Starting this month: Pic-A-Switch by Peter Rhodes, G3XJP

RadCom

www.rsgb.org

OUT THIS MONTH!

£3.95 Vol 77 No 9 ♦ September 2001 The Radio Society of Great Britain Members' Magazine

Leicester Show 21/22 Sept

Living with your Neighbours - a Guide to EMC

The RSGB Morse Campaign - Two Years On

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FT-817

160m - 70cms 5W Portable

£799.95
Plus £8.00 Carr.

FT-817 is an incredible design feat by Yaesu, and world reviews agree that there has never been anything like it. It's not expensive either. So why not get out in the fresh air, or put one in the car, and put the fun back into your radio. Check out the exciting AT & ATX portable antennas elsewhere in our add.

Z-11 Auto ATU for FT-817
160m - 10m £199.95

OTT-1 One Touch Tune

Plugs into rear of FT-817and gives immediate carrier for adjusting ATU or checking VSWR **£59.95**

NEW 25 Amp Switch-Mode Power Supply. **W-25SM**

Specially modified by Watson to offer extra large terminals and increased terminal spacing to make it easier to attach the thicker HF radio DC cables.

£65
UK Carriage £8

Front panel design and colour, subject to revision for production models. This product available September.

Switched 230 / 115V AC input and fixed 13.8V output at 22 Amps continuous and 25 Amps peak. Over voltage and over current protected and fan cooled. Measures 180mm (W), 75mm (H) and 190mm (D) excluding terminals. Provided with detachable 13 Amp plug and cable.

YAESU FT-1000MP Mk-V

200W HF All Mode Transceiver

£2899
Plus £8.00 Carr.

The New Industry Standard ..... Would a Serious DXer accept anything less ?

FT-1000MP AC 160-10m 100W Transceiver £1699 C

FT-1000 Accessories			
FTV-1000 6m (MKV)	£799 B	YF-114CN CW	£84 B
MD-100ABX Mic	£110 B	YF-110SN SSB	£95 B
SP-8 Speaker	£139 B	YF-110CN CW	£106 B
DVS-2 Vce messge	£199 B	YF-115C Collins	£99 B
YF-114SN Fil SSB	£84 B	TXCO-6 Ref Osc	£128 B
		YH-77STA Phones	£56 B

YAESU FT-847

160m - 70cm All Mode

£1199
Plus £8.00 Carr.

Accessories for FT-847			
FC-20 ATU	£219 B	MD-100ABX Mic	£110 B
SP-8 Speaker	£139 B	YF-115C Collins	£99 B
FVS-1A Vce synth	£38 B	YF-115S Collins	£99 B

ICOM IC-746

160m - 2m All-mode

£1395
Plus £8.00 Carr.

Accessories			
FL-100 CW	£59 B	RS-746 Software	£44 A
FL-101 CW	£84 B	SM-8 Mic	£129 B
FL-103 SSB	£59 B	SM-20 Mic	£149 B
FL-223 SSB	£59 B	SP-21 Speaker	£74 B
		UT-102 Vce Synth	£32 B

YAESU FT-100D

160 - 70cm All Mode

£1249
Plus £8.00 Carr.

Yaesu's latest version is now available and includes 500Hz CW filter, high stab. osc. and CTCSS decoder.

KENWOOD TS-2000

160m - 70cms
Plus 23cms option

£1695
Plus £8.00 Carr.

TS-2000 Accessories			
FTV-1000 6m (MKV)	£799 B	YF-114CN CW	£84 B
MD-100ABX Mic	£110 B	YF-110SN SSB	£95 B
SP-8 Speaker	£139 B	YF-110CN CW	£106 B
DVS-2 Vce messge	£199 B	YF-115C Collins	£99 B
YF-114SN Fil SSB	£84B	TXCO-6 Ref Osc	£128 B
		YH-77STA Phones	£56 B

ICOM IC-756PRO

1.8 - 52MHz 100W

£1895
Plus £8.00 Carr.

IC-756PRO Accessories			
CT-17 RS-232	£99 B	SP-20 Speaker	£164 B
SM-8 Base mic	£129 B	SP-21 Speaker	£74 B
SM-20 Base mic	£144 B	UT-102 Voice synth	£32 A
		PS-85 Power supply	£266 B

ICOM IC-775 DSP 200W HF

Last of The Many

£2099
Plus £8.00 Carr.

SAVE **£900**

YAESU FT- 920AF

HF 160m-6m-100w

SAVE

£1099
Plus £8.00 Carr.

KENWOOD TS-570DG

160 - 10m All Mode

£849
Plus £8.00 Carr.

TS-570 Accessories			
VS-3 Voice synth	£45 A	MC-80 Desk mic	£72 B
DRU-3A Recording	£99 B	PS-33 Power supply	£199 C
HS-5 H'phones	£52 B	SP-23 Speaker	£68 B
MC-90 Desk mic	£187 B	CW filters each	£61 B
		SSB 1.8kHz	£61.95

Carriage Charge Codes:
A £2, B £6, C £8, E £14
D (N.Ireland and off-shore £12)

Prices
Prices are may be subject to change and are current only until the apperance of next month's advert.

Consumer Protection (Distance Selling) You may return goods within 10 days for a refund. Goods must be in unmarked condition with original packing, handbooks and warranty cards etc. Customers must bear the cost of returning goods unless the goods were faulty on arrival. Please phone prior to sending.

MATLOCK SHOP OPEN DAY

8th SEPTEMBER @10am

BARGAINS, DISCOUNTS AND..... FOOD!

....PLUS MEET THE STAFF FROM YAESU, KENWOOD & ICOM

ICOM IC-706IIG

160m - 70cm All Mode

£999
Plus £8.00 Carr.

New Heil Hands-Free Headset.
This single piece headphone with boom microphone, from Heil USA, allows true hands-free operation using VOX. Wired for IC-706 (all models) it includes PTT switch. Built-in amplifier means no more low audio from older IC-706 models! All this for just **£59.96 B**

IC-706IIG Accessories			
AT-180 Auto ATU	£379 B	FL-223 SSB 1.8kHz	£59 B
FL-100 500Hz CW	£59 B	DC Lead (spare)	£16 A
FL-232 350Hz CW	£59 B	3.5m sep cable	£33 A
FL-103 SSB 2.8KHz	£59 B	5m sep. cable	£49 A
		Others: please phone	

KENWOOD TS-50S HF 100W

SAVE

£599
Plus £8.00 Carr.

Kenwoods TS-50S has stood the test of time. 100W from 160m to 10m makes this a great value rig. Ideal for mobile or portable.

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4 *Scotland & Borders Shop* e-mail jayceecoms@aol.com Waters & Stanton @ Jaycee	**20, Woodside Way, Glenrothes, Fife KY7 5DF** Convenient to Edinburgh, Glasgow, and M9. Tel. (01592) 756962 Fax: 01592 610451 Hours: Tue - Fri 9am - 5pm Sat 9am - 4pm ***OPEN DAY SAT 20th OCT***

ICOM IC-910 2 6 70cm All Mode

£1299 Plus £8.00 Carr.

Icom's new dual band all-mode base station radio with 23cms option.

IC-207H 2 6 70cm FM

£279 Plus £8.00 Carr.

A great budget class radio for VHF & UHF use.

IC-2800H 2 6 70cm FM

£419 Plus £8.00 Carr.

Large full colour screen with video input option

IC-2100H 2M FM Mobile

£229 Plus £8.00 Carr.

Rugged design with switched receive filters 12.5/25kHz

KENWOOD TM-D700E 2 6 70cm FM

£449 Plus £8.00 Carr.

Large detached screen and APRS, make this a firm favourite. One of our best selling dual band mobile radios.

KENWOOD TM-8707E 2 6 70cm FM

£289 Plus £8.00 Carr.

If you are looking for simplicity and low cost, here's the answer.

TM-V7E 2 6 70cm FM

£359 Plus £8.00 Carr.

A lovelycool blue display, easy to read and with 50/35W output. A great choice for kenwood fans.

YAESU FT-90R 2 6 70cm FM

They don't get much smaller than this! Dual band and 50/35W with detachable head. A really great performer.

£309 Plus £8.00 Carr.

FT-1500M 2M FM Mobile

£159 Plus £8.00 Carr.

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

YAESU Yaesu Handhelds

VX-1R	2m/70cm handy	£165 B
VX-5R	6m/2m/70cm	£269 B
FT-11R	2m	£119 B
FT-41R	70cm	£119 B
FT-51R	2m/70cms	£315 B

ICOM IC-T81E 6m, 2m, 70cm & 23cm FM

£299 Plus £8.00 Carr.

Four bands in one very compact handheld. This enables you to take advanatge of the UK's complete repeater network right up to 23cms. Also makesan ideal travel companion. AM air receive.

IC-T8E 6m,2m,& 70cm

Very similar in design to the IC-T81E, but without the 23cms band. And again, like its brother, it offers AM airband receive.

£199 Plus £8.00 Carr.

KENWOOD TH-D7E 2m,& 70cm

Data Communicator

One of the most successful handhelds over the past few years, it even has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit.

£299 Plus £8.00 Carr.

Just Arriving!

MFJ-Micro Key

Perfect for the FT-817 or other compact QRP radios. Comprises CW paddle and connecting 3-way cable. Really dinky!

£19.95 A

WATERS & STANTON

Order details on inside front cover

VISA MasterCard

OUT AND ABOUT ANTENNAS

Mobile "Drive About" 80m - 6m

Driveabout Mobiles

Multiband base loaded whip. Choice of powers. 3/8" stud base.

Driveabout LP 50W	£69.95
Driveabout HP 200W	£89.95
Centre load adaptor	£t.b.a.

Walkabout Portables

Multi & single telescopic whips. Covers 80m to 6m BNC. Ideal for FT-817 and similar QRP radios.

ATX Walkabout 80 - 6m	£69.95
AT-80 Single band	£24.95
AT-40 Single band	£24.95
AT-20 Single band	£19.95
AT-17 Single band	£19.95
AT-15 Single band	£19.95
AT-12 Single band	£19.95
AT-10 Single band	£19.95

WMM-3 Data Modem

£69.95
Carr. £6.00

This modem permits a wide range of data to be sent and received. Starterdisc for SSTV, CW, RTTY, Pactor, 1200baud Packet etc.included. The unit is powered from the PC serial socket.

WSA-1 PSK-31 Adaptor

All you need to connect up to your sound card and run PSK-31. Includes CD software.

£39.95
Carr. £2.00

SP-170F Mobile Speaker

Fitted with volume control and switched filter, it measures 97 x 67 x 27mm and has a 3m lead with 3.5mm mono plug.

£12.95
Carr. £2.00

Get in Front with HUSTLER

5BTV

£199.95
Carr. £8.00

4BTV

£159.95
Carr. £8.00

HUSTLER®

BASE STATION ANTENNAS

Spec	5BTV	4-BTV
Bands	5	4
Coverage	80m-10m	40m-10m
Bandwidth 10-40m	Full	Full
Bandwidth 80m	100kHz	N/A
Resonance	1.15:1	1.15:1
Power	1kW CW	1kW CW
Traps	1" forms	1" forms
Tubing	1.25"	1.25"
Bracket size	1.75"	1.75"
Height	25ft 1" (7.64m)	21ft 5" (6.52m)
Weight	17lbs. (7.7kg)	15lbs (6.8kg)
Wind (112kph)	13kg	-

WM-308 Base Mic

The perfect answer for a high quality base microphone. Built-in pre-amp powered from rig or 2 x AA, electronic PTT and FM/SSB response switch. Includes lead with 8-pin plug.

£59.95
Carr. £6.00

WWC-411 Station Clock

This smart wall clock offers 12 or 24 hour display. It also indicates date and temperature in C or F. Size is 26.6cm diameter and it requires 2 x AA cells.

£34.95
Carr. £6.00

QS-112 Speaker Mic

Models for Yaesu, Kenwood, Icom, Alinco and Motorola.

£16.95
Carr. £2.00

Frequency Counters

Each counter is supplied with internal Ni-Cad pack, AC charger and whip antenna.

Hunter	10MHz - 3GHz	£59.95
FC-130	1MHz - 3GHz	£79.95
S. Hunter	10Hz - 3GHz	£149.95
S. Searcher	10MHz - 3GHz	£99.95

W-6MV Deluxe Key

A high quality Morse key made of brass with wood base. Full set of adjustments

£39.95
Carr. £2.00

NiMH Cells & Chargers

1400mÀh AA size cells for high current applications.
Pack of 4xAA £9.95
Automatic 4-way AC charger for NiMH and Ni-Cad cells.
230v AC charger £9.95

CS-600 2-way Coax Switch

This well-made 2-way coax switch is ideal for HF, 2m and 70cms. Fitted with SO-239 sockets.it will handle up to 500 Watts RF

£12.95
Carr. £3.00

WCT-321 Lapel Talker

Earpiece with combined lapel hanging mic and PTT. Models to suit most radios.

£19.95
Carr. £2.00

Hands-Free Mobile!

Models to suit almost any rig. Head/neck band with adjustable mini-mic boom and transmit/receive switch box.
Drive safely!

£44.95
Carr. £2.00

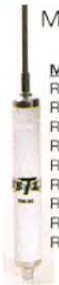
SPM-102 Speaker Mic

Incredible value! Has 4-way 3.5mm plug for VX-1, VX-5, FT-50 and IQ-7E

£9.95
Carr. £2.00

Limited stocks.

MOBILE ANTENNAS



Model	Band	Bandwidth	Price
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	£22.95 B
RM-20	20m	80-100kHz	£22.95 B
RM-30	30m	50-60kHz	£25.95 B
RM-40	40m	40-50kHz	£25.95 B
RM-80	80m	25-30kHz	£29.95 B

Model	Band	Bandwidth	Price
RM-10-S	10m	250-400kHz	£24.95 C
RM-15-S	15m	150-200kHz	£25.95 C
RM-20-S	20m	100-150kHz	£29.95 C
RM-40-S	40m	50-80kHz	£35.95 C
RM-80-S	80m	50-60kHz	£49.95 C

Lower mast sections

MO-1	54" (FOLD @ 22")	£31.95 C
MO-2	54" (FOLD @ 27")	£31.95 C
MO-3	54" (NON FOLD)	£25.95 C
MO-4	27" (NON FOLD)	£21.95 C

Avair VSWR Power Meters

Great value and great performance. There's one just right for you.

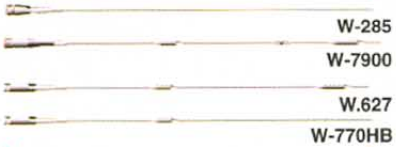
AV-200	1.8 - 200MHz 5/20/200/400W	£49.95
AV-400	140 - 525MHz 5/20/200/400W	£49.95
AV-600	1.8 -525MHz 5/20/200/400W	£59.95

All fitted with SO-239, PEP/RMS readings, 3W for FSD approx. AV-600 has dual sensors.

WATSON

Great value mobile antennas

W-285 2m 5/8th whip with PL-259 base **£14.95**
W-7900 2m/70cm 5 & 7.5dB length 1.58m **£32.95**
W-627 6m / 2m / 70cm 2 / 4.5 7.2dB length 1.6m **£34.95**
W-770HB 2m/70cm whip 3dB / 5.5dB length 1.1m **£24.95**
All with tiltover bases.



Base Co-linears

2m/70cms Fibre Glass

W-30	3/6dB L1.15m	£39.95
W-50	4.5/7.2dB L 1.8m	£49.95
W-300	6.5/9dB L3.1m	£59.95

These antennas are pretuned and have short base radials

HF Mobile Whips

All whips are 2-section helical 2.25m.

WHF-160	£49.95	WHF-17	£18.95
WHF-80	£19.95	WHF-15	£18.95
WHF-40	£18.95	WHF-12	£18.95
WHF-30	£18.95	WHF-10	£18.95
WHF-20	£18.95		

Whip Accessories

W-BM1	Ball mount 3/8".	£19.95
MMT-1	Impedance matching xfr.	£19.95
3401	3-way mag mount 3/8"	£39.95
SS-504	Heavy duty spring 3/8"	£6.95

HF Accessories

ECW	50m 16g enamelled copper wire	£12.95
HDCW	50m hard drawn 16g copper	£14.95
PVC-50	50m clear covered multi-strand	£39.95
WAL-55	16.76m alloy wire 3.5mm	£7.95
WEW-50	50m Lightweight pvc wire	£9.95
WGR-330	30m Polyprop 14kg strain	£6.95
WGR-430	30m Polyprop 45kg strain	£14.95
WGR-630	30m Polyprop 130kg strain	£29.95
Kevlar	60m 181kg strain (Dacron)	£22.95
Insul-8	Black ribbed insulator	£0.99
LadderLoc	Centre insulator for 450 Ohm	£12.95

Base Antennas

2m / 70cm fibre glass colinears with stainless steel fittings, 3 short radials and SO-239 sockets. Pre-tuned and all hardware for mast mounting.

Dual Band 2m/70cms

W-30	3/6dB 1.15m long	£39.95
W-50	4.5/7.2dB 1.8m long	£49.95
W-300	6.5/9dB 3.1m long	£59.95

Triple band 6m/2m/70cms

W-2000	0/6/9dB 2.5m long	£69.95

RSGB Matters

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926
Limited by guarantee
Member society of the International Amateur Radio Union
Patron: HRH Prince Philip, Duke of Edinburgh, KG, KT

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

General Manager: Peter Kirby, MIMgt, MISM, G0TWW
Company Secretary: Mrs Susan Minocha
Honorary Treasurer: Ken Ashcroft, FCA, FCMA, G3MSW

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R H Biddulph, MA, PhD, CChem, CEng, FRSC, MIM, M0CGN
G W Dover, BSc, Dip Ed, G4AFJ
R Horton, BSc, PGCE, G3XWH
R M Page-Jones, CEng, MIEE, G3JWI
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J D Smith, MI0AEX
T W G Menzies, RSSA, GM1GEQ
K A Wilson, M1CNY
R E Piper, G3MEH
R S Atterbury, G4NQI
J H Martindale, GM4VPA
I Rosevear, G3GKC

Details of the Society's volunteer officers can be found in the RSGB Yearbook 2001.

HEADQUARTERS AND REGISTERED OFFICE
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

Tel: 0870 904 7373
Fax: 0870 904 7374

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BOARD AND NATIONAL COUNCIL ELECTIONS 2002

IT IS FORMALLY announced that the following vacancies will arise to the Board and National Council for the 2002 elections.

The Board - Four Vacancies

Dick Biddulph, M0CGN. Retirement. Current joint holder of the Technical Portfolio.

Robin Page-Jones, G3JWI, retires at the end of his first three-year period of office but is eligible for re-election. Current joint holder of the Technical Portfolio.

Richard Horton, G3XWH, not standing for re-election. Current holder of the Amateur Radio Development Portfolio.

Bob Whelan, G3PJT, President 2002/3. Board seat becomes vacant. Current holder of the Management, Commercial and Business Portfolio.

Don Beattie, G3BJ, Retiring President. Eligible for re-election, but has decided not to stand. Current holder of the International and Regulatory Portfolio.

The Society is seeking nominations for election to the Board, from members who have the necessary skills and experience to take up the vacancies in the Portfolio areas indicated.

National Council - Ten Vacancies

Scotland West & the Western Isles

John Martindale, GM4VPA. Current co-opted member, has decided not to seek formal election. Post vacant.

Scotland East & the Highlands

Tommy Menzies, GM1GEQ. Not eligible for re-election. Post vacant.

North West Region

Kath Wilson, M1CNY. Formally standing for election.

North East Region

Geoff Darby, G7GJU. Acting Regional Manager (due to illness of Peter Sheppard, G4EJP). Has indicated he is willing to stand if Peter Sheppard is not well enough to proceed with his candidature.

Midlands Region

Post remains vacant

North Wales Region

Liz Cabban, GW0ETU. Formally standing for election.

London & the Thames Valley

Roger Piper, G3MEH. Formally standing for election.

South & South East

Ivan Rosevear, G3GKC. Formally standing for election.

South West & Channel Islands

Richard Atterbury, G4NQI. Yet to advise his position.

East & East Anglia

Malcolm Salmon, G3XVV. Formally standing for election.

Although the majority of Co-opted Regional Managers have indicated that they are formally standing for election, this does not prevent further nominations to the positions available. Please remember that candidates for the Regional vacancies must reside in the relevant Region.

Members of the Society who wish to stand for election must have been a Corporate member of the Society for at least three years and need to obtain the nomination and supporting signatures from at least 10 Corporate members of the Society. Forms for this purpose are available from the General Manager. Prospective candidates should be aware that nomination forms must be returned to HQ not later than 1 October 2001.

Details of candidates standing in the election, plus voting forms, will appear in the November edition of *RadCom*.

LONG SERVERS LEAVE HQ STAFF

FOUR LONG-TERM employees left the Society's HQ staff at the end of August. Fay Huxley, PA to the General Manager since 1993, stepped down to spend more time with her family. Operational changes in the HQ structure have also resulted in the following people leaving: Derek Lund, the HQ services manager who joined the staff in 1992; Penny Tyler, the cashier who joined in 1995; and Mike Dennison, G3XDV, former *RadCom* editor and latterly the Society's Publications Manager, who has been on the staff since 1988. Mike will be involved with the GB4FUN project for a short time. The Society wishes to thank them all for their long service and commitment to the Society and wishes them all good luck for the future.

GB4FUN HITS THE GROUND RUNNING!

GB4FUN, THE Society's new amateur radio demonstration vehicle, makes its first operational public appearance this month at the Bedfordshire 'Steam Fayre' being held at Old Warden, Beds, over the weekend of **15 and 16 September**.

The vehicle, which was donated to the Society by the Radiocommunications Agency earlier this year, has been fully refitted for its new role. It now boasts a state-of-the-art amateur radio station kindly sponsored by Waters and Stanton plc and an impressive antenna array, the centrepiece of which is the 25ft telescopic mast sponsored by Tennamast, Scotland. Operating the vehicle over the weekend will be members of the Stevenage and District and Shefford and District Amateur Radio Societies, supported by members of the HQ staff.

GB4FUN will also be the star attraction at the Leicester Show, Donington Park over the weekend of **21 - 22 September**. At 12.00 noon on 21 September the vehicle will be the focal point on which the RA will announce important changes to the UK amateur radio licensing structure. If you are attending the show this is not to be missed.

GB4FUN will also appear north of the border for the first time at the open day of Water & Stanton @ Jaycee in Glenrothes, Fife, on **20 October**. Following these three appearances GB4FUN will undertake further fitting out to equip it with a packet station, satcom facilities, an IT suite and video equipment in preparation for its full operational programme commencing March 2002.

BOARD HIGHLIGHTS - JULY

THE BOARD met on 21 July and the following is a summary of the issues discussed at the meeting.

Arrangements were agreed to provide cover for the absence of Peter Sheppard, G4EJP, who is likely to be away convalescing for some significant time. The Board expressed its thanks to the Regional team members who were shouldering the extra load at this time.

The budget for 2001/2 was discussed in some detail. The outlook for the end of 2000/2001 was for a modest surplus. For 2001/2, changes had been made in the cost base of the Society, and allowance made in the new budget for specific areas of additional expenditure, particularly in connection with the demonstration vehicle, promotion of amateur radio and the anticipated additional administration associated with the Foundation licence. Work would be needed to attract sponsorship for the full amateur radio promotion programme, although some expense had been included in the 2001/2 budget. The Board approved the 2001/2 budget.

The Board noted the progress of discussions with the RA on a new structure of licensing, and possible improvements to the privileges of existing licence categories. It is hoped there will be an early announcement.

The Board reviewed the current state of discussions on emission standards for PLT and xDSL systems, noting that the Society had been very active in tests to assess the emission levels from xDSL systems. The Board noted, however, that it was likely that decisions on the acceptable emission levels from these wideband data systems would be taken on more than technical grounds, with considerable commercial pressure for standards which might not be in the interests of HF users. The Society continues to work with other UK users of the HF spectrum, to put forward the case for sensible standards, both nationally and internationally. The Board noted that, at the appropriate time, it may be necessary to become more active at the political level to raise the profile of the issues involved.

The Board reviewed the Society's stance towards portable contest events in the light of the current foot and mouth disease outbreaks. Although the position had eased, great care was still needed in portable operation. However, the Board agreed that portable operation should be accepted in the Society's contests, subject to a clear code of practice, which would be widely publicised.

The Board also reviewed the possible implications of the new Society governance structure (introduced in January 2001) on the structure of committees in the Society. The Board agreed that work should be undertaken to consider whether changes were needed in the structure and operation of Committees, and that as a first step the President should write to Committee chairmen for their views.

The Board also reviewed the arrangements for the AGM in December 2001, to be held in Scotland, and the position on Board vacancies for 2002.

The Treasury review of Spectrum Management (Consultative Paper published June 2001) was discussed, and the Board agreed that a suitable response should be prepared to the key issues in the paper of particular interest to radio amateurs. The response would be sent to the Treasury by the due date (mid-August 2001).

MEMBER SUFFERS ABUSE BY MAIL

IN A RECENT incident a long-serving member has received unsolicited abuse by mail forwarded in good faith via HQ. The letter, which originated in South Wales and was unsigned, was forwarded on request to a member living in Scotland. The letter, which contained abusive language and defamatory comments, caused much distress to the recipient. The Society receives many such requests to forward mail and does so in good faith. However, it does not condone such behaviour and in light of this incident is reviewing its policy of mail forwarding.

PORTABLE CONTESTS RESUME

THE RSGB HF Contests and VHF Contests Committees have announced that with effect from **1 September 2001** RSGB portable contesting will resume. In order to minimise any risk of spreading foot and mouth disease, participating groups are asked to abide by a code of practice which can be found on the HFCC and VHFCC web sites (linked from **www.rsgb.org**). The code of practice will remain in force for all RSGB portable contests until further notice.

MARCONI CENTENARY CONTEST

ANY QUERIES ABOUT the Marconi Centenary Contest (MCC) which takes place on 29 December [see *RadCom* 'News' August 2001, page 11] should be directed to Bob Whelan, G3PJT (QTHR), preferably by e-mail to: g3pjt@rsgb.org.uk The full rules of the Marconi Centenary Contest will be published in *RadCom* later in the year. This event is being sponsored by Marconi plc in conjunction with the RSGB and Radio Amateurs of Canada (RAC).

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Front Cover:

At a recent Morse Campaign. Back row: Toby Walsh, G1ZUV; Derek Harding, G8LSN; Denis Nicol, G8CYJ; Front row: Steve Woods, G1AGT; Gwen Kirkham. See special feature on p22. *Photo: Steve White, G3ZVW.*

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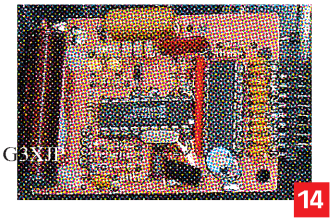
September 2001

News and Reports

Technical Features



Down To Earth - Amateur Radio From The Ground Up

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Regulars

RadCom NEWS

Propagation Research

FORMER TV meteorologist Jim Bacon, G3YLA, is the new IARU Region 1 Sporadic E Propagation Research Co-ordinator. To promote further research into Sporadic E propagation, the 'F8SH Challenge' has recently been announced in memory of the late Serge Canivenc, F8SH. The rules can be found on the Internet at http://challengef8sh.ifrance.com/challengef8sh/indexen.htm Logs collected during the challenge will be used by Jim Bacon to supply a database for this research.

● A NEW microwave beacon is now operational in the 24GHz band from Telford, Shropshire. The callsign is GB3ZME and the allotted frequency is 24,192.910MHz. The precise location is at IO82SQ40 at a clear site 200m ASL. Reports would be very welcome by Martyn, G3UKV (QTHR), tel: 01952 255416, or e-mail: ukv@globalnet.co.uk

Original WAI Activity

THREE NEW Worked All Ireland squares - J06, J07 and J08 County Tyrone - were recently activated for the first time ever. The County Tyrone sectors for these squares can only be reached by boat, and they are all located on the central areas of Lough Neagh. The operators were Ernie, GI0GDF, and Jim, GI0PGC, who were transported to the sites by boat owner Ken McCleod. The boat was a semi-inflatable previously used by a German team in a cross-Pacific race! The equipment used was an Alinco DX-70TH with 100 watts out to a Hustler 40m whip with a Hi-Q resonator on a triple mag mount. Conditions on the Lough were deceptively rough, with 20 knot winds and six-foot waves providing a very bumpy ride. A good crowd of WAI square chasers were on 7068kHz on 29 July and all but a few made two-way contacts from all three squares. Ernie and Jim now hope to make this trip an annual event.

The Rare Square Hunters - Jim, GI0PGC (left) and Ernie, GI0GDF (right).

Friends of Marconi Lecture

THE ASSOCIATION 'Cyfeillion Marconi' ('Friends of Marconi') will hold its third annual public lecture on **Friday 5 October** at 7.30pm. The venue is the community hall Y Ganolfan in the village of Waunfawr, close to the site of the old transmitting station known to Guglielmo Marconi as the Carnarvon Station.

The presentation will be given by Hari Williams C Eng, MIEE, on the subject 'Marconi and his Welsh Connections'. Mr Williams is the author of the recent book *Marconi and his Wireless Stations in Wales*. For further details contact Dewi Roberts, GW0ABL (QTHR), the secretary of Cyfeillion Marconi.

The association, consisting of members of local community organisations, radio amateurs and members of the general public, aims to provide a permanent commemorative stone at the station and to set up an exhibition in cooperation with the heritage museum run by Antur Waunfawr.

Commonwealth Games 2002

NO FEWER THAN eight special event stations located in and around the Manchester area came on the air on 25 July in order to help publicise the 2002 Commonwealth Games. GB stations 2, 4 and 5 CG will mainly be active on CW, while GBs 0, 2 and 4 MCG will be active on HF on all modes, including PSK and SSTV. GB5MCG and GB8MCG will be active on the VHF bands. G0TOG will also operate an Internet gateway on 431.175MHz. All the stations will be operational for a year. Over 5250 athletes plus officials from 72 countries will take part in 17 events to be broadcast by the BBC to 110 countries during the Games, which take place over two weeks in July 2002.

P29 DXpedition Invite

WOULD YOU LIKE to go on an exotic DXpedition to the South Pacific? *Marlin 1* is a 50ft live-aboard dive-boat based in Alotau, Papua New Guinea, that is now also available for charter by would-be DXpeditioners. Two itineraries are suggested, each taking in three RSGB Islands on the Air (IOTA) island groups. These are, firstly, east from Alotau, visiting Milne Bay (Papua New Guinea mainland, OC-034); the Engineer Group and Samarai Island (OC-240); and the Louisiade Archipelago, Misima Island, the Conflict Group and Deboyne Islands (OC-117); and, secondly, north from Alotau, taking in Milne Bay (OC-034); the D'Entrecasteaux Islands (OC-116) and Trobriand Islands (OC-115). The cost is US $200 per person per day, based on a group of six (maximum), and includes food, snorkeling, fishing etc. A 10 or 14-day charter is recommended to take in these itineraries. Further information is on the web site at www.png-diveboat.com

VHF Award News

JULY SAW the RSGB VHF Awards Manager busier than usual processing awards, with no fewer than 14 separate awards being issued. As in previous months, they were all for the 50MHz band.

Alan Charlton, G6NUZ (PE), dropped in a large package which resulted in successful claims for 'squares', countries (2-way) and also 'DX countries'. Although Alan is a first-time claimant, this bumper crop has lifted him well up in the listings.

Roy White, G6XCY (CM), also makes an entry into the 'squares' listings with an initial successful claim for 25 squares.

Lee Humphrey, G6BFP (HP); Martyn Medcalf, G1EFL (CM) and Grant Wilson, MM1ALC (GW), successfully claim increments for their 'squares' awards.

Finally, Paul Baker, GW6VZW (NP), gains stickers for 450 squares and 110 countries (2-way). These lift Paul up a place in the listings tables which can be viewed on the Internet (check www.rsgb.org/operating/index.htm, follow the link to 'VHF / UHF Awards', then 'Award Holders' from the main menu.)

Congratulations to all award recipients.

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

Summary of Award Recipients for July

50MHz: 25 Squares: G6NUZ, G6XCY. 50s: G6NUZ.

75s: MM1ALC, G6NUZ. 100s: G6NUZ, G6BFP.

175s: G1EFL. 450s: GW6VZW.

10 Countries (2-way): G6NUZ. 20c: G6NUZ. 30c: G6NUZ. 110c: GW6VZW.

25 Countries (DX): G6NUZ.

RadCom NEWS

Project 'JJ'

AMSAT North America has announced the specifications for the next generation of amateur radio satellites, called 'Project JJ'. AMSAT North America president Robin Haighton, VE3FRH, says that the 'bird' will open a new era for ham radio in space. Every aspect of the design, including schematics, codes and telemetry, will be published, apart from details that might endanger the security of the satellite. Some early decisions have already been announced. The satellite should include sideband uplinks on L and S bands, with an S-band downlink and it should have both gain and omnidirectional antennas. A propulsion system should be built only if absolutely necessary. AMSAT-NA is looking for a launch by 2004.

Anyone Seen our Tables?

AT THE McMichael Rally two tables, which had been borrowed from the Woodley Horticultural Society, went missing. The organisers of the rally are obliged to replace them, so if whoever took them - accidentally or otherwise - would care to return them they should contact Pete Milton, G8FRC (QTHR).

● THE ORKNEY Wireless Museum station, GB2OWM, will be operating from Kiln Corner, Kirkwall, during the 11th Orkney Science Festival from **31 August to 7 September**. More information is available from Bill, GM3IBU (QTHR), or by e-mail to: gm3ibu@argonet.co.uk

Internet Linking News

ON 7 JULY a Notice of Variation was issued to allow the Arfon Repeater Group's Amateur Television Repeater GB3TM, located on the Isle of Anglesey to link video as well as audio to the Internet. It is believed that GB3TM-1 is the first such NoV to be issued in the UK. The Notice was issued to Derek, GW0BCR, who will be in full control of the gateway, and will be responsible for the video and audio transmissions from his station. Users of GB3TM will be able to have contacts with stations on the Internet, expanding the possibilities to world-wide contacts in video and audio. Derek uses Iphone software, and initially GB3TM-1 will be on the 'Ham Radio' and 'Repeater Link' chat rooms every day between 5.00pm and 6.00pm local time. Likewise, if you have video and audio access to these Internet chat rooms, a contact through GB3TM is a possibility.

GB3US at Sheffield University is the first UK repeater to be connected to the Internet using the IRLP system 24 hours a day, seven days a week. GB3US is on 433.00MHz. About 100 repeaters around the world are now available by just dialling them up using a DTMF keypad. Further information is on the web site of Ian Abel, G3ZHI, at http://www.qsl.net/g3zhi

Nominations Sought for 2001 IIE Prize

Young Woman Engineer of the Year

NOMINATIONS are invited for the prestigious 'Young Woman Engineer of the Year' award 2001. The award, sponsored by the Institution of Incorporated Engineers (IIE) and the Caroline Haslett Memorial Trust, is open to any woman engaged in electronic, electrical or mechanical engineering who is under 30 on **8 October** 2001, the closing date for nominations.

The award carries with it a trophy, a certificate and a £1000 prize. The WISE / IBM prize, of £600, is presented to the runner-up. For further details please contact the IIE on tel: 020 7836 3357; e-mail: info@iie.org.uk or take a look at www.iie.org.uk

Samantha Hubbard, Young Woman Engineer of the Year 2000, receiving her trophy from Science Minister Lord Sainsbury.

British Wireless for Blind Fund's 'Transmission 2001'

THE ANNUAL 'Transmission 2001' fund-raising event for the British Wireless for the Blind Fund (BWBF), a registered charity, will take place over the weekend of **15 / 16 September**. Individuals and groups are invited to obtain sponsorship for contacts made during the weekend. There are prizes for the most contacts made and free QSL cards are offered to those taking part in the event. For further details, or to obtain a sponsorship form, please contact the British Wireless for the Blind Fund at Gabriel House, 34 New Road, Chatham, Kent ME4 4QR; tel: 01634 832 501; or e-mail: fiona@blind.org.uk

The Cray Valley Radio Society will be running GB2FB from Dartford, Kent, for 'Transmission 2001'. The Cray Valley team will be active on both HF and VHF from early on the Saturday morning with the aim of contacting as many amateurs in as many DXCC entities as possible. Special QSL cards will be available for anyone working or hearing the station.

Anyone wishing to sponsor GB2FB is invited to contact Nobby, G0VJG (QTHR), or by e-mail to: g0vjg@aol.com Any donations sent with direct QSL cards to QSL manager Owen, G4DFI, will also be forwarded to the BWBF.

Robert and Mikiko Shepperley at their station in Mitcham, Surrey. Robert became 2E1MRS in April and just two months later M1MRS. Mikiko, at present RS181326, is planning to take the RAE in the future, while Robert plans to obtain his full A licence soon.

DXCC Field Checking: UK Update

JIM KELLAWAY, G3RTE, is retiring as a DXCC 'Field Checker' after over five years of service. Jim was one of the first DXCC checkers approved outside the USA and has checked several hundred applications since his appointment. On behalf of all UK DXers, Jim is thanked for his dedication and hard work, and is wished much DX on the bands. Ian Capon, G0KRL, will take over from Jim and be responsible for checking cards for all *English* stations. Rob Ferguson, GM3YTS, continues as checker for other UK stations. Please note that Jim will complete any 'work in progress', but new applications should be sent to G0KRL (QTHR) with immediate effect.

Full information on the UK DXCC Field checking process can be found at www.g3wkl.freeserve.co.uk/awards/DXCC_checking.htm

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Pic-A-Switch:
a frequency-dependent switch

*Part one, by Peter Rhodes, BSc, G3XJP **

THIS IS A SOFTWARE construction project. Don't stop reading! It's really not that difficult, so suspend disbelief for a while - and remember Clause 1 of your licence. Aimed at those who have never written PIC software before, this article is designed to get you started in this powerful medium with minimal pain and cost.

The end result is a useful little PCB which produces relay switching outputs - as a function of the *frequency* of a sniff of RF.

BACKGROUND

THIS project was inspired by a good deal of interest in the 'frequency-sensitive bits' option in 'PicATUne' [1], and by the number of people who have asked just what it takes to write their own PIC code. So, it seems like a natural evolution to combine these two interests.

I have always believed that it is an uphill struggle to acquire any new skill without some clear objective and target benefit. Going on a 'computer course' or 'learning French' are desperately difficult if you have no clear end-purpose. Not least, how do you know if you have succeeded? The same with 'writing software'. You need, in my view, to start with a target project - whose utility you value - to act as a learning vehicle. This also breaks the chicken-and-egg cycle since until you can 'do software', you are not entirely sure what it can do for you.

All software needs some hardware to run on. This project satisfies the requirement for a first project - namely that the hardware is quick and inexpensive to build. So you can concentrate your intellect on the software dimension.

The other great virtue from a personal perspective is that - so far as I am aware - there is no equivalent commercial device on the market. So it fits well in the eternal crusade for *amateur* radio.

OUTLINE OF OPERATION

AS ILLUSTRATED IN **Fig 1**, Pic-A-Switch applications fall into the two generic categories of 'remote' and 'local'. For remote use, 12V DC power is piped up the coax. For local use, 12V DC is assumed to be available. The hardware design covers both possibilities. For local use, you simply miss out some of the components.

Pic-A-Switch itself is less than the size of a cigarette packet - not even King Size! It comprises a simple PCB, two ICs and a handful of small components. One IC is the PIC itself, the other a relay driver.

It can be built in a day from scratch - including making the PCB - for about £5. At this price, you could easily justify having more than one!

The Pic-A-Switch PCB has an RF input for frequency-sensing purposes; its sensitivity may be set from a few milliwatts to a few hundred watts.

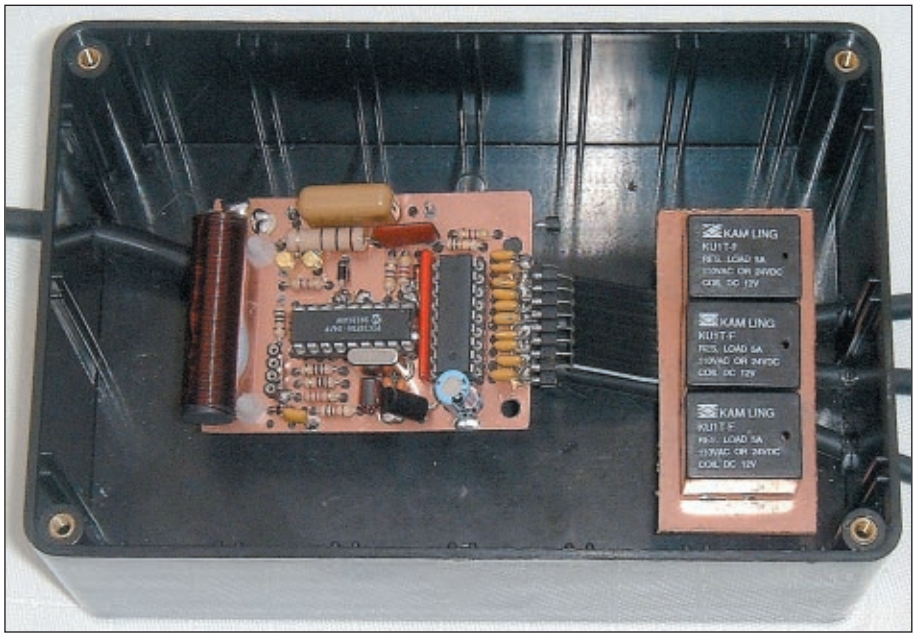
It has six frequency-sensitive switching outputs. That is, if the sensed RF lies within one of the nine HF amateur allocations, one of these outputs is activated. You can customise Pic-A-Switch to specify which output is selected by which band - and indeed any number of bands may activate a common output, providing complete customisation flexibility.

Further optional outputs are available for driving a T/R relay and a PA bias control line. Provided for control of active devices such as a linear, a transverter or masthead preamp, these lines are timed both mutually and to the RF input (and / or the optional PTT line). These timing parameters may be customised to suit the parameters of your particular relays.

Each of the outputs is capable of sinking 500mA - more than enough for several relays (or solid state switches) per line.

Two status LEDs are provided for commissioning and monitoring as follows:-

- RF detected (dimmed) and then frequency successfully measured (bright).
- Channel-changing in progress.



The author's Pic-A-Switch ready for masthead mounting - to auto-switch nested tri-band quads. This fits above the rotator, resulting in one coax feed up the mast from the shack. The common balun is fitted under the relays and three short lengths of twin feeder are routed to the appropriate driven elements. See also Fig 2.

SUMMARY

THIS ARTICLE OUTLINES potential applications for Pic-A-Switch so that you can evaluate its utility to you.

All you need to make the hardware -

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E-mail: G3XJP@qsl.net

including the PCB - is detailed. The environment and tools needed for software development are covered - as are the workings of a PIC in this context. Finally, the code you need is provided - with enough explanation so that even if you have never seen PIC code before, you will be able to follow it.

The 'plan' is that if you keep up with the article as it is published, at the end you will have made a useful device. More importantly, you will have acquired a capability and some new skills which have countless implications (and applications) to amateur radio and elsewhere.

TARGET APPLICATIONS

A FREQUENCY-dependent switch has a number of potential uses. A few are outlined here - and you will doubtless think of others.

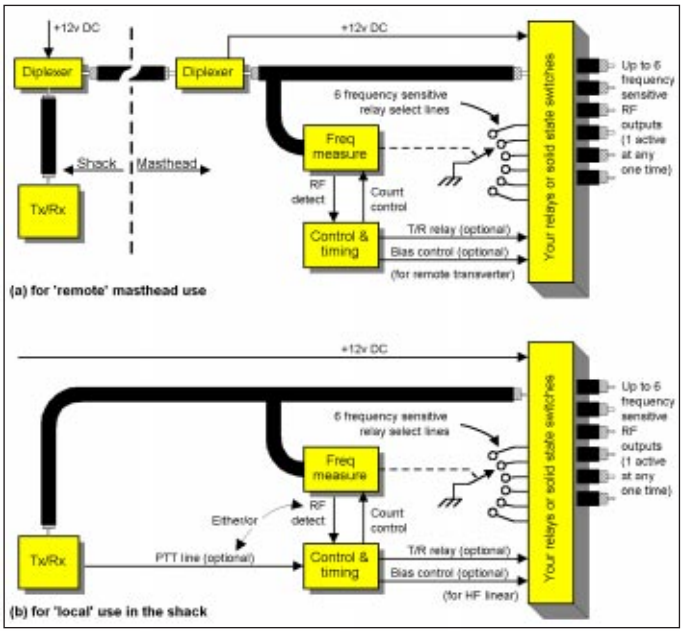


Fig 1: Functional diagrams of Pic-A-Switch configurations. Note that frequency measurement and consequent switching - and control and timing - all occur in software. For 'remote' use (a), DC power is diplexed up the coax and typically, a PTT line would not be used. For 'local' use (b), use of a PTT line is optional. In either case, the relay style, configuration and rating is determined by your application.

REMOTE ANTENNA SELECTION

The most obvious application is remote automatic antenna selection - as a function of which HF band you are operating on. This removes yet another of those switches you have to remember when changing bands. It also results in only one length of quality coax from the shack to the antenna(s) feed-point - and no control lines - giving reduced cost and installation aggravation.

Fig 2 shows a 'simple' arrangement and **Fig 3** shows one for someone blessed with much good fortune! Although Pic-A-Switch only works on HF, Fig 3 illustrates how you can get one 'free' VHF antenna selection (or HF, for that matter) by using suitable relay contact arrangements - and by simply turning off the DC power. For an illustration, see RL1 which is energised unconditionally by presence of DC power.

Thus this application is suitable for up to seven co-located antenna feedpoints. If you need more or have clusters of feedpoints, what you need is several Pic-A-Switches!

ACTIVE ANTENNA SWITCHING

Other antenna possibilities include switching earth, stub, matching and counterpoise arrangements as a function of which band you are using.

Fig 4 and **Fig 5** show two typical examples taken directly from G6XN's *HF Antennas for all Locations* [2] - complete with Les Moxon's captions.

For the record, I haven't tried either of these, but any situation where you require (fairly) low-impedance band-switching is clearly a target application.

I rather fancy Fig 4 as the basis for a full-size tri-band beam. Since I have never had a QSO on 20m and don't intend to start now, I would make it for 17/15/10m. This has the further merit of getting nearer to optimum element spacing. I think I would permanently connect the ends of the 10m coil - but split it in the middle with a relay contact or two.

Rather than run lots of leads along the boom from a central Pic-A-Switch, I would put one in the middle of each element (the cost and weight penalties are trivial) - and there would surely be plenty of RF 'floating around' to sense the frequency. Not sure, but it would be fun having a go because, if it worked, the performance of a beam this size feels as though it ought to be brilliant. The biggest objection to date has been the need to source Ledex switches.

MASTHEAD PREAMPS

Besides the frequency-sensitive outputs, Pic-A-Switch also has a timed T/R relay control line. This opens up the possibilities for switching mast-head pre-amps

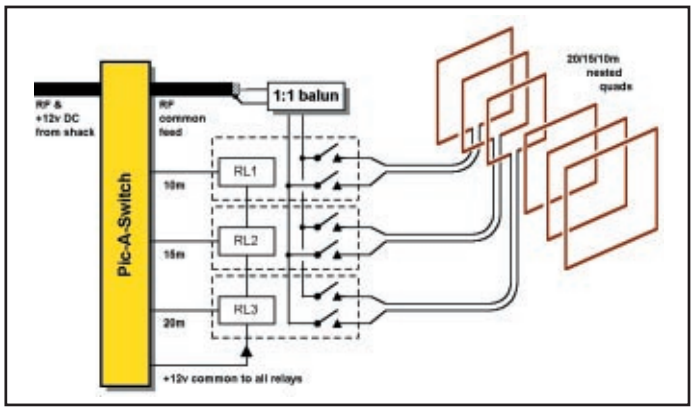


Fig 2: A classic Pic-A-Switch application. Mounted at the masthead, it automatically switches in the quad which corresponds to the frequency of the transmitted RF. Three spare switched outputs are unused here, as are the T/R and bias control lines. They are simply not connected.

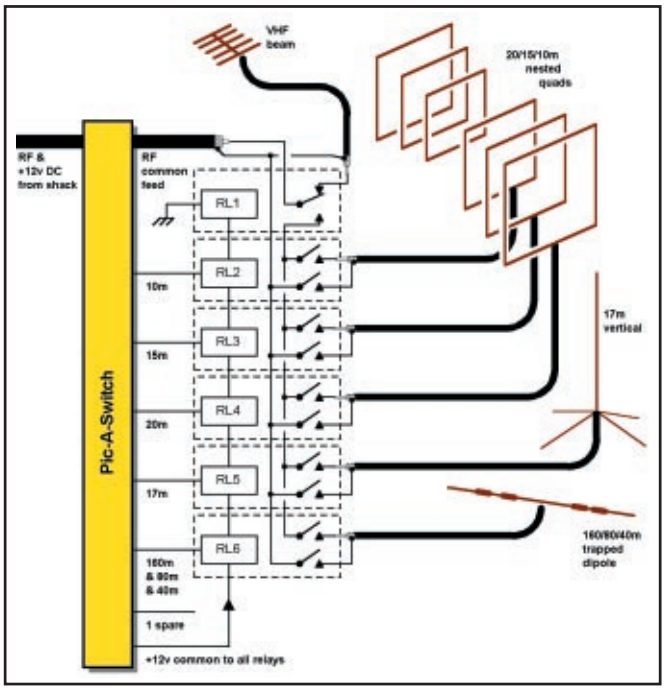
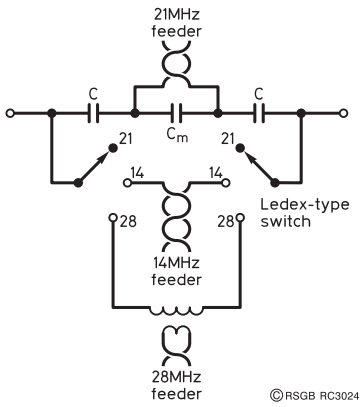


Fig 3: A remote Pic-A-Switch, illustrated automatically selecting one of a number of antennas. The 'rule of thumb' is one relay per antenna. Their contact configuration and rating is your choice. Shown here is a 2-pole arrangement, but you may wish to switch only the coax inners - or you may want to ground (some) unused antennas. See text for discussion of RL1.



