SPALDING & DARS Annual Rally – New venue – Sir John Gleed Technical School, Halmer Gardens, Spalding. OT 10am, £2. CP, TS, CBS, TI, but no camping this year. Ray, M0CTM, 01775 711 953, or John, G4NBR, 07946 302 815. [www.sdars.org.uk]

WEST MANCHESTER RC 7th Red Rose QRP Festival – Formby Hall, Alder Street (off High Street), Atherton, Manchester. OT 11am, £1.50. TS, RSGB, G QRP, B&B, CP free, DF, C, LB, TI on 144.550MHz, construction competition. Les, G4HZJ, 01942 870 634, g4hzj1@ntlworld.com

6–8 JUNE 2003

25TH NORDIC VHF Meeting - Hotel Gavelstad (JO49XI), 45km N of Larvik, Norway. Accommodation for 90 people plus caravan park. LEC, FM, barbecue.

8 JUNE 2003

NUNSFIELD HOUSE ARG 34th Elvaston Castle National Radio Rally – Elvaston Castle Country Park nr Derby. Les, G4CWD, 01332 559 965 or secretary@elvastonrally.co.uk

YEOVIL & DARC 19th QRP Convention – Digby Hall, Hound Street, Sherborne, Dorset. OT 10am. LEC, C, TS, B&B, Construction Challenge, TI on 144.550MHz via GB2LOW. G W Davis, G3ICO, george@mudford.fsnet.co.uk

14/15 JUNE 2003

INTERNATIONAL MUSEUMS Weekend 2003. Harry, M1BYT, 0113 2866 897, 07812 738 205. [www.ukradioamateur.org/imw]

15 JUNE 2003

MID-LANARK ARS Scottish Mini-Convention – Summerlee Heritage Museum, Coatbridge. John, GM0XFK, 01698 822 860. [www.qsl.net/gm3pxk]

NEWBURY & DARS Amateur Radio Boot Sale – Cold Ash, near Newbury. Free entry for buyers, but donations welcome. MA, MT, TI via GB4NBS on 144.550MHz. [www.nadars.org.uk]

EAST SUFFOLK Wireless Revival – Suffolk Showground, Felixstowe Road, Ipswich. OT 9.30am. CP, CBS, B&B, MA, bookstall, clubs, C, HF station. John, G3XDY, 01473 717 830 or Steve, M1ACB, 07720 412 648. [www.btinternet.com/~thomassg/eswr.htm]

22 JUNE 2003

BANGOR & DARS Summer Radio Rally – Crawfordsburn Country Club, nr Bangor, Co Down. OT 12 noon. TS, B&B,

EPSOM RADIO & Electronics Fair - Grandstand, Epsom Downs Racecourse. MT, B&B, CBS, RSGB, TS, FAM. Paul, M0CJX, m0cjx@lineone.net [www.epsomrally.co.uk]

27–29 JUNE 2003

HAM RADIO 2003 – Friedrichshafen, Germany. [www.messefn.de/fairs/ham_radio]

28 JUNE 2003

REDDISH RALLY – St Mary's Parish Hall, South Reddish, Stockport. OT 11am, £1. John, G4ILA, 0161 477 6702, john@mckae.freeserve.co.uk

29 JUNE 2003

BRISTOL RSGB GROUP 46th Longleat Rally *** CANCELLED ***.

1–3 JULY 2003

THE ROYAL SOCIETY Summer Science Exhibition – 6–9 Carlton House Terrace, London. Admission free. 20 exhibits, with research teams on hand to explain. Exhibits include: optical diagnosis of lung cancer; 'Sting Jet', a new phenomenon causing severe surface winds; how Trinidadian guppies are providing insight into the formation of new species. Tim Watson, 020 7451 2508, tim.watson@royalsoc.ac.uk [www.royalsoc.ac.uk]

6 JULY 2003

NORFOLK ARC Barford Radio Rally - Barford, 9 miles SW of Norwich near the A11 and A47. OT 10am. CP, TI, CBS, B&B, C, TS. David G7URP, 01953 457 322/458 844 or e-mail dpalmer@dcpmicro.com