Centre-tuning of 14MHz half-wave dipole. C, C_m and C resonate with L at 28MHz, a low-impedance feeder being coupled into L as shown, though a high-impedance feeder tapped across L may also be used. At 21MHz the capacitors are series-resonant with the excess inductance of the antenna, and C_m is chosen to match any desired feeder impedance. At 14MHz the element is series-fed in the normal way with low-impedance line, the shunting effect of C_m being negligible. A common low-impedance feeder may be used via two extra poles on the switch. This is only one of many possible arrengements.

Fig 4: Although shown for a Ledex-type switch, this could be easily adapted for relays - with the appropriate contact arrangements - along the lines of Fig1 - to give a common balun and coax feeder.

and transverters.

For example, you could arrange a pre-amp to be in circuit only *if* on 10m *and* on receive - as well as selecting your 10m antenna from several others.

BAND-SWITCHED ATUs

Pic-A-Switch is an obvious candidate for switching remote mono-band matching units. Ian White, G3SEK, reviewed this topic comprehensively in 'In Practice' [3].

LOW-PASS FILTER SELECTION

The classic 'local' application is that of auto-LPF selection in a stand-alone solid-state linear. Indeed, this was considered so useful that the optional facilities for T/R and PA bias control - and their mutual timing - were included.

This saves routing half a dozen band-select lines to the linear (and is arguably cheaper) - or it might save the day in a moment of forgetfulness if your linear has a separate manual band switch.

It also allows the linear to be moved from one exciter to another without the need to engineer some compatible band-switching interface.

Fig 6 shows a representative block diagram. Any ALC and SWR protection circuitry is not shown. The antenna-side T/R contacts could be on the other side of the LPF block if the LPF were also required on receive. Note that the RF feed to Pic-A-Switch must be taken from the exciter side of the input T/R relay. Details of a suitable MOSFET bias switch are provided later.

USING THE PIC-A-SWITCH CODE

ONCE YOU HAVE acquired the generic capability to create and edit *any* PIC software, you are presented with two choices for the Pic-A-Switch code:

- use the code in the article, unmodified, to give exactly the specified features;
- modify (or gently customise) the code to suit your needs; this presents the greater learning opportunity - and the code is written to make it easy.

If you are still unwilling or simply unable to take the plunge, but would like the end-product, I will supply a pre-programmed PIC for £15. In addition to the specified features, this version contains a utility which allows anyone to customise Pic-A-Switch operation without altering the code and with no tools (I lie, you need a 1k resistor on a flying lead).

DEVELOPMENT ENVIRONMENT

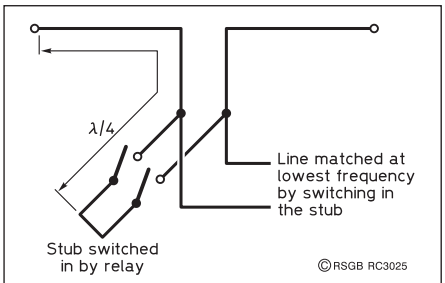
THIS SECTION COVERS what you need to acquire a general development capability - and to use the published Pic-A-Switch code in particular. This topic is covered early so you can get ready.

One of the confusions which tends to put people off here is that there are a vast number of options in the specialised field of PIC tools - not all of which are mutually compatible. You can end up being spoiled for - and confused by - choice. Price is absolutely no guide. There are some very good products available literally free; and the exploitative end of the spectrum goes from those who charge for packaging free products to those who charge substantial sums for rubbish.

I will tell you what I have been using for several years now and although, from time to time, I have tried variations and other environments, this is what I have always come back to.

PERSONAL COMPUTER

First, you do need a PC. It need not be elaborate for this purpose. Mine is a 6-year-old 486, and it used to work fine on a 386. If you shop around, you can find one for £50 or less. This needs to be running Windows® 3.1 or later. For at least long enough to download the software required, you will need a modem and an account with a service provider. However… *how you use a PC, Windows and the Internet are absolutely* not *the subject of this article.* If this is a stumbling block for you, then get someone else to show you - or get on a course at the local college. Please do not get someone else to do it for you, because *you* need the base skills.



When an antenna is used well below its normal resonance or if it is a long way from the shack, losses in a resonant feeder tend to be excessive and the bandwidth narrows. To overcome this, a matching stub may be switched in as shown.

Fig 5: For this application, 12v would be fed separately to a Pic-A-Switch mounted at the stub switch point. It would sense which band you were on by sniffing RF with a small pick-up antenna.

DEVELOPMENT TOOLS

To write and test PIC software, you will need an editor, an assembler and preferably a simulator. These terms will be explained later. They are available as one integrated package called MPLAB (under Windows). Designed by none other than the manufacturer of the PIC, it is available free via the

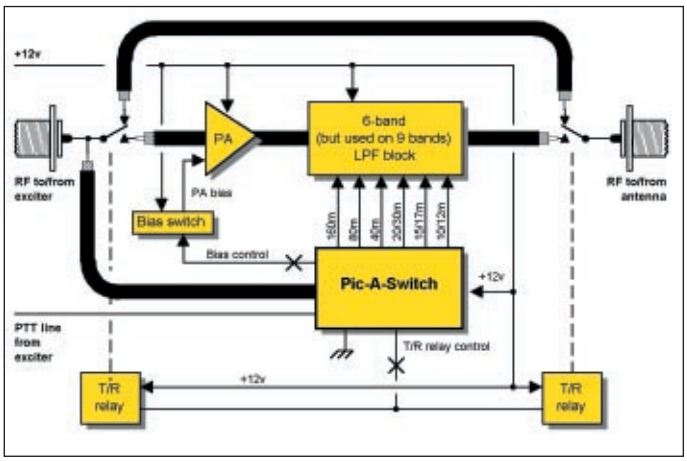


Fig 6: Typical solid-state linear block diagram, illustrating Pic-A-Switch automatically selecting 1 from 6 relay-switched low-pass filters. The relay contact configuration and rating is your choice. As illustrated, the T/R relay(s) and bias supply to the PA are also controlled - and mutually timed from the exciter PTT line. To switch the linear in and out of circuit, a 2-pole on/off switch could be inserted in the T/R relay and bias control lines (not shown, but inserted at the points marked X). This would still allow LPF selection when the linear is switched out.

Internet from their web-site - see below - and at a charge from others.

PIC PROGRAMMER

To download your code to the PIC you need a programmer. This has two components. The *hardware* which connects to either a serial or parallel port on your PC - and a *software* utility to transfer the code from your PC - via the programmer hardware - to the PIC chip itself. You would be well advised to source both from a single supplier!

Many different proprietary devices are available. In general, I prefer those that are DOS-based - because I don't need a beautiful but slow user interface for such an elementary task. If you are not familiar with the implications, you also need to beware of some of the so-called 'basic programmers' which can restrict your use of some of the PIC's input/output pins.

Still easily my favourite after many years of reliable use is *TOPIC* by David Tait, now at version 0.3. This runs under DOS - and MPLAB has the facility for sending the required commands to it.

The web site keeps moving around, but if you enter 'Tait Topic Pic' in any search engine you will find many sources. The software is free and the package includes full details of a programmer board which can be built for under £10. This runs off an LPT port, so you will probably want a parallel extension cable. And it also needs a small power supply at about 15V DC. I use my cordless drill charger.

USEFUL INFORMATION

Also on the Microchip web-site (see below), you will find an MPLAB tutorial which is worth a read for beginners. And a further useful piece of reference material you will need is the PIC16F84-04P data sheet (124 pages). This covers aspects of this PIC which are not used by Pic-A-Switch and therefore not elaborated in this article; not least, the full Instruction Set. There are also countless other application notes.

For balance, I suppose, I am bound to state that you could buy all this in the form of one of the many advertised 'PIC starter kits', but to do so would not only *not* be in the spirit of this project, but also risks your acquiring other than the latest software and documentation releases. Having never taken this route, I am not in a position to make any recommendations.

SOFTWARE DESIGN

AS HAS BEEN SAID many times, writing the code is the easy bit. The tricky aspect is deciding what you want the 'total system' to do in the first place. There are

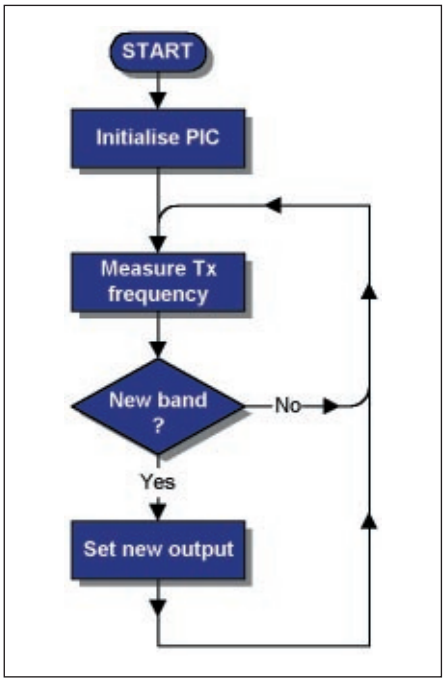


Fig 7: Simplistic first flow-chart. Probably not wrong, but certainly not right!

many approaches and techniques for this specification phase - but the simplest of these suffices for most PIC applications. Namely, start by drawing a flow-chart of the intended behaviour.

Critically, this is *not* a software flow-chart. This is a 'system behaviour' flow-chart - and when you get to the end, you may well form a judgment that it is better implemented in say, TTL MSI hardware. Or perhaps parts of it.

But there is a process problem here. If you just look at other people's flow-charts you can either agree with them or disagree with them. But what is missed by an observer are the ideas, moments of inspiration and mere clarity of thought that come *while* you are drawing it. So although the 'final' flow-chart is certainly important, it is how you got there that really matters.

Bearing this in mind, I will progressively develop the flow-chart over a few episodes and, in good soap-opera style, keep the final denouement till near the end.

Fig 7 shows a first quick stab at a flow-chart to collect some thoughts - and maybe provoke a few. Although fairly trivial, it does suggest that the logic has one structural truth, namely that it has a beginning - but no end. More precisely, the 'end' just 'happens' when you switch off.

I can immediately see a number of objections to this simplistic flow-chart (in no particular order):-

- How do we know when we are actually transmitting? As it stands, on receive, there would be a measured frequency of zero. How is this handled?
- What happens if we start or stop transmitting part-way through frequency measurement. Serious risk of occasional undercounting and consequent spurious switching!
- What happens if a frequency is measured outside the amateur allocations?
- How can we minimise the risk of the transmitter looking into an open circuit load during relay switching times?
- What happens at first switch-on - before any transmission has been sensed and measured?
- How do we handle some control signals to a PA for the LPF switching application?
- Can any feedback be provided to the operator (especially on first commissioning) so that he or she can be confident it is working?

So, in the interests of self-training, why don't you try sketching a more detailed flow-chart before you see my version? Something around a dozen boxes gives enough detail to get the basic structure - and this will grow to about 30 before it is detailed enough to code. Then you can compare yours with mine, and if you prefer yours then you can code that instead.

Can't say fairer than that!

BETA TESTING

THE BUILD AND PERFORMANCE of Pic-A-Switch were reproduced by Harry, G3NHR, and David, G4FQR, to prove (and improve) the drawings and to verify repeatability.

SO GIVE IT A GO...

... BECAUSE ONCE you have developed the capability, you will discover a whole new world of applications that can be easily and cost-effectively addressed with this technology.

And don't forget the social benefits. You can home-brew software in the living room - with no risk of dropping those solder splashes and component leads on the carpet. And those components cost money. A line of code does not!

REFERENCES

[1] 'PicATUne - The Intelligent ATU', by Peter Rhodes, G3XJP, *RadCom*, Sep 2000 - Jan 2001.

[2] *HF Antennas for All Locations*, by Les Moxon, G6XN, 1982 edition, p111 & p158 (RSGB).

[3] 'In Practice', by Ian White, G3SEK, *RadCom*, Dec 2000.

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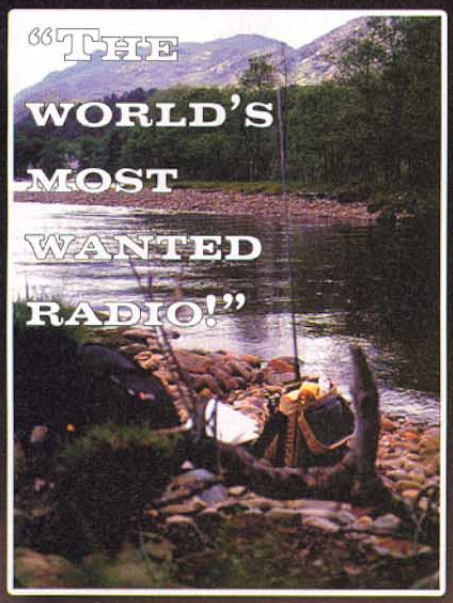

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RAE, Novice and Morse Courses

Details of Radio Amateurs Examination (RAE), Novice Radio Amateurs Examination (NRAE) and Morse code courses starting this autumn. See also page 32 of August 2001 *RadCom* for details of more courses

Scotland East and the Highlands Region

Livingston & DARS is running **RAE** courses on demand, every Tuesday 7.00 - 9.00pm, at the Crofthead Centre, Dedridge, Livingston. Morse classes and tests are run continually throughout the year. Contact Billy, MM0WKJ, on 0131 475 7242 (office hours).

Moray Firth ARS is currently running an **RAE** course, aiming for the December examination. MFARS is also an approved City & Guilds examination centre. For further information contact Geoff Crowley, MM5AHO, gcrowley@cwcom.net or tel: 01542 882818.

North West Region

North Cheshire RC is running weekly **RAE** and **NRAE** classes from Sunday 9 September starting at 7.00pm. Enrolment can take place on any Sunday until the end of November at the Morley Social Club, Morley Green, **Wilmslow,** Cheshire. The club is also a registered examination centre. For details contact Gordon, G3LEQ, tel: 01565 652652, fax: 01565 634560, or e-mail: g3leq@cwcom.net

Oldham ARC is running **RAE, NRAE** and **Morse** courses on Thursday evenings from September at The Royston ATC, Park Lane, **Royston**. For details contact Mike Crossley, M1CVL, on 01706 367454 (eve), 0161 249 2131 (day) or e-mail: m1cvl@thersgb.net See also page 32 of the August 2001 *RadCom* for more courses in this region.

North East Region

Bishop Auckland RAC will be running **RAE** and **NRAE** courses, starting at the beginning of September 2001. These will be held at the club, which meets 8.00pm every Thursday evening at the Stanley Crook Village Hall. Those interested should call Tim Bevan, M0ACV, on **01388 832 948** (please note correction to telephone number published last month).

East Cleveland ARC is offering **RAE** and **NRAE** courses on Friday evenings in the Committee Room of the New Marske Institute Club, Gurney Street, **New Marske**. Enrolment is on 14 September. For more details contact Alistair, G4OLK, on 01642 475671 or e-mail alistair.mackay@talk21.com

Keighley ARS will be running an **NRAE** course starting in September in preparation for the exam in December. The course will be run on Wednesday evenings, 7.30 - 9.30pm at the KARS Training Group HQ, Ingrow Cricket Club in Keighley. They will be running a **Morse** course starting from Wednesday 29 August at 7.30pm. In January 2002 an **RAE** course begins, leading to the May 2002 exam. For further details contact Ian, M1BGY, on tel: 01274 723951, or e-mail: ian.m1bgy@btinternet.com

Sheffield ARC will be running **RAE** and **NRAE** courses, starting in September, every Monday at 7.15 - 8.45pm, at the SARC HQ, Sheffield University Staff Social Club, First Floor, 197 Brook Hill, Sheffield. For further details please contact Tony, G1TKX, by e-mail:g1tkx@thersgb.net

Midlands Region

Bromsgrove & DARC is holding **RAE**, **NRAE** and **Morse** classes at the Avonscroft Arts Centre, Bromsgrove, starting in September. Details are available from John Burford, G4OAZ, on tel: 01527 871903.

Broxtowe College, High Road, **Chilwell**, **Nottingham**, will be running an **RAE** course starting on Monday 17 September 2001 at 7.00 - 9.00pm, for the May exam. Enrolment is from now onwards. For further details contact the tutor, Paul Benson, G0SPA, on tel: 0115 9175279, or e-mail: bensonp@broxtowe.ac.uk

The **Hereford Amateur Radio Society** is holding RAE and NRAE courses, plus Morse code tests at the **Herefordshire College of Technology Engineering Department**. The **RAE** course will commence in September or October, depending on numbers. The course is taught by Bob, G3IXZ. For further information, either contact the college on tel: 01432 352235, extension 654, or Tim Bridgland-Taylor, G0JWJ, on tel: 01432 279345 (evenings). The **NRAE** course will commence in mid-October, and is taught be Tim Bridgland-Taylor, G0JWJ. The course has been run for seven years and all ages are welcome. Contact Tim on tel: 01432 279435 (evenings) only. Both courses are on Wednesday evenings, commencing at 6.30pm. **Morse *tests*** are also available at Herefordshire College of Technology, and are conducted by Derek, G3LCK. To book a test, or for further information, contact Derek, G3LCK (QTHR), or phone Tim, G0JWJ, on tel: 01432 279435 (evenings).

Murray Park Community School, Murray Road, **Mickleover** in **Derby**, will be offering an **RAE** course on Wednesday evenings starting 12 September 2001. For details contact tel: 01332 515922 or take a look at the web site www.murraypark.derby.sch.uk Alternatively, contact the course tutor Frank, G4MLL, on tel: 01332 512080.

John, M5DVT, will be running continuous courses for the **NRAE** in the **Stoke-on-Trent** area. His next course begins in early September, aimed at the December exam. You can contact him on tel: 01782 533370 or e-mail: m5dvt@qsl.net Course information is also available on www.qsl.net/m5dvt

South Wales Region

Mid-Glamorgan ARC will be holding **RAE**, **NRAE** and **Morse** courses every Thursday at 7.30pm, from September in **Aberkenfig**. Full details are on the club's web site at http://homepage.ntlworld.com/mw0cna

Northern Ireland Region

Foyle & DARC will run an **RAE** course from September. Enrolment is on Monday 10 September at the club's headquarters. For further details contact Aidan McIntyre, EI2FPB, on 00 353 744 2222 or e-mail: aidan.mcintyre@lyit.ie

South & South East Region

Bognor Regis Community College is running an **RAE** course, scheduled to begin on Thursday evening, 27 September at Westloats Lane, Bognor Regis, West Sussex PO21 5LH. The duration is 24 weeks and the cost is £74. Enrol on line by e-mailing baec@westsussex.gov.uk or for further details contact Dave Johnson on tel: 01243 543218.

The **QRZ Amateur Radio Group of Sussex** will be running an **RAE** course at its club room in **Herstmonceux, East Sussex**, on Monday evenings beginning in September. For more information contact Stuart Constable, M0CHW, tel: 01435 863020 or e-mail: qrz@jandc.demon.co.uk

South West & Channel Islands Region

The Cornish Radio Amateur Club is running on-demand courses for the **RAE** and **NRAE** examinations. It also holds the City & Guilds examinations for both the RAE and Novice RAE. For further details contact Mrs C Hammett, tel: 01726 882758.

University of Plymouth Electronics ARS will be holding an **RAE** course in Room 312, Smeaton Building, Drake Circus, from the first Tuesday in September until the May 2002 examination. Enrolment should have been during August, but contact Bob Griffiths, G7NHB, on tel: 01752 343177 for more details.

East & East Anglia Region

Maidstone YMCA ARS will be holding **RAE** and **NRAE** classes and examinations at the YMCA Centre on Wednesdays, starting in late August. Contact Keith Maskell, G4YTU, for details on tel: 01634 831504 or visit the web site at http://website.lineone.net/~g3trf

For further information on passing the RSGB Morse code test at 5WPM, see the article 'The RSGB Morse Campaign - Two Years of Success' over the page.

The RSGB Morse Campaign - Two Years of Success

by Bob Whelan, G3PJT*, with members of the Morse Campaign team: Ron Lindsay, G3KTZ; David Cutter, G3UNA; and David Seddon, G4VCO

IT HAS BEEN two years since the first 'Morse Camp' was held at Cuffley in Hertfordshire. Since then, 15 camps have been held in three locations; at RSGB HQ, at Harrogate Ladies' College and most recently at the University of Ulster. Over 320 people have attended these weekends, 235 have taken the Morse test and 206 have passed, most at 5WPM but some at 12WPM.

Over the period April 2000 to March 2001 over 20% of all of the Morse tests given by the RSGB have been at Morse Campaign weekends.

The purpose of this article is to help those learning Morse to prepare themselves more effectively for either a Morse Campaign weekend or for a normal Morse test at one of the many events around the country where tests are available on demand.

Your chances of success are very similar wherever you choose to take the test, although pass rates at 5WPM are higher at Morse Campaign weekends. It is believed that the reason for this is the intensive practice and helpful tips which the Morse Campaign instructors are able to pass on to candidates. To make these tips available to a wider audience is the main purpose of this article.

WHAT DOES A MORSE CAMP WEEKEND ENTAIL?

THE FORMAT OF these Morse Campaign weekends is much the same as it has always been, namely:

- a pre-camp self-assessment tape and sending hints
- a two-day weekend intensive course
- receiving practice in a group (~20)
- individual one-to-one sending practice in four to six parallel sessions
- pre-exam assessment
- on-demand Morse tests

The weekend is concerned as much with improving the self-confidence as well as the Morse skills of the candidates. The Camps provide expert tuition and a well-defined target. Candidates make their own decision on whether or not to take the test.

As all the Morse Campaign material is standardised to the Morse test format it has become possible to set performance standards which a candidate should meet if he or she is likely to pass the test. In addition, this standardised material helps the instructor team to spot areas of difficulty and take steps to remedy problems the candidate may be having.

WHAT HAVE WE LEARNED?

UNSURPRISINGLY, the most important success factor is the level of preparation undertaken by the candidate. This is not to say that people who attend these weekends would have passed the test anyway, but there is a definite limit to what can be achieved in a weekend and therefore candidates have to prepare themselves beforehand. The preparation material has therefore received a great deal of attention over the past two years.

Receiving Practice

A set of tapes has been made available the prime function of which is to allow a candidate to self-check his or her progress. These can be marked by the candidate and targets set. With these tapes candidates need to have fewer than six errors if they are to stand any chance of passing the receiving part of the test. As they can be expected to make quite a bit of improvement at the weekend itself, if they have errors of up to 15 (this is about 10% of the message) they should be able to reach the required standard in the weekend. Some candidates have improved much more than this. These tapes are not available outside the Morse Campaign, but similar tapes are available from the RSGB.

Sending Practice

Nearly all failures in Morse tests are errors in *sending*, and mostly due to mis-sent characters. Why is sending so important? Whilst up to six errors in receiving are allowed, *no uncorrected errors at all* are permitted in sending, and also only four *corrected* errors. Candidates are rarely, if ever, failed for sending too slowly, but they make more mistakes if they send too quickly.

We have also found that many Campaign attendees did not have much help available locally who could listen to their sending and correct common errors. With this in mind, we came up with the following tips:

1. Equipment

You will need a basic straight key and oscillator or bleeper (buzzers are not recommended). Suitable keys are available at reasonable prices from a number of suppliers. The ex-military Type 8 key is as good as any and is currently readily available. Mount the key on a firm base, about 15cm square, so that it cannot rock or skid on smooth surfaces. A mouse mat, thin kitchen sponge or rubber feet may be helpful and will soften the feel. Referring to **Fig 1 (a)** opposite, set the Morse key gap with one or at most two thicknesses of paper and set the spring to about 50gm. This setting will give a positive feel to the key closures.

2. Holding the key and getting started

Your sitting posture is important - see **Fig 1 (b)**. Sit upright on a steady chair. Place the key on a steady table in front but slightly to the right if you are right handed, or to your left if you are left handed. Hold the key between the thumb, index finger and the second finger with the index finger on top. Do not grip the key. Relax the shoulder and arm. The hand, wrist, lower arm and fingers should move together but be completely flexible. Try to build up a rhythm for the dot and dash elements. Send a string of dashes and dots, 'T's and 'E's. To help you with this we have recorded a string of dashes and dots at 5WPM at the end of Side B of the self-assessment tape. You can play the tape and send in step. Use this as a warm-up sending practice.

3. First steps

Learn the Morse alphabet, numbers and punctuation first by receiving. Start sending practice when you are fluent. Send for periods of about two minutes to start. At 5WPM this is about 60 - 70 characters. Work up to about 100 characters. Memorise the sounds as dits and dahs not dots and dashes on the page; this will help with recall when you hear the sounds. After each receiving test, send the text on your Morse key. If you record this it will help you compare your own sending so you can improve quickly.

4. Building up

Don't try to send too fast. Concentrate on sending characters correctly and leave breaks between each one. Remember, a little and often is the best practice method.

* *c/o Amateur Radio Department, RSGB HQ.*

Always remember to correct sending errors. This is the most common reason for test failures. Correction should start from the beginning of the word or group in which the error was made. Make sure you can send the correction character, eight dots, as eight dots and not as 'H H'. That itself would be an error! Send it slower if it helps.

5. Testing yourself

What do you sound like? Record yourself on a cassette and play it back. You will probably find that certain letters cause you problems. Don't forget the Prosigns - $\overline{BT}$, $\overline{VA}$, $\overline{AR}$, $\overline{SK}$ and the two required punctuation marks '?' (which is . . - - . .)and '/' (which is - . . - .) They must be sent as a single character, not as two characters, eg $\overline{BT}$ is '-. . . -' and not B space T, ie '-... -'. The same applies to numbers; you must not send '3' for example as 'S M'. Send at a constant speed; don't send the characters you know faster than the ones you don't. The first script of the self-assessment tape is an alphabet. Try sending in step with the tape.

If at all possible ask a friend to criticise your Morse and how you hold the key. Visit someone, send on VHF or send your tape to a friend. Early assessment should prevent you getting into bad habits which will take more time to iron out at the Camp. Above all, relax.

6. Don't forget . . .

. . . to bring your key and oscillator to the Morse weekend or Morse test, not forgetting your photographs for the Morse test.

What if you don't pass?

Don't give up! I didn't pass first time. You have almost certainly made tremendous progress. Keep up the practice and set yourself a new target by booking to take the test at an early but realistic date. Hopefully you will have a good idea where you need to concentrate your practice.

Persistence *does* have its reward as far as Morse code is concerned.

YOUR FIRST QSOs

WE HAVE MANY requests from successful candidates for help with the first few QSOs on the air. First, please be active on the air and give your new HF station a good airing. Whilst you will hear many who say that Morse is outmoded with little relevance to modern professional communication, a few minutes listening around the HF bands will quickly convince you that Morse is very relevant to amateur communication. Quite apart from the spectrum, power efficiency and elegant simplicity of the mode, it remains very popular and for many represents the only way they can enjoy amateur radio.

But if you want a slow Morse QSO what can you do? Asking, via RSGB, for a QSO with one of the Morse Campaign instructors is one option. But a better one is to look in the higher frequency parts of the CW sub-bands, especially on 40 and 20 metres at any time of the day, or on 80 metres in the evenings. Also, many of the operators giving on-air slow Morse transmissions will take calls at the end of their sessions.

Finally, many contacts are so-called 'rubber-stamp QSOs'. One tip is to write out on a card a rubber-stamp QSO with your call, name and QTH, station details etc and send from the card, using the card as an *aide memoire*.

" . . . Don't give up! . . . "

AN EXAMINER'S THOUGHTS

Comments from David Seddon, G4VCO, Chief Morse Examiner for Hertfordshire:

"The Morse test itself is an optional part of the Morse Campaign weekend and is entirely separate from the training sessions.

"**Receiving:** The candidate will usually listen to a tape for the receiving test (although it may be hand-sent if the examiner prefers). Candidates may bring their own straight key and will be given time to settle and have a short piece of received text as a 'warm up'. The test is in a QSO-style format (see *Amateur Radio QSO-Format Morse Tests, RA Requirements*, available from RSGB).

"**Sending:** When learning Morse to 5WPM, it is vitally important to learn and practise how to send the characters and figures correctly. Using a tape recorder and listening to your own sending is probably the fastest way to correcting the way you send characters and figures. Remember that all examiners are skilled in the art of sending and receiving Morse code to a minimum standard of 20WPM, so there is little chance of them not noticing an uncorrected error!

"**Be prepared:** Please don't take your test if you are not ready! It is a waste of your money and the examiner's time. And it's very demotivating for you, if you choose to take a test when you are not up to speed and subsequently fail. It is far better to go away and prepare properly for your Morse test."

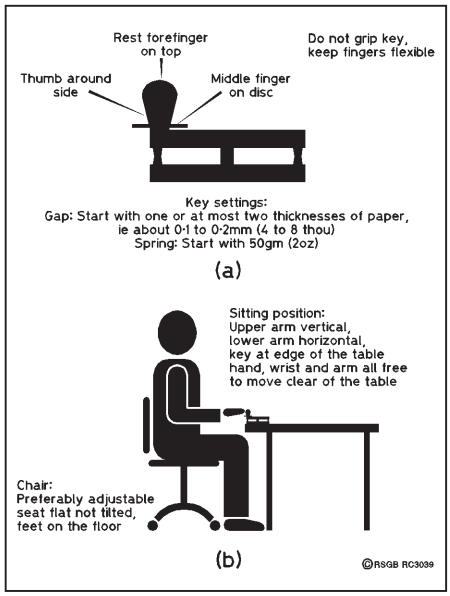

Fig 1. (a) How to grip the Morse key. (b) Correct seating posture for sending.

SUMMARY

SINCE 1985, the RSGB has been appointed by the Radiocommunications Agency to run the Morse Test Service throughout the UK. The RSGB provides over 100 different test centres / venues, where candidates can take their 5WPM or 12WPM Morse test. The current fee for a 5WPM test is £15.00 and 12WPM £20.00.

For more information on the format and conduct of Morse tests and an application form, including details of forthcoming Morse tests, please contact the Amateur Radio Department at RSGB HQ (details below).

There are two Morse Campaign weekends left in 2001. These are: **27 / 28 October** at **Harrogate Ladies' College in North Yorkshire**, and **10 / 11 November** at **RSGB HQ**, **Potters Bar, Hertfordshire**. The weekend package costs £15.00 to RSGB members and £20.00 to non-members.

If you are interested in taking part, please contact the Amateur Radio Department at RSGB HQ for an application form, tel: 0870 904 7373 or e-mail: ar.dept@rsgb.org.uk Alternatively, you can click on www.rsgb.org/shop to book online.

The RSGB Morse Campaign has been a great success for all involved. We must thank Yaesu and Martin Lynch for their ongoing sponsorship of these events and the two clubs FOC, the First Class Operators Club, and CDXC, the UK DX Foundation, for their support. Above all can I thank, on behalf of the RSGB and personally, the instructors and examiners who give of their weekends to the Morse Campaign.

FURTHER STUDY

Morse Code - the Essential Language
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ARRL Morse Tapes (three sets available: 5 - 10WPM, 10 - 15WPM and 15 - 22WPM) are currently available to RSGB members only at 25% off for just £7.49 per set.

Details of all these are available at www.rsgb.org/shop or by calling RSGB Sales on tel: 0870 904 7373. ♦

WWW.

RSGB / ARRL Morse code training products, and for Morse Campaign booking:
www.rsgb.org/shop

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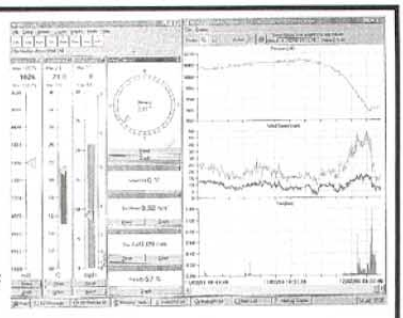

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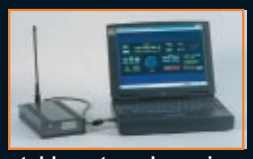
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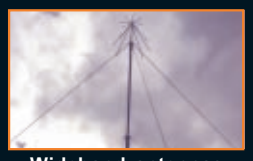
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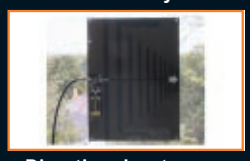
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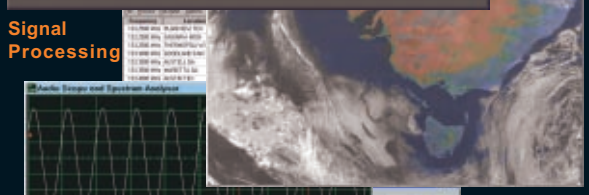

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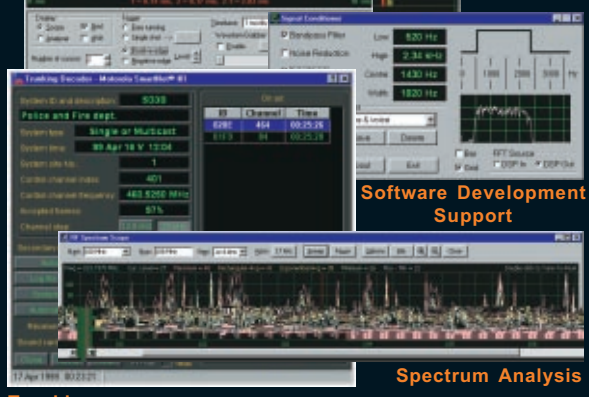

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The Leicester Show 2001

Venue: International Exhibition Centre, Castle Donington, Leicestershire

Date: Friday 21 & Saturday 22 September

Time: 9.30am - 5.30pm each day

- Purpose-built exhibition hall
- Easy access for disabled
- Morse tests on demand
- Talk-in on 145.550MHz and 433.550MHz
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Raynet Supplies
RNARS
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South Yorkshire Repeater Group
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Lectures & Seminars

Please note that this year the Convention and AGMs will be held in the Lounge adjacent to the Main Exhibition Hall.

Friday 21 September

1400 **RAOTA AGM**

1500 **The Science of Audio Workshop**, by Bob Heil, K9EID, Heil Sound.

1600 **A New Licensing Structure for the UK,** by RSGB President, Don Beattie, G3BJ, and General Manager, Peter Kirby, G0TWW, plus RA representatives.

Saturday 22 September

1100 **RAIBC AGM**

1400 **The National Space Centre Amateur Radio Society,** Andy Thomas, G0SFJ, Chairman, and George Barnet, Technical Manager, NSC.

1500 **The Science of Audio Workshop**, by Bob Heil, K9EID, Heil Sound.

1600 **APRS**, by Dave Ackrill, G0DJA.

For further details contact Geoff Dover, G4AFJ, tel: 01455 823344.

Accommodation

There are numerous local hotels, guest houses and farmhouses offering accommodation in the Donington area. For details, visit the LARS web site at www.lars.org.uk

Leicester Show Product News

NEVADA

NEVADA will be launching the **'Trident'** range of UK-designed and manufactured **verticals** and **monoband Yagis** at the Leicester Show. The Trident 6 metre and 4 metre beams will be on display, with a range of HF Yagis and verticals to follow. The aim of Trident antennas is to provide UK-manufactured high-quality antennas at affordable prices. The Yagis use a lightweight construction, with the element clamps being pre-assembled on the boom by heavy-duty rivets. They are quick and easy to assemble, with no measuring necessary upon erection. Prices start from as low as £89 for a 3-element 6 metre Yagi and further information is at www.tridentantennas.co.uk

The new **Patcomm PC500 QRP two-band HF transceiver** will be on show for the first time at Leicester. Rob van der Ent, PE9PE, from **Patcomm International** will be on the stand to answer questions and demonstrate the radio.

Nevada will also be showing the full range of **Maha batteries and chargers** for amateur radio equipment, including the new MH-FNB72 high-power 1700 mAH re-chargeable battery pack for the Yaesu FT-817.

WATERS & STANTON PLC

BOB HEIL, K9EID, manufacturer of **Heil microphones**, is coming over from the USA as guest of **Waters & Stanton** for the Leicester Show. Bob will run some workshop sessions on audio for amateur radio and be on the W&S stand demonstrating the range of Heil microphones. The full range of Heil products will be on sale at the W&S stand at special prices, including the new 'hands-free' HS-706 mobile system for the Icom IC-706.

For the first time in a number of years, the **Hustler** range of **mobile antennas** and **base station verticals** will be available in the UK. Waters & Stanton have recently been appointed UK distributor of Hustler products.

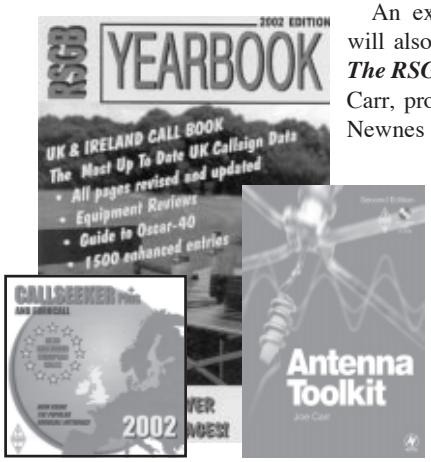
Waters & Stanton have also been appointed distributor for the **Sanyo Digital Satellite Radio**. The radio receives world-wide digital stereo broadcasts and has a built-in mini speaker, plus digital outputs for stereo. It most situations, no external antenna is necessary.

Finally, Waters & Stanton's new ***2002 Radio Communications Guide***, which this year runs to over 330 colour pages, will also be on the stand at the show.

RSGB

THREE BRAND-NEW publications will be available for the first time at the Leicester Show. Firstly, the ***RSGB Yearbook.*** This eternal favourite is back again, bigger and better than ever before. At 784 pages, the 2002 edition is easily the biggest *Yearbook* ever and is on sale at the show at the same price as last year - *only £13.59*. This year's edition contains colour features including how to get the best out of Oscar 40, and reviews of the FT-1000MP MarkV, the TS-2000 and the FT-817. There are comparitive reviews on logging software, HF linears, VHF / UHF handhelds and kits. Plus the mass of information you have come to expect, and the most accurate and comprehensive UK and Eire callsign listings.

For those who want to be able to search callsigns by computer, the new and enhanced ***Callseeker Plus*** is available for the first time this year. Not only does this CD contain all the call listings in the *Yearbook*, it now also contains a European callsign directory from 20 different countries. The CD also uses the popular *Eurocall* interface and as before has all 176 pages of the information directory. As an added bonus the CD contains information sections from Germany, Hungary and Estonia and is astonishing value at Leicester at *only £11.89*. The *Yearbook* and *Callseeker Plus* are available together at the show at the special offer price of *only £20.00*!



An exciting new antenna book will also be available at Leicester: ***The RSGB Antenna Toolkit*** by Joe Carr, produced in partnership with Newnes Publications, is subtitled 'the complete solution for antenna design'. This new edition has been revised from Joe's original book and includes new chapters on small loop and Yagi beam antennas. Together with the **antenna design software** included on a *free* **CD-ROM** with this book, the reader will have a complete solution for constructing or using an antenna. *The RSGB Antenna Toolkit* costs £21.24.

If you can't get to the show, these and other RSGB publications can be ordered by calling RSGB Sales on 0870 904 7373; faxing the order to 0870 904 7374 or e-mailing sales@rsgb.org.uk The full catalogue is on the web at www.rsgb.org/shop

LAKE ELECTRONICS

THE NEW (September 2001) **fully-illustrated catalogue** from **Lake Electronics** (www.lake-electronics.co.uk) includes details of all their 'Novice' kits and, of course, the full range of all kits (with *all* the bits!), accessories and components for amateurs and short wave listeners.

The new ***short-wave*** version of the **Solderless Crystal Set** is introduced at the same 'pocket money' price as the rest of the 'Novice' range - just £8 plus £1 P&P. This will make a good 'stocking filler' for many youngsters at Christmas!

A sample listing of **Vintage Wireless Books** is included in the catalogue. The full listing, which is frequently being updated, is available separately on request. Go along to the Lake Electronics stand at the Leicester Show for your free copy.

The Elecraft K1

IT IS OFTEN said that home construction is dying out. That may be true, but in some areas of the hobby there remains a strong desire to build equipment. One such area is that of QRP (low power operation). Low power operating tends to lend itself to the construction of simple equipment and many have testified to the satisfaction that comes from making contacts with equipment that has been home made. There is a vast pool of amateurs who have learned all the skills needed to build simple equipment, but many of them lack the confidence to pick up a circuit diagram and construct something 'from scratch'. These amateurs are today's Novices. For Novices, building well-designed kits is surely a good way to gain more confidence before 'flying solo' with a circuit diagram. But kits are not just for Novices. The pleasure of assembling a high-quality kit with all of the components to hand and all the mechanical work done by someone else is something that all amateurs can enjoy.

There is a vast range of kits available these days. They span from very simple station accessories to fully-featured HF transceivers. The quality varies just as widely. People have sometimes said to me that kits are expensive (compared with second-hand equipment), lacking in features (compared with what is available in the ready-built market) and have little or no residual value (no-one will buy your old kit equipment). Before embarking on this review it is perhaps worth exploring these ideas.

WHY BUILD KITS?

KITS HAVE BEEN with us for nearly as long as amateur radio has existed, but what purpose do they serve? Recently someone said to me at our local radio club that he could not understand why people would pay £100 or more for a low-power, single-band, CW transceiver kit when they could pick up an old FT-101 for not much more. He has a point of course. In general, if you compare functionality and cost, that old FT-101 will almost always come out ahead of a kit.

But that's missing some of the picture. Amateur radio is about 'self training' - learning by doing. Kits surely offer a readily-accessible way to start constructing your own equipment. A charge sometimes levelled against kits is that, like painting by numbers, there is no real understanding of the art gained during the construction process. That may be true in some (even many) cases - but surely what *is* gained is familiarity with components, assembly techniques, working methodically - even tidiness (something that has never rubbed off on me!) These skills certainly don't necessarily lead to a better understanding of circuits and circuit design, but they surely do lay a foundation from which that higher-level understanding may come. Kits also lend themselves to modification much more than commercial gear; that's a valuable learning process too.

Continuing the comparison with that old FT-101 and a kit, people seem to get great satisfaction from building kits. There is nothing quite like using a radio that you have built yourself. I am sure that this accounts for the almost magical results that people get with home-built gear. I think that it 's not really magic, it's just that they are so much more inclined to call that DX station, just to see what can be done with something they made themselves.

I build kits (and radios from schematics) because I want small basic equipment for back-packing. I'm prepared to pay a premium for that, as I can't afford the medical bills that would result from backpacking with an FT-101.

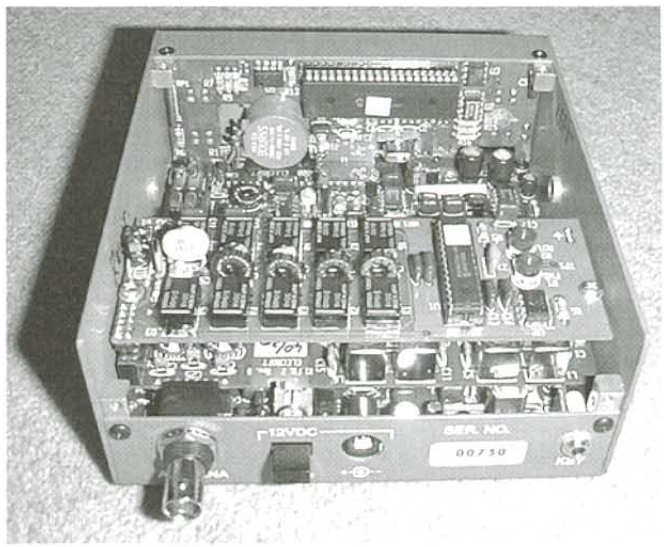
"Of course kits offer poorer performance than 'bought' equipment". This is simply not true. The best kit radios can compete with the best that you can buy. How's it done? Simple; kits don't have to have all of the unnecessary 'bells and whistles' that sell the ready-built radio. The bells and whistles often lead to compromises in other areas; kits can concentrate on decent RF performance - and that's what really matters most of the time.

"So how come kits cost so much?" I'm not sure that they do. Let's look at the economics. A successful kit transceiver will sell maybe 500 units. Yaesu's next major HF transceiver may sell over 100,000. That economy of scale makes a huge difference in the costs that can be achieved. Yaesu's transceiver will be constructed mostly by machine. That will not add much to the overall cost of the product. They will also use cheap surface-mount components - your kit will probably use more expensive through-hole parts. The kit will have to be packaged with all its components in little bags, Yaesu's components come in bulk on reels and have very low handling costs. You will build your kit but won't be saving much by doing so. If you think that a kit is a rip-off, try getting all those components together yourself and charge your time at, say, £10 per hour, then see how much your home-built gear costs! Don't expect to save money with a kit - you're paying more for a better overall experience, and a more serviceable product.

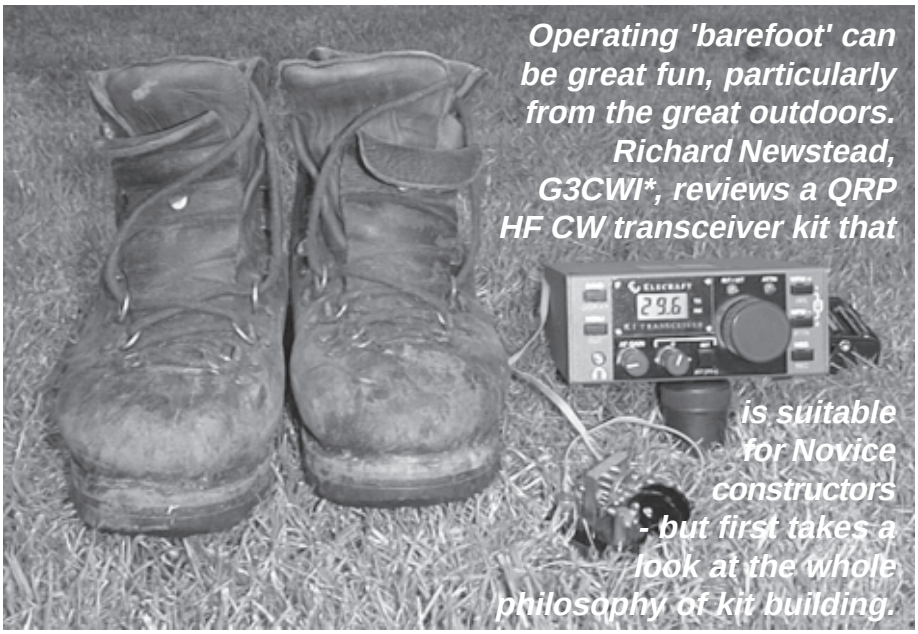
Residual value (what you get if you sell something second-hand) is also worth considering. 'Home-brew' gear generally has a very low residual value, as do most kits. Good residual value can make kits seem much more financially attractive - but good residual value generally means that the finished product must not look 'home made'. The best kits look good when they are finished - which is perhaps why Heathkit radios still command good prices.

ELECRAFT

A COUPLE OF YEARS ago a new company - Elecraft - appeared in the kit market. Based in the USA, they launched an ambitious first product - the K2. This is a fully-featured HF transceiver that compares well with the very best ready-built gear. It is a complex project,



Transceiver Kit



Operating 'barefoot' can be great fun, particularly from the great outdoors. Richard Newstead, G3CWI*, reviews a QRP HF CW transceiver kit that is suitable for Novice constructors - but first takes a look at the whole philosophy of kit building.

although many first-time constructors have successfully built it. Its fame spread quickly and there are now thousands in everyday use. The K2 is an excellent home station and vacation radio, but is perhaps a little large for truly portable operation. Elecraft realised this and last year they announced the K1, a small HF transceiver designed with portable operation in mind.

Such is the reputation of Elecraft that the K1 has already sold around 1000 units.

CIRCUIT DESCRIPTION

THE K1 IS a two-band CW transceiver. It has a single conversion superheterodyne receiver with an IF of 4.915MHz. The transmitter runs 5 watts. This sounds rather dull - so why has it been so successful? I believe it is because the design is so cleverly implemented. Let's work through the receiver.

The signal enters through a low pass filter (also used on transmit) and then passes through a band pass filter. These filters in common with all of the band-specific components are mounted on a small plug-in circuit board. This sits piggy-back style on the main PCB and allows the users to choose any pair of bands between 80 and 15 metres. Changing boards is easy and for most portable operation, a pair of bands will give adequate flexibility. I chose 20m and 40m - the most popular combination.

The signal next passes via a switched attenuator to the first mixer. This is a Gilbert Cell device (NE602). These devices are very popular and are characterised by high gain, low current consumption, and unfortunately rather poor dynamic range. So why have Elecraft chosen them? For good portable equipment, there are compromises to be made. Mixers with good dynamic range tend to have high current consumption. That means bigger batteries or less operating time. The NE602 is cheap, simple and mostly adequate.

The oscillator uses a 3MHz VFO with a premix scheme to give the correct frequencies for each band. The VFO is tuned by a high quality 10-turn potentiometer and covers approximately 80kHz (the exact range can be changed by the constructor). The mixer output is at 4.915MHz. IF filtering is achieved with a four-crystal ladder filter.

Another NE602 is used as the BFO / product detector mixer, the resulting audio is then fed to an AF preamp and finally and LM380N AF amplifier. An audio-derived automatic gain control loop keeps the output constant.

The transmitter is very simple with the premix signal fed to another NE602 mixer, a buffer, some filtering and finally a broadband PA consisting of two stages of amplification using bipolar transistors.

Reading this description, I expect you are still thinking that the design is pretty ordinary. But that's because I have missed out Elecraft's clever design. Much of this radio is controlled by a microprocessor and in doing this Elecraft has achieved some amazing facilities. Let's go back to the receiver. The attenuator is switched from the front panel under software control. The operating frequency and band are displayed to a resolution of 100Hz on an LCD display on the front panel. The display shows three digits and tapping the 'display' button causes the display to show the Megahertz, kilohertz and finally decimals of kilohertz. The receiver bandwidth is also under software control. The crystal ladder filter is implemented with varactor diodes instead of fixed capacitors and the control voltage (bandwidth) is selected from the front panel. Three different bandwidths are selectable from the front panel and these can be defined by the user. I have mine set at 850Hz, 400HZ and 200Hz. The AGC voltage is also read by the processor and one of the display modes shows bars relating to signal strength. In this mode, the frequency cannot be displayed but the radio detects when you turn the tuning knob and displays the frequency again until you stop tuning - a nice touch!

The transmit / receive switching is all solid state and the delay is user-definable under software control. Full break-in is easily possible and is silky smooth with no nasty clicks or thumps (and no clattering relays).