YORK RC Rally – York Racecourse. OT 10.30am. C, CP free, B&B, DF, WIN, SIG. Arthur, G8IMZ, 01904 787 799 (office hours). [www.yorkradioclub.net]

12 JULY 2003

CORNISH RAC Radio & Computer Rally – Penair School, Truro. OT 10.30. TS, B&B, MT, CP free, C, TI. Ken, G0FIC, ken@jtarry.freeserve.co.uk or John, G4LJY, g4ljy@hotmail.com

20 JULY 2003

LINCOLN SWC Hamfest - New venue: Lincoln University Sports Centre, Brayford Pool, Lincoln. OT 10.30am. TS, B&B, FM, MT, C, LB, FAM. John, G8VGF, 01522 525 760.

MCMICHAEL Rally & Boot Sale - No details yet.

27 JULY 2003

COLCHESTER RA Amateur Radio Rally & Computer Fair - St Helena School, Sheepen Road, Colchester. Gary, 01621 818 620 or James, 01255 242 748. E-mail cra2003@garycavie.com or cra2003@mcginty.net

RUGBY ATS Rally - BP Truckstop on the A5 outside Rugby. *** POSTPONED - see 9 August ***. The BP Truckstop is no longer available. Tony, G0OLS, thumph3426@aol.com

VINTAGE VALVE Technology Fair - Haydock Park racecourse, Merseyside. On A49, 5 minutes from jn 23 of M6. OT 10am, £2.50. Vintage comms, domestic, military, Hi-Fi, gramophones, telephones, valves & vinyl. Trevor, 01274 824 816 or vvt@supanet.com [www.myciuka.supanet.com/VVTF2003 (case-sensitive)]

8 AUGUST 2003

COCKENZIE & PORT SETON ARC 10th Annual Radio Junk Night - Bob, GM4UYZ, 01875 811 723 or bob.gm4uyz@btinternet.com

9 AUGUST 2003

RUGBY ATS Rally - New venue: Stanford Hall. Tony, G0OLS, thumph3426@aol.com

10 AUGUST 2003

FLIGHT REFUELLING ARS Hamfest – Mike, M0MJS, 01202 883 479 or hamfest@frars.org.uk

16 AUGUST 2003

NATIONAL WIRELESS MUSEUM Annual Wireless Rally - Douglas, G3KPO/GB3WM, 01983 567 665.

24 AUGUST 2003

MILTON KEYNES ARS 17th Annual Rally & Car Boot Sale - David, G3ZPA, 01908 501 310.

TORBAY ARS Communications Fair – rally@tars.org.uk

25 AUGUST 2003

HUNTINGDONSHIRE ARS Annual Bank Holiday Monday Rally – Peter, M5ABN, 01480 457 347, or peteherbert@aol.com

30–31 AUGUST 2003

WEINHEIM VHF Meeting - same venue as last year.

31 AUGUST 2003

TELFORD AMATEUR RADIO RALLY GROUP 2003 Telford Rally - mstreet@g3jkx.freeserve.co.uk or Bob, M0RJS, bob@somrob.unet.com [www.telfordrally.org.uk]

14 SEPTEMBER 2003

FENLAND RG Horncastle Summer Amateur Radio Rally - Chris, G0PXB, 01526 860 320 or Tony, G3ZPU, 07778 274 535. [www.fenlandrepeater.org.uk]

19–20 SEPTEMBER 2003

LEICESTER Amateur Radio Show - Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or g4afj@argonet.co.uk

19–28 SEPTEMBER 2003

HORNSEA ARC Antenna Workshop & Farm – Richard, G4YTV, 01964 562 498 or g4ytv@aol.com

12 OCTOBER 2003

GREAT LUMLEY AR & ES Rally – Nancy, 0191 477 0036 or 07990 760 920 or nancybone2001@yahoo.co.uk

19 OCTOBER 2003

BLACKWOOD & DARS Rally – George, 2W1JLK, 01495 724 942, or Dave, GW4HBK, 01495 228 516.