The transmitter power control is under software control and the power can be directly set from the front panel. The display reverts to a bargraph showing power output on transmit and when in the 'tune' mode actual power output is displayed. Power can be set between 100mW and just over 5W in 100mW steps.

The radio has a built-in Morse keyer. The speed is under software control and is displayed directly in words per minute on the front panel display. The keyer has two memories each with 90 bytes available - easily enough for most purposes.

The front panel display will also read the battery voltage (and alert you when it is low both by means of a tone and on the display). The receiver has incremental tuning (RIT) as does the transmitter (XIT). There is a menu system accessible from the front panel that allows various other facilities to be customised, for example transmit sidetone frequency and level are adjustable. Since the radio is designed to allow low current portable operation, even the RIT and attenuator LEDs can be disabled via the menu system to save current (they are replaced by audio tones). Another current saving feature is the use of latching relays throughout. These only consume power whilst changing over.

The transceiver is housed in a very smart-looking case, giving a professional finish to your home-made radio. The case design is cunning too and each panel can be removed

89 Victoria Road, Macclesfield, Cheshire SK10 3JA.

separately for access. The circuit boards all plug together leaving very little wiring to be done to assemble the radio - neat!

There are several options available including an internal automatic aerial matching unit, a noise blanker, a stand and an internal battery pack.

ASSEMBLY

I ORDERED MY K1 and 11 days later it arrived. Even the purchasing experience was good with Elecraft acknowledging my order via e-mail and then telling me (a couple of days later) that my kit had been shipped - fast and efficient. The K1 arrives in a small cardboard box. Inside there are various plastic bags with components for each of the three printed circuit boards. The manual runs to about 70 pages and gives extremely detailed instructions on how to build the radio. Each instruction has a tick box against it so you can see how you are progressing. The order of construction is logical and each section is tested on completion.

In all, I took about 12 hours to assemble my K1. Some have suggested that an inexperienced constructor might take about twice this time, working carefully. The whole process was extremely enjoyable and the instructions were perfect. Anyone who has learned to solder will be able to assemble this radio with confidence. At the end of the assembly, I had no components left over - a good sign. Everything was there and everything fitted properly. The components and printed circuit boards were of the highest quality.

Building kits can seem a bit daunting at first. You pay your money and a box of bits arrives. Half-way through you wonder if you have wasted both your time and money. You're on your own. But that's not the case with Elecraft. They have a web-based forum where builders can discuss their kits and get fast advice - often from the people who actually designed the kits. I didn't have to use it, but it was nice to know that it was there.

The alignment was really quite easy and is well described. No sophisticated test equipment is needed. A simple multi-meter is enough. My K1 worked first time!

IN USE

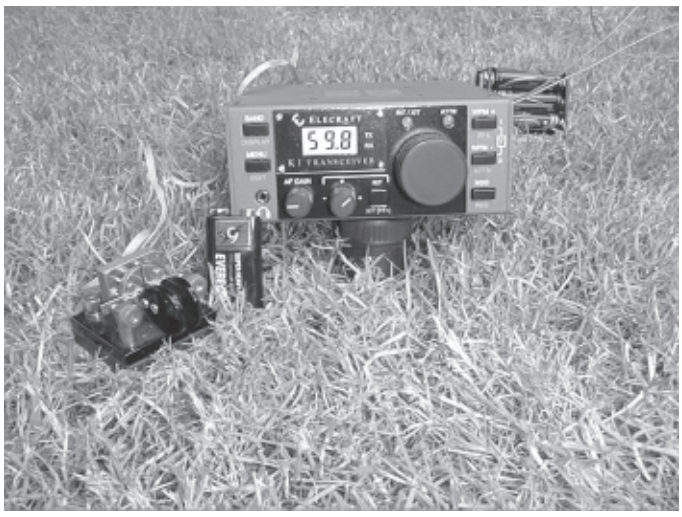
I COULDN'T WAIT to get on the air. I tuned up my doublet for 40 metres and was quickly making QSOs. My K1 will give about 7W on 40 metres and 5W on 20 metres. I was keen to explore the lower power settings too and was excited when an Italian replied to my 100mW CQ call on 20 metres. He was in the QRO league, of course - running 300mW! During the *CQ* WPX CW contest, I worked a string of west coast USA stations on 20 metres and was able to work into the USA on 40m too.

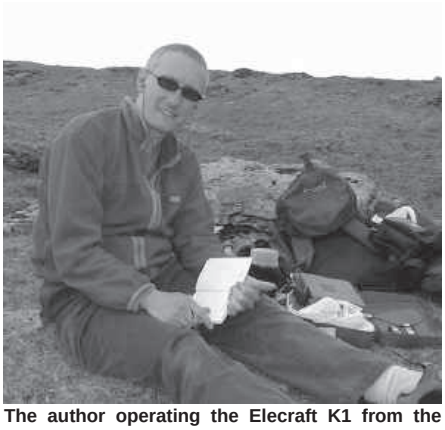
The radio is easy to operate and works well. But what of the dynamic range? How did it perform on 40 metres at night? The simple answer is that it performed as I had expected. The attenuator (fixed at 14dB) is absolutely essential on 40m at night. Without it, the band is virtually unusable. With the attenuator in, sanity returns and although there are still audible intermodulation products, they don't cause a real problem. On 20 metres, I have not needed to use the attenuator at all.

THE K1 ON SNOWDON

BUT ALL THIS 'shack-bound' operating was not what I bought my K1 for, and so as soon as the weekend came I told my son (Lewis, aged six) that it was time he climbed Snowdon. The reward for him was a train ride down, for me it was the chance to use the K1 on a mountain.

The radio is very small and 8 AA-sized batteries will provide adequate power. The K1 works down to below 8 volts. The whole station (excluding the aerial and mast) fitted into a plastic lunch box. Lewis and I were soon at the summit and I was itching to get on the air. We found a grassy spot and set up the 10 metre mast, strung out the 40m dipole and away we went. This was not going to be a marathon effort however, as six-year olds don't find CW radio all that interesting so my bargain was just three QSOs and then the train followed by an ice cream (pity this level of bribery doesn't work with the wife!) The K1 performed perfectly. I was glad of the pre-programmed CQ facilities and before long the three QSOs were in the log and the journey down commenced.





The author operating the Elecraft K1 from the summit of Snowdon.

COULD DO BETTER?

THERE HAS YET to be a perfect radio made, and the K1 isn't perfect. There are several things that could have been a little better. I am not convinced that the balance between performance and current consumption of the NE602 mixer is quite right. I would have liked a little better strong-signal performance (even at the expense of some current).

The manual, while generally excellent, does not list the default settings for each menu option. That would have been nice.

The RIT / XIT pot needs a centre detent and ideally the frequency display would read the offset when you turn the control (not the absolute frequency).

Provision for some way to illuminate the frequency readout would be useful. For general listening, an option to move the VFO range into the sideband section of the band and select a little wider filter bandwidth (even if the shape wasn't too good) would be nice.

An earth terminal at the rear of the radio would have been useful (for those radials).

An unused switch on the front panel for user customisation would be good too.

CONCLUSIONS

THE K1 has fully lived up to my expectations. I'm looking forward to my next trip out with it. It will also make a super vacation radio. Its limited dynamic range rules it out for me as a home station (the K2 will do that!) But out and about, there is nothing to touch it.

It would make a good first project and gives a pleasing piece of equipment that is certain to have a good resale value (you won't want to sell it, though!) The basic K1 cost me £215 + £48 VAT and import duty. It is available via the Elecraft website and can be bought by credit card. Overall, I think that the K1 is good value for money.

WWW.

Elecraft: **http://www.elecraft.com/**
Richard Newstead's Adventure Radio: **www.adventureradio.org**

Newcomers' News

Down To Earth

News and Comment from and for Amateur Radio's Newcomers. Compiled by Steve Hartley, G0FUW *

A BIT OF A Scouting theme to start this month with news from a couple of groups and notice of this year's Jamboree On The Air event. With the lack of opportunities to operate outdoors this year let's hope that the Scouts make the most of it and the weather holds up. Let me know how you get on!

BOOST FOR SCOUTS

MARTYN MEDCALF, G1EFL, wrote with news from the Chelmsford Scout Amateur Radio Fellowship (ScARF). The organisation was formed over a year ago after many years of participation in the Scouts' annual Jamboree On The Air (JOTA) event. The group has gone from strength to strength and now has some 25 members, mostly Scout leaders with amateur radio licences.

Earlier this year the group received a huge boost when a local business donated £8000 worth of equipment including Yaesu FT-100 and Icom IC-706 transceivers. The equipment will allow newly-licensed Scouts to get straight on the air as soon as their callsigns come through.

ScARF provides City & Guilds NRAE training. It also caters for the Scout / Cub Communicator and Electronics badges and the Scout Radio Technician badge. If any readers would like more information they should contact Martyn, G1EFL, who's address is correct in the current *RSGB Yearbook* (QTHR).

SCOUT RADIO NEWSLETTER

LAST OCTOBER Malcolm Bell, G4CXT, Editor of the *Scout Radio Newsletter* consulted the readership on whether the *Newsletter* should continue in paper format or whether it should go fully electronic through the world-wide web. The consultation favoured the continuation of the paper-based newsletter with access through the Internet for those with that facility. The latest *Newsletter* includes Radio Scouting topics from all over the world and it is clear that interest remains high, but unfortunately steadily-falling subscriptions and the prevalence of the web have forced the production team to wind up the printed newsletter.

Malcolm promises that all the valuable information which had previously been available in printed form will be made available in downloadable format and advises those without Internet access to make arrangements with someone who has access to print out material for local distribution.

Trevor, M5AKA (front right), presents ScARF with equipment donated by his company AKA Technology (see Boost for Scouts).

JOTA 2001

ONE OF THE TOPICS covered in the latest edition of the Scout Radio Newsletter is this year's JOTA. Richard Middelkoop, PA3BAR, the world JOTA organiser, has completely revised and updated the official JOTA website. As well as down-loadable briefing packs for this year's event (**20 / 21 October**) you can find the specially-created logo, historical information and links to national organisers.

I always find JOTA an excellent event for introducing amateur radio to newcomers, why not get involved this year? If you are licensed, contact your local Scout group and offer your services. If you are a newcomer, check out the JOTA website for your nearest JOTA station and pay them a visit.

A MORSE QUESTION

DAVID PRATT, G4DMP, is often quoted in this column as he is responsible for posting the Radio Amateurs Examination (RAE) and Novice RAE examiners reports on the world-wide web. However, in a recent exchange of e-mails David posed the question, "Does anyone know the Morse symbol for the @ symbol in order to send an e-mail address in Morse code?"

He suggests that di-dah-di-di-dah, which was the old sign used for separating whole numbers from fractions, as one possibility, or that the French accented 'a', di-dah-dah-di-dah. The French idea would follow the use of 'de' for 'from'.

I think learning Morse is complicated enough for the newcomer without making life more difficult, but from a practical point of view we should be able to send 'modern' terminology using good old Morse. Any thoughts?

WWW.

UK Radio Scouting	www.radio-scouting.org.uk
Official JOTA site	www.scout.org/jota/
Ian Abel, G3ZHI (Internet linking)	www.qsl.net/g3zhi/index2.html

NOVICES IN KENYA

THE LATEST NEWS from Ted Alleyne, 5Z4NU, is that the boys from the Starehe school who passed their Novice exams last year now have their licences. After several disappointments Ted now believes the licences to have been issued and by the time this column is published the boys should be back in school and fully operational (QRV). Look out for them on 7 and 28MHz single sideband (SSB).

Not deterred by the constant knock backs with the Starehe licensing situation, Ted is now trying to set up a similar scheme at Kamusinga. Any offers of help would be gratefully received. I am more than happy to forward any correspondence, addresses at the foot of the page.

WORLD-WIDE HANDHELDS

A FEW WEEKS AGO I had a telephone call about linking amateur radio through the Internet. I had to confess to knowing about these experiments, but not having tried it out for myself. This new service is a way of extending the range of Very High Frequency (VHF) or Ultra High Frequency (UHF) radios, like we do with repeaters, but using the Internet.

I took the opportunity to catch up on some back reading to find out more, but I have to say that most of the information I could find relates to linking your own station to the Internet via a voice-operated-transmit (VOX) unit. There appears to be a need of a simple 'newcomers' guide' to using the service; any willing authors?

Several UK amateurs have now opened 'gateways' through their radios linked to the Internet under a scheme approved by the Radiocommunications Agency enabling newly-licensed operators to work the world using a VHF handheld. Quite exiting!

You can find out more about linking amateur radio to the Internet from Ian's, G3ZHI, site. ♦

* *5 Sydenham Buildings, Lower Bristol Road, Bath BA23BS; e-mail: newcomers.radcom@rsgb.org.uk*

Down To Earth

The Voices

Part Fifteen, by Gordon L. Adams, G3LEQ *

RADIO WAVES have the incredibly powerful property of being able to cross political frontiers without hindrance. In Part 14 last month, I started to consider the role that propaganda broadcasting played around the onset of WWII. Vladimir Ilyich Lenin is reputed to have written that "radio is a newspaper without paper and without boundaries". One must always be careful when making short quotations out of context, but I hope that readers of 'The Voices' series will agree with me that radio has been one of the major developments of the 20th century. We are now celebrating its 100th birthday (give or take a few years), and in the final Part 15 of 'The Voices' I take a further look at the war years and the half century that followed.

POLITICAL AND PSYCHOLOGICAL WARFARE

WHEN THE FIGHTING in France had reached a critical stage, British intelligence, with the assistance of the French *Deuxieme Bureau*, had contacted a Dr Carl Spiecker, and brought him over from France to the Political Warfare Executive country base at Woburn Abbey. Prior to Hitler's assumption of power, Dr Spiecker had been head of a department in the German Ministry of the Interior, where he was responsible for monitoring the activities of both the National Socialists and the Communists. However, he was a renegade Nazi, and he belonged to a political grouping called the *Freikorps*. It was rumoured that he had also provided financial backing for Dr Otto Strasser and his undercover *Freiheitsender* radio stations, which I described in Part 14.

At Woburn, Dr Spiecker was known as 'Mr Turner', and he made his first short-wave broadcast over the British 'black' station *Das wahre Deutschland (DWD)* on 26 May 1940 using 9710kHz in the 31-metre band. The *Sender der Europäischen Revolution (SER)* began short-wave transmissions from the UK four months later on 7 October - using 9585kHz. These two PWE 'underground' stations were set up as a response to the German operation called the *New British Broadcasting Station (NBBS)*, which had commenced broadcasting in English in April 1940. Bear in mind that the Germans had invaded Denmark, Norway and the Low Countries and were entering France via Amiens in the north. The RAF had therefore had to abandon the dropping of propaganda leaflets on 23 April, and radio propaganda assumed a new urgency.

In reality Dr Spiecker was working for the Secret Intelligence Service (MI6), whilst he was in England; but it is probable that he was only aware of the Political Warfare Executive as his employers. Whether he felt that he was not safe in Great Britain is not clear, but - within a year - he decided that he wanted to go to the USA. PWE therefore acceded to his wish, and he was replaced in the black broadcasting operation by a former 'centre' member of the Reichstag. His successor is believed to have been a Dr Hermann Rauschning, who along with Otto Strasser, Baron Putlitz and Herr Halterman, was an exiled German helping British experts to understand the German political scene. Whether correctly identified or not, it is known that the new incumbent died on 15 March 1941, and the DWD transmissions therefore had to be terminated.

Two French under-cover stations started to broadcast from England about a month after SER went on the air. These were called *Radio Inconnue (RI)* on 9750kHz and *Radio Travail (RT)*. The material broadcast by RI in particular was highly subversive. The station attacked Marshal Petain and his Vichy government as *collaborateurs*. A small team of French broadcasters and scriptwriters were billeted at the Old Rectory in Toddington, just four miles to the south of Woburn Abbey. As the illustration shows, they promoted an imaginary organisation termed *les chevaliers du coup de balai* (the knights of the sweeping broom); who were dedicated to 'sweeping' the Germans out of occupied France. Their campaign preached, not just harassment of the Germans, but also the assassination of leading *collaborateurs*. It has to be emphasised that this was a wholly 'black' activity; because at this stage of the war, the British government still harboured hopes that Marshall Petain might remove himself to North Africa and then denounce the Germans.

Sticker for use in France advertising *Radio Inconnue*.

ENTER 'TOM' DELMER

UNFORTUNATELY, THE output from *DWD* and *SER* was not thought to be very effective, and Denis Sefton ('Tom') Delmer, an ex-*Daily Express* reporter, joined the 'black broadcasting' operation in May 1941 to put some journalistic punch into the operation. Richard Crossman was later transferred by the PWE to Algiers (May 1943), where he became involved with the joint Anglo-American Psychological Warfare Branch (PSYOPS) operating in North Africa.

Delmer had a gifted journalistic approach to the job, and his first creation was radio station *Gustav Siegfried Eins (GS1)*, which commenced broadcasting to Germany on 23 May 1941. The object of the station was to try to stir up friction between the Nazi party and the *Wehrmacht* (German Army) by employing rumour and insinuation.

Upon recruitment into MI6, Delmer had spent the latter part of 1940 working in Lisbon. Because Portugal was neutral during the war, he was able to mix freely with people of every political persuasion. The material that he collected came in extremely useful to him some months later, when he returned to England and set up the black station GS1.

On Sunday 12 May 1941, Delmer and his wife Isabel installed themselves in a requisitioned villa called 'Larchfield', located in the small village of Aspley Guise - a few miles from the PWE at Woburn Abbey. It appears that his residence soon became known as 'The Rookery' at Aspley Guise - or 'RAG' for short. Coincidentally, only the night before Delmer's arrival at RAG, Hitler's Deputy Führer Rudolph Hess had unexpectedly parachuted into Scotland - apparently seeking some kind of reconciliation between Great Britain and Germany. Unfortunately, GS1 missed out on this excitement, because it was not ready to come on the air; whilst the BBC decided not to comment either for security reasons.

Sefton, or 'Tom' as he was known to his friends, created a mysterious character called *Der Chef* (The Chief or Boss); who - without being overtly anti-Hitler - would represent the views of 'good' patriotic Germans. Delmer

Sefton Delmer at the microphone.

* 2 Ash Grove, Knutsford, Cheshire WA16 8BB.

wanted to attract the interest of those Germans who were becoming increasingly concerned about the manner in which Germany was being run, not by the Führer, but by his "corrupt and self-seeking Nazi Party functionaries". Obviously, no statistics on listeners were available at the time, but information gathered later indicated that the *potential* audience for British propaganda broadcasting in Germany rose rapidly. It was estimated at about one million in late 1941 - rising to between 10 and 15 million by the end of 1944. This would be due in part to the launch of the German 'People's Receiver', described in Part 14, which continued to be manufactured in large quantities well into the war years.

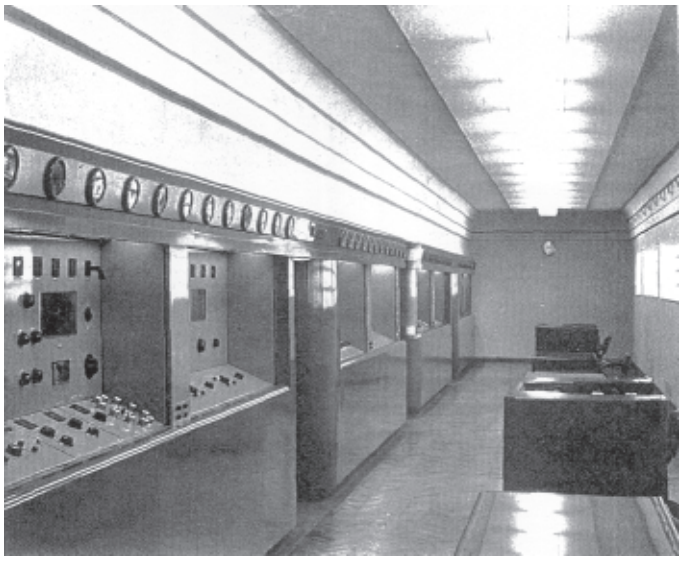
ASPIDISTRA - DREADNOUGHT OF THE ETHER

ALSO IN 1941, a proposal was put forward for a very high-power medium-wave (MF) transmitter of 600kW, to be installed at Crowborough, Sussex in Ashdown Forest (see Part One in June 2000 *RadCom*) and known as 'Aspidistra'. Churchill said that "this apparatus should be a raiding dreadnought of the ether - firing broadcasts at unpredictable times" in order to counteract enemy propaganda. It was first employed operationally on 8 November 1942 as a follow-up to the American landings in North Africa. Shortly afterwards, it was used to intrude on the Radio Rabat wavelength of the quisling French Vichy regime in Morocco (remember the film *Casablanca*?).

RESEARCH UNITS

THE VARIOUS 'black' radio stations and their teams of broadcasters and scriptwriters soon became known as 'Research Units' or RUs for short. The people involved with each language group were kept separate from each other, and lived in requisitioned country mansions - all within a convenient distance of Woburn. Indeed, where several 'black' stations were broadcasting in the same language, the different groups of participants were kept apart - because the political views being expressed had different objectives. This might seem odd at first sight, but the important thing was to disrupt the German war machine by psychological means - using as many dissident groups as possible. They recorded their broadcasts, using glass-backed 33.3RPM discs, in conditions of the utmost secrecy at hurriedly constructed studios in a large house called 'Wavendon Tower'. This was generally referred to as 'Simpson's', because there was apparently a village of that name just up the road; but I have been unable to trace it on any Ordnance Survey map. Wavendon Tower, however, is easy to find. It now forms part of a very public edifice - the offices of the Milton Keynes Development Corporation!

It also needs to be understood that although there were eventually more than 50 RUs operated by the PWE - there were only a few transmission sites involved, the main ones being Gawcott, Potsgrove and Crowborough. In normal radio terminology the 'stations' were more akin to programmes; but separated in terms of language, listener targets, transmission times and frequencies. Furthermore, most of the transmitters at Gawcott and Potsgrove were of the point-to-point type, employing less than 5kW and being used for Morse telegraphy communications with agents in occupied Europe.



Four short-wave senders at Crowborough.

RADIO LIVORNO

MOST BROADCASTING to Italy, for example, was spasmodic and inadequately planned. The first Italian RU was called *Radio Italia* and known colloquially at the time as 'Wop 1'. This was launched on 17 November 1940, and 'Wop 2' or *Radio Liberta* followed in June 1941. Their various exhortations to the Italian public were intended to create shortages of valuable commodities through hoarding. The problem was that very few Italian families owned radio receivers with any short-wave bands incorporated. *Radio Livorno* commenced operations on 25 July 1943, and it claimed to be broadcasting from Livorno, near Pisa, in the Leghorn area of Northern Italy. In fact the programmes were being created in Delmer's second studio at Milton Bryan, near Woburn Abbey. They were produced at the behest of the British Naval Intelligence section 17Z. These broadcasts were therefore directed primarily at the Italian Naval forces. Their effectiveness has been called into question by some war historians. Sefton Delmer published a book called *Black Boomerang* in 1962, in which he claimed that *Radio Livorno* played a major part in the surrender of the Italian Navy to the Allies in Malta. Ellic Howe, aka Armin Hull, who wrote *The Black Game* in 1982, cast doubts in his book on this claim by Delmer.

TOKYO ROSE

PERHAPS BECAUSE their country is so far away on the other side of the world, the part played by the Japanese in WWII never seems to have received the same kind of historical attention as that given to the Germans. Certainly the British prisoners of war, who were lucky enough to return from the Japanese horror camps, have maintained this point of view over many years. Numerous historians would, however, argue that it was the Japanese who really began WWII when they invaded China in 1937. That Sino-Japanese war continued for eight years. The Japanese attacked Pearl Harbor on 7 December 1941, and thus brought the Americans into the war. They soon captured large numbers of American, British, Australian and New Zealand troops, who were put to work in forced labour camps. Radio Tokyo started daily hour-long broadcasts on the short-wave bands in the English language. They called these transmissions the 'Hino Maro Hour' or Zero Hour, and announced that they were intended "to let you know how your boys are living as prisoners of war in far-off Japan". A team of 13 female announcers was employed, all native speakers of American English, who were collectively known as 'Tokyo Rose'. This name was coined because of their seductive-sounding voices. There was very little point in broadcasting back to the Japanese on the short waves, as suitable receivers were illegal in Japan - and had been prior to the war as well.

ATLANTIK AND SOLDATENSENDER

THERE IS LITTLE doubt that the most effective 'black' broadcasts of all time went out from Crowborough. Delmer's *Kurzwellensender Atlantik* (or Atlantic short-wave station KA) first went on the air on 22 March 1943. This was followed on 18 November 1943 by *Soldatensender Calais* (SC), transmitting on the medium wave via the 600kW 'Aspidistra' sender. *Atlantiksender* was originally a concept of the Naval Intelligence Division (NID) of the Admiralty, and its programming was aimed especially at the German U-boat crews, who had been

creating havoc amongst the North Atlantic convoys of supply ships sailing from the USA to the UK. Unfortunately, it was a little late to undermine German morale in that connection, because the 'Battle of the Atlantic' was largely over by May 1943. However, SC continued to be extremely effective, and after the Allies had landed in Normandy on 6 June 1944, it soon changed its title to *Soldatensender West*, in order to keep up its geographical credibility. Its target audience was the troops of the *Wehrmacht* in occupied France.

During 1943 Harold Robin installed four 7.5kW short-wave transmitters and two of 100kW in the underground 'bunker' at Crowborough.

THE BLACK LEGACY

AFTER THE WAR, around 1959, the German Democratic Republic (GDR) set up a high-power medium-wave station on 904kHz (later 908 and 935kHz) called *Deutscher Soldatensender* (DS). Besides broadcasting German-language polemic against the West German government in Bonn, they also dished out plenty of popular rock and roll music, and even competed with the American Forces Network (AFN) by programming country and western on a Thursday evening! Furthermore, they employed the 'Ode to Joy' from Beethoven's Ninth Symphony as their interval music. They also dictated coded messages to agents in the West. In recent years the North Korean state has employed the same techniques when broadcasting to South Korea.

Some people make a distinction between 'White', 'Grey' and 'Black' propaganda stations, but here I refer to all propaganda broadcasting as 'Black'. That being the case, one has to ask what was the outcome of all this black broadcasting activity? Clearly, those involved felt that they were doing something extremely worthwhile; and, judging by the various books on the subject that have been published in the post-war period in the UK, USA and Germany, the writers still feel that way.

The problem with all such black activities is that one has to rely on anecdotal evidence rather than the outcome of opinion polls conducted behind enemy lines at the time.

Since the end of WWII, the UK has been involved in propaganda broadcasting to Palestine (*Sharq al-Adna*), Greece, Egypt, Southern Rhodesia (Francistown Radio) and the Falklands Islands (Radio Atlantico del Sur based on Ascension Island). More recently, similar operations to Cuba and the Caribbean area, Iraq during the Gulf War, and to Serbia, Bosnia and Kosovo during the Balkans conflicts, have been a largely American activity.

Does this black legacy make our hobby more interesting? Well, I can only conclude by saying that I have been fascinated by it, ever since I heard that 'Boom-boom-boom-boooom' tuning signal emanating from the station up on Ashdown Forest. As a teenager, I also used to listen to Radio Moscow and learned about the latest Russian five-year plan. The political usage of radio was not a turn-on, but I felt that what was going on behind the scenes was intriguing. Was it anything to do with amateur radio? No, not really! I obtained my amateur radio transmitting licence as a result of being attracted to radio by the nefarious radio activities that I have described in this series. Is that a strange reason for becoming a radio amateur? Quite probably - but you must be the judge of that! ♦

Understanding Your S-Meter

Tony Martin, G4HBV, takes a look at the humble S-meter and how it behaves.

ONE OF THE intriguing aspects of radio is the tremendous variation that can exist in the paths between two stations in communication with each other. This is evident in the ability of low-power HF transmitters, using powers of one watt or so and in the hands of skilled operators, to cover what seem like amazing distances. In an article such as this, it would be impossible to describe in detail all the mechanisms involved, some human, some part of our natural environment and some determined by the equipment we use.

However, a simple review may reveal aspects that we have never thought deeply about. So what lies behind the S-meter reports that feature so prominently in amateur QSOs?

SOME THEORY

THE BLOCK DIAGRAM of **Fig 1** shows a radio system, with a transmitter, receiver, antennas and the transmission medium. For simplicity, let us consider a modulation system using SSB voice or Morse, a single path between transmitter and receiver, and an omnidirectional antenna erected in free space (the transmission medium). We can think of free space simply as a place where there are no obstacles or complications to the uniform expansion of the radiation fields (thus ignoring the effects of the ground and the ionosphere, for example).

We can imagine the radiated power, P, from the transmitting antenna as spreading out in all directions. Thus, at a point where the receiving antenna is located, which is a distance R from the transmitter, the total power available is spread over the surface area of an imaginary sphere of

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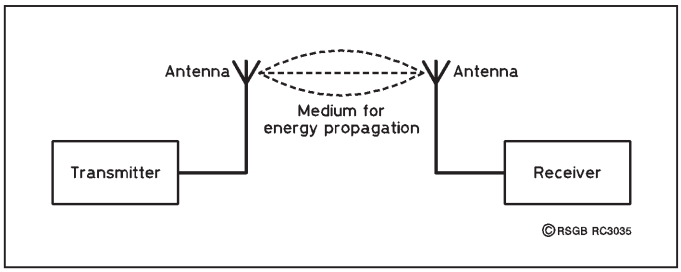

Fig 1: The basic communications system.

radius R, as shown in **Fig 2**. In simple mathematics, the power in a unit area of such a surface is the total radiated power divided by the surface area of the sphere:

$$\text{Power per unit area} = \frac{P}{4\pi R^2}.$$

Outside the immediate vicinity of

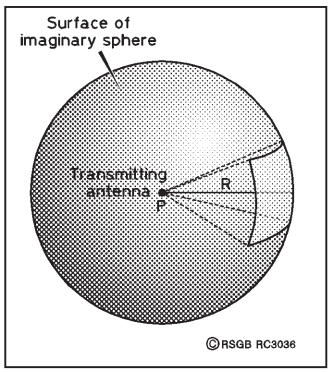

Fig 2: Showing a patch one metre square on the surface of a sphere of radius R and surface area $4\pi R^2$, receiving power from the transmitter at the sphere's centre.

the antenna, the radiated power in a unit area can also be calculated as the product of the E (electric component) and H (magnetic component) field strengths at that point. In free space, the field strengths E and H of this radiated energy have a fixed relationship, known as the plane-wave impedance. This impedance, defined as E/H, we can call Z, and so we can also represent power in a unit area at a receiving point as being equal to E^2/Z, where Z is a constant. Thus, the power per unit area

$$= \frac{P}{4\pi R^2} = \frac{E^2}{Z}.$$

By making E the subject of the equation, we find that

$$E = \sqrt{\frac{PZ}{4\pi R^2}} = \frac{1}{R}\sqrt{\frac{PZ}{4\pi}},$$

showing that E:

- varies with the square root of the power;
- varies with the reciprocal of the distance from the transmitting antenna.

These two factors are represented conveniently by the graph of **Fig 3**, which relates power, field strength and distance, under the free-space conditions we are considering here [1]. For the moment, ignore the right-hand decibel scale.

VARIATIONS

THE FIELD STRENGTH and distance axes are drawn on logarithmic scales, which allow the graph to show the variations as simple proportional ones, which otherwise, with linear scales, would be curves. The essential points to grasp are:

- For a fixed value of power, the field strength, E, follows a linear characteristic according, as we have noted, to the reciprocal of the distance between antennas. Thus, for a 1W transmitter at 1km distance, E ~ 5mV/m. At 10km, E becomes 1/10 of this at ~ 0.5mV/m.
- The graph also shows how the field strength, E, changes according to the square root of the power. On the graph, this is evident by examining the vertical line at the appropriate distance, and noting that this line intersects the two different 'power' straight-line characteristics at different points on the field strength axis.

Thus, for 10W at 10km, E ~ 1.8mV/m, and for 100W, E ~ 5.7mV/m. Note that the power changes by a factor of 10, and that the new value of E is found simply by multiplying its original value by the square root of 10 (which is 3.16):

3.16 x 1.8mV/m = 5.7mV/m.

To fix this in our minds, we have to return to the concept of a fixed amount of radiated power spreading outwards from the transmitting antenna, over larger and larger imaginary spheres as the distance increases. Also, in terms of transmitter power, only a small part of the spherical surface area can be intercepted by the receiving antenna, so that increasing transmitter power is not as effective as might at first be thought.

Returning to the graph, we can now consider the decibel scale on the right-hand vertical axis. The tremendous variations that can exist in the transmitter/receiver path have already been shown. Without the use of decibels, such variations are inconveniently large, and calculations difficult.

The decibel is simply a logarithmic measure of the ratio of two quantities. For the same reason that the logarithmic scales of Fig 3 made it easy to represent large values, the decibel is used to express changes in electrical power, voltage or current as a logarithm.

Because of the way voltages and currents relate to power, there is a slight complication in the use of decibels for these three quantities. For the purposes of this article, we are interested in changes of field strength and

signal voltages, so:

$$\text{Change} = 20 \times \log_{10}(A_2/A_1) \text{ dB},$$

where A_2 and A_1 can represent either field strength or signal voltage. Since the decibel is a ratio, A_1 can be given a specific value (eg 1µV/m) which, in turn, enables the decibel to represent *specific* values. Hence, the right-hand vertical scale of Fig 3 shows decibels relative to a field strength of 1µV/m.

Now let us consider what I call the "QRP equation", which indicates that quadrupling transmitter power results in only about one S-point increase at the distant receiver. The decibel scale on Fig 3 is not precise enough to check this directly.

Instead, using the graph, check that a 5W transmitter produces almost 2mV/m at 6km distance. Now check that a 20W transmitter produces almost 4mV/m at the same distance and convince yourself that we have doubled the field strength (remember it varies as the square root of the power). The increase in field strength works out at 6dB, often quoted as the 'standard' S-point. We have just established the viability of QRP operation.

In theory, if your 100W signal is being received at S9, reducing the power to 25W should produce S8. Reducing it to about 6W should produce S7, and 1.5W should produce S6 - in theory, not necessarily in practice!

COMPLICATIONS

AT THE RECEIVER end of the path shown in Fig 1, we have now to translate field strength at the receiving antenna into signal voltage at the receiver input terminals. This is rather complex because, although the value of the induced voltage per metre of the receiving antenna in our system *does* correspond to the field strength, other complications arise. Firstly, the induced voltages are distributed along the antenna and cannot just be added together. The induced voltages cause currents to flow in the antenna, which then re-radiates because of them. This means that some of the intercepted energy cannot be delivered to the receiver, and can be accounted for by assuming that the antenna's equivalent radiation resistance appears in series with the receiver input. We may simplify matters, however, by just accepting that signal voltage, delivered to the receiver, is proportional to the incident field strength, E.

It should now be apparent why traditional S-meter scales always look like **Fig 4**, because we are measuring in logarithmic terms.

The free space conditions and simple antennas that we assumed, however, do not describe what actually happens in real life: obstacles complicate the fields; receiving antennas intercept the wavefront obliquely; the polarisation of the field may change.

The other assumption we made, that of considering the transmission path only one way, also needs further comment. We would normally expect similar performance of the system if the transmitter and receiver positions were reversed. There are some reasons why this basic property of radio-wave behaviour seems not always to apply, and this is sometimes evident to operators at the ends of a path.

- We can use the term 'reciprocity' to describe the comparative performance of two antennas at the ends of a communications system. Put simply in this context, reciprocity means that if the two antennas *only* in Fig 1 were swapped, and that the electrical conditions at the newly-assigned transmitting antenna were as before, the performance of the system would remain the same. The proviso of electrical conditions at the transmitting antenna remaining unchanged rules out as absurd any idea of interchanging a ferrite-rod receiving antenna with a medium wave broadcast antenna. Reciprocity of two antennas cannot be assumed under conditions of ionospheric propagation, where path conditions may differ in each direction. Reciprocity will become most evident in the VHF and UHF bands by similar S-meter reports being given both ways.
- With high-performance transceivers commonly in use at most amateur stations, the question of compatibility between receiver and transmitter capabilities at each end of a path is less likely to be evident. Such compatibility can be upset, either by addition of receiver pre-amps or transmitting linears; this situation often applies if VHF and UHF stations are upgraded, when both a linear and a pre-amp will be needed.
- The signal-to-noise ratio, determined by local conditions at the receiver, may differ significantly at each end of the path. This may be so significant that, for instance, stations attempting difficult DX working may need to erect separate receiving antennas.

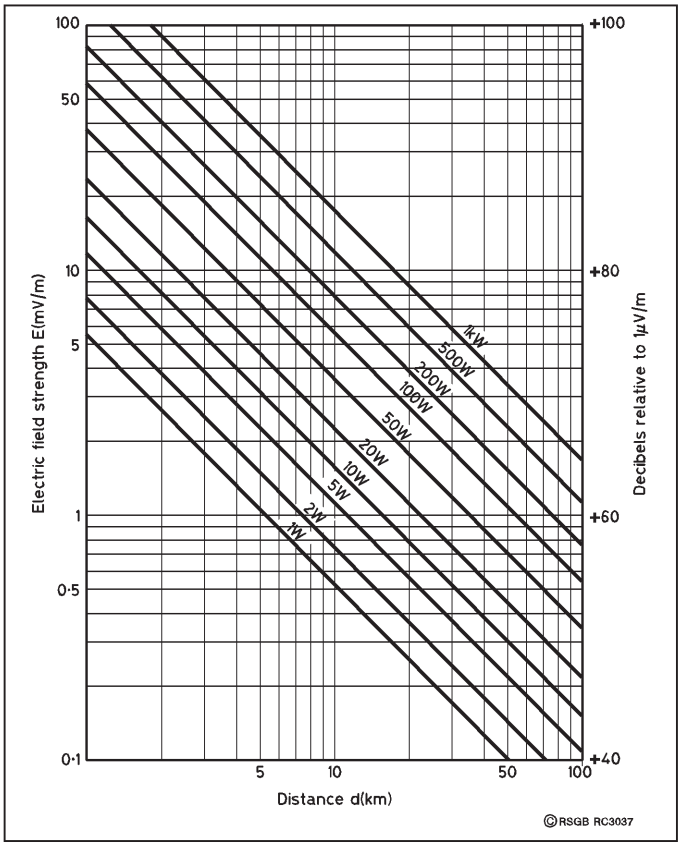

Fig 3: The variation of field strength with distance and power for an omni-directional antenna in free space [1].

SUMMARY

WE HAVE REVIEWED a basic feature of radio wave behaviour, the spatial expansion of energy from a transmitting antenna. We also saw that reducing transmitter power down to QRP levels of a watt or so was not such a disadvantage as might at first have been thought. This means that if propagation conditions are good and QRM is low, successful QRP operation is possible and will depend on the effectiveness of the antennas and the skill of the operators.

We saw how logarithmic S-meter scales are necessary in order to display the tremendous variation in signal levels possible at the receiver. Finally, it was briefly explained why disparities sometimes arise in the S-meter reports exchanged by stations in a QSO. ♦

REFERENCE

[1] *Radio Communication Handbook,* RSGB.

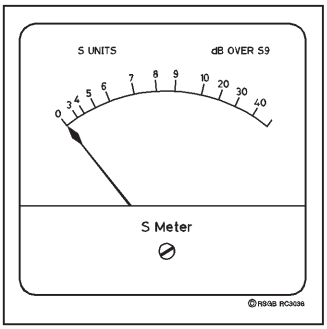

Fig 4: The logarithmic S-meter display of signal voltage, based on decibels, allows what would otherwise be a gigantic linear variation to be conveniently displayed. Calibration of the meter requires a signal voltage to be assigned to one of the S-points, typically 50mV at S9 [1].

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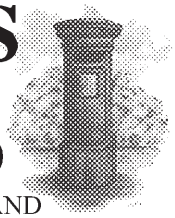

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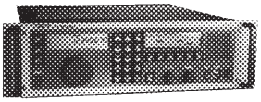

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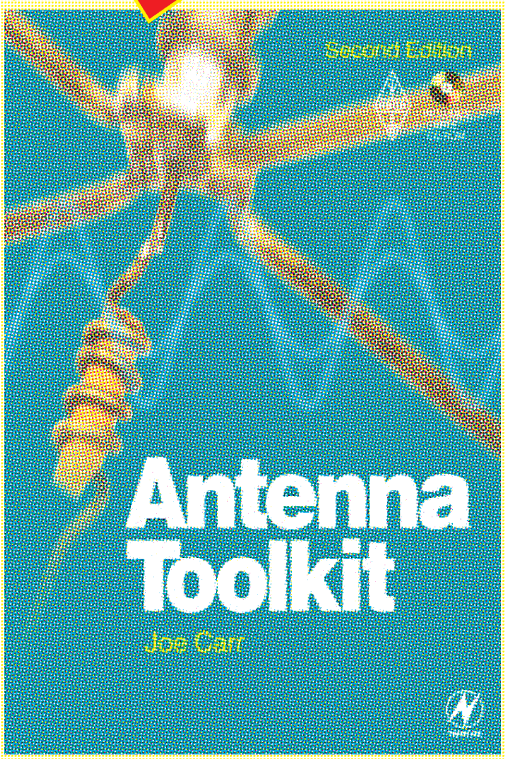

The legendary Joe Carr writes for the first time for the RSGB and brings you his vast experience in the area of antenna design. Joe's latest book provides radio amateurs with the definitive design guide for sending and receiving radio signals.

Together with the powerful suite of **CD software included** with this book, the reader will have a complete solution for constructing or using an antenna – bar the actual hardware! The software is based on Joe Carr's own Antler program, which provides a simple Windows-based aid to carrying out the design calculations at the heart of successful antenna design. All the user needs to do is select the antenna type and set the frequency – a much more fun and less error prone method than using a conventional calculator to solve formulae!

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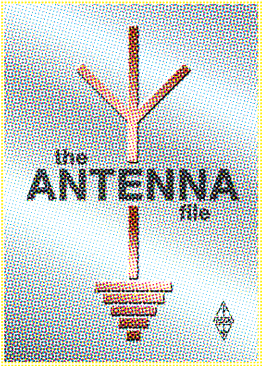

The Antenna File

The Radio Society of Great Britain produces some of the best works on antennas and this is a collection of that work from the last ten years. This book contains articles drawn from the Radcom magazine and includes:

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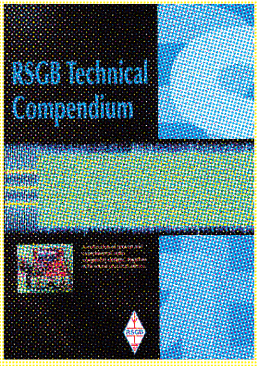

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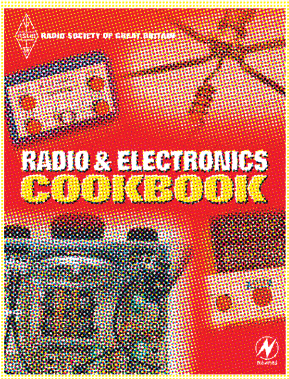

Radio & Electronics Cookbook

This is a collection of the very best weekend projects from the popular Radio Society of Great Britain magazine D-I-Y RADIO.

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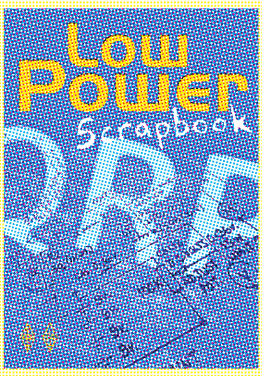

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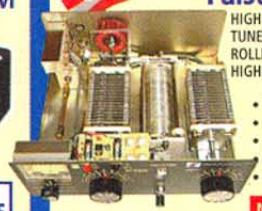

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MODEL	BAND	EL.	BOOM LGTH	TURNING RADIUS	GAIN DB	F/B RATIO	WEIGHT (KG)	PRICE
6m Band								
ZX6-2	50MHz	2	0.60m	1.53	6.2	-18	2.20	£49.95
ZX6-3bn	50MHz	3	1.75m	1.74	9.1	-25	3.00	£89.00
ZX6-4	50MHz	4	2.75m	2.03	11.4	-28	4.30	£99.95
ZX6-5	50MHz	5	4.35m	2.64	12.1	-28	6.50	£129.00
10m Band								
ZX10-3DX	28MHz	3	3.35m	3.35	10.3	-20	6.50	£129.00
ZX10-4DX	28MHz	4	5.80m	3.90	12	-26	10.80	£166.00
12m Band								
ZX12-2	24MHz	2	1.10m	2.85	6.3	-18	4.20	£99.95
ZX12-3	24MHz	3	3.50m	3.30	9.1	-25	6.90	£128.00
ZX12-4	24MHz	4	5.50m	3.92	11.4	-28	3.70	£159.00
ZX12-5	24MHz	5	8.60m	5.13	12.1	-28	14.80	£215.00
ZX12-6	24MHz	6	14.50m	7.78	12.7	-35	19.59	£229.00
15m Band								
ZX15-3	21MHz	3	4.15m	3.98	9.1	-25	10.90	£155.00
ZX15-4	21MHz	4	6.40m	4.67	11.4	-28	15.40	£185.00
17m Band								
ZX17-3	18MHz	3	4.90m	4.85	9.1	-25	11.58	£159.95
ZX17-4	18MHz	4	7.50m	5.63	11.4	-28	16.80	£189.95
20m Band								
ZX20-2	14MHz	2	1.70m	4.57	6.3	-18	10.00	£149.95
ZX20-3	14MHz	3	6.20m	5.60	9.1	-25	13.50	£199.95
ZX20-4	14MHz	4	9.40m	6.58	11.4	-28	21.00	£259.00
30m Band								
ZX30-2	10MHz	2	2.35m	2.63	6.3	-18	15.60	£189.00
ZX30-3	10MHz	3	8.55m	8.10	9.1	-25	27.50	£220.00

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- AM airband receive
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- Size: 142 x 40 x 174mm

£235.95

ALSO AVAILABLE:
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LIVING WITH YOUR NEIGHBOURS - A GUIDE TO PEACEFUL CO-EXISTENCE

by Martyn Culling, G8UCP* Martyn is a member of the RSGB EMC committee, and works for BBC Reception Advice.
The assistance of other members of the EMC committee, the BBC and the Radiocommunications Agency (RA) in the preparation of this article is gratefully acknowledged.

DO YOU TALK to your neighbours? Do they understand what amateur radio is? Do you get the blame for every bit of interference in your locality? Do you even care?

If you answer 'no' to the last question, you are the sort of person who brings the hobby into disrepute! If however, you've advised the postman on what to do about his interference and retuned the neighbour's video recorder because the man from Channel 5 got it wrong, then maybe you've made a start in the right direction.

In all truth, many EMC problems are not difficult to solve if both parties are being reasonable. The radio amateur who is at war with the neighbours is never going to get a totally satisfactory outcome. While it is true that many cases of breakthrough happen as a result of poor design of receiving equipment, it is far easier to blame the amateur. As a result, such an amateur could easily find himself at the receiving end of an RA shack inspection.

In the proper way of things, a neighbour who has an interference problem should feel quite at ease to talk to the local amateur about the issue. If you spend time talking to your neighbours it may prove to have been time well spent. Producing your log should verify whether there is any substance to the complaint.

Suppose you prove you are *not* to blame, are you still going to try to assist? I hope so. In any event, providing first-line help for any interference is simple.

*RSGB EMC Committee, c/o RSGB HQ.

TRY TO IDENTIFY THE PROBLEM

DOES THE interference occur when you transmit? Although you might not have changed anything for some years, and your neighbour's television installation is unchanged, the 'rusty bolt' effect can creep up on anyone.

So as a first point, is it you? The use of a licensed assistant, perhaps with a walkie-talkie apiece, to co-ordinate activities is very helpful.

If it *is* you, much helpful advice can be found in the *RSGB Guide to EMC* published by the RSGB [1].

The RSGB EMC Committee has produced the following leaflets, which can also be found on the committee's web site: *Radio Transmitters and Domestic Electronic Equipment; Radio Transmitters and Home Security Systems; Dealing with Alarm EMC Problems – Advice to RSGB Members; Locating Sources of Interference to Amateur Radio Reception; Radio Transmitters and Telephones; Automotive EMC for Radio Amateurs; Protective Multiple Earthing (PME); and TV Distribution Amplifiers.*

If you establish that your transmissions are to blame (albeit they are completely legitimate) and a solution is not immediately apparent, it is a good idea to ascertain the operating conditions that do not cause a problem.

This is a good time to take a serious look at how you are operating your station. Are you doing all you can to avoid interference to your neighbours? This is covered in several RSGB publications (as above). However, in a way this is shutting the stable door after the horse has bolted. You should be aware of likely EMC issues before operating, but it is all too easy to be wise after the event. If you have read all the books, used the web site and leaflets and the services of your EMC co-ordinator and still drawn a blank, your neighbour may need the services of the

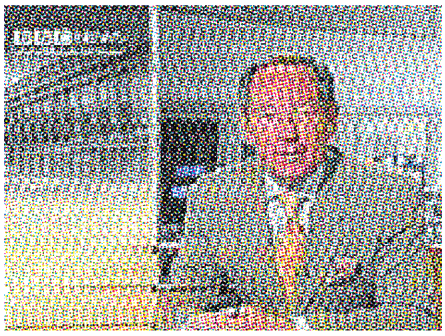

Fig 1: Simulated herring bone patterning (a common form), from the BBC Reception Advice website (picture © BBC).

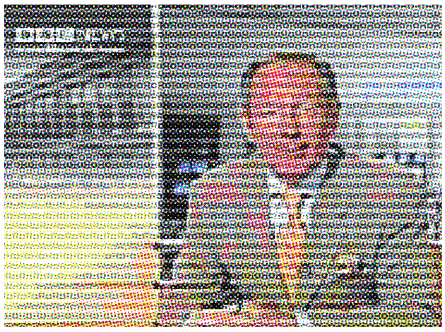

Fig 2: Simulated co-channel interference from the BBC Reception Advice website (picture © BBC).

RA. Their form is referred to at the end of the article.

WHAT IF IT'S NOT YOU?

FOR TELEVISION interference, a band of 'sparklies' across the screen every 15 minutes or so is often thermostat interference. This problem is so widespread that the RA has actually written a leaflet on this subject, *RA 272 - Problems Thermostats can cause to Television and Radio Reception.*

A lot of interference problems cause patterning on a television screen, often of 'herring bone' form as in **Fig 1**. This can tell you a lot about the source. Is it wild and all over the place, 24 hours a day, or during working hours, or leisure hours? A 'hooting' (or oscillating) mast head or distribution amplifier could be to blame. Such things are often very cheaply made, and since any amplifier can be considered to be an oscillator with insufficient feedback, anything that increases the feedback (such as water in the works) could cause it to oscillate.

Regular patterning implies a source of greater precision. The possibility exists of another amateur transmitter or some form of private mobile radio. Analyse the pattern. Most amateurs talk and listen in roughly equal percentages. However, taxi base stations definitely spend most busy times on the air, with short breaks (listen to the radio next time you are in a cab).

Totally locked to vision patterning is relatively rare, and often implies a transmitter fault, but if this is so, all viewers of the same transmitter would have exactly the same problem. Do note that co-channel interference often gives the appearance of being locked, as movement is very slow.

Co-channel interference is generally produced by temperature inversions and usually appears as the 'Venetian blind' effects well known to amateurs (see **Fig 2**). Not so common is the appearance of another picture entirely and the possibility of slow movement if the source is overseas.

A good factsheet on weather-related interference can be downloaded from the BBC Reception Advice site.

DIGITAL TELEVISION

DIGITAL TELEVISION presents its own problems. Unfortunately it shows interference of any kind or a poor signal as a failure of the picture once a critical level is reached. Until that point, perfect pictures will be produced.

There is a small area in which 'blocking' effects can be seen but you will not learn anything from it. As there are no on-screen clues, it can make it more likely that the obvious local transmitter (amateur, cellphone or whatever) gets the initial blame.

Resolving interference to digital TV places much higher importance on when the problem occurs. If analogue TV is also affected, the effect on that may prove to be of help.

CALLING IN THE RA

IF YOU CAN'T GET anywhere, or all the above indicates a source that you can do nothing about other than to report it, the only avenue open to is to call in the RA. This is done by using Form RA 179 either on-line from their web site, or obtaining a paper copy by ringing 020 7211 0502 (or 0505).

The RA only investigates interference to radio and television broadcast services. Interference to amateur radio reception does not come into this category. However, there is no reason why an amateur should not report severe interference to the RA for 'information'. This may assist them in specific cases and may also provide background information for spectrum protection requirements.

The RA has recently revised its interference form, and its charging policy. The charge (currently £50) is now only levied if the problem is found to be caused by a faulty or inadequate installation of the radio or television itself. Do note that the requirement is that the person with the problems pays. Where the problem originates from an outside source, such as an illegal radio transmission, or some piece of faulty machinery, the necessary action will be taken without charge. When filling in the form, the complainant should provide as much useful information as possible. The RA does not want to visit at the wrong time, and anything that enables its officers to carry out the on-site work more quickly is much appreciated.

The broadcasters can, and do, report cases of pirate broadcasters interfering with licensed broadcast services. Complaints from the public are helpful and underline the seriousness of the situation.

FURTHER READING

[1] *RSGB Guide to EMC* by Robin Page-Jones, G3JWI, is available to RSGB members only for just £14.99 - that's 25% off the normal retail price of £19.99 - during the month of September only. Order now! For details of how to order, please see pages 86 / 87. ♦

WWW.

Radiocommunications Agency	**www.radio.gov.uk/publication/ra_info/ra179/ra179.htm**

(for obtaining the on-line version of Form 179).

RSGB EMC Committee	**www.qsl.net/rsgb_emc/**

(for much advice and downloading leaflets - see text).

FCC	**www.fcc.gov/cib/Publications/tvibook.html**

(the American Federal Communications Commission. Although all the rules and regulations appertain to the US, their section on interference is very good. Unfortunately the navigation to this was not obvious to me).

BBC Reception Advice	**www.bbc.co.uk/reception**

(a site mostly aimed at the general viewer rather than the specialist. Contains basic hints and help on matters relating to reception of BBC services, and a page showing transmitter work and faults, updated several times a day).

Digital Television Group	**www.dtg.org.uk**

(much information on digital television, including technical data that is also on BBC and ITC sites, but also contains progress information, with dates. From this point of view, can be very helpful).

Independent Television Commission (ITC)	**http://www.itc.org.uk/** *and follow 'ITC groups', then 'Technology group'.*

WHATEVER NEXT

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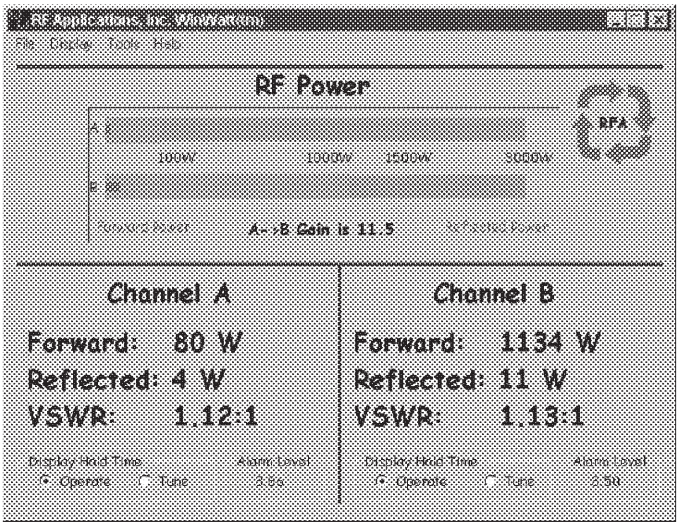
e-mail: steve.white@rsgb.org.uk

FOR ABOUT the last 20 years people have been writing applications for home computers, so much so that today we expect a variety of applications to be available for every imaginable purpose in the shack. These days it quite surprises me when someone comes up with a new application or add-on, especially when it is one that seems so obvious when you discover what it is.

PC POWER METER

MEASURING RF POWER is one of the fundamentals in amateur radio, so why has it taken so long for someone to develop a package (for the amateur market, at least) that uses a sensor connected to a computer to display power, VSWR, etc?

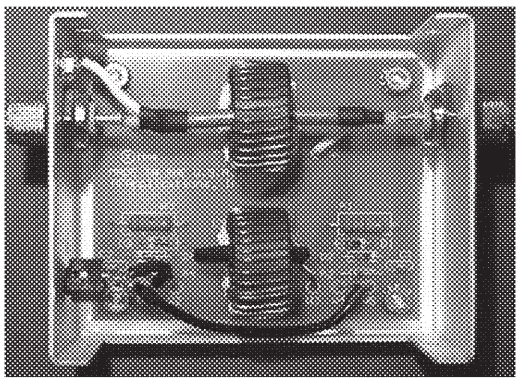
The new package I am talking about is called *WinWatt*, from RF Applications. It is its latest product, developed to complement the existing range of microprocessor-controlled wattmeters. *WinWatt* uses the same sensor as its existing products (see photo below), but connects instead to an interface that plugs into the serial port of a PC. As the picture above shows, this enables the display of forward and reverse power, and VSWR. The interface can accommodate the connection of a second sensor, and if you opt to do so you will also be able to measure the gain of an amplifier, the loss of a length of coax, or the simultaneous VSWR and power on two antennas.



The *WinWatt* screen. Users need a PC with Windows 95/98/NT and an available COM port. The software requires about 3.7MB of disk space.

Of course, once you start employing a computer, the inevitable use of software means that lots of additional features become possible. Features such as user-adjustable alarms, to alert you if the VSWR rises above a given level; being able to display power readings in watts, dBm, or as a percentage of full scale; and the ability to calibrate the unit without adjusting any potentiometers.

RF Applications has adopted a policy of allowing anyone to download freely the *WinWatt* software application from its web site. This is harmless enough. After all, 1) the software is no good without the hardware, and 2) once you have downloaded the software and seen the possibilities, you are more likely to want the hardware that implements it.



Inside view of the P-3000-D sensor, which looks similar to many other power meters.

EVEN LOSSIER COMPRESSION

IT WAS ONLY in July that I mentioned Advanced Audio Coding (AAC), widely seen as a better way of compressing audio files than MP3, but things don't stand still very long in the modern world of communications and it already looks as though AAC might have been eclipsed. The new kid on the block is mp3PRO which is, as you might imagine, the newest incarnation of the popular audio codec MP3.

mp3PRO is a combination of MP3 and SBR (Spectral Band Replication) in a backwards compatible way. SBR is a new audio coding enhancement tool that improves the efficiency and fidelity of conventional audio codecs and offers full audio bandwidth at virtually all bit rates, the practical upshot of which is that mp3PRO files are about half the size of MP3s. mp3PRO has been cleverly designed to be as compatible as possible with MP3, with the result that existing MP3 players will be able to produce a "useful output" from mp3PRO files (presumably this means that they won't sound as good as an MP3), and in the opposite direction mp3PRO players will be fully compatible with MP3 files.

The performance of mp3PRO is said to be significantly higher than that of MP3, with mp3PRO at 64kbps outperforming MP3 at 96kbps. This offers users a convenient way to improve drastically the storage efficiency of portable players. mp3PRO will also be able to improve the fidelity at 128kbps, allowing true CD-quality storage and replay in the home stereo environment. At the lower bit rates used for streaming applications today, mp3PRO will help to increase the audio bandwidth of the compressed signal, giving it a substantial subjective quality boost over current streaming formats.

However, a little research leads me to the conclusion that mp3PRO, despite the fact that it enjoys the advantage of having 'MP3' in its name, might not enjoy an easy ride. This is because several rivals are entering (or have entered) the marketplace. I have already mentioned AAC, but there are also Microsoft's WMA, Sony's ATRAC3, and Universal's Bluematter formats, Liquid Audio, Ogg Vorbis, and others including a licence-free alternative being developed by open-source programmers. All of these formats claim higher quality from smaller file sizes, so it will be very interesting to see how things develop.

THE DESIRED EFFECT

JULY'S ITEM ON improvising a WorldSpace antenna certainly struck a chord. Within a couple of days of publication, Graham Shirville, G3VZV, e-mailed to say the following about my experiment: "It's really in the category of 'why didn't I think of that?'. I spent 30 minutes this morning making my version, as the attached picture [see right - *Ed*] shows. Much more sophisticated, with a reflector held in place with some elastic bands left by the postman, and waterproofed using some non-corrosive Tempflex sealant. It works

fine, of course. Again, many thanks for the inspiration." The reflector that G3VZV used was spaced "about 1.5in" from the driven element, and it would have been my next step if my original experiment hadn't worked.

Frank Osborne, G2CVO, wrote to say "well done", even though he had already bought a commercially-made outdoor WorldSpace antenna. For anyone who is thinking of going down the commercial route, he describes his miniature Yagi, which is of Indian manufacture, as "completely weatherproof" and "beautifully made". Alan Reeves, G4ZFQ, didn't have any success with the satellite dish and bow tie combination, but built an 11-turn LH polarised helical and obtained signals directly (ie no dish). His design was taken from the *ARRL Antenna Book*, the diameter of the turns being 2.6in, spacing 2.0in, and length approximately 22in.

MOTOROLA GP300

JUNE'S FEATURE, 'The Next Generation', in which I discussed re-programming Motorola GP300 handheld transceivers on to 144 or 432MHz, brought-in some interesting correspondence from a PMR workshop engineer, who described the GP300 as "an excellent piece of kit".

In particular, it was brought to my attention that the Motorola model number (located on the serial number label) is 12 digits long and contains some very useful information for would-be purchasers. However, even before you look at **Table 1** above, it is worth noting that the GP300 comes in two types, the 'basic' and the '5T' (five tone). The latter can send five sequential tones for selective calling, but how do you tell one from the other just by looking? Unfortunately it isn't as simple as seeing the presence of a keypad (most, but not all, 5T models have one), it is what happens when you switch the transceiver on that gives the game away. The basic version gives a short beep, whereas the 5T version gives a much longer beep. The model number also tells you - if the 8th digit is a '0' it is a 'basic', and if the 8th digit is a '9' it is a '5T'.

A few e-mails asked how to get a GP300 re-programmed or where the software was available to do it, so clearly there are already some GP300s waiting to be pressed into amateur use. No-one has yet offered information on the source of software - although you should be able to FTP download some from the Internet - so the answer at this time is that you would need to take your GP300 to a Motorola dealer. Ideally this should to one that has a radio amateur on its staff! I am told that the 136 - 162MHz version can be re-programmed for about £15 - £25. I am also told that "the 146 - 174MHz basic version can also be re-programmed to 144MHz by fiddling the program, but a dealer may be reluctant to do this".

There are two important points to note. The first is that the software used to program the basic version is very different from that used to program the 5T. The second is that the transceiver stores the version number of the software being used to program it in a non-backwards compatible way. In other words, if the transceiver was last programmed using version 2.1 software, you will need to use at least version 2.1 software to program it again.

As well as software, a hardware interface - a 'Radio Interface Box', as it is known - is required for reprogramming. These can be purchased, but you can also build your own. Designs are available on the Internet. ♦

Type of unit	Tx Power	Freq.	Model Series	Channel spacing	Channel capability	Freq sub-band	Version	Unique Model
P (Portable)	9 1-5W VHF 1-4W UHF	3 (VHF)	YPC (Universal)	00 (12.5kHz, B)	A (2 channels)	1 (Low Split)	A	
		4 (UHF)		20 (20/25kHz, B)	D (8 channels)	2 (High Split)		A (packaged model with battery, antenna etc)
				09 (12.5kHz, 5T)	C (16 channels)	3 465-495MHz		
				29 (20/25kHz, 5T)		4 490-520MHz		

Table 1: Motorola GP300 model numbers are composed of 12 digits. Example: P94YPC09C3AA. B = basic; 5T = 5-tone; Low split = 136-162MHz if VHF, 403-433MHz if UHF; High split = 146-174MHz if VHF, 438-40MHz if UHF.

G3VZV's WorldSpace antenna.

WWW.

WinWatt: www.rfapps.com and www.arraysolutions.com
mp3PRO: www.mp3newswire.net/stories/2001/mp3pro.html
Ogg Vorbis: www.vorbis.com
Liquid Audio: www.liquidaudio.com
ATRAC3: www.zdnet.com/special/stories/sc/digaudio/help/0,12491,2687934-7,00.html
Bluematter: www.bluematter.com
DIY Motorola Radio Interface Box: www.batlabs.com/2wayrib.html

If there is an item of new technology you would like to know more about - or one that you know about and think ought to be mentioned here - drop a line to the author, or e-mail him at the address at the start of the feature.

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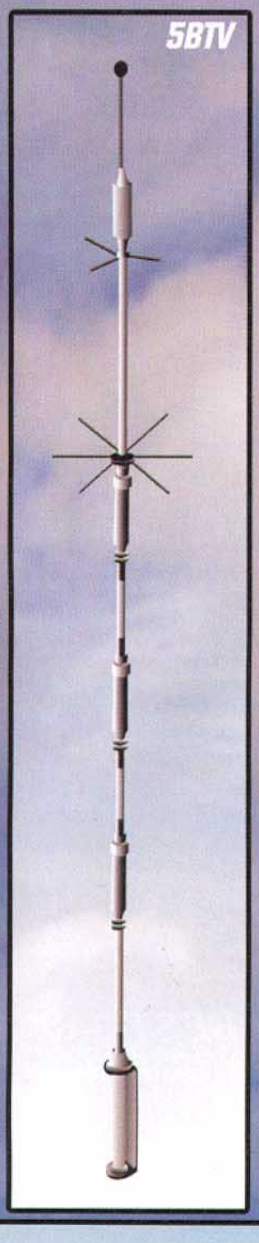

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Keep the postcards coming - and tell us about your holiday radio stories.

See you soon - Chris

MALTA

MOSTA DOME

Hi All,

Having a wonderful holiday and a big thankyou for recommending the Yaesu VX-5R. It just fits the bill, while the missus goes shopping I can continue with my hobby. I'll show you the pics of me with my brilliant new radio when I get back! See you soon,

John

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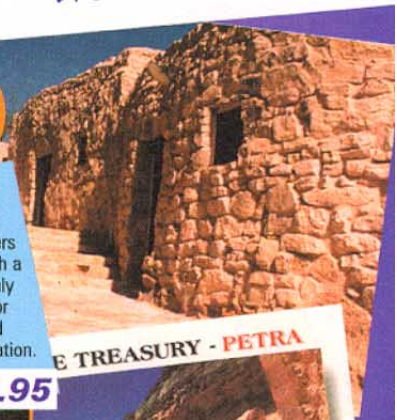

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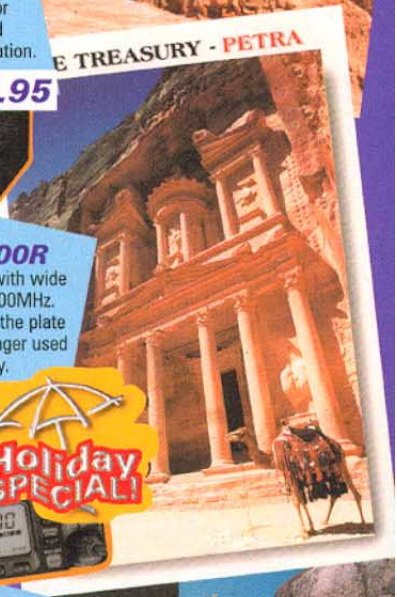

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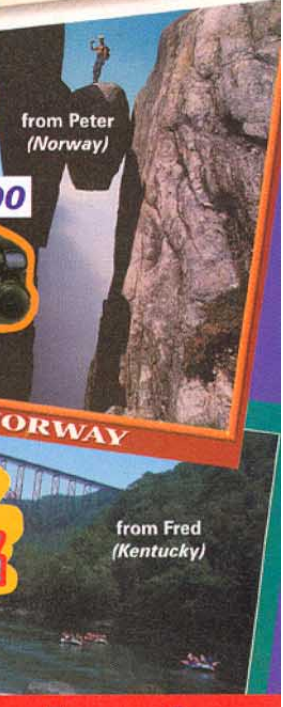

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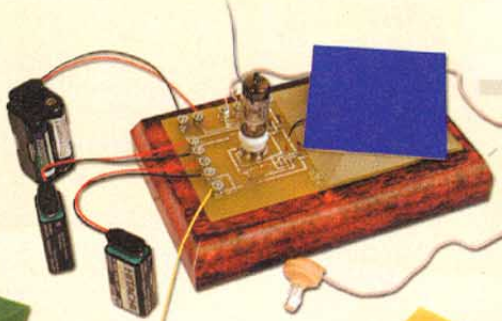

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REPAIRING A TRANSCEIVER recently, I learned a few practical lessons and was reminded of a profound truth... I hope this pin-by-pin account helps your fault-finding techniques too.

I HAD BEEN working on my HF transceiver, on the transmitter side, but when it came to boxing it up again the receiver was more than half-dead. Even when the AF and RF gains were turned right up, there was almost no background noise, and a test with the signal generator showed it could only hear signals at levels of millivolts instead of the usual microvolts. This was the same on all bands, which probably meant that the front-end and synthesiser stages were OK. The problem had to be somewhere in the IF stages or beyond - even though I hadn't been working on that circuit board at all.

Before doing anything else, I spent some time checking the front-panel control settings because, while working on the transmitter, I'd been reaching somewhat blindly around to the front panel and might have changed a few controls. For example, I checked to ensure that the passband tuning controls had not been inadvertently rotated to a setting of 'pass nothing', and that the IF bandwidth settings hadn't been reconfigured to use a filter socket that was empty. Well, it was worth a try... but no luck there.

Still, it had to be something I could have done accidentally in the last few evenings, so that immediately eliminated a lot of possible causes such as switch failures, alignment problems or any kind of ailment that comes on only gradually.

Armed with that knowledge, I set about probing down the IF stages with a 'scope, while the millivolt RF signal was being fed into the front-end (**Fig 1**). With the high-impedance 'scope probe, a millivolt at the 9MHz IF input was just enough to see at the input as a thickening of the trace, and signal levels gradually build up along the IF stages and became easier to see. The AGC was turned off so that any observed changes in signal level would be real ones.

The signal path from the input of the IF board through the two filter banks at 9MHz and 455kHz was not hard to trace with the help of the circuit diagram, which told me that the IF amplifiers were dual-gate MOSFETs. Even without any pinout diagrams for the four-pin SMD packages, it was easy to see which pin was gate 1 with the RF input signal on it, and which one was the drain with a much larger copy of the input signal. Input signals to the IF filters could be checked against the output signals, which were slightly smaller and showed the filter passband when the receiver was tuned across the input signal.

Modern transceiver IF boards probably contain several stages of frequency conversion, and in this transceiver the IF mixers were the venerable MC1496 in a modern miniature SMD package. (To help me probe the SMD pins accurately without letting the probe tip short to the next pin, I was wearing extra magnifying 'half-eyes' over the bottom of my normal glasses, and squinting up at the 'scope screen out of the top.)

Everything seemed OK until I got to the second and final 455kHz IF stage. This was supposed to be identical to the stage before it - but it didn't have any RF gain. The output signal level at the drain was almost identical to the input level on gate 1. It was hard to see how anything I'd done earlier could have caused that one stage to fail, without anything else nearby being affected; but I set that question aside for the moment.

I then checked the DC voltages on the four pins of each MOSFET, first measuring the stage that was working to establish what was 'normal'. The suspect device was running at a much lower current, evidenced by a reduced voltage across the source resistor, and the gate 2 voltage seemed abnormally low. The final clue was that although the current in the working MOSFET could be varied by the RF gain control, exactly as you'd expect, the source voltage of the suspect stage didn't budge. That didn't make sense, because gate 2 of each MOSFET was fed from the same point through a 10kΩ decoupling resistor.

By this time I was surrounded by clues which I very nearly missed! The whole problem was caused by a tiny solder splash, as thin as a hair and not much longer than a millimetre, bridging gate 2 of the MOSFET to ground, possibly why I needed an extra magnifying glass to be certain it was there at all. So I switched off, carefully scraped off the solder bridge with the tip of the 'scope probe. When I switched on again, the receiver burst into life.

How that solder splash got there, I don't know and never will. The practical lesson is that when working on modern SMD boards where such a tiny thing can make such a huge difference, it's best to use 'surgical technique' and mask off everything except the immediate work area with a sheet of paper.

The profound truth I'd been reminded of was from that amazing book, *Zen and the Art of Motorcycle Maintenance* (yeah, man, go read it). This was about removing a stuck screw, but exactly the same lesson applies to electronic fault-finding. Robert Pirsig wrote: "Normally screws are so cheap and small and simple you think of them as unimportant. But now you realise that this one, individual, particular screw is neither

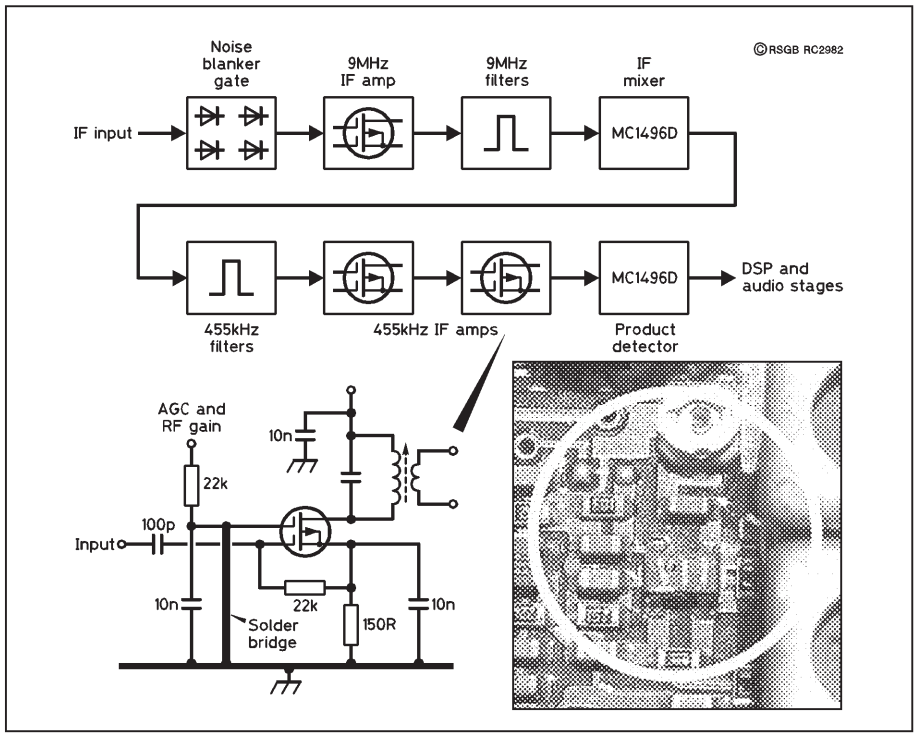


Fig 1: Outline of the transceiver IF board where the fault occurred. Inset: the actual board.

cheap nor small nor unimportant. Right now, this screw is worth exactly the selling price of the whole motorcycle, because the motorcycle is actually valueless until you get the screw out." When you finally realise that, you start to give that one little part all the attention it really deserves, and then you're well on the way to solving the problem. So it was with that tiny splash of solder - until it was tracked down with relentless logic, it was worth the whole value of the transceiver. At £1000 a milligram, I should have kept it.

Q OF AN ATU NETWORK

WHAT IS THE optimum loaded Q for an L-network ATU?

THE OPTIMUM Q is the lowest that will achieve the required impedance transformation, because that gives the lowest loss in the ATU components. The loss (as a fraction of the applied power) is given approximately by (Q_L/Q_U) where Q_L is the loaded Q of the network and Q_U is the unloaded Q of the components. Since Q_L is on the top line of the fraction and Q_U on the bottom line, you want Q_L to be as low as possible, and Q_U as high as possible. The unloaded Q of air-spaced variable capacitors is usually very high, so in practice Q_U for the entire impedance-matching network is associated almost entirely with the inductors, switches and wiring.

Note that the Q_L of the matching network needs to be as *low* as possible. This runs contrary to the old-fashioned folklore about the ATU providing additional harmonic suppression, but it's entirely correct. If you need more harmonic suppression, use a proper low-pass filter between the transmitter and the ATU. Any harmonic attenuation an ATU can provide is both unreliable and not enough to be worth having. Conversely, don't ever worry that some ATU configurations such as the popular C-L-C T-network (**Fig 2(a)**) have a notional high-pass characteristic - if you have harmonic problems, don't blame the ATU, but fix the transmitter because that's where the real problem lies.

However, Q_L must have a certain minimum value in order to achieve the impedance transformation. Approximately, this minimum value is given by:

$$Q_L = \sqrt{\frac{R_2}{R_1} - 1}\,.$$

For example, in order to transform 50Ω up to 1000Ω, the minimum possible loaded Q is about 4.4. To transform 50Ω down to 10Ω, the minimum possible loaded Q is about 2. The actual values will vary with any additional reactance in the source and load impedances, but you see the idea.

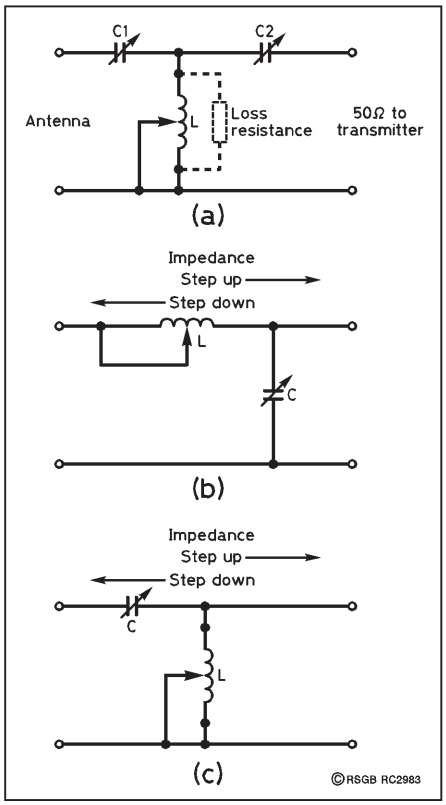


Fig 2: (a) A 'three-knob' ATU like this popular C-L-C configuration allows impedance matching at various levels of loaded Q, which can give higher losses than necessary; (b) The 'two-knob' L-networks only match at one value of loaded Q, which is automatically the optimum; (c) Shorting out C2 to produce a step-up or step-down L-network.

Returning to the original question about the L-network, there are eight possible configurations of L and C, each of which has its own range of impedances between which it can match. **Fig 2(b)** is probably the most common example for matching to impedances higher than 50Ω. When you use a network of only two components to match between two arbitrary impedances, there is only *one* combination of L and C values that will do the job. That means there is only *one* possible value of Q_L and that's the value given above. The maximum, minimum and optimum values of Q_L all coincide and you have no choice about it. It requires a 'three-knob' network such as the C-L-C of Fig 2(a) to open up the possibility of matching at various levels of Q_L - and that's where operator error can introduce significant losses leading to high currents (overheating) and/or high voltages (danger of arcing).

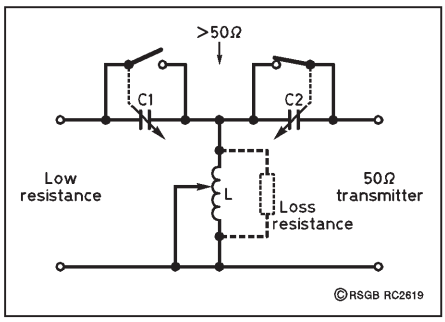


Fig 3: G3LNP's conversion of a C-L-C ATU into either a step-up or a step-down L-network.

This general rule applies to any three-component network. Three adjustments will give a wider range of impedances that can be matched (see below), but if you have three truly independent knobs to twiddle there is a possibility of getting a match at unfavourably high levels of Q_L. Previous 'In Practice' columns have given the correct procedure for optimum matching using the C-L-C network, but the most elegant solution was put forward by G3LNP [1], which is to short out either C1 or C2 at its maximum setting, thus converting the ATU into either a step-down or a step-up L-network - **Fig 2(c)**. If the required L and C values can be realised in practice with a good Q_U, these two networks can match any impedance with optimum Q_L. **Fig 3** shows the impedance step-down configuration, which is particularly useful for the low impedances that the C-L-C network finds difficult.

TOROID TROUBLES

G4CXT and G8IZR have found an interesting fault that can develop on older toroidal inductors.

G4CXT WROTE: "My Ten-Tec Corsair stopped transmitting on 40m a few weeks ago. I figured quite early on that it was a fault in the low-pass filter, and guessed it was a capacitor breaking down. However, it turned out to be more subtle. One of the toroidal inductors had been wound too tightly on the former and, after 12 years of intermittent RF, the insulation had finally cracked on two adjacent turns, thereby creating a shorted turn and no RF power output. The scorching on the former gave the game away. Quite simply fixed, of course, once diagnosed, but a lesson for all constructors not to pull the wire too tightly when winding toroidal coils, and to remove any sharp edges on the inside of the former before starting."

G8IZR added, "Just about the same thing occurred on my 70MHz transverter, and was quite a pain to find. Well worth remembering!" ♦

REFERENCE

[1] 'Save Your Tuner for Two Pence', by Tony Preedy, G3LNP, *RadCom*, May 2000.

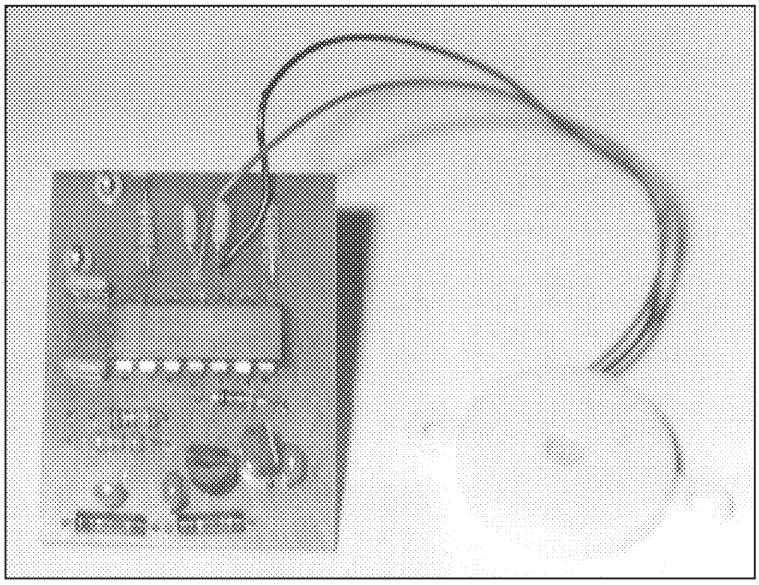
If you have new questions, or any comments to add to this month's column, I'd be very pleased to hear from you by mail or e-mail. Please remember that I can only answer questions through this column, so they need to be on topics of general interest.

An Audible RF Warning Indicator

By Andrew Dermont, M5AGY / G8BGT *

ONE OF THE most interesting constructional projects to have appeared in *RadCom* in recent months is the 'Stealth Antenna Tuning Indicator' [1].

Having constructed it, I was so impressed with the performance that I decided to fit it permanently into a home-built Z-match ATU.



The complete RF Warning Indicator, with piezo-electric transducer attached.

PROBLEMS

ALMOST AS SOON as the project was completed, a rather serious problem became apparent. The very nature of the noise bridge used in the indicator meant that when the antenna was successfully matched to the transceiver, all (or nearly all) of the 'noise' generated by the device disappeared.

The old adage 'out of sight, out of mind' means that it is very easy to forget to switch the indicator out of circuit before operating the transmit switch. The result of applying 100 watts (or more) of RF to the indicator bridge circuitry can be quite spectacular and destructive.

It is probably rather fortunate that the initial indication of the above conditionis a large quantity of smoke from the 50Ω bridge resistor network - at this point the user will realise that all is not well and will hopefully switch back to receive before further damage is done. Even so, it does become rather tiresome to have to keep replacing resistors!

After the third such event in two weeks, it was decided that some form of protection, or warning of impending disaster, should be considered.

SOLUTION

THE ZL3KB STEALTH indicator uses a pair of diodes across the final transistor to offer some protection and one possible solution was to add another pair of high power diodes directly across the output toroid.

There are at least two major problems with this approach:

- The capacitance of the diodes will possibly upset the accurate nulling of the bridge - particularly at higher frequencies.
- Placing a pair of diodes almost into the RF signal path may have an effect on receiver performance, and is most definitely not a good idea if you are keen to avoid the perils of TVI!

After a great deal of thought, it was decided that some form of RF-activated alarm was required. No great originality is claimed for the circuit finally decided upon - but it works well and does the job. It can be mounted, with the stealth indicator, either inside an ATU or, as described in the April 2001 *RadCom*, as a free-standing unit.

THE CIRCUIT

THE COMPLETE CIRCUIT is shown in **Fig** 1. IC1c and IC1d form an astable multivibrator with R3, R4 and C3, C4 chosen to provide an output of approximately 2kHz to the piezo transducer, X1.

4 Fox Close, Burghfield Common, Reading, Berks RG7 3NA.
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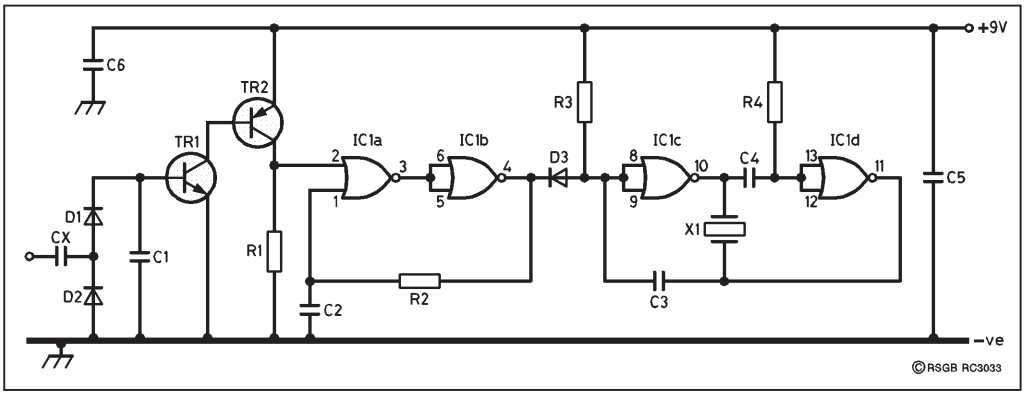

Fig 1: Circuit diagram of the Audible RF Indicator.

When DC power is first applied, the output of IC1b (pin 4) will always be low; this has the effect of holding the astable 'off' due to diode D3.

TR1 and TR2 form a slightly unconventional high gain DC amplifier with both TR1 and TR2 normally non-conducting.

Any sniff of RF detected by diodes D1 and D2 will cause TR1 and TR2 to conduct, pulling pin 2 of IC1a high; the output of IC1b (pin 4) also swings high and the astable produces a piercing shriek through the piezo transducer - which, due to the latching action of R2, will only be silenced by removing the DC supply to the board.

CONSTRUCTION

THERE SHOULD be no difficulty in constructing the circuit if the printed circuit board described below is used. The track side of the PCB is shown in **Fig 2(a)**, with the component layout being shown in **Fig 2(b)**. Alternative methods of construction, such as stripboard, will also be equally satisfactory.

None of the components is critical and almost any silicon transistors could be used for TR1 (npn) and TR2 (pnp). Diodes D1 and D2 *should* be germanium, otherwise the RF sensitivity will suffer.

In the prototype, IC1 was soldered directly to the board, although a 14-pin socket could be used if you are not keen on soldering direct to static-sensitive ICs. The only part of the construction that does require some care is the soldering of diodes D1 and D2 - this needs to be done as quickly as possible in order to avoid 'cooking' the diodes.

TESTING

BEFORE APPLYING POWER, check carefully for solder bridges, wrongly-placed components, diode and transistor polarity etc.

A PP3-type battery or current-limited 9VDC supply can now be connected. If all is well, apart from a small click from the piezo transducer, nothing will happen.

If a source of one watt or more of RF, such as a hand-held transceiver, is placed within a few centimetres of D1 and D2, the alarm should respond with a loud 2kHz tone. This can only be silenced by removing the DC supply to the alarm.

INSTALLATION

THE ALARM is now working as designed and can be installed using double-sided sticky pads. If it is to be fitted inside an ATU, it should ideally be positioned some 4 - 5cm from the main ATU tank inductor, or any other point where a reasonably high RF field is present.

It is not absolutely necessary to drill a hole for the transducer, X1; although providing one will considerably increase the intensity, the sound level is still quite high if the piezo transducer is just fixed to the inside of the box with small blobs of glue.

If the alarm is to be used in a stand-alone unit, mounted inside the same box as the stealth indicator then, to ensure proper operation, it will be necessary to wrap a single turn of insulated wire around the lead which runs from 'Pad 2' on the stealth indicator PCB to 'S1' (the on/off switch) and connect it to point 'A' on the alarm board (Fig 2(b)).

For obvious reasons, the DC supply should be obtained from the 9V supply to the stealth indicator - 'Pad 4' on the PCB, after switch S1. This means that as soon as the indicator is switched off, the alarm is also no longer active.

In order to check that all is working correctly, *with the stealth indicator switched off,* the transceiver should be tuned up on any HF band, into a dummy load and at a modest power output of 10 - 15 watts. Now go back to receive and switch the indicator on.

Key-down, or speak into the microphone and the alarm should loudly warn you that all is not well in the antenna matching department!

The remedy is, of course, to switch the indicator off (and hence the alarm as well) *immediately*.

If the alarm fails to sound, (or a lower power level is to be used) it may be necessary to increase the amount of RF coupling, either by moving the alarm board slightly closer to the ATU tank coil, or by increasing the pick-up coupling to two or even more turns.

OTHER USES

THE UNIT can also be used as a sensitive, broad-band, stand-alone RF alarm/indicator. If used in this way, an external pick-up rod antenna should be connected (via Cx) to point 'A' on the circuit board, shown in Fig 2(b).

An alternative application for the alarm is as a CW side-tone indicator. In this case, it will be necessary to remove R2 so as to disable the 'latching' function. A small pick-up rod antenna as described above will probably also be required in order to obtain reliable triggering.

The audio sound level can be reduced by adding a suitable resistor in series with the piezo transducer, X1. ♦

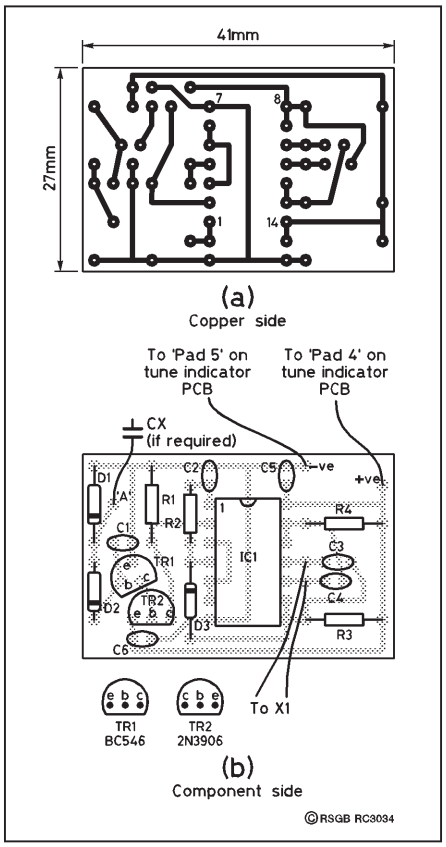

Fig 2: The PCB viewed from (a) the copper track side and (b) the component side.

REFERENCE

[1] 'Antenna Tuning by Stealth', by Kelvin Barnsdale, ZL3KB, *RadCom* April 2001, pp17-21.

COMPONENTS LIST

Resistors (¼W)

R1	27kΩ
R2	2.2kΩ
R3, R4	5.6kΩ

Capacitors (miniature ceramic)

C1, C6	10nF
C2, C3, C4, C5	100nF
Cx	1nF

(Cx required only if alarm is to be used with external pick-up antenna)

Semiconductors

IC1	CD4001 (4 x 2 input CMOS NOR gate)
TR1	BC546 (or almost any npn type)
TR2	2N3906 (or almost any pnp type)
D1, D2	OA81 (or similar *germanium*)
D3	1N914 (or similar)

Miscellaneous

X1	Piezo transducer (Maplin Part No KV58M, KM59P or similar)

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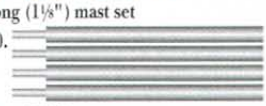

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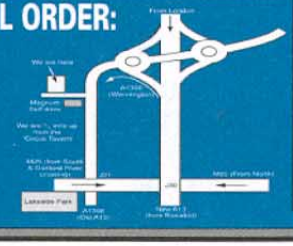

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CLOUD-WARMING NVIS ANTENNAS

TRADITIONALLY, AMATEURS have, in theory, regarded the HF spectrum as a medium in which to strive to make long-distance contacts, seeking to erect antennas with their major radiation lobes at low vertical angles. Yet, in practice, much of our operation, at least on the 1.8, 3.5 and 7MHz bands, has been in the form of 'nets' or regular 'skeds' with friends located within our own or neighbouring countries, anywhere between a few miles and a few hundred miles distant. It is precisely this range that is subject to the variable silent or skip zone that may change markedly with the diurnal, seasonal and sunspot cycles. There is an increasing awareness that, for national rather than international working, far more reliable contacts can be made by exploiting NVIS (near-vertical incidence skywave propagation) by the use of antennas designed to radiate strongly in the vertical direction.

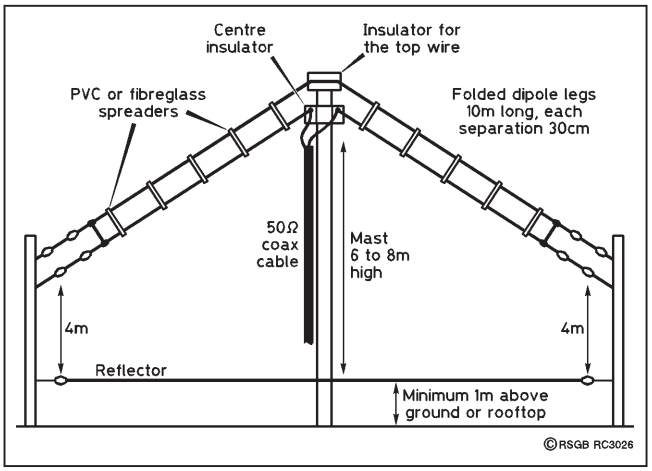

Fig 1: CO2KK's folded dipole plus reflector NVIS 'cloud warmer' antenna for 7MHz. If fed with open-wire line, it is usable also on 10MHz. Scale for 3.5MHz.

This shift in priorities is reflected in HF tactical communications by the military and for rescue, emergency and disaster-relief operations. An early application of NVIS was for tropical HF broadcasting and an excellent *RSGB Bulletin* article 'Skybeams, Moonbeams and Howitzers', by the late Paul Sollom, G3BGL/VS7PS, Part 1, July 1952 and Part 2, August 1952, described pioneering work in Ceylon (Sri Lanka). To quote an editorial introduction: "Popular misconceptions concerning the use of very high-angle radiation, and the inevitability of skip zones for short-wave communication, are exposed by the author in this description of his investigations into unconventional aerial and propagation techniques, carried out in Ceylon with the aid of local amateurs. Although erection of the aerial systems described may be beyond the scope of most readers, the article indicates how professional organisations sharing our low-frequency bands could increase efficiency and minimise interference, resulting in much mutual benefit."

G3BGL described the use of vertically-radiating multi-element arrays. Experimental antennas at VS7PS were designed for the 7MHz band, but the techniques developed were adapted for tropical broadcast services in the 90m, 60m, 49m, 41m and 31m bands.

'TT' has reported a number of times, most recently February 2001, on current military and professional interest in NVIS, for example by replacing the short vertical whips by various forms of loop and inclined whip antennas, 'TT' has also shown that a very low dipole antenna (a few feet above ground) radiates strongly in the vertical direction. Poor for DX but excellent for NVIS!

A recent article by Arnie Coro, CO2KK, 'Build a "Cloud Warmer" NVIS Antenna System' (*CQ*, May 2001, pp90-91) reports on the effective use by CO4BM of a 7MHz dipole "really close to the ground" during hurricane emergency operation, outperforming conventional dipoles at typical heights of 10 to 15 metres.

CO2KK also describes the system that he has used for some three years, designed explicitly for NVIS, comprising an inverted-V folded dipole plus closely-spaced reflector element: **Fig 1**. He reports that this antenna delivers a very strong signal during local daylight hours in the range from about 30 to 300km (20 to 200 miles) "while its behaviour during the ionospheric transitions that occur around sunrise and sunset make it particularly useful to keep communications running during emergencies". Note that, with a high power transmitter, there will be high RF voltages at the ends of the 'reflector' and care should be taken that this does not present a hazard to human beings or animals.

A novel if rather more complex antenna design for NVIS HF communications has been presented by Duncan Telfer, G0SIB, and Brian Austin, G0GSF - both of Liverpool University - at the 2nd International Conference on Advanced Engineering Design at Glasgow (June 2001). An experimental model has been built by G0SIB for the 7MHz band, and computer studies using NEC2 include use for mobile applications and for VHF/UHF. Two patent applications are pending.

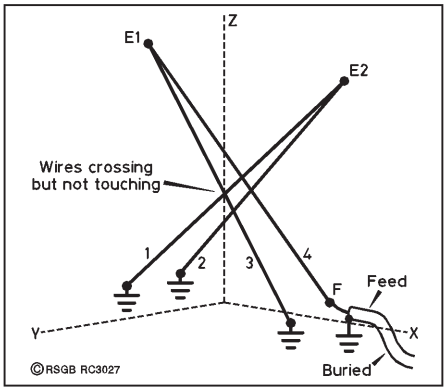

Fig 2: Basic form of the novel NVIS antenna as developed (patent applied for) by G0SIB for 7MHz, comprising inclined dual-folded (tapered) monopoles, one fed between point F and earth, the other parasitically excited. Note that the wires cross without touching. Described in association with G0GSF at the 2nd International Conference on Advanced Engineering Design (Glasgow, June 2001). It provides the desirable near-spherical far-field pattern with maximum gain at 90-deg elevation.

The Abstract of the paper (pages 357 to 362 of the Conference Proceedings) reads: "NVIS propagation for HF radio communication is gaining interest as an effective alternative mode for rescue, emergency services, disaster relief and tactical military operation in situations where the ground-wave path fails. By using the right frequencies and near-vertically directed antennas, NVIS can virtually eliminate the skip dead-zone, as use is made of those parts of the ionosphere at higher elevations. Favoured antennas have included near-ground and buried horizontal dipoles and inclined whips, the latter for mobile operations. In this paper, a novel type of alternative antenna is discussed, for which theoretical calculations (NEC2) predict near-spherical vertically-directed far-field patterns. Comparisons with practical tests demonstrate that the design concept, which embraces an antenna 'family', is particularly well suited to NVIS. Design constraints for vehicular operation are also discussed, as are variations of the design for linear and circular polarisation, and instantiations for use on other frequencies (VHF/UHF)."

Basically, the approach used in this new family of designs is based on configurations featuring inwardly-tilted (non-touching) vertical, folded (tapered), monopoles, one fed at the base, the other(s) parasitically excited: **Fig 2**. To quote the Conference paper: "Theoretical predictions using the EZNEC implementation of the NEC2 'method of moments' calculations suggest that antenna 'families' of this kind can be constructed with near-spherical far-field patterns. On-

axis (Z) gains of around 8dBi can be realised with half-power beamwidths of between 55 and 90°: **Fig 3**. With the arrangement shown, the phases of the antenna currents in the quarter-wavelength monopole elements lead to field cancellation in the XY plane and reinforcement in the Z direction. Conveniently, the SWR can be readily adjusted for direct unbalanced feed with standard 50Ω coaxial cable between point F and earth. Wider frequency range using the same antenna can be achieved by maintaining antiphase (180°) feed between point F and earth and between point 1 and earth. Instantiations of the scheme for practical tests use supported wires for HF, and reduced-scale VHF/UHF versions with an artificial groundplane."

A completed 7MHz wire-antenna at the home of G0SIB is suspended from a polypropylene cord that runs between a house chimney and a vertical tilt-over mast. Although conducting, the mast is sufficiently shorter than a quarter wavelength not to affect adversely the NVIS properties of the far-field pattern. Practical tests were carried out in the 7MHz amateur band between G0SIB and G0GSF (20km apart); between G0SIB and M1DZH (30km); and through several other 'inter-G' contacts. Rigorous testing would require, for example, RF field monitoring using a transmitter supported by a tethered balloon and will be the subject of future work. Meanwhile, other tests carried out on VHF and UHF versions of the design have demonstrated good agreement with the NEC2 predictions. NEC2 predictions suggest that HF NVIS operation would be practicable, with this design, from Land Rover-type vehicles using loading coils, although this would significantly limit the operational bandwidth. Another proposed application is for ionosonde or riometer antennas using a symmetrical multi-element inclined monopole design.