HORNSEA ARC Rally – Richard, G4YTV, 01964 562 498 or g4ytv@aol.com

26 OCTOBER 2003

GALASHIELS & DARS Annual Rally – Jim, GM7LUN, 01896 850 245.

WEST LONDON RADIO & Electronics Rally – Paul, M0CJX, 01737 279 108, m0cjx@lineone.net

2 NOVEMBER 2003

SOUTH YORKSHIRE RG 13th Great Northern Hamfest - Ernie, G4LUE, 01226 716 339 or 07787 546 515.

8/9 NOVEMBER 2003

NORTH WALES Radio & Electronics Show – Jenny, MW0BET, 01492 549 413.

9 NOVEMBER 2003

BISHOP AUCKLAND RAC Rally - Mark, G0GFG, 01388 745 353, or Brian, G7OCK, 01388 762 678.

16 NOVEMBER 2003

MIDLAND ARS 15th Radio & Computer Rally - Peter, G6DRN, 0121 443 1189 or 07710 963 123. [http://midamradio.members.beeb.net]

23 NOVEMBER 2003

RADIOSPORT Communication & Computer Show – RadioSport 01923 893 929. [www.radiosport.co.uk]

29 FEBRUARY 2004

CAMBRIDGE & DARC Rally – [www.cdarc.org.uk]

SILENT KEYS

We regret to record the passing of the following radio amateurs:

G0AZY	Mr E Bjart	20/04/01
G0DLR	Mr L N Buck	10/02
G0IAF	Mr A Fernandez	21/12/02
G0LKP	Mr G A Rhodes	
G0WAQ	Mr F Allen	03/03/03
G2DAR	Mr W Hague	27/02/03
G3ADZ	Mr D Haylock	06/03/03
G3BJB	Mr E Dandy	
G3GXN	Mr R Mapplebeck	14/03/03
G3SLD	Mr R P Daish	09/01/03
G3WBM	Mr J E Durrant	
G3ZMT	Mr J Talboys	10/03/03
G4OSN	Mr F X Tully	24/01/03
G4PHQ	Mr T Burrows	10/02/03
G6LQV	Mr F J V Martin	03/03/03
G6LQV	Mr F V Martin	03/03/03
M1BCN	Mr G Lee	14/03/03
M3AOL	Mr J A Smith	15/02/03

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.

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BUSINESS CARDS

Ansmann	25	Martin Lynch	8,46,47,48,94	Telford Electronic	76
Bhi	25	Moonraker	70,71	Tennamast	42
Castle Electronic	86	Nevada	16,17,58,59	Tetra	42
Chevet Supplies	86	QSL	20	The Postcard Company	42
Curtis Communications	67	Quartslab	42	The Shortwave Shop	76
Essex Amateur Radio	90	Radiosport	39	Timestep	42
FDS Graphics	90	Radioworld	30,31	Track, Ham Radio germany	77
J.Birkett	67	Radio Fairs	21	Vine Antennas	20
G1MFG	25	Radio Swap	76	Walford	42
G3RCQ	77,86	RSGB	7,29,51,65,84,85	Westlake Electronic	77
GWM	86	SGC	24	Waters & Stanton	2,3,4,38,66,98,99
KangarooTabor Software	86	Sharman Multi com	42	Wilson Valves	42
Linear Amp	67	South East Communications	76	Yaesu	54,100
		Spalding	45		

The Last Word

'New Look' RadCom...

The Good...

The new-look *RadCom* arrived this morning. It's excellent. The layout, design, fonts and general readability are all much improved. The whole magazine feels that it contains a lot more text. The text and numbers in the 'results tables' are easier to read. The colour backgrounds to the tables are good (although there are still a number of 'results tables' where the columns of figures should be right-hand justified, eg IOTA). Anyway, it's a great step forward for *RadCom*!

Nigel Cawthorne, G3TXF

The Bad...