G0SIB and G0GSF summarise their work and conclusions as follows: "In NVIS, ionospheric reflection near the critical frequency (f_{0_E} or f_{0_F}) overcomes difficulties posed by ground-wave attenuation or obstruction by intervening terrain and is a technique of particular interest when suitable satellite-relay facilities are unavailable. Successful exploitation of NVIS for disaster relief and emergency services requires reliance on, and access to, reliable data sources for critical frequency values peculiar to the times and locations of the communication paths. A novel antenna design based on inwardly-inclined quarter-wave monopoles provides the necessary vertically-directed far-field pattern over a useful frequency range, subject to maintaining antiphase feed in each element. Viable support structure options – a catenary insulator rope, or radial insulating ropes from a central mast – allow flexibility of choice and ease of assembly. The design of a variant for circular polarisation yields a particularly symmetrical far-field pattern, and is proposed for ionosonde and riometer applications."

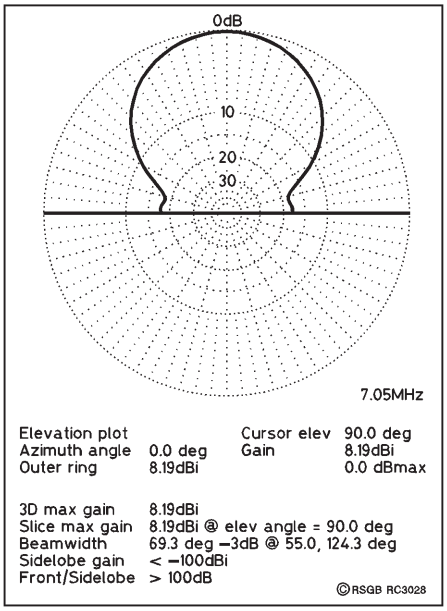

Fig 3: Sectional far-field EZNEC plot for the inclined dual-folded monopoles above perfect ground.

Duncan Telfer, G0SIB, adds some additional information: "The XYL is still quite happy (well, tolerant) to have the linearly-polarised 7MHz version adorning the back garden, and we have configured the garden design, including a pebble bed for potted plants, around the antenna. This also prevents people from tripping over the feed point, which is about 6in above ground and connected to buried unbalanced 50Ω coaxial cable. The 'ground stakes' at the earth ends of the wires are actually buried steel girders with protruding hooks for zinc-plated turnbuckles (courtesy of B&Q DIY stores) which tension the wires. With an MFJ Versa Tuner, it fires up nicely on the 3.5, 14, 21 and 28MHz bands, but with far-field radiation patterns different from that on its design frequency of 7MHz. A more detailed constructional article is planned."

I cannot help feeling that the cause of NVIS for emergency and relief operations (or for UK inter-G working by amateurs) would be strengthened if a small frequency allocation around 5MHz could be negotiated at a future ITU World Radiocommunication Conference. As we descend again towards the sunspot minimum, daytime critical frequencies can be expected increasingly to be significantly below 7MHz for much of the time. It is perhaps too much to hope for a similar additional allocation somewhere in the region of 2.75MHz!

AGC FOR D-C RECEIVERS

ERIC CHRISTER, Z21FO, provides information on a simple AGC system that he has found quite effective when used on a direct-conversion receiver. He writes: "In the arrangement shown in **Fig 4**, the purpose of the diodes in the input to the circuit is to prevent low-volume audio causing the AGC to operate. The components, values etc are not critical, but some experimentation would be helpful in matching to the characteristics of the particular receiver. As a start, simply feed a DC voltage to the PIN diode (or any diode) via the 470Ω resistor and determine the attenuation of the signal that can be obtained before deciding to build the complete circuit. Wiring of the components at the antenna input should be kept as short as possible to create a low impedance path. Change the value of 220µF electrolytic capacitor in order to slow down or speed up the AGC decay time. The brightness of the LED gives some indication of the signal strength."

POTENTIOMETER TUNES WIEN BRIDGE AF OSCILLATOR

A NOVEL FORM of Wien Bridge oscillator (**Fig 5**) that is tuned by a single-track potentiometer from about 500 to 6000Hz was described in *Electronics World* (De-

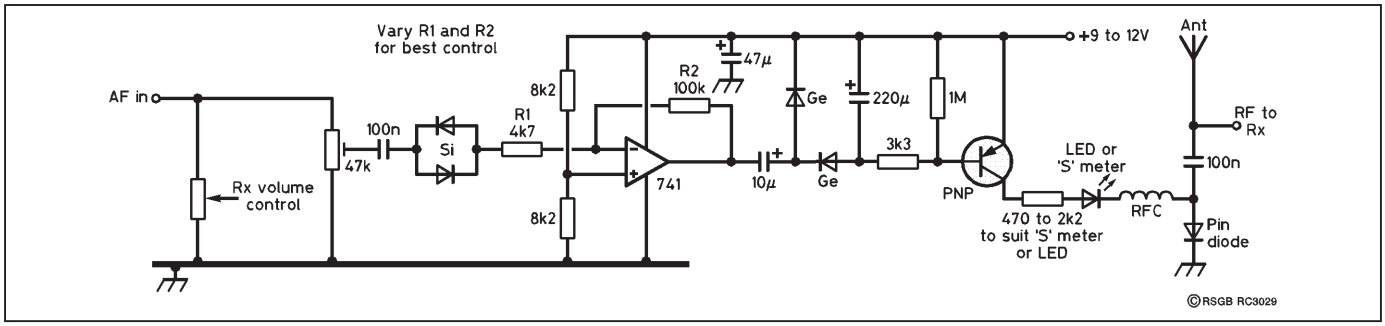

Fig 4: Z21FO's simple AGC system for direct conversion receivers.

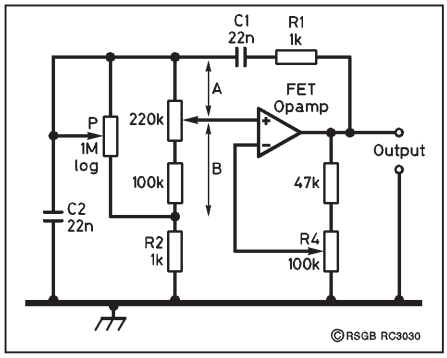

Fig 5: Wien bridge AF oscillator tunable with single potentiometer from about 500 to 6000Hz (George Short in *Electronics World*).

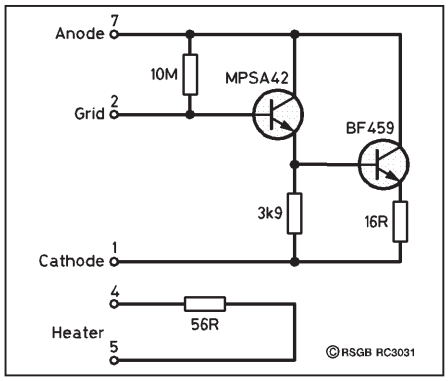

Fig 6: Circuit diagram of the PL502s solid-state, plug-in replacement for the PL502 video amplifier (B9A) valve as marketed some years ago by Edicron of London using high-voltage bipolar transistors in a Darlington configuration with heat-sink and high-wattage resistor to permit the device to be used with series-chain heater sets.

cember 2000, p971) by George Short of Brighton. [I suspect he is the George Short who for many years was a member of the BBC World Service Science Unit at Bush House.]

He states that a Wien-type network can be modified to give smooth change of the zero-phase-shift frequency, f_0, at constant attenuation by varying the single-track resistance, P. C1, C2, R1 and R2 form the basic reactive arms of the bridge. It is convenient to make C1 = C2 and R1 = R2, whence

$$f_0 = \frac{1}{\sqrt{2\pi R1C1}}.$$

The added resistances A and B enable the frequency to be varied by P. When P = 0, the frequency will be f_0 but, as P is increased, the frequency falls. For one setting of the A/B combination (B = 2A), the attenuation factor is constant at 3. To avoid loading the network, the op-amp must have a FET-input, preferably with a low input capacitance.

To set up, set P to zero and adjust R4 for weak oscillation, then adjust P to maximum and adjust A/B for weak oscillation. These settings should be retained. To avoid cramping at the HF end, add a fine-tuning resistance of a few kilohms in series with P. The arrangement can be even more useful in selective amplifiers where consistent performance can be obtained over a range of frequency [as tunable CW filter etc].

SOLID-STATE VALVE SUBSTITUTES

BERNARD BUTCHER, G4HKG, was interested to see the July item on the high-voltage-FET substitute for an octal-base 6V6 audio-output valve. Many years ago, he came across a commercial range of solid-state 'electronic valve substitutes' by the UK firm Edicron. Recently, he found one in a box given to him by another amateur. He writes: "This was the PL802s intended as a plug-in replacement for the PL802 video amplifier valve with a B9A base. Basically, it comprises two high-voltage transistors - MPSA42 and BF459 - in a Darlington configuration: **Fig 6**. These are bipolar transistors designed for 300V operation. A high-wattage 56Ω resistor is incorporated to permit direct substitution in the usual valve TV series heater chain. The device also includes a substantial heat sink. I intend to try the PL802s as a power-amplifier for a simple transmitter since it is capable of handling about 6 watts up to about 40MHz."

G4HKG thinks it might be possible to use a similar arrangement as a substitute for some of the rarer types of valve provided a suitable base could be constructed. It might, however, be difficult to devise a plug-in replacement for a triode-hexode frequency changer.

EXPANDING WORLD OF SUPERCONDUCTIVITY

SOME FIFTEEN YEARS ago, the scientific world went into overdrive when it was announced that Bednorz and Müller of IBM Zurich had discovered that some ceramic oxides composed of barium, yttrium, copper and oxygen exhibit zero resistance (superconductivity) at temperatures above that of liquid nitrogen (77K). Liquid nitrogen is available as a coolant at a fraction of the cost of liquid helium (4.2K) needed to induce superconductivity in metals. Today, it is also possible to reduce and keep temperatures down to that of liquid nitrogen using electrical refrigeration techniques to provide a compact coolant system.

This discovery sparked off an intense flurry of scientific investigation into 'high-temperature' superconductors and into possible applications. It brought a Nobel Prize for Physics to J G Bednorz and K A Müller.

Superconductors are materials that lose their resistance to electrical current flow below a critical temperature, *Tc*. Theoretically, an electric current flowing in a loop of superconductive wire would flow forever, never losing any of its energy. In practice, there are small losses from tiny flaws, and absolute zero resistance is never achieved. Critical temperatures as high as 160K have been reported for some exotic compounds. This is still very cold (-113°C) but well above absolute zero (-273°C)

Conductors with near zero resistance would provide communications engineers with a number of potential breakthroughs: electrically-efficient small antennas that could defeat the classical limitations imposed by low radiation resistance; matching elements to ensure that the transmitter output feeds into such antennas; inductors with extremely high Q, fashioned into filters comparable with those formed from ceramic or even crystal resonators, to name just the more obvious advantages. For electrical engineers, superconductivity would mean more powerful magnets, lossless transmission of power, etc. We could enter a world of virtually perpetual engines, trains magnetically floating above the tracks, and ultrafast computers.

These 'pluses' have to be set against the problem of providing the necessary cryogenics. It is not easy to keep an entire antenna or matching unit at the 77K temperature of liquid nitrogen, let alone the classic requirement of 4.2K with liquid helium. But it soon transpired that there was a further problem, which affects some, but not all, potential applications of high-temperature superconducting materials. There is a serious problem in making wires from the high-temperature copper oxides capable of carrying high currents without losing superconductivity.

Practical applications of classical superconducting metals already exist, for example magnets used in magnetic resonance imaging instruments are cooled below the *Tc* of their metal-alloy wires with liquid helium.

It is difficult to estimate the extent to which high-temperature superconducting (HTS) systems are currently in use in the communications field, although there is little doubt that the military have been interested over the past decade. I recall attending in late 1989 an IEE Colloquium on electrically-small antennas (incidentally under the chairmanship of Dr Brian Austin, G0GSF). Several papers were presented on the use of HTS, although it was then already clear that copper-oxide ceramics have mechanical and electrical characteristics that complicate their use in practical systems. Much effort was still being directed towards the improvement of the material processing, including the growth of large-area superconducting samples, and to increase the maximum current density in the superconducting state.

Nevertheless, Professor J R James of the then Royal Military College of Science Shrivenham, in conjunction with ARE Portsdown and ARE Holton Heath was work-

ing on the design of a small 500MHz loop receiving antenna using a matching capacitor formed from superconducting plates. The loop radius was only 7.5mm for an application demanding near 100% efficiency, no added circuit noise and a very narrow bandwidth. Other HTS work on small antennas was reported by speakers from Birmingham and Bradford universities and ICI. See my report in *Electronics World & Wireless World* (January 1991, p82).

David Williams, G3CCO, and Brian Bower, G3COJ, have drawn attention to a current civilian project which plans to use HTS to provide extremely high-Q UHF input and output channel filters for the new generation of UHF low-power TV transposers ('Transposer Systems for Digital Terrestrial Television', by P B Kenington *et al*, *Electronics & Communication Engineering Journal,* February 2001, pp17-32). It is claimed that HTS filter technology promises to deliver a combination of compact size and exceptionally high component Q-factors, despite the need to provide cooling to about 80K. This would involve the use of a relatively expensive cryocooler, incorporating a linear motor and in which cooling is produced pneumatically by controlling the phase angle between the compressor and displacer. The cryocooler operates on a closed thermodynamic regenerative cycle with near isothermal compression and expansion of the working gas (pure helium) at various temperature levels. It would appear that such cryocoolers have emerged from military systems and are continuously achieving run times of greater than five years. **Fig 7** shows the measured response of a prototype superconducting five-pole channel filter - a response that could not be achieved using conventional filters.

Recently, a highly-significant development has rocked the scientific world and may open the way for the many heavy-current applications of HTS that are impracticable with the copper-oxide materials: 'Genie in a Bottle', by Robert J Cave. This comments on 'Strongly-Linked Current Flow in Polycrystalline Forms of the Superconductor MgB_2', by D C Larbalestier et al, both in *Nature*, 1 March 2001. For the first time it has been discovered that the stable metallic compound, magnesium boride, becomes superconductive with the classical BCS (Bardeen Cooper Schrieffer) mechanism at 39K, some 16K higher than any other simple metallic compound. Magnesium boride has been available in large quantities from suppliers of inorganic chemicals for many years, but had never previously been investigated for its electrical performance at low temperatures. Although 39K is much lower than some HTS oxides which can superconduct at temperatures as high as 160K, the discovery holds out the promise of heavy-current wires etc and, as noted in *Nature*, may be only the tip of the iceberg as scientists investigate other less-expensive stable metallic compounds.

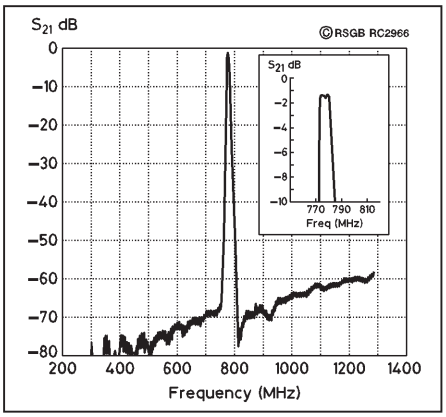

Fig 7: Measured response of the 800MHz five pole prototype quasi-lumped-element high-temperature-superconductor filter developed for the new generation of digital terrestrial television local-relay transposers. One filter in the input channel and a second in the 10-watt output channel. (Source: *Electronics & Communication Engineering Journal).*

HERE & THERE

MIKE STONE, G4JGA, provides a safer alternative to Dick Biddulph's method of differentiating between PVC and polyethylene ('TT' July 2001, p83). He writes: "In the later period of my 35 years with a regional electricity company, where I had specific responsibility for power-cable specification, I leaned a simple test from one of our major cable supply companies. This involves taking a sample of each material and immersing it in a vessel of ordinary tap water. The PVC sinks to the bottom and the polyethylene sample floats on the surface. I sometimes forget which way round this test performs, so then I simply take a sample of house wiring cable insulation and some coax solid dielectric and drop them in water to remind myself. Of course, this check does not work if you fail to remove the conductor from the samples."

JOHN LIEN, LA6PB, has recently submitted a translation of an article he wrote for the Norwegian *Amatør Radio*, January 2001 'The Ferrite Split Dipole – a new feeding method for dipoles'. His system depends on using a number of ferrite rings at the centre of a dipole formed from a continuous element, to 'split' the element into two 'separated' sections, which are then fed in the conventional manner using hose clamps on either side of the ferrite rings. The performance he achieves appears to be excellent. Originally I intended to provide full details of his system, but the more I thought about it, the more I questioned the extra expense and complexity of using up to eight of the large Philips 4330-000-3445 ferrite rings (a type recommended by the RSGB EMC Committee for various applications). LA6PB himself points out that a continuous element could be fed using gamma- or T-matching (and presumably also with a simple form of delta matching) without the requirement for ferrite rings. Furthermore he mentions that "with three rings and an output of 200W there was very little heating of the rings, but with 500W the rings became a little warm. When the number of rings was increased to 8, there was no apparent heating at 200W and only a very modest heating at 500W after some minutes key down". The fact that there was *any* heating is an indication (as with some forms of balun) that RF power is being wasted. So, although LA6PB seems very satisfied with his system, I feel that further thought is needed before recommending it over the more conventional alternatives. But for anyone wishing to try out the idea, I can provide a copy of LA6PB's English text and diagram (SASE and extra 27p stamp to cover photocopying).

GODFREY MANNING, G4GLM, points out that the 74HC86 and 74VHC86 devices used by G0BBL in his improved system of obtaining switching quadrature LO outputs (Fig 2, p62 of the July 'TT') are exclusive-OR (XOR) gates, not NOR gates as shown. Otherwise output pin 11 of IC1d would be fixed low! The correct symbol for an XOR gate is shown in **Fig 8** which illustrates commonly-used logic symbols.

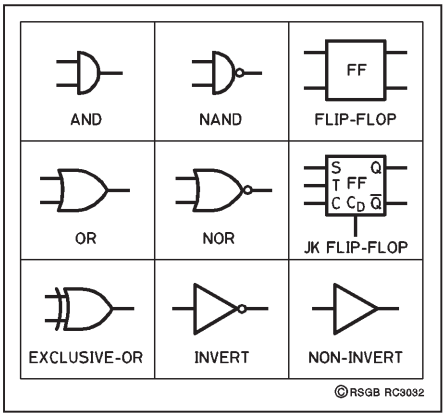

Fig 8: Commonly used logic symbols. G4GLM points out that the 74HC86 in Fig 2 of the July 'TT' should have indicated 'exclusive-OR' gates rather than 'NOR' gates.

DENZIL RODEN, G3KXF, is concerned at the growing use of UTC rather than GMT as the time 'standard' for amateur radio contacts and for other purposes based on normal time-keeping. He points out that Universal Co-ordinated Time is a highly accurate scientific time standard, accurate to better than five parts in 10^9. He feels that UTC should be reserved for use only where scientific accuracy is warranted or demanded. He detects that some countries seem to relish and encourage the abandonment of GMT, yet both standards are still geographically tied to the Greenwich Meridian. ♦

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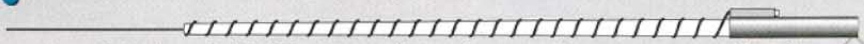

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MFJ	MFJ-462B MULTI-READER	£100.00
MFJ	MFJ-956 SWR AND ANTENNA TUNER	£30.00
MFJ	MFJ-986 ANTENNA TUNER	£195.00
MFJ	MFJ-989 3KW ROLLER COASTER ATU	£230.00
MFJ	MFJ-959B RECEIVER ANTENNA TUNER	£55.00
MICROSET	PT-135 POWER SUPPLY	£80.00
MICROWAVE MODULES	MML-144/100 2m 100W LINEAR AMPLIFIER	£129.00
MICROWAVE MODULES	MML-144/50S 2m 50W LINEAR AMPLIFIER	£80.00
MICROWAVE MODULES	28/144 TRANSVERTER 28/144	£125.00
NAIGAI	NAG-144XL 2m 400W PEP LINEAR AMPLIFIER	£325.00
OPTOECLECTRONICS	SCOUT FREQUENCY COUNTER Inc MEMORIES	£220.00
PAC RATT	PIC-232 Multimode, dual port data controller	£175.00
PACCOM	TNC-320 TNC	£90.00
PANASONIC	DR-49 RECEIVER	£125.00
QM 70	28/144 TRANSVERTER	£100.00
SAGRA	AMP-600 2M 1KW PEP MAINS AMPLIFIER	£750.00
SEM	TRANSMATCH Z-MATCH ATU INC 160m	£75.00
SEM	ANTENNA TUNING BRIDGE	£30.00
SHURE	SR-444 CLASSIC BASE MIC	£35.00
SMC	T3-170L SWR & POWER METER	£20.00
SML	SWR-25 SWR & POWER METER	£20.00
SOMMERKAMP	FT290R 2m MULTI-MODE TRANSCEIVER	£180.00
SSB ELECTRONICS	LT-23 23cms TRANSVERTER	£450.00
ST3 HEADPHONES	DELUXE HEADPHONES	£45.00
STANDARD	AX-700E WIDE BAND RECEIVER - BASE SCANNER	£170.00
SYNCRON	PS-1220VU 20 AMP POWER SUPPLY	£60.00
TAGRA	22AMP POWER SUPPLY	£70.00
TIMEWAVE	DSP-599ZX TOP OF THE RANGE DSP UNIT	£250.00
TIMEWAVE	DSP-9+	£125.00
TOKYO HY-POWER	HL-166V 6m 160W LINEAR AMPLIFIER	£175.00
TOKYO HY-POWER	HL-30V 2M and 25W AMPLIFIER	£75.00
TOKYO HY-POWER	HL-37V LINEAR AMPLIFIER	£60.00
TONNA	7000E TERMINAL	£130.00
TRIO	TR-2300 2M PORTABLE TRANSCEIVER	£60.00
TRIO	TR-9130 2M ALL MODE TRANSCEIVER	£250.00
TRIO	TS-940SAT HF TRANSCEIVER	£750.00
WELZ	AC-38M 200W MOBILE MATCHING NETWORK	£50.00
WELZ	SP-15M SWR & POWER METER	£20.00
YAESU	FC-102 1.2KW ATU WITH 4 WAY SWITCHING UNIT	£200.00
YAESU	FC-20 AUTO ANTENNA TUNER FOR 847/FT100	£175.00
YAESU	FC-757AT FULLY AUTOMATIC ATU	£180.00
YAESU	FC-902 ATU 500W	£140.00
YAESU	FEX-767-2M 2m MODULE for the FT-767GX	£140.00
YAESU	FEX-767-6M 6m MODULE for the FT-767GX	£140.00
YAESU	FEX-767-70CM 70cms MODULE for the FT-767GX	£150.00
YAESU	FL-2100Z HF AMPLIFIER	£450.00
YAESU	FP-107E POWER SUPPLY	£120.00
YAESU	FP700 POWER SUPPLY	£100.00
YAESU	FP-757HD HEAVY DUTY POWER SUPPLY	£120.00
YAESU	FRG-100 HF RECEIVER	£300.00
YAESU	FRG-7 HF RECEIVER	£99.00
YAESU	FRG-7700 HF RECEIVER	£220.00
YAESU	FRG-9600 60-905MHz All mode Receiver	£199.00
YAESU	FT-1000MK5 200W DSP HF TRANSCEIVER	£2,600.00
YAESU	FT-1000MP AC HF BASE DSP TRANSCEIVER(Late serial no)	£1,550.00
YAESU	FT-1000MP DC BASE TRANSCEIVER	£1,200.00
YAESU	FT-101 TRANSCEIVER MINT!	£200.00
YAESU	FT-101ZDmk111 HF TRANSCEIVER inc FM	£375.00
YAESU	FT-23R HANDY TRANSCEIVER	£89.00
YAESU	FT-2500M MOBILE TRANSCEIVER	£190.00
YAESU	FT-290RMK1 2M ALL MODE TRANSCEIVER	£180.00
YAESU	FT-290RMK1 Includes Bracket + FL-2010 LINEAR AMP	£275.00
YAESU	FT-290RMK11 MOBILE 2M MULTIMODE TRANSCEIVER	£275.00
YAESU	FT-3000M 2m 70W MOBILE TRANSCEIVER	£175.00
YAESU	FT-41R HANDY TRANSCEIVER	£120.00
YAESU	FT-470 DUALBAND HANDIE TRANSCEIVER	£150.00
YAESU	FT-690MK11 6M MULTIMODE MOBILE TRANSCEIVER	£295.00
YAESU	FT-7 MINT! CONDITION	£275.00
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-7400 70cm MOBILE TRANSCEIVER	£160.00
YAESU	FT-747GX HF TRANSCEIVER	£399.00
YAESU	FT-757MK1GX HF TRANSCEIVER	£375.00
YAESU	FT-767GX HF BASE 100watt built-in ATU	£599.00
YAESU	FT-790R 70CM MULTIMODE MOBILE TRANSCEIVER	£225.00
YAESU	FT-7B HF 50 W MOBILE TRANSCEIVER	£199.00
YAESU	FT-80C 0-30MHz COMMERCIAL TRANSCEIVER	£375.00
YAESU	FT-840 HF MOBILE TRANSCEIVER	£450.00
YAESU	FT-847 HF / 2 / 6 / 70cm BASE TRANSCEIVER	£999.00
YAESU	FT-900AT HF/ DETACHABLE FRONT BUILT IN ATU	£650.00
YAESU	FT-980 HF TRANSCEIVER	£495.00
YAESU	FT-ONE HF BASE TRANSCEIVER	£450.00
YAESU	FTV-901 TRANSVERTER Inc 2m Mod	£165.00
YAESU	MD-1 DESK MICROPHONE	£75.00
YAESU	SP-5 LOUDSPEAKER Including Audio Filters	£100.00
YAESU	SP-767 LOUDSPEAKER Including Audio Filters	£80.00
YAESU	SP-8 LOUDSPEAKER Including Audio Filters	£100.00
YAESU	SP-980 LOUDSPEAKER Including Audio Filters	£55.00
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	YS-60 SWR METER 1.6 - 60MHz	£30.00
ZETAGI	B-132 10 / 11m LINEAR AMPLIFIER , MAINS	£60.00

Members' Advertisements

RSGB Members wishing to place an advertisement in this section must use the official form incorporated on the label carrier of Radio Communication. This will prove membership and must be for the current month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged pro rata. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsign and QTHR, provided their address in the current edition of the RSGB Yearbook is correct. RS members will have to provide their name and address or telephone number. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition of *RadCom.*

The closing date for copy is the first day of the month prior to publication, eg the deadline for the March issue is 1 February.

Warning: *Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid.*

FOR SALE

KENWOOD TL-922 amplifier. New valves, spare band switch, spare valves, man, £700 buyer collects. 0118 969 3284 (Reading). E-mail: 101764.2735@compuserve.com

KENWOOD TS-520 80-10m HF tcvr mic, man, vgc, £150. Microwave Modules 144 - 28MHz converter, £20. Gould ±15V 1.2A PSU, £20. Gould ±5V 5A PSU, £20. Mechanical side-swipe keyer, £5. Homebrew QQVO3-10 28-144MHz transverter for parts, £15. Homebrew wavemeters various xtals, discrete components, offers? Buyer collects. G3YEG, QTHR. 0118 948 4696 (Reading). E-mail: nic_sears@compuserve.com

KENWOOD TS-870S, HF tcvr, only used on receive, boxed, mans, mint cond, £950. 01954 212 989 (Cambridge). E-mail: dghill@tesco.net

SGC SG-231 1-60MHz antenna coupler, new unused and boxed, cost £390 new. Now £280. Diamond X200N 2m/70cm vertical, new, £40. 01243 586 838 (Bognor Regis). E-mail: dfall@btinternet.com

STRUMECH Versatower 60ft HD, auto-braked winches less ground posts. KT34A 4-ele 3-band beam. Yaesu G10000SDX rotator. Ameritron RCS-4 remote coax switch unit. All less than 6 years old and in good order. Total cost £2250. Going QRT so £600 for quick sale. 01823 400 926 (Taunton). E-mail: eddie.hayden@clara.co.uk

YAESU FT-767 6-2-20 modules built-in, ATU, pristine cond with SP-767 matching speaker with slight scratching on sides, N-leads and switch box boxed h/book from new, non-smoker, £495. Icom U-101 70cm 10W mobile, 12 synthesised channels, 11 repeaters and calling channel programmed, CTCSS, h/mic and Heatherlite boom mic with PTT, boxed with mount, £75. 01235 868 498 (Wantage). E-mail: shapwick@aol.com

AMERITRON AL-800 1.2kW PEP amplifier three years old, mint cond, £900. TS-870, SP-31, MC-60, mint cond, £850. Karl. Evenings 01296 435 815 (Aylesbury). E-mail: karl@heines3.netscapeonline.co.uk

B2 transmit unit with case but missing meter and valves, in gc, £300. Ten-Tec Scout 555 HF tcvr band modules for 40 20 15 and 10m with h/book, £300. 01728 604 621 (Saxmundham). E-mail: john@bramble-corner.freeserve.co.uk

DAIWA CN801H SWR/PWR meter, cross needle, 1.8-200MHz, 2kW. Virtually unused, save £30 on dealer price, £80. Prefer collected, G3UZM, QTHR. 01395 273 090 (Exmouth).

DRAKE R8E comms rcvr, all modes in mint/boxed cond, very sensitive and selective, £450 ono, cash. G0DBX, Dave. 01507 604 419 (Louth, Lincs). E-mail: g0dbx@aol.com

FL-2100Z HF linear amp, good cond 400W+ output, £390, carriage extra. G3PJK, QTHR. 0161 654 6160 (Manchester).

FT-101ZD, desk mic FP-102, £250. FT-480 2m tcvr, £100. Standard SRC140, SRCV110, £60. Vibroplex key, £10. Shure 444, £15. FC-707 ATU, £60. G2AIS, QTHR.01943 879 815 (Leeds).

FT-107S tcvr 12V 10W, £175. FTV-107R transverter, 50MHz module fitted, £85. Solid-state 50MHz linear 50W, £30. HB valve linear, 100W with sequencer, £25. 144MHz linear transverter 28-30, 6W, £10. Carriage extra or collect etc. Ian, GW8VUG, QTHR. 01492 517 786 (Colwyn Bay).

FT-290 Mk1, £90. Microwave Modules transverter 2m - 70cm, £90. Spectrum transverter 2m - 6m, £40. Alinco DJ-190 2m h/held, £50. Albrecht RL-702 70cm h/held, £60. 2m Yagis various. 2m co-linear HB9CVs, various 6m 2m 70cm. Ian, G7SBD, QTHR. 01743 463 711 (Shrewsbury). E-mail: m0549t00@cwcom.net

GAP Voyager 40 to 160m, £100. Hex40 40m beam, weight 40lb, £150. Hex5B 5 bands 14 to 28MHz, only 10lb, £300. G2QT, QTHR. 01303 814 194 (Ashford). E-mail: frank.g2qt@virgin.net

HALLICRAFTERS SX25 Super Defiant, £100. S20-R Sky Champion, £80. Cossor Melody Maker 1930 3V-TRF, £50. Philips 2514 LV-TRF 1928, £75. Tony Harwood, G4HHZ, QTHR. 023 8027 0785 (Chandlers Ford). E-mail: tony@nicholrd.fsnet.co.uk

HY-GAIN DX-77 vertical HF antenna, 7-band, auto switching, c/w man, £150. 01395 568 422 (Exmouth). E-mail: lufflands@compuserve.com

HY-GAIN T2X rotator, £350. MFJ-259 antenna analyser, boxed, £150. Diamond SX-100 meter, £60. Racal 9915H UHF frequency meter, £60. Air-Dux coil 10 x 3½in, 40 turns, £20. Heil HM-10 mic stand, £10. Six lengths new aluminium tube 5/8 OD, 7/8 OD, 1¼ OD, £30. Versatower rotator top, £25. Used £15. Collins Trio speakers, £25 each. Transfomer 1kW 110-230V, £10. Brown type F headphones, £20. D-104 mic, £25. 01386 41951 (Evesham).

ICOM 706 MkII with extras fitted, DSP unit, narrow SSB filter, voice synthesiser, full mobile fitting pack never used, boxed, man, h/mic, £650. Alan, G4YYD, QTHR. 0161 797 7893 (Bury, Lancs).

ICOM 735 with CW filter and AH2 auto ATU, £300. Complete set of Collins mans on four CD-ROMs, £50. Marconi TF2370 110MHz spectrum analyser, £150. Shure 444D mic, £30. MFJ-931 artificial earth, £30. Tono 5000E CW/RTTY terminal, £75. Icom FL-53A filter, £25. Stuart, G4MIB, QTHR. 020 8674 6452 (South London). E-mail: stuart_senior@email.msn.com

ICOM 765 tcvr boxed with (new) SM-8 mic, immac cond. To clear, silly price of £650. Yaesu FL-2100Z linear amplifier, new valves and heavy-duty resistors fitted recently, for quick sale, just £200. Above items must be sale of the century. 0115 919 0236 (Nottingham). E-mail: francis.cokayne@ntlworld.com

ICOM IC-207H 2/70 mobile, exc cond in original packing, £195 plus delivery (next day £15). Private sale, G8AJP, QTHR. 01323 441 440 (Eastbourne). E-mail: james@eade.uk.com

ICOM IC-725 100W all-mode 1.6-30MHz, boxed, gc, £300. Yaesu FT-101ZD HF, gc, service man, £200. Delivery at cost see www.nn14.co.uk for pictures and info. 01536 711 625 (Rothwell, N Hants). E-mail: john@nn14.co.uk

IMMACULATE FT-840 tcvr never used on tx, also MFJ-945E mobile tuner, man etc, £500 ono, must sell. 01827 830 644 (Tamworth, Staffs).

KENWOOD power supply PSU-33 surplus to requirements, comes with spare power transistors, inst man, circuit diag, £65. Buyer to carry away. 0116 287 5241 (Leicester). E-mail: r73@beeb.net

KENWOOD TL-922 linear 160-10m overhauled 1999 by Linear Amp UK, new 3-500ZGs fitted, exc working order, £700. Kenwood YK88CN-1 270Hz CW filter, suit TS-940/930S etc boxed with info, £30. Force 12 dual-band 10/12m 7-ele Yagi exc order, £90. 01751 476 380 (Pickering, N Yorks).

KENWOOD TS-870 with Kenwood PSU PS-430, perfect, boxed, £800. Buyer collects. Sony ICF-SW55 rcvr, £50. Gap Challenger multi-band vertical, £100, buyer dismantles. Valved homebrew items and half-G5RV free to Kenwood buyer. All silent key items. G8IDL, QTHR. 01223 247 991 (Cambridge). E-mail: dadsmith@iee.org

LARGE 3-bedroom new bungalow including garage, low maintenance, all chippings, no grass. Full size loops 160-10, inside loft area, POA. 07974 892 179 (nr Tintagel, Cornwall).

MIZUHO MX-14S 20m SSB/CW h/held QRP tcvr, 2 watts, 4 crystals to cover most of 20m band. DC-DC converter for mobile use or internal batteries. Built-in mic, mint cond, £100. Also Datong FL3 audio filter, £50. G0MPO, QTHR. 01543 375 807 (Brownhills, W Mids). E-mail: andy@ws86jf.freeserve.co.uk

P40 tower to good home, no ground post otherwise complete, free, already dismantled. 0115 975 2936 (Nottingham).

PHILIPS MX295 converted to 2m full coverage. All repeater and simplex frequencies, toneburst, reverse repeat, extended receive, 20W output, mic and speaker, £40 ono or part exchange for an FV-101 external VFO for an FT-101. Mr Hall evenings. 01603 744 197 (Norwich).

RACAL RA117E, gone deaf, needs attention, buyer collects, h/book included, £60 ono. G3MQX, QTHR. 01803 855 597 (Brixham).

RACAL RA17L HF rcvr with man, fully serviced, vgc, £250. Plessey PVS1730 (Royal Navy type 1203) VHF/UHF tcvr, like new, £275. Ferrograph series 4 tape recorder with man, vgc, £75. Murphy 62B HF rcvr with man, unused, stored since 1958, £250. Wanted:Racal Speedrace MA275 oscillator coupling unit; Marconi Instruments TF2008, TF1101, TF2600, TF2300A, TF2500, TF2603. Nigel, G0UGD. 01327 357 824 (W). 01323 486 822 (H) (Eastbourne).

RACAL Syncal 30 manpack tcvr, 1.6-30MHz with battery pack and charger: mains supply unit, h/set and whip, man, £350. Racal 9m heavy-duty glass fibre mast with guys, halyard and full erection kit in carrying case. Dipoles, feeder and top whip included, £75. 01932 228 722 (Walton-on-Thames).

SHACK clearance sale, there are several radio components, some bits and pieces, Trio TR-7200G 2m tcvr, Belcom AMR-104 H VHF/FM 2m rcvr, both require some attention, all are open to offer. Bill, G6DJE. 01296 661 300. (Leighton Buzzard).

SILENT key sale PK-232 TNC, Yaesu FT-757GX, Yaesu FC-700 ATU, Sommerkamp 767DX, Yaesu FP-707 PSU, Yaesu FV-707 external VFO for Sommerkamp, Cobwebb 5-band antenna, A3S triband beam with 40m extension, 2m mobile tcvr. Offers on all above (genuine ones). Ron, G4YRR. 01782 388 393 (Stoke). E-mail: cqdx@btinternet.com

TEN-TEC Corsair II/516 HF/WARC, 100W, internal keyer. Complete station with PSU, ATU. Vibroplex paddle. Desk mic, clean cond. No h/book, £300. Electronic keyers, qty 2, £20 each. Icom 13V/3A PSU, £20. Weltz SWR meter 200W, £30. All in working order, sold as seen. Inspect/collect. Carriage at cost. All ono. John, G4GMZ, QTHR. Call evenings/weekends. 07850 154 204 (Congleton, Ches).

TOKYO HL1K linear amp (2 x 4CX250B), immac with original packing, will meet within 50 miles, £600. 01299 832 279 (Clows Top). E-mail: mowerman@supanet.com.

TOWERS 35ft lattice, £175. 35ft square complete, £130. FL-2000B linear, £150. Drake TR-7 PS-7 RV-7, £350. 3-ele Hygain beam, £50. Swap or p/x any above for Cushcraft MA5B beam. Will deliver anywhere UK mainland for cost of fuel and B&B. 01482 355 645 (Hull).

TRIO R-600 gc rcvr, offers? *RadCom* 1965 to 1995, *SWM* 1963 to 1968, free, collect from G3TCT, QTHR. 01372 459 605 (Leatherhead).

TRIO TS-120S, £195. PS-30, £45. Icom IC-240 2m mobile, £60. Azden PCS-7000 2m mobile with gc VHF rcvr, £120, collected or carriage extra. Wanted: Ex-Army and ex-RAF wireless sets, rcvrs, txs and accessories for private collection. Anything considered. G4NCE, QTHR. 0121 357 6139 (Birmingham). E-mail: martin.swift@virgin.net

TS-450SAT exc cond used as base station only c/w with mic, £450. 01529 461 537 (Sleaford). E-mail: diqsl@tesco.net

VALVED linear amplifier Loudenboomer, full legal output all HF bands including WARC, exc cond, superb performance includes safe tune pulser, man, very little used approximately 20 hours from new. Bargain £250, buyer collects or carriage extra. G3UFQ, QTHR. 01564 777 802 (Solihull).

YAESU FL-2100Z amp with spare tubes, £350. Yaesu FV-101DM VFO, £40. FT-101B with FV-101B VFO, £100 vgc all with mans. Ian. Please phone evenings only. 01829 760 072 (Tarporley).

YAESU FT-847, 3 Collins filters, FC-20 auto-ATU, £1200. Would accept 2m/70cm multimode in part exchange. G3PTN, QTHR. 0113 265 4644 (Leeds). E-mail: zygic@btinternet.com

YAESU MD-100A8X desktop dynamic mic for FT1000MP, FT-900, also compatible with FT-747 FT-1000 FT-840 FT-890 FT-990, £80, good reason for sale. Terry after 6pm. 01284 731 960 (Bury St Edmunds).

CONGRATULATIONS

To the following whom our records show as having reached fifty or sixty years' continuous RSGB membership this month:

50 years

G3HQH	Mr H Froggatt
G3IFX	Mr A R Cooke
VE3EZP	Mr J C Watson

60 years

G2HDU	Mr C W Cragg
RS4430	Mr W Telfer

WANTED

CRYSTAL sets and early valve radios wanted; all old equipment, valves, horn speakers, Morse keys, spark txs. Spy sets are of interest; keen to find Hallicrafters SX42 or similar rcvr, also Meccano and Bassett Lowke crystal sets. Jim, G4ERU, QTHR. 01202 510 400 (Bournemouth).

EDDYSTONE EA12, must be exc cond / FWO with h/book. Howard, G3XBE. 07866 077 249 (Nottingham). E-mail: howardwalton@thersgb.net

ALL spy/clandestine radio sets from any period or origin, wanted by collector. Cash waiting. Bill, G8PUJ, QTHR. 020 8505 0838 (London).

BOOKS wanted *Magneto-Ionic Theory* – Ratcliffe; *Planning & Engineering of Shortwave Links* – Braun. AGARD, DSIR reports etc. G3REP. 01903 879 083 (Steyning). E-mail: reparkes@iee.org.uk

CIRCUIT diagram and man for Pye VHF rcvr R8, AM, 19in unit. G8FDJ. 0114 233 3847 (Sheffield). E-mail: j.s.roberts@sheffield.ac.uk

COLLINS transmitter 32S3 and power supply required. Icom 271E 2m m/mode with Mutek board, £250. Gerry, G0AQH. 01273 454 108 (Brighton).

EDDYSTONE EC958/7 or /7E would consider the mark 12 version, also required the Drake RV-7 and RV-75. Tony, evenings. 01494 778 352 (Chesham).

HEATHKIT SB-101 for rebuild project. Electrical cond unimportant, but must be mechanically sound and unmodified. Winding machines suitable for mains transformers. Output transformer for AR880, G3WCE. 01692 538 794 (North Walsham)

NATIONAL SW3-TRF with plug-in coils, good price offered. Marconi/Ekco output meter TF340. Marconi R-C oscillator TF1370A. H/books for TF2604 voltmeter and Levell microvoltmeter TM3A. Tony Harwood, G4HHZ, QTHR. 023 8027 0785 (Chandlers Ford).
E-mail: tony@nicholrd.fsnet.co.uk

OPERATING instructions for Miranda 175 SWR/FS meter - buy, borrow, copy. Ron, G3FNY, QTHR. 01438 871 374 (Hitchin).
E-mail: ron1.greyfell.@virgin.net

PARTIALLY-sighted G3DSX needs linear amp (50-100W) for simple Ten-Tec Argonaut QRP rig by courier delivery to QTH on approval if possible. 01264 352 619 (Andover, Hants).

SILENT key clearout or just not needed. Wanted for research project, QSL accumulations, old call books etc, can collect. 0113 269 3892 (Leeds).
E-mail: g4uzn@qsl.net

TRIO 711E 2m tcvr with internal power supply, gwo. G3JTS, QTHR. 020 8478 7346 (Ilford).

WANTED B29 navy rcvr also Drake L-4B linear. Man for Gould Advance oscilloscope OS3000A, all costs paid. Frank, G3KJG, QTHR. 01943 254 2597 (Leeds).

YAESU FT-101Z mains plug/lead and DC plug/lead. Appears to be six (large) pin type. Kenwood AT-300 automatic external aerial tuning unit. Must be boxed & complete. Richard Perzyna, G8ITB, QTHR. 01689 602 948 (Bromley, Kent).

Rallies & Events

1 SEPTEMBER 2001

CHIPPENHAM & TROWBRIDGE ARCs Special Event Station GB4BHS - Joint Services Open Day, Basil Hill, Corsham, Wiltshire. OT 11am. FAM, Royal Marines Band, RAF Falcons, SIG. Activity on 20 and 40m, with possibility of 2m and 6m also. Ian, G0GRI, 01225 864 698 (e/w).

2 SEPTEMBER 2001

ANDOVER ARC Radio & Computer Boot Sale - Middle Wallop Airfield, nr Andover, Hants, on the A343 between Andover & Salisbury. OT 10am, £1 per car (buyers), £5 per boot (sellers). TI on S22. Jack, G0UJW, 01264 391 383.

TELFORD ARRG Telford Radio Rally - RAF Cosford Museum, off jn 3 M54. OT 10am, £2. TS, FM, CBS, SIG, CP free, C, MT (two photos needed). Dave, M0VZT, 01952 222 101. Web site www.TelfordRally.org.uk or e-mail bob@somrob.u-net.com

9 SEPTEMBER 2001

LINCOLN SWC Hamfest - Lincolnshire Showground, on A15 five miles North of Lincoln. OT 10.30am, £2. Celebrating the Club's 80th Anniversary, there will be an aircraft flypast, model aircraft, boats and cars, oil engines, B&B, plants, Police, Fire and RAF displays. John, G8VGF, 01522 525 760 or 07968 050 318.

15/16 SEPTEMBER 2001

TRANSMISSION 2001 - 9th annual event to raise money for British Wireless for the Blind Fund. John 01634 832 501.

16 SEPTEMBER 2001

BARRY ARS Welsh Amateur Radio Exhibition - Memorial Hall, Barry. Brian, 029 2083 2253.

21/22 SEPTEMBER 2001

LEICESTER Amateur Radio Show – Donington International Centre, Castle Donington, Leics. Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or e-mail g4afj@argonet.co.uk

22 SEPTEMBER 2001

LOWESTOFT & DARS and PYE ARS QRP Beside the Seaside - United Reformed Church, Back Chapel Lane, Gorleston, nr Gt Yarmouth. OT 2pm, CP free, B&B, A, C, DF, WIN. David, G3OEP, 01493 662 323.

30 SEPTEMBER 2001

BELGIUM Amateur Radio & Computer Rally - *La Louvière Expo* Hall, La Louvière, access from motorway 50km S of Brussels. OT 9am. TI via local repeaters, TS, FM. Michel, ON7FI, 0032 64 849 596.

7 OCTOBER 2001

GREAT LUMLEY AR & ES Rally - Community Centre, Front Street, Great Lumley, just off the A1M. OT 10.30am, £1, accompanied under-14s free. CP free, C, SIG, B&B, TI. Nancy, 0191 274 4274 (W) or 07990 760 920, or e-mail lumley.rally@ic24.net

MANSFIELD ARS Radio, Computer & Electronics Rally - New Venue (under cover), Intake Leisure Club, Kirkland Avenue, Mansfield. OT 10am. David, G0RDP, 01623 631 931 or david.g0rdp@lineone.net or web site www.andange.btinternet.co.uk/rally.htm

12 - 14 OCTOBER 2001

RSGB International HF and IOTA Convention HFC 2001 - Beaumont Conference Centre, Old Windsor. RSGB, 0870 904 7373.

WACRAL 2001 Conference - Bournemouth. G4EZU, QTHR or 01474 533 686.

13 OCTOBER 2001

THE G QRP CLUB MINI-CONVENTION - St Aidan's Hall, Sudden, Rochdale. OT 10am, £1. TI on S22, LEC, large social area, B&B, surplus - junk - components - kit traders, C (including the famous pie and peas). George, G3RJV, g3rjv@gqrp.com

14 OCTOBER 2001

MICROWAVE ROUND TABLE - GCHQ, Cheltenham, Glos. Admission by prior application only. Application forms available from Peter, G3PHO, QTHR, on receipt of an SASE. Personal and car security checks on entrance and exit, and some form of identity will be needed.

NORTH WAKEFIELD RC 18th Amateur Radio & Computer Rally - Outwood Grange Secondary School, Potovens Lane, Outwood, Wakefield, W Yorkshire. Follow signs from M1 jn 41. CP free, TS, SIG, B&B, C, MT (two photos needed). 01924 824 451 or www.nwrc.mcmail.com

20/21 OCTOBER 2001

REF-UNION HamExpo 2001 - Auxerre, France. OT 9am, 50F, ladies and children under 16 free. C, TS, SIG. Web site www.ref-union.org E-mail ref@ref.tm.fr

21 OCTOBER 2001

BLACKWOOD & DARS Radio, Computer and Electronics Rally - Newport Centre, 1 mile from jn 25A, M4. OT 10.30/10.45am, £1.50. B&B, TI, TS, SIG, LB, C, DF. Dave, GW4HBK, 01495 228 516 (eve).

HORNSEA ARC Radio & Computer Rally - Floral Hall, Hornsea. OT 11am, £1.50. TI, CP, B&B, SIG, LB, C. Duncan, G3TLI, 01964 532 588 or e-mail duncanheathershaw@lineone.net

28 OCTOBER 2001

GALASHIELS & DARS Annual Rally - Volunteer Hall, St Johns Street, Galashiels. OT 10.34/11am, £2 including free cash prize draw ticket, TS, B&B, C. Jim, GM7LUN, 01896 850 245 or e-mail jimk@gm7lun.freeserve.co.uk

HANNOVER 19th INTERRADIO Exhibition - Hannover fairground. OT 9am, 10DM. TS, FM, WIN, LEC, SIG. Web site www.interradio-hannover.de

3/4 NOVEMBER 2001

NORTH WALES RRC Rally 2001 – North Wales Conference Centre, Llandudno Promenade. OT 10am, £2, accompanied under-14s free. C, LB, B&B, DF, TI on S22. Muriel, GW7NFY, 01745 591 704 or www.nwrrcw.org.uk

4 NOVEMBER 2001

NORTH DEVON 21st RADIO RALLY - Holsworthy Memorial Hall. OT 10am. B&B, etc. G8XMI, 01409 241 202.

6/7 NOVEMBER 2001

LOW POWER RADIO ASSOCIATION Radio Solutions 2001 - Commonwealth Conference & Events Centre, Kensington. 01422 886 463 or www.lpra.org or e-mail info@lpra.org

11 NOVEMBER 2001

SOUTH YORKSHIRE REPEATER GROUP Great Northern Hamfest - Metrodome Leisure Complex, Queen's Road, Barnsley town centre (follow the Metrodome signs from all directions). OT 10am, £2.50. DF, TS, SIG, B&B, MT between noon and 3pm (two photos needed), TI on S22. Ernie, G4LUE, 01226 716 339 or 07787 546 515.

18 NOVEMBER 2001

COULSDON ATS Bazaar - 4th Purley Scout HQ, behind Lion Green Road public car park, Coulsdon, Surrey. OT 10am. Andy, G0KZT, or coulsdon_ats@hotmail.com

MIDLAND AMATEUR RADIO SOCIETY 12th Radio & Computer Rally - New venue. OT 10am, £1. CP free, C, TS, local clubs. Peter, G6DRN, 0121 443 1189.

WEST MANCHESTER RC Red Rose Rally - Horwich Leisure Centre, Horwich, Bolton, off M61 jn 6. OT 10.30/11am, £1.50, OAP £1. B&B, C etc. Don, G3BSA, phone/fax 01942 871 620 or e-mail don@g3bsa.freeserve.co.uk

24 NOVEMBER 2001

ROCHDALE & DARS Traditional Radio Rally - St Vincent de Paul Catholic Church, Caldershaw Road, off A680 Edenfield Road, approx 2 miles west of Rochdale. Follow orange arrows from M62 jn 20. OT 10.15/10.30am, £1. TI on S22, CP free, TS, B&B, C. John, G7OAI, 01706 376 204 (eve), or e-mail radars@mbc.co.uk Please note that this is a *Saturday*!

24/25 NOVEMBER 2001

LONDON AMATEUR RADIO & COMPUTER SHOW - Lee Valley Leisure Centre, Pickett's Lock Lane, Edmonton, London N9. OT 9.45/10am. TS, B&B, SIG, DF, C, LB, MT, TI on 2m & 70cm, CP, CS, FAM (cinema, swimming, golf, spa). 01923 893 929, www.radiosport.co.uk

25 NOVEMBER 2001

BISHOP AUCKLAND RAC Rally - Spennymoor Leisure Centre. OT 10.30/11am, £1, accompanied under-14s free. Radio, computers & electronics, B&B, TI on S22, TS, CP, C, LB, MT (two photos needed). Mark, G0GFG, 01388 745 353 or Brian, G7OCK, 01388 762 678.

1 DECEMBER 2001

RSGB ANNUAL GENERAL MEETING - GM1GEQ, QTHR.

8 DECEMBER 2001

WORCESTER Radio, Electronics & Computer Rally - John, G8MGK, 01527 545 823 or 07762 203 355. Web site www.qsl.net/gb2tcr

20 JANUARY 2002

OLDHAM ARC Rally - Steve, 01706 848 092 or m5aeg@btinternet.com

3 FEBRUARY 2002

SOUTH ESSEX ARS Rally - Brian, G7IIO, 01268 756 331 or www.southessex.ars.btinternet.co.uk

10 FEBRUARY 2002

HARWELL ARS Radio and Computer Rally - Ann, G8NVI, 01235 816 379 or annstevens@compuserve.com

17 MARCH 2002

NORBRECK Amateur Radio, Electronics & Computing Exhibition - Peter, G6CGF, 0151 630 5790.

13/14 APRIL 2002

RSGB Spring Radio & Computer Show (incorporating **RSGB National VHF Convention**) - Jan, 0870 904 7377.

19 MAY 2002

MIDLAND ARS Drayton Manor Radio & Computer Rally - Peter, G6DRN, 0121 443 1189 (eve).

KEY

Rallies & Events

TI - Talk-In; **CP** - Car Park; **£** - admission; **OT** - Opening Time - time for disabled visitors appears first, eg (10.30/11am); **TS** - Trade Stands; **FM** - Flea Market; **CBS** - Car Boot Sale; **B&B** - Bring and Buy; **A** - Auction; **SIG** - Special Interest Groups; **MT** - Morse Tests; **LB** - Licensed Bar; **C** - Catering; **DF** - Disabled Facilities; **WIN** - prize draw, raffle; **LEC** - LECtures / seminars; **FAM** - FAMily attractions; **CS** - Camp Site.

SILENT KEYS

WE REGRET to record the passing of the following radio amateurs:

BRS173465		
	Mr J Kerr	07/01
G1ZGO	Mr L Hopper	27/06/01
G2BOX	Mr G E Smith	12/05/01
G2FMO	Mr J Harris	12/07/01
G3COO	Mr F Charrett	21/07/01
G3DXB	Mr R Gladwell	29/06/01
G3GWD	Mr M Pavely	10/07/01
G3GWY	Mr E W Hancock	10/07/01
G3NJP	Mr M T Phillips	17/07/01
G3NL	Mr G W Parkes	07/07/01
G3OAN	Mr RFJ Heath	15/06/01
G3RJD	Mr G A Partridge	04/01
G3WDR	Mr H J Kearsey	12/07/01
G3ZXC	Mr G W Earnshaw	27/06/01
G4GLL	Mr G Rodwell	02/06/01
G4OAY	Mr R Jellett	
GM0OTP	Mr G Sim	07/04/01
GW3KXC	Mr J H Rowntree	19/06/01
PA0WFO	Mr W Oorschot	28/06/01
RS96408	Mr C R Dalby	04/07/01

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 QSL Bureau Sub-Managers for special event station callsigns are as follows:

GBxAAA-MZZ - Mike Evans, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR, e-mail mw0cna@ntlworld.com
GBxNAA-ZZZ - Graham Ridgeway, 6 Rosewood Avenue, Blackburn BB1 9SZ, e-mail m5aav@zetnet.co.uk
Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-managers?

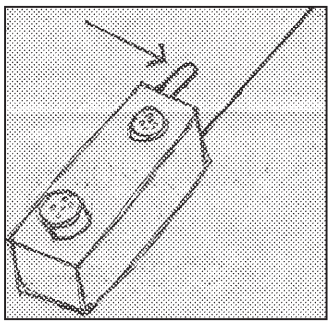
1 Sep GB2LL: Langford Lodge. Crumlin, Co. Antrim. LHV2 (GI0OUM)
GB4BHS: Basil Hill Site. Corsham. LHV2 (G0GRI)
2 Sep GB0CBS: Carrickfergus Boat Show. Carrickfergus. LHV2 (GI4FUE)
3 Sep GB2MN: RNARS Official Event Callsign. Desborough, Northants. LH (G4TNI)
GB4ROC: Royal Observer Corps. Abingdon, Oxon. LHV (M0BRE)
GB8MCG: Manchester Commonwealth Games. Rochdale. V27 (G7BRJ)
6 Sep GB0WMF: Winscombe Michaelmas Fair. Winscombe, North Somerset. LH27 (G3YOL)
7 Sep GB0RAF: Royal Air Force. Lincoln Hamfest, Lincolnshire. LHV27 (M0CBN)
8 Sep GB2CCC: Christ Church Cathedral. Oxford. LH2 (G3NGX)
GB2HCC: Historic Classic Cars. Dudley, West Midlands. LH2 (G0TMF)
GB2SEC: St Elisabeth's Church. Eastbourne, East Sussex. L2 (G4YJW)
GB5SH: Saint Hilda. Hartlepool. LH2 (G3NUA)
10 Sep GB4YOU: Youlbury Scout and Guide Radio. Oxford. TLH27P (G0REL)
GB4YOU: Youlbury Scout and Guide Radio. Oxford. TLH27P (G0RJX)
13 Sep GB4OFC: FIRAC Congress. Blackpool. LH2 (G4DBS)
GB8SW: Swadlincote Woodlands. Swadlincote, Derbyshire. LH27 (G4CRT)
14 Sep GB0HIS: Hayling Island Station. Hayling Island. TLHV27 (G4PRG)
15 Sep GB0SRH: Sponsored Radio, Highfields. Roath, Cardiff. LHV2 (MW0CCL)
GB0WB: Wireless for the Blind. Truro Cornwall. LHV (M5GUS)
GB2FB: For the Blind. Dartford, Kent. LH2 (G0VJG)
GB2HEN: Henham Steam Rally. Suffolk. TLH27 (G3IWC)
GB5BWB: *CANCELLED*. Truro, Cornwall. LHV (M5GUS)
17 Sep GB5MAR: Manchester Amateur Radio. Manchester. 2 (M1ETK)
19 Sep GB0RAF: Royal Air Force. Derby. LHV27P (M0CBN)
GB60ATC: Air Training Corps. TLHV27P (M5EHG)
23 Sep GB0BOX: Boxted Airfield. Langham, Nr Colchester. LH2 (G3FIJ)
29 Sep GB25STD: 25th Anniversary of St.D.ARS. Brighton, East Sussex. LH2 (G3SEJ)

Helplines FOR RadCom MEMBERS

● Ray, G0GXJ, needs a circuit diagram, components list / placement for a **Microwave Modules MML 144/30-LS amplifier**, as some parts are missing. All expenses covered. G0GXJ, QTHR. Tel: 01226 743 987 or e-mail bradshawrrp@netscapeonline.co.uk

● John, G4WQZ, is looking for the rear connection details for **NEC Thermal Printer type PC8221A** (100mm paper). The connector has two-row, 13-way header-style pins to an IDC 26-way flat ribbon cable. All expenses refunded. G4WQZ, QTHR. Tel: 023 9226 4288 or e-mail g4wqz@lineone.net

● Mr J Barton would like someone to identify the two-way military radio used by the American forces during WWII. He has sketched it, as shown, and would like to know: (a) the frequencies used; (b) their range; (c) the function of the projection indicated with an arrow; (d) the model number; (e) the power output. He can be contacted at 32 Springvale Park, Sutton Road, Wisbech, Cambs PE13 5DS.



● John, M0AVO, would like circuit diagrams and information for the **Racal 9082H** signal generator, the **Racal 9009** modulation meter, and the **Coutant ATC500/12/12** power supply. Photocopying and postage charges will be reimbursed. M0AVO, tel: 01428 713 687 or e-mail: j42r@tesco.net

● Richard, G7RVI, is building up a history of the design, development and trials of the Army **Wireless Set No 42**. He would like to get in touch with anyone knowing about its design or trials. Manuals, reports, etc on the set would also be welcomed. All costs reimbursed. G7RVI, QTHR. Tel: 01989 769 654 or e-mail g7rvi@richard-hankins.org.uk

● Joe, G3DII, urgently requires on loan (to copy) the for the **Sony ICF2001D PLL** receiver. Costs refunded. G3DII, QTHR. Tel: 01826 353 362.

● George, G3RGO, is seeking the manual, circuit diagram or any information on the **Yaesu Musen Receiver FR-DX400**. G3RGO, QTHR. Tel: 01529 303 247.

● Alex, GM4TAL, is looking for a source for a thermistor for an **Eddystone 840c receiver**. Failing this, the type number or characteristics would be useful. GM4TAL, QTHR. E-mail: ECKY@amber71.fsnet.co.uk

● Denzil, G3KXF, needs information (manual, circuit, etc) for an **Amalgamated Wireless (Australasia) Ltd, Sydney VHF/UHF FM Radio Test Set, Model A412**, distributed in the UK by Marconi Instruments. Also any data for the associated **Oscillator Module Type 11A94779** (143-177MHz). He would also like to obtain circuits and component information for a Vintage **AVO Test Oscillator** which covers the frequency ranges: 100-270kHz and 500-1500kHz (harmonics?). It's housed in a die-cast case approximately 7x4x3in and has the following controls: MOD Switch 4-way rotary 2-position switch (L & S); OUTPUT LEVEL Switchpot; three 4mm banana sockets (E, OUTPUT, DA). It contains a valve: Hivac XL (made in England) with 4-contact bayonet socket (only one bayonet-stud on valve moulding). He would also appreciate valve data and battery voltages. Any costs will be reimbursed. G3KXF QTHR. Tel: 01903 764 599 or e-mail denzil-roden@lineone.net

● Mike, G4WYZ, is looking for a service manual for the **Bradley CT471C** electronic multimeter. All costs reimbursed. G4WYZ, QTHR. Tel: 01772 854 858 (W) or 01257 265 748 (H).

● Colin, G0VAR, needs the manual or circuit diagram of the **Trio TS-700** 2m multimode transceiver. G0VAR, QTHR. Tel: 01622 751 187 or 07990 511 032. Fax: 01622 687 926.

● Roger, G0AOZ, would like the circuit diagram, workshop info, or any help with a Micronetwork Systems Ltd **Manager 7700 telephone/fax/modem router**. Model 3300 may also be similar. G0AOZ, QTHR. E-mail: roger@g0aoz.freeserve.co.uk

● Mr W T Clegg, G3EFK, seeks someone to service his old **Philips VCR type VR6660** "the best ever made". Cost no object. Service manual available. G3EFK, QTHR.

● Mr G Tremelling, G3FWG, is in need of a service manual, circuit diagram, and as much information as possible to enable him to bring a venerable **KW2000A** back into use. If necessary, he will photocopy all documents and meet all expenses. G3FWG, QTHR. Tel: 01326 373 758.

● G3NTM needs the wire lengths that make up the **Mosley (UK) TD3Jr 20/15/10m trap dipole**, ie the length from the centre feed point to the trap and the length from the trap to the end insulator. The aerial is the wire version of the Mosley (UK) TA31/32/33 beam radiating element. All costs refunded. G3NTM, QTHR. E-mail: rosieb@freenet.co.uk

● Victor, G0XYS, needs information on **ships' callsigns**. Before the advent of radio, ships were identified with a four-letter code, which eventually was adopted as its callsign. In 1923, the British ship *Ariano* had the 'signal' JSDR which, according to modern signals, would indicate a Japanese ship. Does anyone know when the change took place? Was there a period when both types of signal were in use? G0XYS, tel: 01482 216 549.

● Zygmunt, G3PTN, requires a noise blanker and/or circuit diagram for the **Collins KWM-2**. G3PTN, QTHR. Tel: 0113 265 4644 or e-mail zygic@btinternet.com

● Victor, G8WCQ, needs help with **Visual Basic** on his computer. He needs to print the screen picture. The program graphics are displayed on the form and he is trying to print the screen. There is a print form command which he cannot get to work. G8WCQ, QTHR.

● Farnborough & District Radio Society is trying to adopt the call **G2DX**, formerly that of **Ken Alford**. To do this they are seeking permission from surviving members of the Alford family. Are there any of Ken's family still alive, or is there anyone who may know of their whereabouts so that the Farnborough club may contact them? Please contact G0YYY, QTHR.

Regional and Club News

Club NEWS

Scotland West and the Islands Region

PAISLEY (YMCA) ARC
5, 'What's this ATU for?'; 19, 'Why won't that station answer me?' Jim, GM3UWX, 01505 862817.

Scotland East and the Highlands Region

COCKENZIE & PORT SETON ARC
7, 'Normal club night'. Bob, GM4UYZ, 01875 811 723.
DUNDEE ARC
11, Construction and Morse instruction; 18, 'QRP - a Way of Life', George Burt, GM3OXX; 25, AGM. Donald, GM0PIV, 01382 455771.

North West Region

CENTRAL LANCS ARC
17, Award hunting, G0GVA. jim@g1rcu.fsnet.co.uk
CHESTER & DRS
19, Members' forum. Bob, G4CMI, 01244 378 699.
MID-CHESHIRE ARS
5, Activity night & committee meeting; 12, VHF on air (144MHz Cumulatives 8-10pm local); 19, AGM; 26, HF on air. Niall, G0VOK, 01606 871 413.
THORNTON CLEVELEYS ARS
3, Construction techniques, Mick, G4EZM; 10, On air; 17, 'How I became a Radio Amateur', Ian, G3ZRZ; 24, Construction competition. Jack, G4BFH, jack@jduddington.fsnet.co.uk

North East Region

BISHOP AUCKLAND RAC
16, 17, Battle of Britain weekend. The club has recently installed a 60ft mast at its club HQ 850ft ASL at Stanley, Co Durham. Club meets every Thursday at 8.00pm: all welcome. Details: Mark Hill, G0GFG, 01388 745353.
FINNINGLEY ARS
11, Ladies' social evening, raffle. Novice classes begin in September. Eric, G3KPU, 01302 840166.
GOOLE RES
6, BBQ; 13, Junk sale at Courtyard Centre, Boothferry Rd; 20, AGM; 27, Pub night at Barnes Wallis Inn. Richard, G0GLZ, 07867 862 169.
GREAT LUMLEY AR & ES
5, On air, VHF and HF net; 26, Committee meeting. Nancy Bone, lumley.rally@ic24.net
GRIMSBY ARS
20, Computer night, Joe, G4CFO. Brian, G4DXB, 01472 231 383.
HAMBLETON ARS
5, On air. John, G0VXH, 01845 537547.
NORTH WAKEFIELD RC
5, 'On demand' Morse tests. Jim, G3YDL, 01924 824 451.

Midlands Region

BROMSGROVE ARS
11, Junk sale; 25, Free night, on air. Angus, G8DEC, 01257 875 573.
CHELTENHAM ARS
7, The Future of Amateur Radio, RSGB President Don Beattie, G3BJ. Derek, G3NKS, 01242 241099.
COVENTRY ARS
7, On air, Novice class, CW practice; 14, Surplus equipment sale; 21, 2m DF hunt; 28, On air, Novice class, CW practice. John, G8SEQ, 024 7627 3190.
GLOUCESTER AR & ES
3, AGM; 10, APRS; 17, On air 160/80m, 5WPM Morse practice; 24, 'A Trip to Lundy'. Tony, 01452 618 930 office hours only.
HEREFORD ARS
21, D68C Comoros DXpedition, Don Beattie, G3BJ. Mike, G0WZY, 01981 251 743.
KIDDERMINSTER & DARS
4, AGM. Phil, G4SPZ, 01299 403 025.
LEICESTER RS AND COMPUTER CLUB
3, Junk sale; 10, 24, Activities HF, VHF and computers. Stan, G3HYH, 0116 224 2598.
LOUGHBOROUGH & DARC
4, 6th DF of the year, 160m, start point TBA; 11, Demo evening PSK31 & 23cm ATV; 18, Open evening G3RAL; 25, On air: try 6m or 70cm. Chris, G1ETZ, 01509 504 319.
MID-WARWICKSHIRE ARS
11, Technical Topics evening; 25, 'Home brew' evening. Bernard, M1AUK, 01926 420 913.
RAF WADDINGTON ARC
6, RAE class; 13, Making circuit boards, Dave, G3SET; 20, 27, RAE classes. Bob, G3VCA, 01522 528 708.
SALOP ARS
1, 2, Telford Rally; 6, HF contesting, G0EBD; 20, Quiz with Newtown at home. Diane, M5DSJ, 01743 341 654.
SOUTH NOTTS ARC
1, 2, SSB Field Day; 5, Field Day clear-up; 12, 'DX from the Bottom of the Pile-Up', David, M0BWY; 19, On air HF & VHF; 26, Open Forum (members only). 01509 569679.
STOURBRIDGE & DRS
24, BBC TV Cameraman demo, Ian Hickman. John, M1EJG, 01562 700513

North Wales Region

DRAGON ARC
3, Planning for forthcoming GB2VK special event. 17, Visit from RSGB President Don Beattie, G3BJ. Stewart, GW0ETF, 01248 362 229.

South Wales Region

BARRY ARS
4, On air; 11, Morse practice; 16, BARS Radio & Computer Rally; 18, Lecture TBA & construction projects; 25, Annual club dinner, past members & guests welcome. Ken, GW1FKY, 01656 656 909.
CLEDDAU ARS
Club will run RAE & NRAE classes on demand from September. Trevor, GW4XQK (QTHR), e-mail: g4xqk@ntlworld.com
SWANSEA ARS
22, Coach trip to Leicester Show at Donington, details from Roger, GW4HSH, 01792 404422.

Northern Ireland Region

BANGOR & DARS
5, AGM. Mike, GI4XSF, 028 42772383.

London & Thames Valley Region

CHESHUNT & DARC
5, The D68C Comoros DXpedition, Steve Telenius-Lowe, G4JVG; 19, Members' forum. John, G3WFM, 01707 651532
COULSDON ATS
10, What RA Kenley does (TBC). Steve, G7SYO, 01737 354 271.
CRAY VALLEY RS
6, DXing, Roger Western, G3SXW (TBC); 20, October activity planning. Bob, BRS32525, 020 8265 7735 after 8pm & weekends.
CRYSTAL PALACE & DRS
5, Completion of GDO project and discussion on new stripline SWR bridge project; 21, The new RSGB Regional Structure, activities. Bob, G3OOU, 01737 552 170 or Victor, 020 8653 2946.
DORKING & DISTRICT RS
11, *King William Mickleham* meet in bar / garden; 25, The Life and Times of Guglielmo Marconi, illustrated talk by Ralph Barrett. John, G3AEZ, 01306 631 236.
ECHELFORD ARS
1, 2, IARU Region 1 SSB Field Day; 13, DXing, Roger Western, G3SXW; 27, Antenna modelling, Paul Elliot, G0TXL. Robin, G3TDR, 01784 456 513.
MAIDENHEAD & DARC
1, 2, SSB Field Day; 6, PSK31, Bernard, G3SMW & Neil,

G0SVN; 18, TBA. John, G3TWG, 01628 525 275.

NEWBURY AND DARS
10, Morse test. Mark, M0CUK, 01635 36444.

NORTH HERTS RAYNET ASSOC
8, Samaritan's Walk. Stephen, G8LXY, 01582 615 772.

RADIO SOCIETY OF HARROW
2, GB2DHH on air from Mosquito Museum, London Colney; 17, Novice course starts. 21, Simple home remedies / healing foods, Linda, G7RJL. Jim, G0AOT, 01895 476 933 or 020 7278 6421.

READING & DARC
13, The new regional structure of the RSGB, Neil Savin, G0SVN. Pete, G8FRC, 0118 969 5697.

SURREY RADIO CONTACT CLUB
3, 'For Those in Peril', Peter, G7PWV. Ray, G4FFY, 020 8644 7589.

VERULAM ARC
10, Bring and Buy (members' evening); 24, Great Erg Race (teams from other clubs welcomed). Walter, G3PMF, 01923 262180.

WELWYN-HATFIELD ARC
1, 2, SSB Field Day; 3, The Terry Finch Memorial Lecture: G QRP Club (TBC); 17, Icom IC-756Pro and IC-775DSP MkII. 24, Construction evening at Lakeside school. dean@g3wgc.freeserve.co.uk

South & South East Region

ANDOVER RC
2, Sixth Middle Wallop Radio & Computer Boot Sale. Terry, M0BVO, 01980 629346 eves.

FARNBOROUGH & DARS
18, Batteries, Chris, M1EBL; 26, 'Experiences of a Fleet Arm Flyer', Brian, G3VXF. Norman, G0VYR, 01483 835 320.

HARWELL ARS
11, 'History and Theory of Valves', Geoff, G3NAQ. John, G6LNU, 01235 223 250.

HASTINGS ELECTRONICS & RC
2, BBQ at Fairlight helipad; 19, 'Bring your Thing', members' display of 'homebrew' models and equipment; 26, Club executive meeting. R C Gornall, G7DME, 01424 444 466.

HORNDEAN & DARC
25, Electro-Medicine, Dr Alan Glaze. Stuart, G0FYX, 023 9247 2846.

HORSHAM ARC
6, LF, Peter Dodd, G3LDO. David, G4JHI, 01403 252221.

MID SUSSEX ARS
14, Royal Observer Corps talk; 21, HF on air. Geoff, G6MJW, 01273 845103.

OXFORD & DARS
13, 'South Oxford Repeater Group', Mike Stevens, G8CUL. Details from Dave, G3BLS, tel: 01865 247 311.

QRZ AMATEUR RADIO GROUP OF SUSSEX
14, AGM; 28, Club project evening. Stuart Constable, M0CHW, 01435 863020.

SOUTHDOWN ARS
3, D68C Comoros DXpedition, Nigel Peacock, G4KIU. Glynn, M0CHO, 01323 765 731.

TROWBRIDGE & DARC
5, HF antenna adjustment, Dave Buik, G0DAB. Ian, G0GRI, 01225 864 698 evenings and weekends.

WATERSIDE (New Forest) ARS
4, Final details for rally, visit by RSGB Regional Manager Ivan Rosevear; 15, First Club Radio & Computer Rally. A Horton, G0LKG, 023 8084 4316.

WORTHING & DARC
5, Satellite receiver conversion for ATV; 12, PIC chips; 19, Construction contest; 26, Club members' contest. Roy, G4GPX, 01903 753 893.

South West & Channel Islands Region

APPLEDORE & DARC
17, Club quiz night, Dave, G0PJK. Details from Brian, M0BRB, tel: 01237 473 251.

BLACKMORE VALE ARS
4, VHF on air & CW classes; 11, Planning for open day; 18, Microwave communications, Geoff, G7RMG; 22, BVARS Open Day; 25, Project night. Stewart, M5SLC, 01747 821186.

CORNISH RAC
3, Committee meeting; 6, Construction and demonstration evening; 10, Computer section: family history update. Robin, G0MYR, 01209 820 118.

POLDHU ARC
11, Look at new Marconi Centre, planning for special events. Keith, G0WYS, 01326 574 441.

Region	RSGB Regional Manager
Scotland West & the Islands Region	John Martindale, GM4VPA
Scotland East & the Highlands Region	Tommy Menzies, GM1GEQ
North West Region	Kath Wilson, M1CNY
North East Region	Geoff Darby, G7GJU (temp)
Midlands Region	Vacant
North Wales Region	Liz Cabban, GW0ETU
South Wales Region	Simon Lloyd Hughes, GW0NVN
Northern Ireland Region	Jeff Smith, MI0AEX
London & Thames Valley	Roger Piper, G3MEH
South & South East Region	Ivan Rosevear, G3GKC
South West & Channel Islands Region	Richard Atterbury, G4NQI
East & East Anglia Region	Malcolm Salmon, G3XVV

RSGB Regional Managers (as of 1 August).

POOLE RS
1, 2, Field Day; 7, Operating (shack). Phil, G0KKL, 01202 700 903.

SOUTH BRISTOL ARC
5, 10m Challenge BS Postcodes, Sam, M1DCS; 12, Peter's Eclipse Video, G0DRX; 19, Annual club 'foxhunt', Fred, G7LPP; 26, Soldering iron evening, Len, G4RZY. Len, G4RZY, 01275 834 282.

THORNBURY & S GLOS ARC
5, Operating night; 12, Practical night: bring projects / failing gear / mistakes and see if we can fix it between us; 19, Video night; 26, 73kHz, guest speaker. John, 01454 850 798.

WEST SOMERSET ARC
4, Junk sale. Alan, M0AOJ, 01643 707 207.

YEOVIL ARC
6, Old communication systems, G3WNG; 13, Radio on patrol, M1WOB; 20, The Windom and VS1AA aerials, G3MYM; 27, Committee meeting and on air. Derek, M1WOB, tel: 01935 414 452.

East & East Anglia Region

BRAINTREE AR & CCC
17, Junk sale. Keith, M0CLO, 01376 347736.

BROMLEY & DARS
17, 'The PicATUne ATU', Paul Berkeley. Alan, G0TLK, alangm2@clara.net

CAMBRIDGE UNIVERSITY WIRELESS SOCIETY
An introductory evening meeting for anyone interested in amateur radio will be held towards the end of October. Please contact Dominic Smith (Girton College) by e-mail to: dnas2@cam.ac.uk or Martin Atherton, e-mail: g3zay@btinternet.com for more details.

CHELMSFORD ARS
4, Tabletop sale. David Bradley, M0BQC, 01245 602 838.

COLCHESTER RA
13, Constructors' evening; 23, Exhibition station GB0BOX Boxted Airfield Celebration. Kevin, M0BCK, 01206 561 117.

HARWICH AMATEUR RADIO INTEREST GROUP
12, Junk sale. Eugene, G4FTP, 01206 826 633.

IPSWICH RADIO CLUB
5, Demonstration of members' radios; 26, Morse practice, John, G4BAV. Keith, G7CIY, 01394 420 226.

LEISTON ARC
4, Auroras, Paul, G4YQC. Lisa, 2E1HBF, 01728 833 202.

LOWESTOFT & DARS
22, Novices and low power enthusiasts, Bill Cox, G3IWC. David, G3OEP, 01493 662323.

MAIDSTONE YMCA ARS
7, Open evening for G3RAL, radio demos; 14, RAE licensing conditions; 21, Lecture TBA; 28, RAE operating procedures. Andy, M0CST, 01622 661035.

MEDWAY R&TS
22, Toroids, Prof Roger Jennison, G2AJV. C Sumner, G0POS, 01634 379140.

NORFOLK ARC
5, Radio clinic, Roger, G3LDI, Stuart, G3XYO & Tony, G0MQG; 12, Morse instruction; 19, Amateur television, Colin, M1FXY & Andrew, M1EOX; 26, Morse instruction. Peter, G3ASQ QTHR.

NORTH KENT R&E COMMUNICATIONS CLUB
4, Astronomy, Jerry Workman. Dave Collings, 01322 330 830.

SWALE ARC
Meets Monday evenings at the Ivy Leaf Club, Dover Road, Sittingbourne. Tony Lifton, G0PEH, e-mail: tony@marant.freeserve.co.uk

CLUB NEWS IN BRIEF

SWALE ON THE WEB

THE SWALE Amateur Radio Club, which meets in Sittingbourne, Kent, has a new web site at **www.swalerc.fsnet.co.uk** The club meets on Monday evenings at the Ivy Leaf Club, Dover Road, Sittingbourne, and further information may be obtained from Tony Lifton, G0PEH, e-mail: tony@marant.freeserve.co.uk or Gordon Powell, M0AKA, e-mail: m0aka@sheppey72.freeserve.co.uk

HAVE FUN - AND RAISE THOUSANDS FOR A GOOD CAUSE

THE HILLCREST Amateur Radio Society, based in Dudley, West Midlands, is to be presented with a special certificate from the Royal National Lifeboat Institution for its fund-raising efforts. Over the past four years the club has raised over £1200 for the RNLI.

The money has been raised through sponsorship of the special event station GB2HLM at the 'Himley Lifeboat Marathon'. For the last 26 years teams of dinghy sailors have taken part each May in a sponsored 24-hour sailing event at Himley Hall Sailing Club near Dudley, in aid of the RNLI. At the same time the special event station has operated for some 23 years, but for the last four years sponsorship has been collected by the club members to help the event.

About 32 hours of operation over the two-day event resulted in around 200 contacts world-wide on the HF, 6m, 2m and 70cm bands. Operation carries on throughout the night and, needless to say, a good time is had by all. The event raises money for a good cause and creates a great deal of interest in amateur radio - what more could one ask for?

GB2HLM on the air and raising funds for the RNLI.

RadCom Helplines FOR MEMBERS

● Peter, GW4GCB, is looking for a copy of the instruction manual for a **Yaesu FT-107** transceiver. All costs refunded. GW4GCB. Tel: 01745 720 756 or e-mail peter.kay1@virgin.net

● Terry, G4HZT, needs two **74LS166** chips for a young friend in Romania. If you have any spares, please send them to Terry. G4HZT, QTHR.

● Angie, G0HGA, needs the manual (or a photocopy) for the **Nikko TRM-500** stereo amplifier. She will defray all expenses. G0HGA, QTHR or gohga@hotmail.com

● David, G4EEV, requires a DSP **56002EVM** card for a repeater linking project. This card was originally used for PSK31 and may now be surplus to requirements. G4EEV, QTHR. Tel: 01423 770 922 or e-mail webmaster@gb3ny.co.uk

● Pascal, GI0SFT, has an **AVO Valve Tester (1950 vintage)** with a burned-out transformer. He would like a replacement, probably from another tester with another serious fault. Or perhaps someone can do a rewind job? Please help! GI0SFT, QTHR. Tel: 028 7135 2804

● Snowy, G0HZE, requires circuit diagrams and interwiring wiring diagrams for a **Standard C78** (similar to an **FT-790**). The transmitter is OK; on receive with the squelch control fully anti-clockwise, the audio sounds like something cooking. The audio chip and IF chip have been changed. He also needs information on the SMC modification to the **Yaesu FT-227** which changes the steps from 10kHz to 25kHz. The mod is a small daughter board fitted in place of the tone squelch board. The thin connecting wires have corroded away from the main PLL board. Can anyone supply circuit diagrams or even sell a working rig so that the wiring interconnections can be copied? Write to: G0HZE (QTHR), tel: 01733 816 253(W) or 01733 342 439(H after 6pm), fax: 01733 330 943 or e-mail snowy.howell@btinternet.com

● Brian, G3GDU, is researching the wartime '**Rebecca/Eureka**' transponder system and '**BABS**' (Blind Approach Beacon System). Would anyone who used or serviced these please get in touch with him? His e-mail address is brian_kendal@bigfoot.com

● Malcolm, G6JKP, requires manuals or circuit diagrams for the **Hameg HM203-6** 'scope and the **Daiwa DC7001a** rotator with round controller. Can copy and return, all expenses met. G6JKP QTHR, tel: 01977 662 706.

● Simon, G8POO/M5POO, is looking for single issues or bound volumes of the *T & R Bulletin*. Call him to discuss his requirements. G8POO, QTHR. Tel: 01434 634 224 or e-mail simon@nomis.co.uk

VHF/UHF

NORMAN FITCH, G3FPK
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THE PERIOD from mid-June through to mid-July saw more Sporadic E (Es) openings on 2m and lots of interesting DX on 6m. Some decent tropospheric periods occurred, including another extended tropo opening on 2m to the Canary Islands plus more exotic modes.

All times are in UTC, ODX indicates best DX and QTHR signifies that the operator's address is correct in the current *RSGB Yearbook.* An asterisk (*) after a callsign denotes a CW contact, (SN), (FK) etc refers to the postcode area and (IO93), for example, is the Maidenhead grid.

PUBLICATIONS

THE SUMMER edition - 2001-Q2 - of the quarterly magazine *VHF Communications* includes several articles of potential interest to VHF/UHF operators. Wolfgang Schneider, DJ8ES, describes a 'Digital Speech Store', ideal as a contest CQ calling aid, designed around the ISD 2560 speech memory IC using a minimum number of components and for which he can supply a printed circuit board (PCB). Carl Lödström, SM6MOM, writes on 'The Noble Art of De-coupling'. He used the Eagleware Superstar computer program for the modelling. Wolfgang Borschel's, DK2DO, contribution is 'Is Silver-plating Worth While in RF Applications?' and is well worth a read. Gunthard Kraus's, DG8GB, 'Internet Treasure Trove' piece is always very informative. He mentions the Philips homepage, now with 35MB of information, and the National Semiconductors web site which contains lots of detailed application notes - see the list for both and for the publisher's web site. Andy Barter, G8ATD, edits *VHF Communications* and the address is 63 Ringwood Road, Luton LU2 7BG.

SOLAR ACTIVITY

THE DAILY SOLAR data from the NOAA's Space Environment Center (SEC) for the 30 days up to 17 July reveals that the average 2.8GHz radio flux was 152.7 units, slightly down on the previous value. The peak was 221 on 18 June and the minimum of 116 occurred on 6 July. The SESC sunspot number peaked at 232 on 20 June with a minimum of 68 being recorded on 6 July, giving an average of 152.3. Note that there were Es openings on 2m on 6 and 7 July coinciding with the minimum SSNs. 38 new sunspot regions were noted in this period.

The mid-latitude A-index only exceeded 10 on eight days with the peak value of 13 on 14 July being in the lower quarter of the 'unsettled' category. The three-hourly K-index only reached 5 on one occasion in the period and only one contributor mentioned any auroral activity. The latest issue to hand of the *Six and Ten Report* is for April and the data in it have already been covered in previous *VHF/UHF* columns.

MOONBOUNCE

THE ONLY REPORT from a British EME operator in the July issue of the *432 and above EME Newsletter* was from Peter Blair, G3LTF (IO91). Following the 'death' of his 7650 70cm PA, he has commissioned another one using a 4661 valve, which is similar to a 7213. He still needs to do some work on his eight-Yagi array and his preamp is a bit noisy. He completed a sked with AL7OB and also made a random QSO with VK4AFL for a couple of new initials. He heard a few new stations on 23cm and says, "It is surprising how much stronger I hear signals on 23cm as compared to 70cm. I listened to a three-way SSB QSO between W2UHI, K0YW and HB9BBD. All were Q5 on my 4.2m dish."

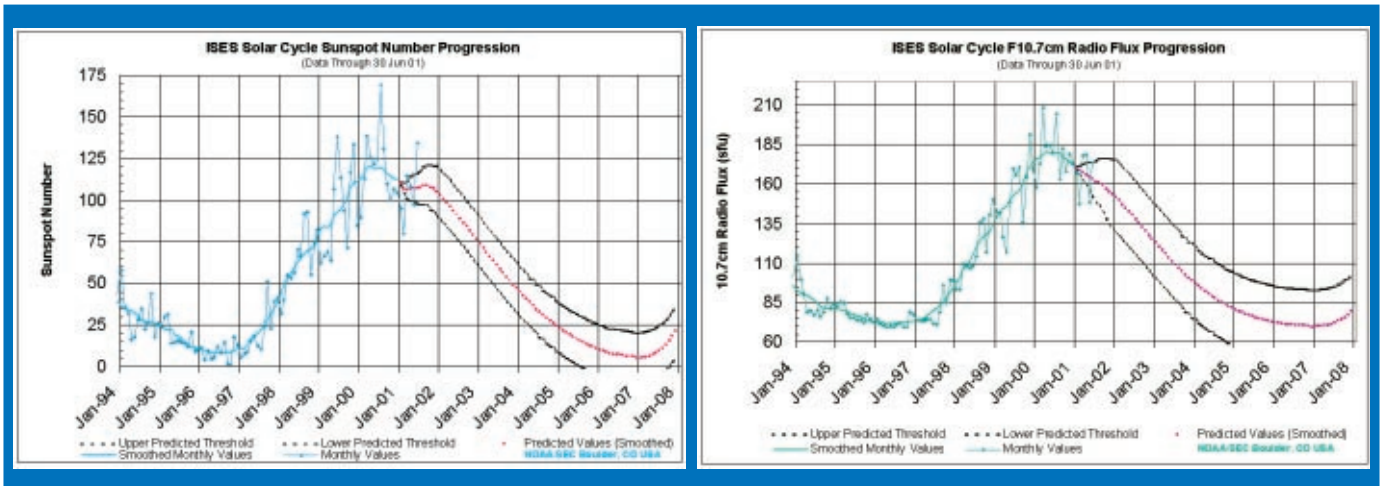
During the 23/24 June activity weekend Howard Ling, G4CCH (IO93), made 18 QSOs on 23cm but no new stations were worked. On the 23rd he completed CW QSOs with JA6CZD, ZS6AXT, DL1YMK, WA1JOF and VE1ALQ. K0YW was worked on CW and SSB. Next day saw CW completions with F6ETI, IK2MMB, VE1ALQ, G3LQR, VE6TA, SM3AKW, G4DZU and W7XQ. F6CGJ was worked on SSB and HB9BBD on both modes. He reports that K7XQ is a new station on the band running 25W to a coffee can feed and a 10ft dish. During a sked Jeff heard him but Howard copied nothing. John Regnault, G4SWX (JO02), was QRV on 23 June and completed with OK1MS* and F3VS* on 2m.

The next sked weekend is on 8/9 September when London latitude stations will have a theoretical 28.7 hours of Moon time. The declination varies from +11.77º to +19.44º, the signal degradation referred to perigee ranges from -1.25dB to -0.82dB and the 144/432MHz sky temperature varies from 405/28K to 439/32K. The Sun offset at Saturday midnight is -112º.

BAND REPORTS

50MHz

Terry Chaplin, G1UGH (IP), heard lots of Balkan and East European stations in an Es event



The progression of sunspot number (left) and solar flux (right), from the gopher://solar.sec.noaa.gov/ website

on 2 July and worked SP5ZCC (KO02). In more Es next day he contacted EH3FF (JN01) and CT1FOH (IN50) for a new grid. Successes on the 8th were IK1LBW (JN44), 9A7W (JN85) and IW4DCW (JN54).

Ken Punshon, G4APJ (BL), has worked a clutch of new countries this year, filling in some of the gaps on the grids map. On 6 July he heard SV9CVY (KM25) and then a station in KM74, who was drowned in QRM - it was probably OD5SX. Next day he worked Z36W (KN11) and 4N7N.

Bob Harrison, G8HGN (CM), has been active (QRV) from Billericay in Essex since July 1985. He runs 100W to an HB9CV antenna at 4m AGL, the site being 55m ASL. Take-off is good from the north clockwise round to the west, after which a 300ft hill gets in the way. From mid-June stations worked were F5LJA/P (JN19), OH6MSZ (KP22) and OH2BNP (KP21) on the 16th; EH1LF (IN70), EI9CDB, EI5FK and EI7GL (IO51) on the 17th; ES6RQ (KO28) on the 18th. July brought QSOs with SM6CMU/3 (JP74) on the 4th; OD5SX and SV9CVY on the 6th; CN8NK (IM63), EH1AGZ/P (IN71) and EM5U (KO40) on the 7th and YO4NF (KN44) on the 8th.

Clive O'Hennessey, GM4VVX (IO78), heard a pile-up of stations working into the Azores around 1850 on 2 July. As he couldn't hear the station being called, he QSYd and put out a CQ call which was answered by L72DS. On querying the call, it was confirmed and he got an RST459 report but the station faded before he could copy a locator. Could this have been a poorly-sent or misread LZ2DS? He found strong short skip Es into the continent on 4 July and completed with over 90 stations. Some contacts were as short as with IO92 and IO53.

Mike Johnson, GU6AJE, picked up four new countries and 11 new grids between 19 June and 14 July. These were TT8JE* (JK72) on 22 June and EH1EAU (IN70) on the 30th. In July HB0/DL1FDH (JN47), F1NSR (JN33), IZ1DXS/P (JN43), SU9ZZ* (KM50) and 4Z5AO (KM72) on the 2nd; ES4EQ (KO39) on the 3rd; SP6FUN/3 (JO72) and SM6CMU/3 on the 4th; YO2LEA (KN06) and LZ2KZ (KN33) on the 5th. In the contest weekend ODX was 5B/G1JJE (KM64) at 3269km and three new grids were HB9BQU (JN37), F6HGC (JN27) and F1FSH (JN36) to bring his tally to 352 in 72 DXCC countries. The big opening to the Caribbean on 7 July was marginal in the Channel Islands although he did hear WP4N and 9Z4BM for a while. Mike will be QRV again from late August as MU5MUF/MM and hopes to be in a good spot for transequatorial propagation (TEP), probably in the Mediterranean. He will be QRV on 6m but cannot promise any specific times or dates. He may be able to operate from land, work and CEPT regulations permitting. He posts a full log of DX worked on his website - see the list - and last minute news of his maritime mobile activity will be thereon.

Mike Kerry, GW1SXT (NP), running 10W to a 3-ele Yagi made Es contacts with EH3MD, IW0GXY, EH7AH, T94OL, YU1HQR, CT1AVR, MD6V, OH5LK and SM6FYQ. On 8 July he worked into EI, ON and F.

Jamie Ashford, GW7SMV (NP), has been troubled by really bad electrical storms which curtailed operation. His amateur gear was unaffected, but his telephone answering machine was zapped. As usual, he lists some choice DX worked. In June A45XR* (LL93) a new country and grid, ZC4FL, OD5UT and S5, YU, 9A, OE and YO stations on the 21st; TT8JE (JK72) another new country and grid on the 25th. In July he contacted SV4KJ (KM09), SV9CVY, HB0/DL1FDH, 3A2MW, 3A2MD, YL2GC (KO26), SU9ZZ* and SM6CMU/3 on the 2nd; 5R8FU* a new country and grid on the 3rd and WP4KJJ (FK68), WP4N (FK78) and FG5FR (FK96) a new country and grid on the 7th.

Ted Collins, G4UPS (EX), forwarded his usual comprehensive log for the remainder of June when there was some DX around every day except the 26th and 28th. At 1933 on the 20th he heard PY5CC briefly on 50.110MHz. Next day brought A45XR* at 0849 for country number 162. JY9NX* (KM71) was worked at 1744 on the 24th with Israeli stations heard calling for North America.

Robin Burrows-Ellis, M1DUD (IP), continues to have great success in Es openings using just 250mW. On 30 June he worked EH1EAU (IN70) and OH5LK (KP30) and on 6 July CT4NH (IM59). Next day, during the Field Day weekend, he completed with SP9FUN (KO04), ES2QH/7 (KO38), LZ2PP (KN33), Z36W (KN11), YU1KX, YT1AD and YZ1W (KN03) and YT1ET (KN04). Next morning brought YO4NF (KN44 and ODX at 2189km), YT1Z (KN13) and IK7LMX (JN80).

70MHz

GU6AJE is QRV again on the band and during the Es opening on 2 July Mike worked S51DI* and S52AU (JN76) and S53X (JN65) in the mid-afternoon period. G4DEZ is also QRV on the band and uses a 5-ele Yagi at 10ft AGL at present. Bryn says, "I still do not have the tower planted, but the site is so good that it does not seem to matter that the antennas are all rather low."

144MHz

Gabriel Sampol Duran, EA6VQ (JM19), worked 13 British stations in an Es opening on 7 July, ODX being Jim Rabbitts, GM8LFB (IO88KK) at 2135km. From 1600 to 1830 on 14 July he made tropo, Es and FAI contacts, ODX being YL3AG at 2450km. It was his 475th grid and 82nd country on the band. He completed nine tropo QSOs over 700km in the 1604 - 1706 slot with EA9, HB9 and I0, 1, 2, 5 and 8 stations in JN44, 45, 52, 54, 55 and 70 and IM85. The FAI contacts occurred between 1816 and 1819 and were with HA5OV (JN97), HA6NQ (JN98) and HA6ZB (KN07). The Es opening only lasted a few minutes but did bring YL3AG with two YLs and an SP heard.

Dave, EI4IX (IO53HV), runs 100W to a 17-ele Yagi and in the 7 July Es worked 36 stations in I, IS0, TK, 9A and S5, ODX being I8MPO (JN70) at 2306km. Philip, G0ISW (IO84), worked EA6VQ and EB6ALB (JM19) in this event for a new country and grid. Conrad Farlow, G0RUZ (SD), completed 14 Italian SSB QSOs in the Es opening on 2 July, ODX being IW9CBU (JM77) at 2220km. G1UGH caught the tropo on 8 July and Terry worked EI7KRC/P (IO63), DL0PVD (JN49) and DK0OX (JN48). At 1556 on 7 July G4APJ heard G4LOH in Harrogate calling for tropo contacts so Ken turned his beam to the south and via Es worked EA6XQ and EB6ALB. He also heard a couple of EA3s, F6CH/P (JN12) and IK7NXM (JN81). Dave Butler, G4ASR (HR), describes the 2 July Es opening as "spotty" with eight stations worked in I, IT9, T9, LZ, Z3, 9A and YU. ODX was LZ5UV (KN12) at 2212km.

John Lemay, G4ZTR (CO), reports that the Es on 7 July was, indeed, sporadic with lots of very short openings, some of them too brief for a QSO to be completed. He managed to complete with IZ7ANL (JN80), YU1HFG (KN12), LZ1KCO (KN21) and LZ1KWT (KN32) for grid number 248. John runs a 3CX800 PA to a 5-wavelength M^2 Yagi.

In June G8HGN worked DK2XZ (JN59) on the 16th; EA2AGZ (IN91) on the 19th; HB9RDE (JN37), DF0CI (JO51) and PA2DWM/MM (JO12 on a diving barge) on the 23rd; SM7WT (JO65) on the 24th and OZ2TF (JO46) on the 25th. Bob's July successes included DK3SR (JN49) on the 3rd and EA7AJ (IM87) via Es on the 6th.

ANNUAL VHF/UHF TABLE - JAN TO DEC 2001

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Pts
G4ZTR	29	25	20	2	91	25	13	5	-	-	210
G4DEZ	28	50	1	2	57	13	5	3	-	-	159
G3FIJ	25	31	19	3	43	11	10	4	3	1	150
G4APJ	6	13	-	-	45	10	13	4	-	-	92
G7CLY	4	1	-	-	15	3	4	1	-	-	28
G1UGH	1	9	-	-	7	7	-	1	-	-	25

The District Codes are the 124 listed on page 53 in the October 2000 *RadCom*. Up to six different GI stations and up to three 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 11 September.

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CONTEST

TIM KIRBY, G4VXE
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Windsor SL4 5BZ
E-mail:tim@ukgateway.net

THIS MONTH WE are publishing the results of the 2001 Affiliated Societies (AFS) CW contest. The results of the SSB leg will be published next month. Although these contests have attracted some criticism as to their format recently, looking at the sheer number of entrants to each event, these have to be our most popular domestic contests. And why not? The format is simple and there are several levels of competition involved. The big guns slug it out at the top of the table, but just as important are the competitions that go on within clubs for top spot. This type of friendly rivalry does much to cement relationships within clubs and, of course, develop operators' skills. It's marvellous, also, to see clubs fielding one, two or even three teams in the contest. Despite some of the gloomy comments that one sees from time to time, there is good and substantial interest in amateur radio in general within the club scene.

If your club would like to field more entrants in next year's AFS event, what better training ground for the CW leg than the Slow Speed CW Cumulatives to be held in September? See the 'Contest Calendar' on page 79 for details.

When you are looking at the AFS results this year, remember that where an error was found, all points for that QSO were deducted. So, it may look as if no reductions have been made, but this is not, in fact, the case!

DIGITAL CONTESTING

THE LAST WEEKEND in September brings one of the big RTTY / Digital contests of the year, the CQ / RJ RTTY Contest. For those of you who have not tried a digital modes contest before, this could be the one to try – and rack up a few band / mode country slots into the bargain. There is a lot of good software around that will use your soundcard to decode the signals. A very simple interface can be constructed in minutes, so there should be no barriers to your participation! I'd recommend the *MixW* v2 software (http://tav.kiev.ua/~nick/mixw2/) which deals with RTTY, PSK, MFSK and pretty much anything else you can think of, but there are many other programs you can use. Activity in this digital contest, like most others, is predominantly RTTY, but you will find some PSK and other modes in use from time to time.

IARU 144MHz EVENT

WRITING THIS COLUMN in mid-July, it is unclear whether the portable section of the 144MHz Trophy contest can take place this year, owing to foot and mouth disease. The situation appears to be clearing up, so let's hope so. If not, I am sure that there may be some substantial Fixed station activity in the 144MHz Trophy contest. I know from the conversations I have had with many people that everyone is really missing the portable events this year. Let's hope that things get back to normal as quickly as possible, but please do abide by the VHFCC's recommendations for not operating under portable conditions until a further announcement is made. Check the VHFCC's website at http://www.blacksheep.org/vhfcc or listen to GB2RS News Bulletins for further information.