I wish to register several complaints about the new layout and production standards of *RadCom*. The presentation of technical information is poor or incomplete and is not what I expect from what I would hope was a 'flagship' publication. In particular, circuit diagrams are badly drawn and conform to no known standard, neither BS, IEC or USA; compared with those in earlier editions, they are of a very poor standard.

Neither is legibility enhanced by printing circuits in thick blueish lines, nor notes presented as narrow, right justified sidebars remote from minuscule illustrations. Similarly, legibility is made poor by information printed in a particularly hard to read, small, narrow sans-serif fonts on grey backgrounds. The format of the journal is not enhanced by *Sun*-style banner headlines distributed round the page. Perhaps these compensate for the paucity of technical information? The excess white space would be better used to increase the size of text, illustrations and diagrams.

Please attend to these aspects; keep the colour for the adverts and the "what I did on my holidays" pictures, put away the style toybox and return to a presentation worthy of a great journal. As to content, for me, more techno, please.

John Button

The Font

I have just received my new *RadCom* (April '03) and although I really like the new layout, I have to say that I think that the choice of font is a very retrograde step. It makes the pages look overly fussy and more difficult to read to those of us with eyes that aren't 100% any more. The new layout coupled with the old font would have been a great improvement: with the new font it's a disaster.

Pete Halpin, PE1MHO/G7ECN/M3ECN

...Whoever thought to use the Serif face, I presume by looking at it either Memorial/Memento or Garamond [it is Bookman Old Style – *Ed*], hats off to you sir or madam, it's always been one of my favourites and provides easy on the eye reading which is always a joy.

Pete Lowrie, MI5JYK

And Finally...

A very retrograde step I feel for us old timers.

Stewart Cameron, GM4UTP

...Received my copy of *RadCom* today and think the 'New Look' is great. Congratulations to all concerned at *RadCom*.

John Francis, G3LWI

[We have received a huge postbag on the new-look *RadCom* and the above is a small selection of representative letters. The changes appear to have been generally welcomed, but with a significant number of members who dislike the new look and particularly the circuit diagrams. There was a printing error in the April issue which caused the circuits to appear in purple, many of the photographs to be printed too dark and, conversely, the PCB on page 79 to be in grey rather than black. These points have already been taken up with the printer. All feedback, both positive and negative, has been passed on to the new designers – *Ed.*]

Echolink Defended

Perhaps I could offer an alternative view of the apparent threat perceived by GM4FDM in the use of Echolink ('The Last Word' April 2003). This morning there were 1025 stations present on Echolink, of these 310 were repeaters, 392 were Link stations. Both of these involve the use of RF in the contact. Of the remainder, 71 were specialised Conference set-ups, that leaves some 242 simplex links where no RF is involved. Hardly a massive threat to 2m or 70cm! Of the last 42 stations spoken to on my Echolink log 16 involved either a repeater or Link station set-up.

In addition I have spoken to a number of amateurs on Echolink who were living in apartments, retirement homes or had antenna restrictions. All welcomed the opportunity to continue to speak with other amateurs with a common interest. I have always been interested in VK and ZL contacts, in 30 years of operation I have a handfull of QSOs due to the modest capabilities of a suburban plot and lack of beam or quad antennas. In nearly a year of I-Link and Echolink operation I have had regular chats with VK and ZL stations, including an 84-year old ZL who thought he might soon have to take his homebuilt tower down! My station logbook still fills up with SSB and digital QSOs, no slower now than prior to Echolink. Yes, there is pressure on our bands but to state that Echolink is playing into the hands of those waiting to grab our frequency allocations is nonsense.

Ron Raven, G4CFW

'New Calls for All?'

I have read through the letters from Bill Borland, Stan Wilde, Mike Dixon, and Ian Swan ['The Last Word' March 2003], and I am sorry to say that the one argument which runs through them all, when faced by the logic of reform of UK callsigns, is, "I don't want to"! That is no argument at all!

Recently I heard on the air, from someone unaware of this controversy, the statement, "These callsigns are not getting any easier." Another contact said to me, "I am not a string of letters and numbers, I am an amateur operator." Now *that* is what we all ought to be proud of!

Damn right my letter is to be taken seriously, and for those of you who think you have seen the last of this campaign - you ain't seen nothing yet!

Paul Thompson, licensed radio amateur (and proud of it!)

Keep it Legal

I was dismayed to read the letter in February 2003 *RadCom* from G3OEP concerning the illegal activi-

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ty of a radio amateur, and the outcome of that amateur's prosecution by the RA. That G3OEP appears to condone such blatant illegal activity and denigrates the RA for taking enforcement action is very disappointing.

In the original RA press release it reports that information relating to illegal 27MHz CB SSB radio transmissions was posted on the Internet publicising a forthcoming meeting of a club identifying itself as 26AT000. A mobile monitoring station was established in the area of the meeting and unauthorised transmissions on 27.555MHz were heard. The station identified itself as 26AT000. Using portable DF equipment, transmissions were traced to an aerial on the side of premises at which a meeting was taking place. RA Enforcement Officers accompanied by Barrow Police entered the premises, where they located a modified Kenwood amateur radio transceiver on the frequency, and labelled as "26AT000 Special Event Station". A licensed radio amateur was identified as the owner. The RA reported that he was convicted of having illegal radio equipment available for use, and was fined £500 after pleading guilty to a charge under Section 1A of the WT Act.

I don't have any sympathy for him – he's the architect of his own misfortune, has brought the hobby into disrepute, and reinforced the poor image of CB too. The RA has a duty to deal with unlawful activity, brings few prosecutions, and is very supportive of our hobby. We should applaud their efforts to bring to justice those who abuse the considerable privileges afforded to us. Prosecution statistics can be viewed on the RA's website (they have a 100% conviction record). The website shows that the RA issues more cautions and warning letters than prosecutions, and prosecutes as a last, not a first, resort. If radio amateurs and CBers can't derive enjoyment by operating within the terms of their licence, they're in the wrong hobby.

D Taylor, G4EBT

In Praise of...

I now live on the Costa del Sol and write in praise of one of your advertisers. I was in need of some 300 ohm heavy duty ribbon which is made in the USA. I enquired locally and was told that it is not available in Europe. Of course I knew different as I had seen it advertised by W H Westlake in *RadCom*. I contacted them by fax and ascertained that postage to Europe from the UK was reasonable with the Small Package rate up to 2kg. Henry volunteered to make up a parcel to this weight to see how much he could get in and still be under 2kg. He also allowed me to pay in Euros as I no longer have any Sterling. The punch line is that I received it in three days, wonderful service. It is nice in 2003 to find a firm who still has old-fashioned values and provides such an excellent service!

Fred Pilkington, EA7FSF, ex G3IAG

Planning Success

I would like to express my sincere thanks to Stephen Dean of the RSGB planning committee and also Norrie Brown of Tennamast in Scotland who have both offered great support and advice to me during the painful process of obtaining planning permission for a mast and aerials from my local council.

The planning process can be very complex at times and without any prior experience of the hoops you have to jump through, quite a nightmare. The support received from the RSGB planning committee was extremely welcome and has enabled me to finally own a 'proper' antenna system at home. I can now look forward to some exciting radio operation without having to go portable!

Thanks once again.

Mark Jones, G0MGX

Ham Spirit

I acquired a little-used FT-101E transceiver in mint condition apart from a little fire on one of the plug-in cards which made the printed circuit difficult to repair. I was describing the problem to a G station on 40 metres when another G broke in to offer help. After a brief interchange and a letter I received a beautifully packed replacement card by first class post within a few days. It was, however, a later card with a completely different circuit. Another phone call and through the post, again first class, came a copy of the later version handbook.

I will embarrass my benefactor who refused any payment by giving his callsign – G4DBS. As well as thanking him, the purpose of this letter is to show that despite 'black boxes', the 'ham spirit' which was evident in the early days of home construction is still alive and well. Long may it continue.