NEW HF CONTESTS COMMITTEE WEBSITE

THE RSGB HF Contests Committee has a new URL for its website. It is http://www.rsgbhfcc.org It is hoped, over the coming months, to increase the range of facilities and information that is available at this site.

Gordon, GW8ASA, is active on a number of bands during contests. Here you can see the preparations for a 70MHz event last season.

AFFILIATED SOCIETIES CW CONTEST, 2001

CONGRATULATIONS TO Chris Burbanks, G3SJJ, the winner of the Marconi Trophy, awarded for the first time this year. Chris heads up the individual section of the contest. Many congratulations, also, to the Chiltern DX Club 'A' who are awarded the Edgware Trophy, for their win in the Affiliated Societies section.

Each year there are comments from entrants regarding the start and finish time of AFS. It is now a few years since the start time was delayed by an hour to help those stations at the extremities of the country, who do not have the propagation at the start of the contest and much 'local' activity to help compensate. Whilst this change has made the start of the contest more enjoyable and feel fairer for the distant stations there are comments from those nearer the continent that the last hour is increasingly hard work.

This year in the results I thought it might be of interest to show how some of the stations in different parts of the country fared. There is also the opportunity for each station to compare itself with the leaders. For those not aware GW3YDX is located in Powys, G4BUO in Kent, G0IVZ in Cornwall and GM3POI in Orkney. What is clear is that those nearer the activity have high contact rates at the start of the contest that reduce with each subsequent hour. However, those further away have a more consistent, or even increasing, rate through the contest. Interestingly those with the activity never really fall behind the more distant stations. So perhaps it is in the final hour that they start to understand how it feels for the poorer stations!

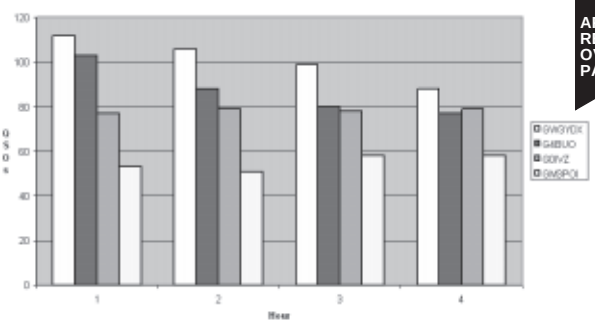
Some comments from the logs: "Just great fun! Don't change anything"; "Best contest after NFD"; "Reduce to three hours and smaller teams"; "At 91 years of age I find this a bit of a struggle".

I would like to apologise to the Scarborough society, whose logs did not make it into the 2000 results. On their claimed score they would have made it into the top 20. We hope to see them back in the future.

Thank you to those who supplied check logs: perhaps next year you will be able to enter a team. My thanks to Steve, G4UOL, who put in considerable time adjudicating this contest.

Laurence Mason, G4HTD

AFS CW RESULTS OVER PAGE



AFS CW QSO rates per hour for GW3YDX, G4BUO, G0IVZ and GM3POI.

AFFILIATED SOCIETIES CW CONTEST, 2001

Affiliated Societies Section

Place	Team	Call	Call	Call	Call	Call	Score
1	Chiltern DX Club - A	G4BUO	G3RTE	G4DJX	G3XTT	G3BJ	12890
2	Lichfield ARS - A	G3SJJ	GW3YDX	G3VHB	G0MTN	G3ZBE	12750
3	De Montfort Uni ARS - A	G3CWI	G3RIR	G3OAY	G4ARI	G4EOF	12420
4	Mid Beds Contest Association	G4BJM	G5LP	G4PIQ	G4CXT	G3PJT	12070
5	Addiscombe ARC - A	G3UFY	G3SJX	G3VYI	G4ALE	G3RQZ	11750
6	Grimsby ARS - A	G3TBK	G3RXP	G3PDL	G3RSD	G4EBK	10830
7	Cheltenham ARA - A	G3NKS	G4PDQ	G4ERP	G3TA	G4ENA	10580
8	Bristol Contest Group	G3SWH	G0WKW	G3XSV	G3TKF	G3YHV	10330
9	RNARS Colchester	G3GLL	G3YAJ	G3YEC	G3OOK	G0IBN/P	9610
10	Newbury & Dist ARS - A	G3RVM	G3KLH	G0ORH	G3ZGC	G3NVO	9240
11	Yorkshire Cluster Support Gp	G4RCG	G3LZQ	G0LII	G4BYG	G3KKP	9050
12	Three As Contest Group	G3TXF	G3WVG	G3SXW	G3MXJ		9030
13	Horsham ARC - A	G3WZT	G3OGP	G3VQO	G3SWC	G3TNO	8650
14	Chiltern DX Club - B	G0CKP	G0OPB	M0CDX	G3WPH		8220
15	RAFARS Waddington - A	G2AFV	G4KGG	G4PZQ	G3ZDW/P	G3IGU	8010
16	Torbay ARS - A	G0IVZ	G3LHJ	G4ELZ	G0UBG	G0RDO	7660
17	Dragon ARC	GW4VEQ	GW0GEI	GW3VVC	GW3HCL	GW3PRL	7510
18	Maidenhead & Dist ARC	G4RGK	G4WJS	G3RZF	G3TWG	G3LVW	7320
19	Taunton & Dist ARC	G4HTD	G3OLB	G0PSE	G3WNI		6570
20	RNARS Portsmouth	G3LIK	G3LWI	G3JTG	G3KKJ	G0FOD	6390
21	RNARS Liverpool	G3HQH	G3HZL	G3RFH	G4SYC	G3HWS	6070
22	Mimram CG	G3ZVW	G3YXX	G4KZD			5900
23	Cheltenham ARA - B	G3BGW	G3LVP	G3IFB	G3JJG	G3TEV	5770
24	Echelford ARS - A	G3KKQ	G4TSH	M0AJM	G3XTZ	G3EAO	5740
25	RNARS Rosyth	GM4SID	GM3UM	GM3NCS	GM3HUN	GM4FGD	5530
26	Harwich ARG	G0DVJ/P	G4EYE	G4YJQ	G4FTP	G0SCP	5500
27	Yeovil ARC A	G3GC	G3ICO	G3KSK	G3TSK	G3CQR	5230
28	Scunthorpe Steel ARS	G3KNU	G4OGB	G4FUH			5140
29	Bromsgrove & Dist ARC	G3MRC/P	G3TQD	G4AHK/P			5020
30	De Montfort Uni ARS - B	G4CZB	G3SDC	G5MY			4910
31	Chesham & D ARS	G3ZXG	G3VRY	G3MEH			4850
32	Weston Super Mare RS	G0JQN	G3TJE	G3YOL			4820
33	Farnborough & Dist ARS	G3HEJ	G4BJQ	G0VYR	G3TUX		4690
34	Horndean & Dist ARC	G3PSM	G0DHZ	G0UHM	G0RPX	G0WAQ	4670
35	RAFARS Waddington - B	G0RAF	G3TTH	G3SET	G0NVY	G0DBX/P	4580
36	Stratford on Avon & DRS	G0OGN	G3MXH	G0SOA/P			4320
37	Sutton and Cheam RS	G0KBL	G4CWH/P				4200
38	RAFARS Cosford	G8FC	G0EYX	G4CWN	G0BYA	M0BYJ	4140
39	Greater Peterborough ARC	G3KHZ	G3MCK				3750
40	Norfolk ARC	G3PDH	G4DYC				3530
41	RNARS Newcastle	G3AWR	G4FCH	G3MXZ			3480
42	Edgware & DRS	G4IUZ	G4HMD	G4KEW			3430
43	RNARS Yeovil	G4KJD	G0JCY	G8IB	G3AQM		3200
44	RNARS Chatham	G4FRN	G4PTE	G0SCY			2690
45	Leicester Radio Society	G4OOS	G0WBC				2450
46	Reading and District ARC	G0VQR	G4ELY	M5ACR			2430
47	Southdown ARS	G3SVL	G3DQY	G0JHK			2320
48	Southgate ARC	G3KTZ	G3GUL				2280
49	Ilford RSGB Group	G3XRT					2200
50	Lichfield ARS - B	G3NKC					2160
51	RNARS Barrow	G3IZD					2150
52	South Manchester RC	G0LZL					2130
53=	Orkney ARC	GM3POI					2120
53=	Strathmore Radio Society	GM4AFF					2120
55	Cheshunt & D ARC	G4GYP	G3URA	G3WFM			2100
56	Horsham ARC - B	G3ZBU	G4XHE				2070
57	Banff & District ARC	GM3DZB	GM3OXX				2050
58	Hastings Elec. & RC	G3JKY	G2LL/P				2030
59	Stockport RS - B	G4FAS	M0AWV	M0CGF	M0BEX	G4MUL	1980
60	Clifton ARS	G0UJK	G0DCG				1950
61	Grimsby ARS - B	M0BZU	M0AJT	G4CFO	G0EJQ		1900
62	Addiscombe ARC - B	G3JJZ					1870
63	Trowbridge & D ARC	G0GKH	G0HFX				1860
64	Port Talbot ARC	GW3WWN					1800
65	Worthing & District ARC	G4OAY	G4SLE				1770
66	Gloucester AR & E Soc	G3MA					1450
67	Carmarthen ARS	GW0VEW	GW0UMC	GW0CVY			1330
68	Harwell ARS	G3VPW					1320
69	Stevenage ARS	G4DDX					1300
70	RNARS Thurso	GM3CFS					1180
71	Meirion ARS	GW4LZP					1150
72	Cheltenham ARA - C	G0UPU	G4NSZ	G4GVZ			1100
73	Torbay ARS - B	G4EDG	G3SNU				1070
74	RNARS Lowestoft	G8NT					880
75	Newbury & Dist ARS - B	M0CUK					870
76	Welwyn Hatfield ARC - A	G8OO					770
77	Yeovil ARC B	G0HDJ	2E0NPB	M5EVT			740
78	Blackwood ADARS	GW4BLE					630
79	Echelford ARS - B	G3HBZ	G0VDZ				320
80	RAFARS Waddington - C	G0SWO	G4CZV	G3UYC			310

Individual Section

Posn	Calls	Score	Equip
1	G3SJJ	2800	
2	GW3YDX	2750	
3	G4BJM	2730	4C17
4=	G4BUO	2690	4C16
4=	G3TXF	2690	
6	G3RTE	2630	4C13
7	G3VHB	2610	
8	G3CWI	2590	4C1-
9	G3UFY	2580	4C1-
10	G5LP	2570	3C14
11=	G3RIR	2560	4C1-
11=	G4DJX	2560	
13	G3OAY	2550	4C1-
14=	G0IVZ	2530	
14=	G3XTT	2530	
16	G3NKS	2490	4C13
17	G3BJ	2480	
18	G4PIQ	2470	4C17
19=	G0MTN	2440	
19=	G4ARI	2440	4C1-
21=	G0CKP	2410	
21=	G3SJX	2410	4C1-
23=	G3TBK	2400	4C16
23=	G4HTD	2400	4C12
25	G0JQN	2350	4C12
26	G3VYI	2330	3G13
27=	G4ALE	2310	4C1-
27=	G3PDH	2300	3C1-
27=	G3RXP	2300	4C1-
27=	G3WVG	2300	
31=	G3SWH	2290	3C16
31=	G0KBL	2290	4C14
33=	G4PDQ	2280	4C16
33=	G4EOF	2280	
35	G3PSM	2270	4C1-
36	G4ERP	2250	4C15
37=	G0WKW	2240	4C1-
37=	G4CXT	2240	
39	G4RCG	2230	4C16
40=	G3WZT	2220	4G1-
40=	G3ZVW	2220	
40=	G3LZQ	2220	4C18
43	G3XRT	2200	4C15
44	G3LIK	2190	3C13
45=	G3KHZ	2180	
45=	G3XSV	2180	4C1-
47=	G3GLL	2160	4C14
47=	G0OPB	2160	4C15
47=	G3NKC	2160	
50=	G3IZD	2150	4C13
50=	G3ZBE	2150	
52	G3PDL	2140	4C13
53=	G3RVM	2130	4C14
53=	G0LZL	2130	4C1-
53=	GW0GEI	2130	4C1-
56=	GM3POI	2120	4C18
56=	G3YXX	2120	
56=	G3RQZ	2120	4C1-
56=	GM4AFF	2120	4C13
60=	G3MRC/P	2110	3C1-
60=	G3RSD	2110	3C13
62=	GW4VEQ	2090	4C17
62=	G3KKQ	2090	3Q14
62=	G3KNU	2090	4C1-
62=	G3YAJ	2090	3C1-
66	G4CZB	2080	4C1-
67	G3SXW	2070	
68	G3PJT	2060	3Q1-
69	G3ZXG	2040	
70=	G3KLH	2030	3C12
70=	G3OGP	2030	4C1-
72=	G3HEJ	2020	3W1-
72=	G3MXH	2020	4W1-
72=	G3TKF	2020	4C1-
75=	G4IUZ	2000	4C13
75=	G4OGB	2000	3C13
75=	G0ORH	2000	3C14
78=	GM4SID	1990	4C13
78=	G3SDC	1990	
78=	G3YEC	1990	4C1-
81	G0LII	1980	4Q13
82	G3MXJ	1970	
83=	G2AFV	1930	4C1-
83=	M0CDX	1930	3C16
86	G3OLB	1920	
87	G4CWH/P	1910	4C13
88=	G3HQH	1880	3C1-
88=	G4EBK	1880	3C13
90=	G4RGK	1870	3C1-
90=	G3JJZ	1870	3W1-
90=	G3TJE	1870	3Q12
93	G3OOK	1850	4C15
94	G3KTZ	1830	
95	G4KGG	1820	3C1-
96	G3LHJ	1810	3W1-
97	GW3WWN	1800	3C1-
98	G4ENA	1790	3C14
99=	G4WJS	1780	3C15
99=	G4BYG	1780	3C15
101	G3TA	1770	3C13
102=	G0VQR	1720	3C1-
102=	G3ZGC	1720	3W13
102=	G3WPH	1720	3C1-
105	G3VRY	1700	3C1-
106	G4ELZ	1670	3C1-
107	G0DVJ/P	1650	3C1-
108	G3VQO	1640	3W12
109	G4PZQ	1630	3C1-
110	G3HZL	1610	3C14
111	G3YHV	1600	4C1-
112=	G3BGW	1590	4C1-
112=	G3JKY	1590	3C1-
114	G3MCK	1570	3C1-
115=	G3GC	1560	3C1-
116=	G4KZD	1560	
117	G4EYE	1550	3C1-
118	G0IBN/P	1520	3C1-
119	G3SVL	1500	4W13
120=	G8FC	1460	3C1-
120=	G0GKH	1460	3C1-
120=	G4AHK/P	1460	3C1-
123=	G3MA	1450	3C1-
123=	G3LWI	1450	3C1-
123=	G3TQD	1450	3G1-
123=	G3SWC	1450	3W1-
127=	G3LVP	1430	3G12
127=	G3RFH	1430	3C1-
129	G4OOS	1410	3C1-
130	G3ZDW/P	1370	4C13
131	G3NVO	1360	4C13
132	G3TWG	1350	3C1-
133	G3AWR	1340	3G1-
134	G3RZF	1330	3C1-
135	G3VPW	1320	2C14
136	G3TNO	1310	3W1-
137=	G4FRN	1300	4C1-
137=	G4DDX	1300	3C1-
139	G3ICO	1270	3C1-
140=	G3JTG	1260	3C1-
140=	G3IGU	1260	3W1-
142	G3ZBU	1250	3W14
143=	G4BJQ	1230	3C13
143=	G4DYC	1230	3C1-
145=	G0PSE	1220	3C1-
145=	GW3PRL	1220	3C1-
147	G0UJK	1210	3C1-
148	G0SOA/P	1200	3W1-
149=	GM3CFS	1180	3C1-
149=	GW3VVC	1180	3C1-
151	GM3UM	1160	3W1-
152=	GW4LZP	1150	3C1-
152=	G0DHZ	1150	3C1-
152=	G4FCH	1150	3C1-
155	G3IFB	1120	3C1-
156=	GM3DZB	1110	3C1-
156=	G3MEH	1110	3C1-
158=	G0OGN	1100	3W1-
158=	GM3NCS	1100	3G12
160	G0RAF	1070	3C17
161	G4TSH	1060	4G1-
162=	G3TTH	1050	3C1-
162=	G4FUH	1050	3C1-
164	G0WBC	1040	3C1-
165=	G3KSK	1030	3W1-
165=	G3WNI	1030	3C1-
167=	G4KJD	1020	3G1-
167=	G0VYR	1020	3C13
169=	M0AJM	1000	3W1-
169=	G3IJG	1000	4C11
171=	G3MXZ	990	3C1-
171=	G3LVW	990	3C1-
173	G4YJQ	970	3W12
174=	GM3OXX	940	0W1-
174=	G3SET	940	3C1-
174=	GM3HUN	940	3W1-
177=	G4OAY	930	3C1-
177=	G0JCY	930	3C1-
177=	G0UBG	930	3C1-
180	G4FAS	910	3C13
181	G3KKJ	900	3C12
182=	M0BZU	890	3W11
182=	GW3HCL	890	3C1-
182=	G3XTZ	890	3G1-
185	G8NT	880	3C12
186=	M0CUK	870	3C13
186=	G4PTE	870	3G1-
188=	G4SYC	860	3C1-
188=	G4FTP	860	3C14
190=	G4GYP	840	3C1-
190=	G4SLE	840	3C1-
190=	G5MY	840	3G1-
190=	G3KKP	840	3C11
190=	G0DBX/P	840	3C1-
195=	GW0VEW	820	3C1-
195=	G4XHE	820	3W1-
197	G0EYX	810	3C1-
198	G8OO	770	
199=	G4HMD	760	3C1-
199=	G3TSK	760	3W1-
201	G0DCG	740	
202=	M0AJT	730	3C13
202=	G4CWN	730	4C1-
204	G0RDO	720	3C1-
205	M0AWV	710	3C1-
206	G3EAO	700	3C1-
207	G3DQY	690	3W1-
208=	G3URA	680	2C12
208=	G0NVY	680	3C1-
210=	G4KEW	670	
210=	G8IB	670	2W1-
210=	G0BYA	670	3W1-
213=	GW4BLE	630	3C14
213=	G3TEV	630	3C1-
215=	G4ELY	610	3C1-
215=	G3CQR	610	2C1-
217	G3YOL	600	3C12
218=	G4EDG	590	3C14
218=	G0FOD	590	3C1-
220=	G3WFM	580	3C1-
220=	G3AQM	580	3C1-
222	G0UHM	550	3C1-
223	G0SCY	520	
224	G3SNU	480	3C1-
225=	G0SCP	470	3W12
225=	M0BYJ	470	3G1-
227	G3GUL	450	3C1-
228	G2LL/P	440	3C1-
229=	G3TUX	420	
229=	G0RPX	420	3C1-
213=	G0HFX	400	3W1-
231=	GW0CVY	400	3C1-
233	G0HDJ	390	1C1-
234=	G0UPU	370	3C1-
234=	G4NSZ	370	3W1-
236	G4GVZ	360	3C1-
237=	2E0NPB	340	2C1-
237=	GM4FGD	340	
239	G3HWS	290	2C11
240	G0WAQ	280	3C1-
241	G3HBZ	260	3C1-
242	G4CFO	230	3C13
243	M0CGF	210	3C12
244	G0SWO	190	3C1-
245	G0JHK	130	3C1-
246	M0BEX	120	3C1-
247	GW0UMC	110	3C1-
248	M5ACR	100	3W1-
249=	G0VDZ	60	3C1-
249=	G4CZV	60	3C1-
249=	G3UYC	60	
252	G0EJQ	50	3W12
253	G4MUL	30	3C1-
254	M5EVT	10	1C1-

1st 1.8MHz CW Contest 2001

THE NUMBER OF entries for this year's first 1.8MHz contest was up in both sections, particularly from overseas, compared with last year. Most logs were computer produced but some of the software was not scoring correctly. *SuperDuper* users must use the DXCC.CTY file rather than RSGB.CTY. Whilst *SD* will only allow two-letter codes from UK stations, the American software sometimes counted the two letter returns from PA stations as UK Postcodes. There were eight faultless logs, which are indicated in the listing with a # symbol.

Congratulations to Clive Penna, GM3POI, who was well clear of his competition to win the Somerset Trophy. Fraser Robertson, G4BJM, took second place and third was Terry Bucknell, GI4AFS.

One entrant thought he had VU2JA for a nice bonus but unfortunately, it proved to be a misread (or mistyped) UU2JA! Another operator was sending his old county three-letter code but changed to his postcode during the contest but nobody lost points because of it.

Congratulations to the overseas winners; Vyacheslav, RA1ACJ; Gerhard, DJ5BV, and Andrey, RW4PL.

Thanks to all the entrants and also to those who took part but did not send in a log. Please do it again in the second contest on **17 / 18 November 2001**. The rules can be found in the *December* 2000 *RadCom* on page 82.

Sid Will, GM4SID

RESULTS TABLE ON PAGE 79

1st 1.8MHz CW Contest, 2001

UK Section

Pos	Callsign	Points	QSOs
1	GM3POI	1014	219
2	G4BJM	896	188
3	GI4AFS	870	184
4	G4BUO	869	182
5	G0CKP	806	164
6	G4RCG	748	154
7	G3GLL	747	149
8	G0ORH	666	127
9	G0JQN	654	120
10	G4CXT	634	129
11	G3ZGC	632	83
12	M0EEE/P#	622	114
13	G4OGB	621	120
14	G3TJE	614	117
15	G3VYI	608	119
16	G4CZB	604	121
17	G3HZL	589	111
18	G3YEC#	565	105
19	G3KNU	564	106
20	G2AFV	561	108
21	G3YAJ	558	103
22	G2HLU	537	106
23	GW3NJW	504	95
24	G3WUX	502	90
25	G3KKP	476	89
26	G3LIK	405	61
27	G3GMS#	400	70
28	G3AWR	361	68
29	GM3UM	332	54
30	G3SXW	320	50
31	G3GMM#	319	52
32	G3JJG	297	50
33	G3UFY	285	41
34	GM3PIP	279	44
35	G3VQO#	205	30
36	G4EBK	117	40

Overseas Section

Pos	Callsign	Points	QSOs
1	RA1ACJ	387	61
2	DJ5BV	343	51
3	RW4PL	295	43
4	DL9CHR	239	33
5	DL5NAV	231	33
6	DF8AA#	213	31
7	OK1AYY	203	26
8	LY2OU	201	28
9	DL4KUG	185	26
10	F5ICC#	183	26
11	OE9/G3TXF	182	26
12	RN1AO	174	24
13	SP3VT	173	23
14	PA0MIR	141	19
15	OM3CND#	128	16
16	UU2JA	128	16
17	SP9KRT	117	15
18	UA9ZZ	83	11
19	DF4AE	72	10
20	OK1DKM	72	10
21	SM3ARR	69	9
22	SQ9CAQ#	40	5
23	DL5KVV	13	2
24	LY2BA	8	1

= perfect log

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest
1-2 Sept	*0000-2400*	*SSB*	*All Asian SSB*
1-2 Sept	1300-1300	SSB	RSGB/IARU SSB Field Day
4 Sept	1900-2030	CW	RSGB Slow Speed Cumulative #1
8-9 Sept	*0000-2400*	*SSB*	*WAE DX*
12 Sept	1900-2030	CW	RSGB Slow Speed Cumulative #2
20 Sept	1900-2030	CW	RSGB Slow Speed Cumulative #3
22-23 Sept	*1200-1200*	*SSB*	*Scandinavian Activity SSB*
27 Sept	1900-2030	CW	RSGB Slow Speed Cumulative #4
29-30 Sept	*0000-2400*	*Digital*	*CQ/RJ WW DX RTTY*

VHF Contests

Date	Time	Mode	Contest
1-2 Sept	1400-1400	All	RSGB/IARU 144MHz
4 Sept	1900-2200	All	RSGB 144MHz Activity
8-9 Sept	*1800-1200*	*TV*	*IARU ATV Contest*
9 Sept	1800-2200	All	RSGB 1.3/2.3GHz
11 Sept	*1700-2100*	*All*	*Nordic Activity 432MHz*
12 Sept	1900-2030	All	RSGB 144MHz Cumulative #3
16 Sept	*0400-1100*	*All*	*F9NL Memorial 432MHz (F)*
16 Sept	*0800-1100*	*All*	*DAVUS 144MHz (OZ)*
18 Sept	*1700-2100*	*All*	*Nordic Activity 1.3GHz up*
22 Sept	*1600-1900*	*CW*	*AGCW 144MHz (DL)*
22 Sept	*1900-2100*	*CW*	*AGCW 432MHz (DL)*
23 Sept	0900-1300	All	RSGB 2nd 70MHz
25 Sept	*1700-2100*	*All*	*Nordic Activity 50MHz*
27 Sept	1900-2130	All	RSGB 144MHz Cumulative #4

Microwave Contests

Date	Time	Mode	Contest
9 Sept	0900-2100	All	RSGB Millimetre Bands
23 Sept	0900-2100	All	RSGB 10GHz Cumulative #5

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 2000 *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 web sites from which comprehensive details are available. These are www.g4tsh.demon.co.uk/HFCC/index.htm and www.blacksheep.org/vhfcc

At 0946UTC on 7 July LX/OK1VVT/P (JO30) was worked on tropo. From 1606 Es QSOs were completed with EA7HAF/P (IM76), LZ1KCO (KN21, ODX at 2212km), LZ1UK (KN21), LZ1ZP (KN22), 4N1UN (KN13), LZ1JY (KN12) and LZ2KZ.

Syd Smith-Gauvin, GJ0JSY, caught the short Es opening at 1814 on 14 July and during a couple of minutes worked T94DU (JN95), YZ7MON (KN04), 9A4TM (JN85) and YU1IO (KN04). His station comprises an FT-225RD with Mutek front end, outboard preamp, and 125W to a 16-ele home-brew Yagi 40ft AGL. His QTH is 225ft ASL. GM4VVX reported the band very quiet with only four QSOs completed in the July activity contest. There was a weak aurora on 15 July, the first for a long time, during which Clive worked SM7ALC* and LA0BY*.

Nick Shaxted, GM4OGI (FK), was QRV for the 7 July Es in which he made 11 SSB QSOs into EA, EA6, F and I. ODX was I8LQS (JN70) at 2121km.

GW7SMV enjoyed the tropo on 21 June and Jamie worked EA1CRK (IN73), F/G0TBR/P (IN88), F6FHP (IN94) and EB8BTV (IL18) again. On the 26th he contacted F5ADT and F4ARU (IN94), F1DUZ (IN97), F5MGT (JN07) and F1AJE (JN05). In July, tropo on the 1st brought QSOs with EI5FK and EI2FSB (IO51) and EA1CRK (IN73). In an Es opening on the 2nd he had QSOs with I8MPO and I8YGZ (JN70) and 9A3FT (JN83). More Es on the 6th brought HA8MV/P (JN88) and EA7RZ (IM86) for a new grid. Next day I8TWK/5 and IK5YJY (JN53) and IK0RWX (JN61) were worked. In these last three Es events, Jamie had to go QRT due to thunderstorms.

Now to more exotic modes and G4SWX reports an ionoscatter QSO with I5YDI* (JN54) at 0950 on 23 June with 429/519 reports. At 0940 next morning he completed with RU1AA* (KP40) at 319/529 a QRB of 1977km. On 2 July at 1830 he completed an FAI contact with 9A1CAI* (JN86) with 559 reports each way, his QTE being 80º and at 1851 IZ1BPN* (JO35) was worked 559/53F at the same QTE with the reflection region over JO62/72. He was QRV in the Nordic Activity Contest on 3 July making 16 QSOs into LA, OZ, SM and YL. The two YLs were via Es mode around 1744, the rest being tropo contacts.

430MHz

Tropo was good on 8 July during European Field Day and G1UGH took advantage of it to work PA6NL (JO21). G4APJ was also QRV that weekend and Ken finally managed to work EI7KRC/P at 0815 on the 8th for a new country and grid. PA6NL was a big signal throughout but was typically beaming east. He finally worked him on CW at 1705 on the 7th. On the 12th he had arranged a sked with M1DRN (IG) but found that Andy is now M5DRN.

John Quarmby, G3XDY (IP), worked SM1BSI (JO97) at 2230 on 4 July. His best contacts in the contest on European VHF NFD weekend were DL0UL and DK0ES (JN48), LX/OK1ORA (JO30), DF2VJ and DK0BN (JN39), DL6FAW (JO40), HB9DKZ (JN47), DL0GTH (JO50) and OK2KKW (JO60).

G8HGN is QRV on the band but complains of lack of activity. Wanted French squares include IN98, JN28 and 29. Bob has copied the HB9 beacon several times and there have been a lot of mini-openings to the continent, but nobody was on. He has put out feelers for skeds but no responses yet.

1296MHz

In the Field Day weekend G3XDY lists notable contacts as LX/OK1ORA, DL0GTH and DL3YEE (JO42).

David Dodds, GM4WLL, is keen to encourage 23cm activity in the "top half of the country" so wishes to advise that he has set up a website for 23cm stations. So far it includes a list of stations believed to be QRV with names, locators, e-mail addresses and URLs, a list of north west European 23cm beacons listed by frequency and bearings from IO85, 23cm news and links to a wide variety of antenna designs for the band. He can be contacted at gm4wll@qsl.net and see the list for this website.

DEADLINES

THAT'S IT FOR another month and it's good to be able to report activity on many modes on all the bands. The copy deadline for November is **11 September** and for December it's **9 October**. Note these early dates. My CompuServe ID is g3fpk and the telephone answering/fax machine is on 020 8763 9457. ♦

WWW.

***DUBUS*:**	**http://www.dubus.org**
VHF Communications:	**http://www.vhfcomm.co.uk**
Philips data site:	**http://www.philips.com**
National Semiconductors:	**http://www.wireless.national.com**
GU6AJE / MU5MUF/MM:	**http://www.gu6aje.thersgb.net**
GM4WLL (23cm site):	**http://www.qsl.net/gm4wll/23/23index.htm**

HF HF HF HF

DON FIELD, G3XTT
105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.
e-mail: hf.radcom@rsgb.org.uk

HF BAND conditions always tend to be disappointing during the summer period due to ionospheric absorption and a variety of other technical reasons which it's inappropriate to go into here. Certainly, the bands left something to be desired during July, though hopefully the IOTA Contest will have produced some pleasant surprises (I am writing this before the contest takes place). However, you will be reading this at the time of year when propagation should be taking a decided turn for the better. The solstices (September and March), again for various technical reasons, favour good conditions on all the HF bands, so that this month really signals the return of what, in the northern hemisphere, can be considered the 'DX Season'.

Obviously, contest and DXpedition organisers are well aware of this, so we start to see some of the major international contests, and an increase in the number of scheduled expeditions. In particular, take note of the expeditions mentioned below to various parts of the Pacific. It is no coincidence that these are being mounted by Europeans. Europe really only has a good crack at the Pacific on the high bands at times of sunspot maxima, so that the opportunity to work these rare ones on, say, 10 and 12m will pass within the next year or two. US and Japanese amateurs don't have the same problem (though they do with other parts of the world which might be easy for us!) Hopefully you will have spent the summer doing any essential maintenance on your antennas and feeder systems, and be all set to go! And, for the reasons just described, if you have limited antenna space, now might be the time to forget, say, 20m or the low bands, and put up something like a 10 / 12 / 15m quad to fill those needed slots before the sunspots go away.

DX NEWS

A DUTCH GROUP plans to be on the air from **Luxembourg** as LX9SW from 15 to 22 September, all bands and modes (including PSK31). QSL via PA1KW.

Meteorologist Jack, FR5ZU, says he is going back to **Tromelin** for one month, starting 6 September. He plans to operate SSB on all bands with an FT-850, 100 watts, to a vertical. In the past, his favourite frequencies have been 3773, 3795, 14256, 14274, 18145, 21205, 24945 and 28470. Callsign will be FR5ZU/T. QSL direct or via his current QSL manager, JA8FCG.

COUNTRIES WORKED, 2001
(sorted this month by SSB totals, where declared)

CALL	CW	SSB	RTTY	MIX
G4DUW	182	210	0	256
G0VHI	0	190	0	190
ZC4BS	131	186	42	200
M0LLW	0	149	0	149
MU0FAL	124	125	0	153
G0TSM	166	117	14	205
M0CAL	0	113	0	113
G4OBK	208	103	67	239
G3MDH	0	103	0	103
MM0BQI	81	101	90	140
G3JFS	142	99	103	172
G4FVK	39	76	0	83
G4MUW	0	75	0	75
G3YVH	126	67	1	161
ZC4DW	143	67	80	160
M5AEF	15	66	0	68
G4YWY/M	0	54	0	54
G3LHJ	167	53	46	181
G3XTT	137	38	2	148
G4DDL	42	34	18	58
GI0NQC	0	15	41	49
GM4OBK	89	10	0	95
G3TXF	193	1	1	193
G0NXX	235	0	0	235
G3SXW	211	0	0	211
G3IGW	200	0	0	200
G0ARF	0	0	120	120
GW4SKA	0	0	66	66
G3WP	46	0	0	46
M0BIB	-	-	-	231
M0CTQ	-	-	-	231
M0BZQ	-	-	-	204
G0CAS	-	-	-	142
M0CNP	-	-	-	112
GM4ELV	-	-	-	107
GM4FAM	-	-	-	102
M0ASJ	-	-	-	21

Jack, F6BUM, will be on holiday in **Madagascar** from 9 to 27 September. He'll have an IC-706 and a R7 vertical. He will also make a stop on IOTA AF-090 from 3 - 7 September and on IOTA AF-057 from 23 - 26 September. Look for him mostly on CW.

Phil, G3SWH, and his wife will also be heading to **Madagascar** this month. They will be travelling extensively to start with, so probably no radio, but Phil then hopes to activate Île Ste Marie (IOTA AF-090) from 15 to 20 September, CW only. No callsign has been allocated yet, although Phil has asked for 5R8WH. QSL to his home call.

Bert, PA3GIO, is on his travels again. This time expect him from **Christmas Island** (OC-002) as VK9XV from 6 to 13 September, from the **Cocos (Keeling) Islands** (OC-003) as VK9CQ from 14 to 20 September, from **Australia** (possibly **Kangaroo Island**, OC-139) as VK6GIO from 22 September to 8 October, and from **Lord Howe Island** as VK9LO from 9 to 15 October. Bert operates SSB only, 10 through 80m. Bureau QSLing is preferred, via his home call. Incidentally, don't get confused between the Christmas Island mentioned above and the *other* Christmas Island in Kiribati (T32), perhaps the better known of the two due to its link in the past with various nuclear tests.

The team which activated Conway Reef (3D2CI) earlier this year has announced plans to operate from KH1, **Baker and Howland Islands**, during September / October, led by Hrane, YT1AD. If they are unable to meet that timescale, there is an alternative time window for the operation of February / March next year.

Marcel, ON4QM, will once again be active from the **Austral Islands** and **French Polynesia**, starting around 25 September for about two months in all. His exact itinerary is unclear, but his plans include activating Pukapuka (OC-062) in the Tuamotu Islands, then Rapa (OC-051) in the Austral Islands. There is also a possibility he may operate again from Reao (OC-238) in the Tuamotu Islands. Other stops may include Napuka (OC-094), and Hereheretue (OC-052). Previously he has signed FO0DEH, but this year expect him to sign FO/ON4QM. QSL to his home call.

Gerard, PA3AXU, is yet another one who is off to the Pacific. First stop is Tarawa, **West Kiribati**, where he will be operate as T30XU starting 4 September. Next it's on to **Nauru** beginning 11 September as C21XU. Final stop is **Fiji** as 3D2XU, from 20 to 28 Septem-

View of the antennas used by Scottish team that operated earlier this year from the Falkland Islands as VP8SDX.

9 BAND TABLES No 39

MIXED MODE

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
G3KMA	249	300	327	315	333	328	332	317	329	2830
G4BWP	240	304	332	318	333	327	332	307	319	2812
G3XTT	231	275	316	281	332	306	328	289	306	2664
G3GIQ	150	245	302	260	333	314	331	290	322	2547
GW3JXN	177	250	288	279	325	312	308	281	289	2509
G3TXF	127	230	289	269	323	278	321	252	297	2386
G4OBK	153	208	265	262	324	292	309	282	287	2382
G3TBK	119	231	271	238	323	284	308	263	281	2318
G3SED	227	249	276	259	289	261	248	230	253	2292
G3YVH	124	152	253	274	318	308	300	266	271	2266
G3IFB	62	221	287	224	325	240	304	234	285	2182
G3WGV	106	183	250	267	295	272	283	249	254	2159
G3LAS	92	180	218	227	302	283	300	275	273	2150
GM3PPE	148	210	247	262	312	244	268	219	224	2134
G3KMQ	59	209	264	204	323	233	279	243	242	2056
G3IGW	129	198	315	236	284	240	256	119	231	2008
G5LP	67	222	281	200	308	167	276	112	238	1871
G4PTJ	33	159	191	120	313	227	313	191	279	1826
G3NOF	5	126	131	0	332	298	330	263	305	1790
G0JHC	1	29	148	218	241	277	293	260	301	1768
G3VKW	43	156	206	86	319	169	314	168	295	1756
G4XRX	7	67	168	143	292	225	296	192	255	1645
G4NXG/M	24	58	137	0	287	193	272	173	246	1390
G4UCJ	33	87	178	139	221	173	198	161	186	1376
GM4OBK	40	96	131	68	161	114	150	119	181	1060
G0LRX	1	92	123	0	226	44	245	37	220	988
G4FVK	40	77	102	55	182	103	182	63	161	965
MM0BQI	39	53	96	41	145	65	126	49	107	721
M0CNP	4	54	70	5	130	59	116	19	73	530
AVERAGE	94	170	223	181	284	229	273	204	252	1910

CW ONLY

G3KMA	243	279	324	315	332	321	330	302	318	2764
G3XTT	221	244	303	281	303	281	298	261	275	2467
G4BWP	211	217	284	316	278	296	278	268	233	2381
GW3JXN	174	218	272	279	301	297	294	259	263	2357
G3TXF	127	223	287	269	318	276	315	251	283	2349
G0NXX	168	228	273	278	289	278	264	250	256	2284
G4OBK	140	185	254	262	292	280	272	266	262	2213
G3WGV	108	185	254	271	302	279	295	255	261	2210
G3SXW	96	200	258	251	316	267	298	240	275	2201
G3YVH	123	148	249	274	309	293	282	249	254	2181
G3SED	225	229	273	259	264	232	214	189	201	2086
G3NOH	48	124	204	254	301	284	289	243	248	1995
G3LAS	90	92	191	227	248	243	257	232	252	1832
G5LP	67	217	281	200	297	167	264	111	227	1831
G4PTJ	32	87	138	120	208	185	224	169	206	1369
G3VKW	35	81	150	85	217	128	231	121	173	1221
GM4OBK	32	78	114	68	133	96	129	99	130	879
AVERAGE	126	179	242	236	277	247	267	221	242	2036

Next deadline: 8 October 2001 (to G3GIQ, QTHR, e-mail: Henry.Lewis@compuserve.com)

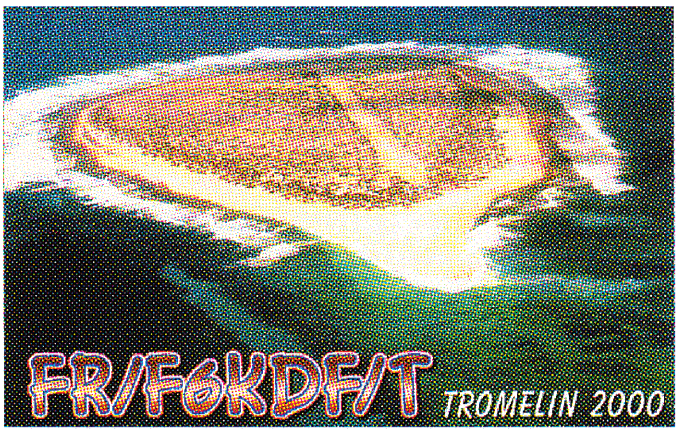
ber. He will be active on SSB, CW, RTTY, SSTV, PSK31 and Hell.

And here's another one. Gunter, DL2AWG, was planning to be in the South Pacific Ocean from late-August to mid-September. First stop, until 29 August, was to have been Rarotonga (OC-013) in the **South Cook Islands** as ZK1AWG. Next will be Vitu Levu (OC-016) in **Fiji** as 3D2AW from 31 August to 8 September.

Bill, AK0A, says he will be going to **Costa Rica** (TI) for the *CQ* World Wide RTTY Contest in September and the TARA PSK31 Rumble in October. His visit will extend from 25 September to 9 October.

A team of eight Spanish operators will be in **Guatemala** from 17 to 26 September installing a digital radio emergency network like the ones installed in past years in El Salvador and Honduras. The operators, EA1QF, EA3CUU, EA4BT, EA4KA, EA7AAW, EA7JB, EB1ADG and EB4EE, will also operate all HF bands, SSB, CW and RTTY with special emphasis on CW and the WARC bands. They are trying to get the callsign TG0R. QSL to EA4URE.

Marty, NW0L; Tom, AE9B; and Geoff, W0CG; will be activating the Caribbean Contesting Consortium's new station as PJ2T (**Netherlands Antilles**) during the Worked All Europe SSB Contest on 8 / 9 September. During the week before the contest, they will be active as PJ2/homecall on SSB, CW, RTTY and possibly PSK31 and MFSK16, on 160 to 10m. QSL prior to the contest via home callsign. Direct QSLs should include SASE / IRCs for a reply. Limited schedules on the digital modes are available. Interested parties should e-mail NW0L directly at nw0l@arrl.net. QSL PJ2T via KN7Y.



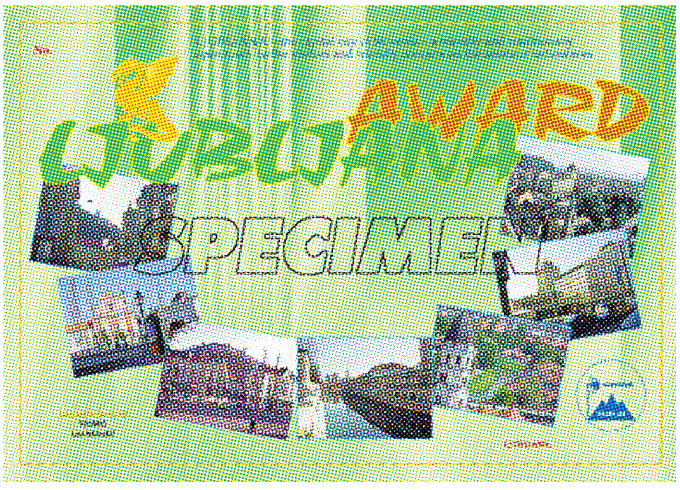
The attractive QSL card from last year's Tromelin Island operation.

Finally, and somewhat more mysteriously, Sigi, DL7DF, and friends have announced that they will be going on a DXpedition between 28 September and 14 October, but with no details (at the time of writing) as to where. However, this is the same team that has pulled off very successful expeditions from a number of Asian, Pacific and South American locations in recent years, so expect to hear them on the bands in a big way, whatever the location.

AWARDS

THE ARRL HAS announced another addition to the **DXCC awards programme**, this time for 12 metres. Applications for this award are now being accepted, although credits will not count toward the DeSoto Cup competition (see July 'HF') until 1 October. However, they will be included in the DXCC Challenge totals. 12m DXCC certificates will be dated but not numbered. If you do not know what credits you have on 12m (any 12m credits in recent DXCC submissions will already be held on the DXCC database), you may contact DXCC for a copy of your record. If you have web access and can handle PDF files, contact DXCC at dxcc@arrl.org for a copy. If you do not have web access, please send a note to DXCC along with $2.00 for postage and handling. If you have received a printout of your DXCC record since 1 January 2001, it will already show any 12m credits you may have. The normal checking procedures apply for this, as with other DXCC awards (see last month).

S51MG has sent me details of the **Ljubljana Award**, issued by the Radio Club Triglav. European stations need contacts with four Ljubljana sta-



The Ljubljana Award, issued by Radio Club Triglav (see text).

tions since 24 October 1992. Contacts can be on any mode and on any of the six main HF bands (160, 80, 40, 20, 15, 10). A list of Ljubljana callsigns can be found on the web page. To apply for the award, send a certified (by two other amateurs) log extract, with 10 DEM or $5 to Leopold Mihelic, S51MG, Beblerjev trg 3, 1122 Ljubljana, Slovenia. Leo can also be reached at leo.s51mg@siol.com

CONTESTS

THE MAIN international contesting events in September are the **Worked All Europe SSB** (see last month) and the ***CQ* / RTTY Journal RTTY Contest** on 29 / 30 September, a must for all RTTY enthusiasts. Also look out for the **All Asian Contest** (SSB) on 1 / 2 September, and the **Scandinavian Activity Contests** (CW on 15 / 16 September, SSB the following weekend, both from 1200 Saturday for 24 hours). As always, I can usually help with full details in return for an SASE (or e-mail me). In this year's **UBA DX Contest** (SSB), GM0NTL scored 11680 on 10m. In the single-op multiband section, GW0RVT scored 41100, GI0OUM 13172, and GM4ELV 2076. In the multi-op section, G3XYZ scored 43524. There were no UK entries in the CW leg.

CLUSTER DATA

IT IS ALWAYS interesting to analyse what has been active on the bands, when , and in which parts of the world it has been heard / worked. Rod Elliott, VE3IRF, has collected the DX spots from the OH2AQ Web Cluster since January 1997. The collection (from January 1997 up to June 2001) is available on the web, along with the software (DXINFO v 1.7) which will enable you to handle the files.

These pictures from the February St Peter & Paul Rocks expedition show how tough the location proved to be!

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 **November** issue (including table updates) by **15 September.** ♦

WWW.

Ljubljana Award:	http://hamljaward.members.easyspace.com
PA3AXU:	http://www.qsl.net/pa3axu/2001/
PA3GIO:	http://www.pa3gio.nl/
UBA Contest results:	http://www.uba.be/Engels/framesgb.htm
VE3IRF Cluster Spots:	http://www.425dxn.org/
Caribbean Contesting Consortium:	http://asgard.kent.edu.ccc

HF F-Layer **Propagation Predictions** for **September 2001**

	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	992....38999	786333569988	.3877888983	3589999998 65	.37999999733	....44543...	....
*** Asia							
Yakutsk	531	3.......3564	..2..235655.	..24345.....	...555.....	....3.....	....
Tokyo	.......12..	.......12..	.........1..	....	....	....1.....	....
Singapore	5661	68873	288862	.....178862.	.....27873..	....25776...	.....3563...
Hyderabad	....	....	.........111.	.....3431.	.....134...	...222555...	...122332...
Tel Aviv	992.....8889	7781..179999	888866789999	333777787975	...433455753	...33334463.	.........5..
*** Oceania							
Wellington	.....89...	...278999...	...8999997..	...7887574..	...6776.5...	...676.....	....5.....
Perth	.....234.	.....2543.	.....3311.	.....14652..	.....2442...	..123553....	..12342.....
Sydney	.....35..	.....356..	.....2534..	....157745..	....256512..	..126774....	...2565.....
Honolulu	..6.......	.5874.....	..6775.....	...664.4....	....5.....	....	....
W. Samoa	....	..7642.....	..688874....	...6788.....	....777.....	....566.....	....
*** Africa							
Mauritius	4.......1455	3.......4665	2.....26653	57521	.....562..	.....33...	.....21...
Johannesburg	99.....9999	99.....9999	997....89999	.898667999 9	..998899997	..999999998.	..899999999..
Ibadan	....	.1........	..2.....1	..33....12..	..1421111...	..15543331..	...2222221..
Nairobi	....	12.....1	45.....1123	2331...13356	11631.135553	..7653356521	..366667732.
Canary Isles	8881....4888	9987...37888	979875678899	647988999 86	4.699999 6964	...8888887..	...6777785..
*** S. America							
Buenos Aires	888.....48	8881.....68	7685.....377	62662...1776	..345...476.	....3...35..	....2...33..
Rio de Janeiro	546.....35	657.....366	536.....654	63763...3976	3.456323 6963	....643477..	....543466..
Lima	322.....1	3231.....12	1.25.....11	2.382....252	...7.3..242.	...4.4..33..	.....3..3...
Caracas	222.....1	4451.....23	5276.....34	...35....241	....6322251.	....6777782.	....476686..
*** N. America							
Guatemala	434.....2	4343.....2	2..5.....1	....	....	.....42.32..	....
New Orleans	655.....3	7675.....6	6.56.....56	5.56.8888886	8888863	.....799985.	.....68887..
Washington	8881.....8	9998.....78	977674.35799	6...68888886	.....888896.	.....899985.	.....77787..
Quebec	898.....88	6371.....376	...62..23662	...587788853	...36777863.	....666676..	....455664..
Anchorage	676.....	777.....6	..7....66776	..7....78977	.....786.	.....77...	.....6..
Vancouver	.1.....	111.....	....	.....4452.	.....254..	.....233..	.....22..
San Francisco	.11.....	.11.....	....	.....1221.	.....222..	.....12...	....

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 July 2001 issued by the Sunspot Data Centre, Brussels, was 82.2. The maximum daily sunspot number was 127 on 18 July and the minimum was 45 on 6 July. The predicted smoothed sunspot numbers for September, October and November are respectively: (SIDC classical method – Waldmeier's standard) 96, 95, 94 (combined method) 95, 93, 92.

SWL

BOB TREACHER, BRS32525
93 Elibank Road, Eltham, SE9 1QJ.
E-Mail: brs32525@compuserve.com

BY THE TIME this hits the doormat, the autumn DX season will just about be upon us. It will be time to dust off the receiver after its restful summer and check to see that the antennas are still functioning properly. It might also be just the opportunity you are looking for to try something different in the way of antennas for the low bands – a sloping dipole, for example. I have to say that my two 7MHz slopers are quite superb and allow me to catch anything that's going on the band. I have not bothered keeping records of the DX heard on 7MHz this year, so I shall be looking to the autumn DX season to 'kick start' my 7MHz score for the year. I am fortunate to be one of the few SWLs that has an all-time SSB score on 7MHz over 300, so I know that new ones will be very hard, if not impossible, to find this coming season, but there is something special about DXing on 7MHz and the DX on offer never fails to surprise me. Why not decide to concentrate more than you normally do on 7MHz and please let me know how much DX you manage to hear.

D68C QSL CARDS

ALL DIRECT and e-mail SWL QSL requests that were sent to me have now been answered. By mid-July, I had replied to a staggering 443 SWL reports. As no bureau cards had been received, I am wondering just how many SWL reports are on their way to me!