J E Packer, G3NRD

...Recent accounts of rip-offs within the amateur fraternity have made sad reading, and I don't underestimate the distress caused by those who exploit others' trust. May I record my happier experiences? 17 offers of an out-of-print book through 'Helplines' from as far as the Canary Islands and New Zealand, often at no cost save postage. And, a Northern Ireland amateur who sent me a Bird wattmeter to check over before I sent a cheque.

It's a great hobby with a lot of great people. Perhaps that's why the few dubious ones stand out so prominently.

David Andrews, G4CWB

A Long Wait

My IOTA checkpoint checker processed 300 cards for me prior to Christmas (the busiest time of anyone's year!) It only took him just over a week. Commendable service, I think, from a volunteer. I then read in the notification papers regarding the IOTA certificates that: "certificates approved and requested from RSGB HQ as per your application (please allow several months for receipt as these are dealt with in batches at RSGB HQ)"

I am amazed that it is felt acceptable to keep people waiting this long! I would have thought that this was a developing / lucrative area and that every effort to 'turn around' certificates should be made.

On a positive note, I am a staunch supporter and member of the RSGB and the work you do - but let's not forget the hundreds of volunteers eg QSL managers, award/checkpoint checkers etc and many more back room guys and gals who we don't hear about. *A big thanks to you!* Your good work should not be in vane.

Perhaps these comments could be aired in 'The Last Word' or is it too controversial?

Phil Croft, G0WSP

[No, not too controversial. I am told that the reason for the delay is that IOTA certificates are produced in batches because they are printed out-of-house. It is simply not cost effective to send very small numbers of certificate to the printers. – *Ed.*]

Help the Sub-Managers

As an RSGB QSL bureau submanager (for the M5 series), I am often asked why the bureau tends to be so slow. After explaining how it works most enquirers go away almost happy. However, having just started assisting by doing some 'pre-sorting' of cards, I have come across another reason for delays, which could easily be avoided. The instructions for the despatch of cards to HQ is quite clear: "Sort all cards alphabetically, by prefix." I have just ploughed through a pile of around 1000 cards from a GB0 Station which were obviously written out at the time of making the QSOs – and left in exactly that sequence when sent in for distribution. Hardly conducive to easy handling.

So, a plea. Read the instructions, follow them, and do 'your' bit to assist in the smooth running of the system.

Graham R Ridgeway, M5AAV

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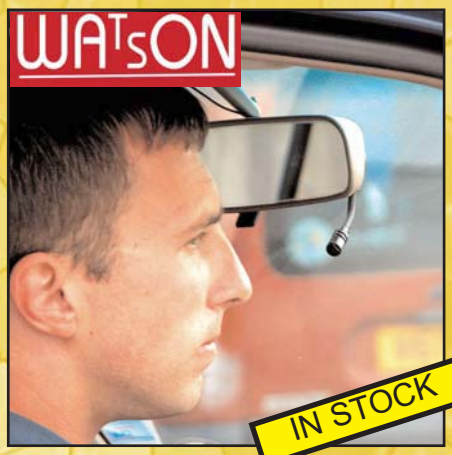

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PRO-SET-PLUS-IC	Large H/phones with IC & HC-4	**£219.95**	B
PRO-SET-4	Large H/phones with HC-4 element	**£129.95**	B
PRO-SET-5	Large H/phones with HC-5 element	**£129.95**	B
PRO-SET-IC	Large H/phones with ICOM element	**£149.95**	B

bhi NES10-2 DSP SPEAKER £99.95 B

Combined speaker and programmable DSP unit. Offers dramatic noise reduction, even reduces annoying hetrodynes.
8 Ohms, 8 filter settings, 3.5mm plug, 12-24V DC

bhi NES-5 DSP SPEAKER £79.95 B

Combined speaker and fixed setting DSP unit. Offers same dramatic noise and hetrodyne reduction. (Formally NESCB)
8 Ohms, 3.5mm jack plug, 12-24V DC 500mA

bhi NEIM1031 NEW £129.95 B

NOISE ELIMINATING IN-LINE MODULE
** Noise attn -20dB (typical) * Noise Attn levels 8*
** Audio output power 2.5W RMS max (8 Ohms)*
** Audio connections: Line level in/out (RCA Phono), Audio in/out 3.5mm mono jack * Line i/p impedance 10K*
** Line o/p impedance 100 Ohms * Line in sensitivity 300mV -2V RMS * Headphone socket 3.5mm mono jack * Power 12-24V DC 500mA*

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PRICE MATCH

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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*

YAESU Z-11 AUTOTUNER £209.95 B

IDEAL FOR YOUR FT-817

An auto ATU to match the FT-817. 1.8MHz to 30MHz up to 60W. Latching relays means very low current and almost zero when not tuning.

WEST MOUNTAIN RIGBLASTERS

RIGblaster pro	Data interface 8-pin/mod, Cd & cables	£299.95	B
RIGblaster Plus	Data interface 8-pin/mod, Cd & cables	£139.95	B
RIGblaster M8	Data interface 8-pin, software & cables	£109.95	B
RIGblaster M4	Data interface 4-pin, software & cables	£109.95	B
Rigblaster RJ	Data interface RJ45, software & cables	£109.95	B
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	£59.95	B
FC-130	Frequency counter 1MHz-3GHz	£79.95	B

OPTOELECTRONICS

More than just a frequency counter, the Xplorer is a complete mini test receiver. High speed nearfield FM receiver 30MHz to 3GHz. Automatically records up to 500 frequencies in memory, built-in CI-V interface.

Xplorer	Freq. cnter / CTCSS/DTMF decode	£849.95	B
Digital-Scout	Digital Freq. counter 60MHz-2.6GHz	£529.95	C
Scout	Freq. finder 10MHz-1.4GHz	£379.95	B
Mini-Scout	Freq. finder (no memories)	£199.95	B
Micro-Counter	Micro freq. counter 10MHz-1.2GHz	£119.95	B
Cub	Mini counter 1-2.8GHz	£149.95	B

TRANSMITTING LOGBOOK NEW £4.99 A

Traditional Logbook for Radio Amateurs, 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 NEW £4.99 A

You've asked for one so here it is - the Radio Amateurs Mobile/Portable Logbook. Also contains relevant repeater information. A mobile logbook is not a legal requirement.

RAMSEY HR RECEIVER KIT SERIES

SPECIAL OFFER

- Models: 20m, 40m, 80m
- NE-602 IC
- Output: 8 Ohms headphones
- Supply: 9V DC PP3 Batt.
- Case & knob set (CHR): Optional

These single band radios use direct conversion with varicap tuning and have amazing sensitivity. They offer reception of SSB, CW and AM and are ideal as part of a QRP station.

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SEE US AT THE NEW RADIO SPORT COMMUNICATION & COMPUTER SHOW

Stevenage Arts & Leisure Centre, Lytton Way, Stevenage, Herts.

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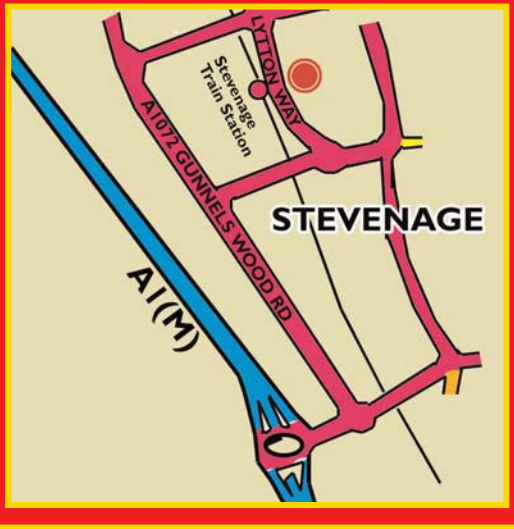

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Opening Times;

Sat: 9am - 5pm

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Admission £3

Under 12's free

HF EXCITEMENT

INTRODUCING YAESU'S ALL NEW HF MOBILE

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-59ABJ (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.

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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