Most of the reports were easy to confirm, but I am concerned at the number of so-called reports that were just not in the log. I'm afraid to say that I have been unable to confirm over 40 reports as the stations being reported were simply not in the log. Either some listeners' hearing and logging capabilities are poor, or there is a more evil animal in our midst. Please make your reports honest and accurate, and only send reports when you have actually heard the QSO.

The D68C Comoros SWL Trophy competition was popular with quite a few entries received. The results will be available at the RSGB HF Convention in October.

CQWW SWL CHALLENGE 2001

THE AIM OF the challenge is to log as many countries as possible - SSB: in the 48 hours from 0000 on 27 October 2001 to 2359 on 28 October 2001; CW: in the 48 hours from 0000 on 24 November 2001 to 2359 on 25 November 2001. The rules are the same for both the SSB and CW Challenges.
Please read the rules carefully.
1. SWLs may listen at any time during the 48 hour periods.
2. Only *one* station from each DXCC country may be logged on each of the main amateur bands (28, 21, 14, 7, 3.5 and 1.8MHz).
3. There will be three sections:
'A': Single operator. *Note*: SWLs entering Section 'A' must include a declaration to the effect that only one listener used the station, there was only one receiver in use, and no use was made of *Packet Cluster* or the *DX Summit*.
'B': Multi-operator multi receiver
'C': Multi-operator single receiver.
NOTE: SWLs using *Packet Cluster* or *DX Summit must* enter Section 'C'.
4. Points will be as follows:
(a) Countries in the SWL's own continent score 1 point on each band. Countries outside the SWL's own continent score 5 points on each band.
(b) The final score shall be the total of the countries heard on the six bands multiplied by the total number of points from each of the six bands (for example, 400 countries x 900 points = a score of 360,000).
5. Entries must show a) Date; b) Time (UTC); c) Callsign of station heard. *The callsign of the station being worked is NOT required;* d) RS(T) of station heard at SWL's QTH. No station may be logged whose RS(T) is less than 33(9). Separate log sheets *must* be provided for each band.
6. A country multiplier check sheet *must* be provided. *Only countries shown on the official DXCC List shall count as a multiplier.* Each entry *must* have a cover sheet giving the claimed score.
7. *Any entry not complying with all of these rules may be omitted from the results listings.*
8. Any entry which is poorly presented or is not within the spirit of the challenge will be omitted from the results listings.
9. Logs should be sent to: Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ.
10. Logs *must* be postmarked no later than: SSB Challenge - **28 November 2001;** CW Challenge - **29 December 2001.**
11. Entrants wishing to receive a copy of the Results Booklet *must* include £1, $1 or 2 IRCs to offset the cost of printing and postage. The results may also be published on the Internet.

/P SWL

SPURRED ON BY the results of my own /P SWL operation from GW last year, Eric Wilson, RS180120, took a Realistic DX-394 receiver on a recent holiday to the Lizard peninsula in Cornwall. He was very pleased with the results and provided a lot of good material. Most of the DX logged was on 18, 21 or 24MHz. He heard much from the Far East, including JAs, HL, YB and BY, a number of Ws and quite a few Europeans, including OJ0VR. Taking a receiver added a different dimension to Eric's holiday, and he received much pleasure in being able to tune the bands from a /P location.

If you have taken, or you intend to take, a receiver on holiday this year, let me know about your successes and I will gladly include your results in the column.

Certificate isued by CDXC and received by Bob's son Simon for the achievement of receiving 109 DXCC entities on the low bands during January.

SWL CALLSIGNS

I AM SOMETIMES asked, mainly by our licensed colleagues, why SWLs in certain countries have SWL calls that are at variance with the calls of licensed amateurs from the same country, and why some SWL calls are so complicated (eg some DL and all W SWLs). I cannot answer the second part of the question, but I can now explain why SWLs in the Netherlands have the 'NL' prefix. This is because the SWL has had his call allocated by VERON (the Dutch national society). There are Dutch SWLs with the more usual 'PA' prefix –these had their calls allocated by the VRZA. It appears, however, that the Dutch QSL bureau operates for both, so anyone sending an SWL QSL card to an 'NL' or 'PA' SWL knows that the card will get to them (providing they have envelopes at the bureau).

Nearer home, I have been asked by amateurs in Russia and the former Soviet republics why British SWLs are issued with an 'RS' number, as 'RS' is recognised as a Russian prefix. I can understand their point as one contest that Simon, RS177448, entered scored all Russian stations as 0 points and all G stations as 3 points, whereas it should have been the other way round!

'RS' in fact stands for 'Receiving Station' and I doubt that the Society's databases would entertain a change to 'G', 'GM' etc. Indeed, a change now would be impractical as SWLs who are members of the ISWL have 'G' SWL callsigns.

INTERNET NEWS

TWO NEW SITES to me are listed below. The VA3RJ site is particularly interesting for any SWL interested in QSLing, IOTA, castles, lighthouses, contests and awards. ♦

WWW.

VA3RJ: www.qsl.net/va3rj/
Mayer.com: www.mayer.com.ar

ATV

TREVOR BROWN, G8CJS
E-mail: chairman@batc.org.uk

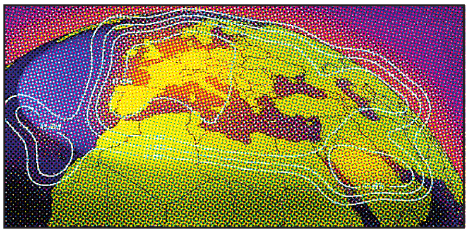
INTERNATIONAL ATV CONTEST 2001
Saturday and Sunday, 8/9 September.
1800GMT Saturday to 1200GMT Sunday
Fast Scan TV all Bands
[contest@batc.org.uk]

ONE OF THE advantages of a bi-monthly column is that there is time to get feedback from the last column before writing the next. All the feedback has been positive and encouraging. The majority is via e-mail, what else would you expect from a technology-based hobby? In an attempt to encourage this and make it more interactive, we now have a web-based forum, where you can leave all your comments, ask questions and discuss ATV with others. This new forum is still in its infancy, but should prove a useful place to find out about and discuss ATV with fellow enthusiasts. You can reach it from the BATC website by selecting the forum link on the home page.

FEEDBACK

MOST OF THE feedback related to the Dutch ATV repeater PI6ALK. This unusual repeater has 12 inputs on 3cm and one input on 23cm. All the 3cm inputs are via 22cm dishes with the exception of two 45cm for DX signals from Amsterdam. The 23cm input is via an omnidirectional array of 8 stacked double-quads.

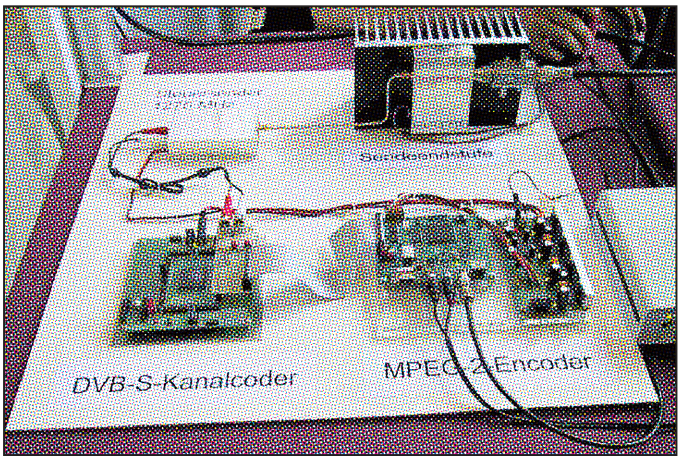
The output is on 13cm (2352MHz) feeding an omnidirectional slotted waveguide, with a gain of approx 10dB. This is useful to know if you are planning a portable expedition to Holland, but for those of you with a digital satellite receiver you can see PI6ALK on the W2 satellite. This is located at 16°E. The frequency is 12.729GHz, the symbol rate is 2000, and the forward error correction (FEC) is ¾. Reception is possible with a 1.6m dish, but I have had reports of it being received in the UK with a dish as small as 1m. During the day you can see an electronic test card with the call PI6ALK displayed, and in the evening you will see a multiplex of the received signals from its numerous inputs. For more details see the PI6ALK web site.



Footprint of the PI6ALK satellite.

DIGITAL ATV

WHILE ON THE subject of digital satellite receivers, Richard Parks, G7MFO, has just returned from Germany after visiting the Friedrichshafen Hamfest where there was a live demonstration of the German proposal for a common European digital ATV system. Richard goes on to say that the pictures looked very good on the link around the hall using 6MHz bandwidth. A demonstration on 70cm was also shown in colour with reduced bandwidth of 2MHz, but the pictures looked pixellated. The Germans have produced a PCB for the MPEG 2 digital encoder that is necessary in order to transmit digital ATV in a format that enables reception via a standard digital satellite receiver. More details on this PCB should be available at the German VHF convention in Weinheim. This is on the weekend of 8/9 September. Richard would love to visit, but he is also the BATC contest organiser, and that is the date of next ATV contest (what a dilemma). Richard also reports that the summer fun contest went well with entries on 70, 23, 13 and 3cm. He has not yet had time to process the results. Further information can be found on the BATC web page under the 'contest' link. An automatic contest log on a Microsoft® Excel spreadsheet can be downloaded from this site which also works out the bearing, back bearing and distance in kilometres.



Digital ATV transmitter at the Friedrichshafen Hamvention.

MAPLIN PRODUCT

KEVIN STADDON, G7VNQ, also e-mailed me to say that the new Maplin Electronics summer supplement listed 2.4GHz transmitters and receivers, for TV surveillance; has anyone tried these? Not to my knowledge, Kevin, I am on the Maplin mailing list but I don't remember seeing anything on these items.

AIRBORNE ATV

I ALSO RECEIVED a telephone call from one of our readers who is hoping to fit a small TV camera and ATV transmitter into a radio-controlled model helicopter. I have seen this done before and the results were very encouraging, but it was some years back when the equipment was somewhat larger than you would expect to use today. The main problem was that the motor caused vibration of the FM oscillator used in the transmitter. When demodulated by the receiver this modulation showed up as LF noise on the picture.

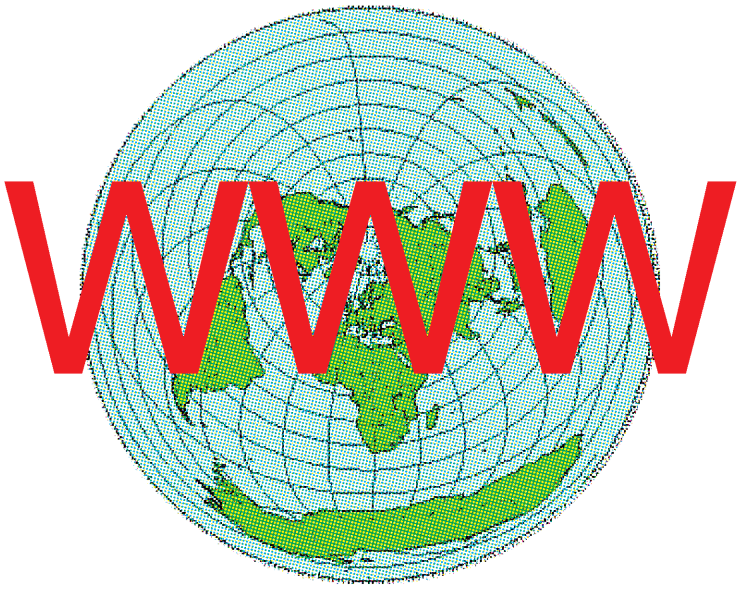
One of the American ATV enthusiasts equipped a model aeroplane with a similar setup and, to reduce this problem, the transmitter was foam-mounted to the aircraft wing as far as possible from the motor. This did somewhat unbalance the plane and I suspect made it difficult to fly. There is a commercial operation of this technology for use in television and film work. The company is called Hovercam. The helicopters are larger than the sort of models you see in the park on Sunday, but then the average film camera is quite heavy. If you are interested you can visit their web site and see pictures of their craft and read some of their film credits; you never know, you might have seen some of their footage on the silver screen.

REPEATER UPDATE

IN LIGHT OF all this feedback I have not found room to feature an ATV repeater, but I must briefly mention GB3TB, a replacement for GB3WV, which was on Dartmoor until the site rental increased. GB3TB is located in Torquay, Devon, has an input frequency 1249.0MHz and an output frequency of 1316.0MHz. The NGR is SX913680 and the locator IO80FL. By the time you read this the repeater should be up and running. Contact Ken Harper, G0EKH, for more details (ken@norstech). ♦

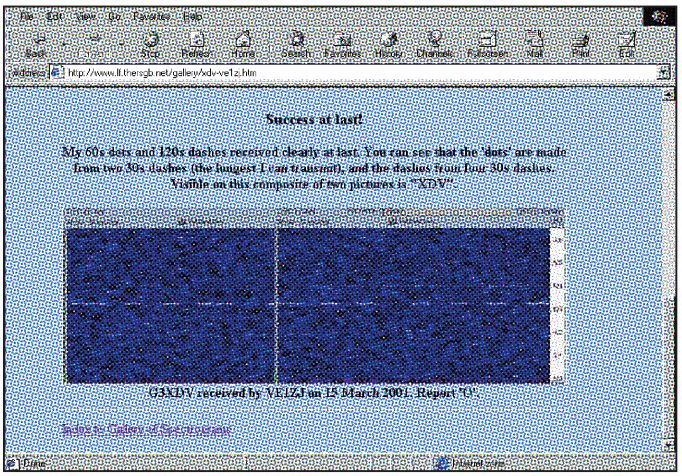
WWW.

BATC	www.batc.org.uk
PI6ALK	www.PI6ALK.NL
Hovercam	www.hovercam.com



ANDY GAYNE, G7KPF
119 Lower Lickhill Road,
Stourport-on-Severn DY13 8UQ.
E-mail: www.radcom@rsgb.org.uk

TECHNICAL investigations have always been a key aspect of amateur radio, and there are some bands that seem to be natural homes for this experimental side of the hobby. The LF bands are a good example of this, as can be seen at the web site of Mike Dennison G3XDV (1), described as "All about life on the 73kHz and 136kHz bands".



Mike Dennison, G3XDV, goes Trans-Atlantic on LF.

LIFE AT LF

MIKE HAS NOT put together a 'how to' web site, rather it is a record of his own activities and those of his fellow LF enthusiasts. Pages describe the G3XDV home station, the latest known activity on the bands, brief outlines of the modes used, plus some pictorial records of unusual portable expeditions. For example, the picture gallery for the operation from the Decca mast at Puckeridge shows some very interesting details of the equipment used, and the accompanying report by Derek Atter, G3GRO, describes what sounds like a very fulfilling weekend's activity. [See also *RadCom*, June 2001, p38ff - *Ed.*]

My overall impression is that Mike's site is a good place for LF enthusiasts to compare notes, as his enthusiasm and knowledge of the subject is clearly evident and much of the information present will really only be understood by someone active on the band. Having said that, for those thinking of getting more involved in LF operation the site does give a very clear idea of the nature of the equipment used, especially for very slow CW, and the links provided ensure there is plenty of further reading.

WWW.

(1) G3XDV LF pages	www.lf.thersgb.net
(2) N1LO towers	www.qsl.net/n1lo
(3) Wrexham ARS Novice course	www.qsl.net/wars
(4) IARU Region 1 monitoring	www.iarumsr1.cwc.net

TOWER SAFETY

A SUBJECT THAT applies equally to all of the amateur bands is the safe construction and use of towers. Barry Kirkwood, ZL1DD, has recently carried out some extensive tower work, and has found the web site of Mark Lowell, N1LO (2), to be invaluable. The site contains a large collection of notes on guyed towers, covering topics like climbing techniques, lightning protection, rotators, and corrosion protection. The tower notes are presented as a single text page, though the index indicates it would be 105 pages if printed!

Not content with producing a definitive guide to towers, N1LO goes on to present designs for various antenna projects, using a hand-drawn 'notebook' style of presentation, and also puts forward another weighty text file describing the construction of a repeater. This latter section is obviously based on US practices, but the technical issues discussed are equally applicable world-wide. Needless to say, these are comprehensive works, and the tower document is probably a 'must read' for anyone contemplating erecting or maintaining such a structure. As Barry reports "I found that virtually everything I had learned about knots 50 years ago was dangerously wrong," which proves we're never too old to learn.

NOVICE NOTES

EDUCATIONAL MATERIAL of a different variety is offered via the Wrexham Amateur Radio Society's pages (3) in the form of a set of Novice course notes prepared by Patrick Smith, GW0VMR. When viewed in July, the notes appeared incomplete, as the first section was titled 'Lesson 2' but, nevertheless, this was the first time I had come across Novice training material presented in this way on the web.

The Novice Licence has never been intended as a self-training exercise, so the GW0VMR material serves two purposes. Firstly, it can be used by trainees to supplement their own learning experiences, as often a subject will become clearer if explained in two different ways. Secondly, this page can be used to show prospective Novice licensees the type of material they will have to study, allowing them to decide if it really *is* a subject that interests them. Either way, the Novice course notes will be a useful reference for those just entering the hobby.

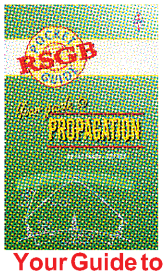
IARUMS

THE COORDINATOR of the IARU Monitoring System (IARUMS) in Region 1, Ron Roden, G4GKO, would like readers to be aware of the IARUMS web site (4). For many years IARUMS has been detecting intruders in the amateur radio bands and taking actions to clear the offending stations, and the web site gives details of this activity. Additionally, the site provides information about the ITU Radio Regulations applicable to amateur radio, as well as a monthly news letter with reports of what intruders have been heard throughout the region, plus a précis of reports from the other two IARU regions. Also available is an archive of various information papers Ron has written during his 11 years as coordinator, covering topics such as the history of the monitoring service, characteristics of receiving equipment, and country prefixes used by the ITU.

WEB WARNING

A FINAL NOTE of caution for everyone designing a web site comes from Angie Sitton, G0HGA. When Angie redesigned her web site recently, she downloaded the RA logo from its site to use as a link graphic, but was cautious enough to e-mail the RA to check that this was allowed. Its reply was that use of the logo was not allowed and that it should be deleted from the G0HGA site. Angie, of course, complied, deleting the link at the same time, but this reinforces the fact that care must be taken when lifting graphics or any other material from anyone else's web sites. The RA policy may seem a bit harsh and self-defeating for an increasingly graphically-rich web, but its wishes and copyright must be respected. ♦

RSGB BOOKSHOP



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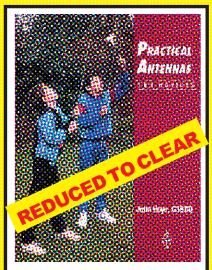

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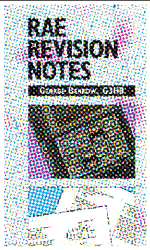

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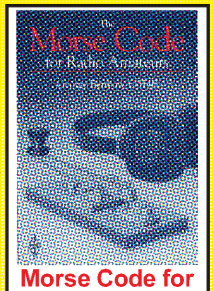

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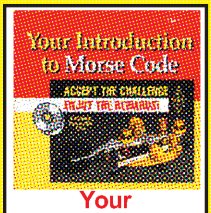

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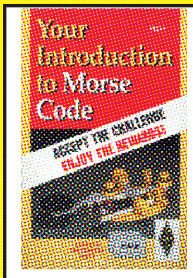

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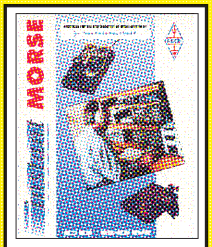

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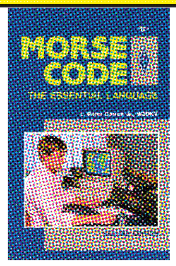

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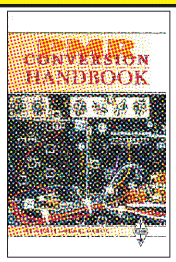

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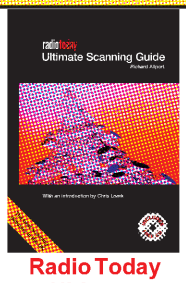

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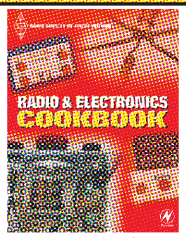

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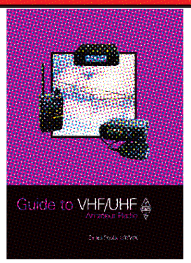

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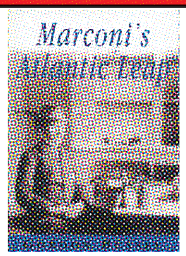

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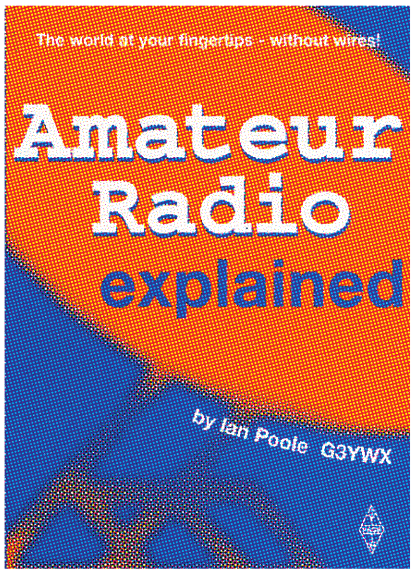

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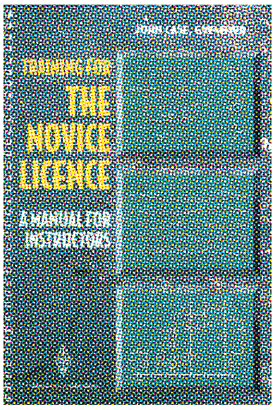

Training for the Novice Licence - A Manual for Instructors

This book is for the Novice Licence Instructor to use when taking students through the 12 week course, and is the companion volume to the Novice licence Student's Notebook. These two books are used throughout the course.

210x298mm - 91 pages

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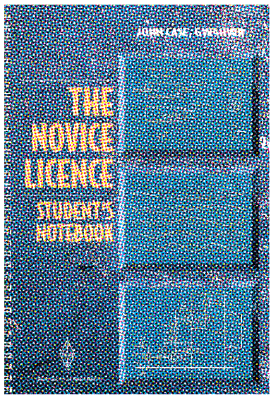

The Novice Licence Student's Notebook

This is the course work book for the Novice licence, and as such contains all the information covered during the 12 week course. It includes full details of the practical excercises, as well as having plenty of room for the student to write his/her notes.

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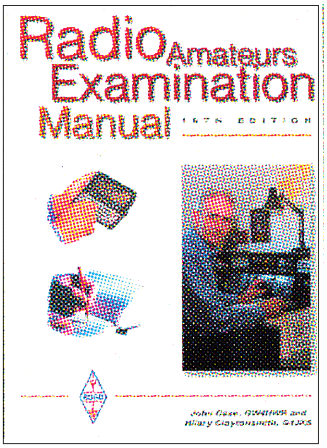

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The RSGB's RAE Manual is recognised as the standard textbook for courses leading up to the Radio Amateurs Examination. It is presented in an easily understandable format and takes the candidate step by step through the syllabus topics. This edition has been completely revised to take account of the changes in the RAE with effect from May 1998.

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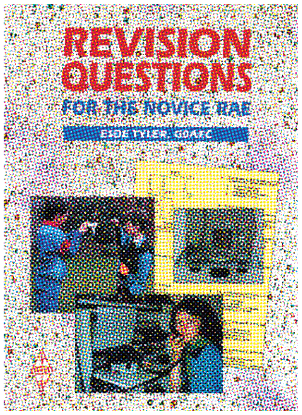

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This book contains a variety of questions and answers for the Novice RAE, which are intended to help candidates to revise and prepare for the multiple choice questions in the examination. A sample paper is included for practice purposes, and there are hints and tips on tackling the exam - an invaluable aid for the Novice Licence candidate to get through that all-important exam.

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Regular Feature

QRP QRP QRP QRP QRP

REV GEORGE DOBBS, G3RJV
St Aidan's Vicarage,
498 Manchester Road,
Rochdale OL11 3HE.
E-mail: g3rjv@gqrp.com

THE AMERICAN QRP Amateur Radio Club International (QRP ARCI) issues a DXCC-QRP Award which is issued to any amateur for confirmed QSOs with 100 ARRL countries while running QRP. QRP is defined as less than 5 watts of RF output. This is a coveted award, usually presented for operation over mixed bands with very few single-band recipients. In June, Peter Haplin, PE1MHO, won the QRP-DXCC Award for single-band QRP operation on six metres. This is the first six-metre-only presentation of the award.

PE1MHO is a long-serving member of the G QRP Club, being the club's representative for the Netherlands. English by birth, Peter has been a keen six-metre DXer for many years and the award represents the pinnacle of his achievements on the band. It certainly shows what can be done on six metres with modest power.

I am informed that a QRP endorsement for the ARRL DXCC Award may be available soon. During the QRP forum at the Dayton Hamvention this year, it was announced that the ARRL is currently working out rules for such an endorsement.

UKRAINE-QRP CLUB EXPEDITION

PETER GRYTSAY, US1REO, President of the UR-QRP Club, writes to tell of a recent QRP expedition. "Between 4 and 11 May 2001, the Ukrainian QRP Club held its first radio expedition to the Crimean Mountains with the special call - EM5QRP.

"It was arranged in two stages: 4-8 May on Mountain Ai-Petri, 1200m above sea level; 9-11 May in the suburbs of the town of Bachchisarai. 562 QRP QSOs were made with 45 countries of the world including JY, 4S7, JA, N8, 9H, EA9, HL & UA0.

QRP OPERATING EVENTS THIS WINTER

Original QRP Contest

Organised by Hartmut Weber, DJ7ST, it provides an opportunity for a genuine QRP contest. The winter event this year is on 29/30 December.

Participants: Operators of original QRP rigs, commercial or homebrew, including commercial QRP rigs exceeding 5W output like QRP Plus, FT-7 and QRP versions of QRO-transceivers like TS-130V, FT-707S, etc. QRO-equipment (>20W out) only temporarily turned down to QRP criteria is not allowed.

Date: The last weekend in December each year, Saturday 1500UTC till Sunday 1500UTC, rest period of 9 hours minimum in one or two parts.

Frequencies: CW segments of the 80-, 40-, and 20m bands. Call: CQ OQRP (Original QRP)

Categories: VLP (1W out or 2W in) QRP (5W out or 10W in) MP (20W out or 49W in).

Operation: Single-operator CW. Various transmitters and transceivers may be operated, but only one at a time.

Exchange: RST, serial-no/category eg 559001/VLP. No series reports, please.

QSO-Points: The log-checker will count four points for a QSO with another contest station whose log has been submitted. All other QSOs count one point. The exchange of RST is sufficient with stations not in the contest.

Multiplier: The log-checker will count two multiplier points for each DXCC-country from a QSO with a station whose log has come in. Otherwise each DXCCC-country counts one multiplier point per band.

Final score: Sum of QSO points multiplied by the sum of multiplier-points (Calculated by the log checker. Do not try your own calculation: you cannot foresee who will send logs).

Summary sheet: must show name, address, callsign and the minimum rest periods. Indicate the types of all equipment used with output or input power on each band according to manufacturer or measured under contest conditions. Homebrew rig descriptions should name the PA transistor or valve and possibly a reference.

Logs: List QSOs sorted by band. Add the DXCC prefix if you claim a multiplier for a QSO.

Entries to: Dr Hartmut Weber, DJ7ST, Schlesierweg 13, D-38228 Salzgitter.

The G QRP Club Winter Sports

Each year between Boxing Day and New Year's Day, the club invites radio amateur operators to join in a QRP 'QSO Party' using five watts of RF output or less. The operating takes place on and around the international QRP calling frequencies. These are:
CW: 1843, 3560, 7030, 10,106, 14,060, 21,060, 28,060kHz
SSB: 3690, 7090, 14,285, 21,285, 28,360kHz

This is not a competitive event, it has no rules other than using five watts or less. The idea is to call or listen for "CQ QRP" and enjoy as many two way QRP QSOs as available time, equipment and band conditions allow. It does provide an opportunity for operators who do not usually use QRP to turn down their power to a maximum of five watts and see what can be done. Those taking part are invited to submit logs and comments to the G QRP Club Communications Manager, Peter Barville, G3XJS, 40 Watchet Lane, Holmer Green, High Wycombe, Bucks HP15 6UG. The G4DQP Trophy is awarded to the station making the best overall contribution.

"The antennas used were a ground-plane and GPA-30, and a 41-metre long wire, the latter with an antenna tuner. We worked in shifts on the 80, 40, 30 and 20m bands, taking propagation into account. Homemade transceivers were used on the 80 and 40m bands. Only a military QRP transceiver worked without any problems from the very beginning to the end.

"Portable FM transceivers with an output power of about one watt were used for work on the 2m band. We had some RTTY QSOs on the 20m band. For this we used an old Notebook IBM 486SLC-50, software HamComm 3.1 and a home-made radio modem. The JVFAX 7.0 Software was used for receiving weather charts (7880kHz), but we didn't manage to have any SSTV QRP QSOs."

Two QRPeters in animated discussion at Friedrichshafen: Peter Mitrovic, S53MA, founder of the S5 QRP Club, and Peter Barville, G3XJS, Communications Manager of the G QRP Club.

URBAN ANTENNAS

ONE OF THE MEMBERS of the Ukraine QRP Expedition was Igor Grigorov, RK3ZK. Igor is a frequent technical writer for *SPRAT*, the journal of the G QRP Club. Igor has recently written a book called *Urban Antennas*, which has been published in the USA. Full information about the book can be found at (1). I have yet to see the book but, judging from Igor's previous work, it will be of a high standard.

CREATIVE SCIENCE AND YOUNG PEOPLE

SOME MONTHS AGO, I mentioned a construction competition called QRP and Youth (QRPy) organised by the QRP ARCI as part of their 'Four Days in May' forum linked to the Dayton Hamvention. The idea was to create a practical project that someone 10 years of age (or older), living in the year 2001, may find fun. An innovative regenerative receiver won the competition.

The short announcement in this column brought me a reply from Dr Jonathan Hare, G1EXG, of the University of Sussex. Jonathan runs the 'Creative Science Centre' in Sussex, which has provided many of the ideas for the 'Rough Science' television series. Things like making a seawater battery in an ice cube tray, a simple generator and an LED flasher, provide science projects for young people using everyday materials. Full information about the Creative Science Centre can be found on their web site (2). ♦

WWW.

(1) *Urban Antennas*
www.antennex.com
(2) Creative Science Centre
www.creative-science.org.uk

LF

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178 Alcester Road South,
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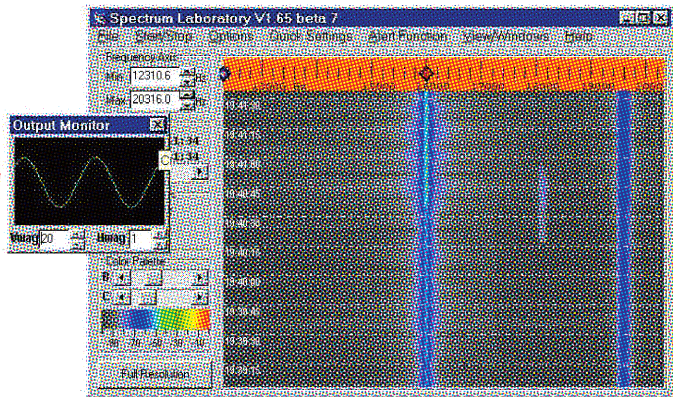
E-mail: lf.radcom@rsgb.org.uk



The *Spectrum Lab* display showing the receiver tuned to GBR on 16kHz. The small window on the left is displaying the received audio.

WITH WINTER over the antipodes it's the turn of the ZLs and VKs to make the running in LF DX. A series of 'Trans-Pac' tests was organised recently using techniques similar to those tried in the Trans-Atlantic tests. A number of ZL and VK stations sent beacon transmissions using very slow CW or frequency-shift CW, whilst stations in Hawaii, west-coast USA and Canada used spectrum analysis software to search for them. On 30 June, VE7SL (Mayne Island, British Columbia) caught sight of a portion of a transmission on 184.4kHz. After rigorous checking it was confirmed beyond reasonable doubt to be from ZL6QH, the club station at Quartz Hill near Wellington and operated by ZL2BBJ and ZL2CA, a distance of 11,709km!

Later in the tests, ZL6QH was received with a perfect copy by P29KFS in Port Moresby, Papua New Guinea at 4400km.

A large proportion of each path is over sea, so whether we will be able to reach 11,000km from Europe is a moot point - no doubt the attempt will be made this winter!

SA6Q

A GROUP of Swedish amateurs operated from the historic VLF site at Grimeton in July (as announced in the last column) using the callsign SA6Q. Although this has been done before, it was the first time they had included 136kHz in their plans. Unfortunately, there were severe problems with reception; with nearby thunderstorms and local QRN, not many QSOs were made on LF. The transmitted signal was good with 400W to the 200-metre inverted-L antenna, 60 metres high. SA6Q was received over a large part of Northern Europe and was 599 in the UK.

The event coincided with a day of transmissions from the Alexanderson alternator transmitter on 17.2kHz, a good opportunity to try out some VLF reception techniques.

VLF RECEIVER, HIGH TECH

THE MOST OBVIOUS way to receive VLF is with a converter such as the Datong model 'VLF', which is a reasonable performer if you tune and attenuate the input appropriately. A more high-tech approach has recently been developed by Wolf, DL4YHF. His *Spectrum-Lab* spectrum analysis program now includes a 'software receiver' which can tune from 1 to 22kHz using only the PC and its sound-card. The aerial is applied to the sound-card input via suitable tuning and protection components. I tried it with a 1:1 audio transformer as isolation, several hundred milli-henrys of series inductance and 1000pF of tuning capacitance. The package operates as a single-conversion receiver with a filtered 650Hz output from the sound-card allowing CW reception.

VLF RECEIVER, LOW TECH

PERHAPS MORE in keeping with the mechanical generation method used at SAQ, and inspired by it, is the electro-mechanical reception system tried by Jim, M0BMU, using junk-box components.

His direct conversion receiver has a 2-pole passive preselector, with an RF bandwidth of about 800Hz, feeding a mixer consisting of saturating ferrite cores. The BFO signal saturates the cores at both the positive and negative peaks of its waveform, so the core windings present an inductance that varies at twice the BFO frequency, in series with the signal path.

To produce the BFO signal, Jim uses a small stepper motor, salvaged from a hard disc drive. Driven by a DC servomotor at 4800rpm, it produces a reasonable, but slightly unstable, sine wave at 8kHz, which effectively gives a 16kHz BFO signal, due to the frequency-doubling action of the mixer.

The resulting audio beat frequency is low-pass filtered, and applied to a pair of vintage headphones which, when resonated to 1.2kHz with a series capacitor, are surprisingly sensitive. With this system, a 30µV signal at 17.2kHz from a signal generator can be detected at the mixer input.

The SAQ broadcasts were received using this system with Jim's 8m-high, 40m-long inverted-L antenna, producing a comfortable audible signal in the headphones. In fact, the limit on sensitivity was the QRN, which was quite strong. Later, he re-tuned the receiver to 18.2kHz, and was able to copy the VTX3 Indian navy station, although this was considerably weaker than SAQ.

Jim would be very interested to hear of any other examples of purely electro-mechanical receivers in existence.

LIGHTNING DAMAGE

There was a discussion about lightning protection on the LF e-mail reflector recently, sparked off (pun intended!) by Tom, G3OLB, constantly blowing diodes in his SWR bridge. He eventually discovered that, with his aerial having no DC path to earth, a static charge was building up and destroying the diodes. The problem was simply solved with a leak-resistor. The general opinion seems to favour earthing the aerial outside the shack during periods of thundery weather.

A practical demonstration of the damage that lightning can cause, even when the strike was not direct, was witnessed by Mike, G3XDV, in June. A loud bang and a flash outside was followed by a smell of burning and mains interruption. He eventually discovered that the mains wiring to one wall socket had blown but, apart from his LF preamp having gone deaf, no other damage was done. His neighbours had suffered various disasters, video recorders and TVs burnt out, modems dead, etc.

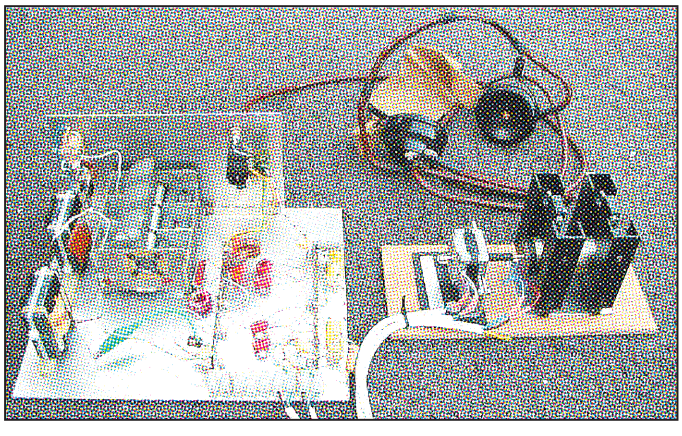
After his lucky escape, Mike is now wondering whether he should offer to raise the height of his LF aerial to provide a wider area of 'lightning protection'! ♦

FURTHER READING

LF Experimenter's Source Book (RSGB).

WWW.

DL4YHF www.qsl.net/dl4yhf/vlf_rcvr.html



M0BMU's electro-mechanical VLF receiver.

Regular Feature

ROGER BALISTER, G3KMA
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E-mail: g3kma@dial.pipex.com

AN INTERESTING new challenge of working IOTA on the VHF / UHF bands has previously been mentioned in this column. A rule change last year made it possible for contacts to count not only for the standard awards but also for a new VHF / UHF only category.

In the last two weeks of July I tried my hand at 6 metres for the first time. This was the band that had generated most enquiries in the past about IOTA. I soon found sufficient island activity to justify the decision. It was clear that for European stations the IOTA Europe award (50 different IOTAs) and IOTA British Isles award (13 IOTAs) were well within reach, while the basic 100 islands award would not be excessively difficult for the active 6-metre enthusiast with a reasonably well-equipped station. In just 15 days 22 IOTAs were worked including GM0EWX (Skye, Inner Hebrides, EU-008), MM5DWW (Mainland, Orkneys, EU-009), MM1EWA (Barra, Outer Hebrides, EU-010), IA5/IZ5BTC (Gemini, EU-028), IA5/I5LHY (Elba, EU-028), IC8AMR (Ischia, EU-031), IC8SDL (Capri, EU-031), IK7JWX/P (Grande, EU-091), LA5QFA (Vanna, EU-046), OH0N (Åland, EU-002), OY/DF2SS (Faeroes, EU-018), SM1BSA (Gotland, EU-020), SV5BYR (Rhodes, EU-001), SV9CVY (Crete, EU-015), 5B/G1JJE and 5B4AFB (Cyprus, AS-004), 9A/DL2VFK (Korcula, EU-016), 9A/DL4WE (Cres, EU-136) and 9A/DC1LTK (Pag, EU-170).

The high activity levels on 6 metres and other VHF / UHF bands could make island chasing a rewarding new attraction in the search for locator squares. The start date for contacts to count is 1 July 2000, the date the *IOTA Directory 2000* with the new rule was published. However, after 1 July 2003 credit will be allowed for confirmed contacts made before this date. This temporary date restriction was made to place everyone on the same footing initially. Full details of award requirements are contained in the *RSGB IOTA Directory* [available from RSGB Sales - *Ed*].

ACTIVITY ON THE BANDS

FORTY-SIX of the 58 new groups added to the *Directory* list last year have now seen activity. The remaining ones may take a little longer given in most cases their remoteness affecting transportation costs and difficulty of access. The tempo of activity from currently unnumbered groups is therefore likely to slacken. Intending DXpeditioners should check not only the 'Most-Wanted IOTAs List' on the RSGB IOTA Programme web site but also pay attention to the date of the last significant operation. An IOTA that has not seen activity for more than five years is likely to generate pile-ups every bit as large as ones for a new IOTA.

Celebrating after the DX Dinner at Dayton Hamvention in May this year. Left to right: Wayne Mills, N7NG, ARRL Membership Services Manager; Luis Chartarifsky, XE1L, well-known DXer and DXpeditioner; Ramon Santoyo, XE1KK, IARU Liaison Representative; Roger Balister, G3KMA, RSGB IOTA Manager.

My own log shows contacts with, in chronological order, BA4DW/2 (AS-158), 5R8GY (AF-090), JW0PK (EU-063), YB8HZ/P (OC-247), PSA088 (SA-088), XF3/AB5EB (NA-045), XF3/KB5SKN (NA-045), YM0KI (AS-159), TA0/IT9YRE/P (AS-159), 3V8GI (AF-091), 4M1X (SA-089), YV5JBI/P (SA-090) and UE0XYZ (AS-091). Again, this is not a comprehensive listing of the rarer stations that have been active, just the ones that have been worked.

OPERATION DOCUMENTATION

FROM TIME TO TIME we are asked by DXpeditioners if it is necessary to send documentation to ensure QSLs are accepted for IOTA. The answer in most cases is "no". Normally, the only occasions are when they have activated a previously unnumbered IOTA group to which a provisional number has been issued, or when activating a numbered group which features on the 'Most-Wanted List' (required by 90% or more of members) or where the island is known to be subject to landing or operating restrictions by reason of government or private ownership. However, it is always wise to keep relevant documentation such as the licence, permits, transportation invoices, photographs, signed statements and other evidence of presence on the island in case of challenge. DXpeditioners should understand that, when doubts are raised, the Committee may well have no alternative to asking them to provide documentation. But please don't send paperwork 'just in case'! ♦

RSGB IOTA Programme, PO Box 9, Potters Bar, Herts EN6 3RH; e-mail: iota.hq@rsgb.org.uk

UE6AAA on Sudzhuk Island off the coast of European Russia was the first station to activate EU-185, one of the 58 new groups added to the *Directory* list last year.

NEW REFERENCES

AF-090	5R	Madagascar's Coastal Islands East*
AF-091/Pr	3V	Jendouba/Bizerte/Tunis/Nabeul Region group
AS-158	BY2	Liaoning Province East group
AS-159	TA	Black Sea Coast West group
EU-188	R1P	Pechorskoye Sea Coast West group*
OC-244	DU1-4	Luzon's Coastal Islands*
OC-247	YB8	Sabalana and Tengah Islands
SA-089/Pr	YV1	Falcon State group*
SA-090/Pr	YV5-7	Anzoategui State / Sucre State West group*

Pr = provisional * see explanation in May *RadCom*

WWW.

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

JOHN HEATH, G7HIA
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SPACE

Readers will be sorry to hear that Dennis Kitchen, G0FCL, our regular columnist, has been taken ill and was unable to write this month's column. We are grateful to John Heath, G7HIA, who stepped in at the last minute. We wish Dennis a speedy recovery.

DURING September an 'Open Evening for Radio Amateurs' is to be held at the National Space Centre by its Amateur Radio Society. By invitation only, it will consist of a short guided tour of the Space Centre, followed by a presentation about the ARS.

From this, the NSC-ARS expects to recruit additional members, and form a group of local amateurs to increase the manning level for its station. Invitations will be mailed to licensed amateurs within the catchment area of the centre. If you would like to attend, but have not received an invitation by 1 September, please contact me at the address above.

SATELLITE OPS WITH A HAND-HELD

VISITING THE AMSAT Colloquium held at the University of Surrey recently, Ray Soiffer; W2RS, Vice President of AMSAT-NA, gave his popular demonstration of QRP satellite working. Using a dual-band hand-held, a small hand-held antenna and 5W output, numerous QSOs were made via the FM 'easy-sats' AO-27 and UO-14. Amongst these was a contact with the veteran satellite QRP experimenter, Pat Gowen, G3IOR, numerous European contacts, and several 'across the pond', including N1JEZ, KA2KCI, VE9PLB and VE1JH.

GAGARIN ANNIVERSARY

KNOWN IN RUSSIA as 'Cosmonautics Day', the anniversary of Gagarin's historic space flight in Vostok-1 reached a milestone this year, being the 40th since the launch.

UK satellite enthusiasts Robert, G8ATE; Matt, G7OBR; and John, G7HIA, marked the occasion by activating the special call GB1MSF (manned space flight). Using all of the current analogue satellites, the group made around 150 phone contacts in 25 countries including the USA and Canada. The commemorative QSL cards will go out shortly. The next anniversary event planned by the group will be GB1WIS (first woman in space), Valentina Tereshkova, aboard Vostok-6 in June 1963.

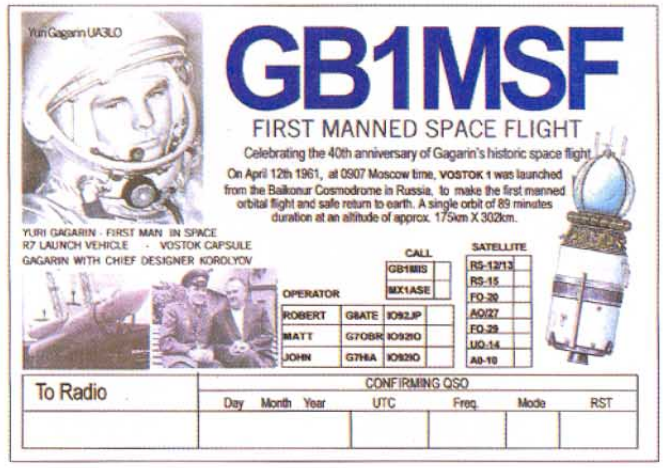
ISS

STS-104 'ATLANTIS' completed its mission with the successful integration of the Quest airlock module. Mission specialists Mike Gernhardt and Jim Reilly completed the 66th space walk in the shuttle programme's history, to mount high-pressure tanks for nitrogen and oxygen. This was the 23rd space walk during the construction of the ISS.

Since July 2000, 77 tons of hardware has been added to the station including the Zvezda module, the Z1 truss assembly, the P6 truss and its 240-foot solar arrays, the US laboratory 'Destiny', the Canadarm-2, and the latest hardware, the Quest airlock. Before leaving, STS-104 fired its engines in a series of controlled pulses to raise the orbit of the station by about 10 miles.

AO-40

SATELLITE controllers have successfully completed the planned series of orbital manoeuvres to raise the perigee to 870km, putting the spacecraft well above any atmospheric drag effects. AO-40 is now in a long-term stable orbit ensuring many years of use. Key parameters are, inclination 5.3°, height at perigee 870km, height at apogee 58,944km, and orbital period 1146 minutes.



Flying high: QSL card commemorating Yuri Gagarin's achievement in 1961. See 'Gagarin Anniversary'.

Following the raising of the perigee, the spacecraft orientation has been changed to bring the antennas into better alignment with the earth. This is always a gradual process in which the ground controllers make calculations, command the spacecraft, analyse the telemetry, study the results, and then adjust again. During the process, controllers observed a phenomenon they have called the 'Mystery Effect' which tended to counteract the turning forces they had applied to the spacecraft. Anyone interested in solving this puzzle is invited to study the telemetry archive and contribute thoughts via the AMSAT bulletin board.

At the time of writing, the transponders are on from MA 10 to MA 99 (a full orbit is 256 MA units) Operation at this part of the orbit corresponds with the times when the antenna pointing angles are favourable. Conditions will be particularly good in northern latitudes. The U and L receivers are on, permitting 70cm and 1.2GHz uplinks. The S2 downlink transmitter is active.

Joining the AMSAT 2m net recently Russ, G4PBP, reported excellent signals from AO-40 using a 1.5m dish, helical feed, and the G3WDG downconverter, which was giving a noise figure of 0.65dB and a gain of 35dB [1]. Controllers plan to test the second 2.4GHz transmitter and the S1 antenna shortly. The S1 high-gain antenna should give significantly stronger signals for stations with small antennas such as short helicals and converted Sky TV dishes. ♦

REFERENCE

[1] 'Microwave Radio via AMSAT Oscar 40', by GM4PLM, *RadCom* August 2001, p18ff.

WWW.

AMSAT-UK	www.uk.amsat.org
AMSAT-DL (AO-40 in-depth design info)	www.amsat-dl.org
National Space Centre ARS	www.nsc-ars.fsnet.co.uk
AO-40 Telemetry Archive	www.amsat.org/amsat/ftp/telemetry/ao40/

Regular Feature

MICROWAVE Special!

SIMON LEWIS, GM4PLM
Creoch Farm, Ochiltree, Ayrshire KA18 2QH.
E-mail: uwave.radcom@rsgb.org.uk

WITH THE foot and mouth crisis appearing to subside, there is a distinct possibility that microwavers will be back out on the hills before the end of the year. However, can I ask that you please check with the landowner to ensure that a site is open and that they agree you can operate from it before commencing any visit? Some areas are still restricted and it is important that we do not contribute to any spread of the disease by operating from a closed area. With some sites open and others still closed it is vital that we do not make a mistake that will close sites to us in the future.

I have received very little news these past few months; whether this is due to foot and mouth restrictions or just a lack of information flow, I am not sure. Can you please forward to me any items for inclusion so that we can show the rest of the world what we are achieving in UK microwaves?

AO-40

AMSAT-OSCAR 40 reopened its transponders at the end of July and is again available for amateur operation. This reopening follows the successful orbital changes needed to move the spacecraft to its final operating configuration. The satellite is still using the 432/1269MHz up and 2400MHz down transponder configuration, a combination known as Mode UL/S. The previous test period of transponder operation was very successful, as reported in this column by Charlie, G3WDG, and antenna-pointing angles this time around (with the orbital changes) are much more favourable. Initial reports suggest the bird is in fine shape and providing an excellent platform for home-based microwave operations. For the latest news and transponder information please see the AMSAT-UK website.

RAINSCATTER

RAINSCATTER IS A mode that many microwavers associate with the higher bands, as rain droplet affects the scattering capability. The rainstorms at the beginning of July were extremely strong and resulted in very high rainfall levels in short periods of time. Michael, DG0OPK, took advantage of these storms to carry out some rainscatter experiments on the 2.3GHz band with some success. He writes "On 7 July we had a big thunderstorm here in southern Germany. The thunderstorm area moved towards the north, so I drove out to Mount Peissenberg, 988m ASL (JN57ML), to make some tests on receiving rainscatter signals on 13cm. After setting up the equipment, I checked the band with my little antenna (30-turn helix). The following signals via RS QTF 0 were received: DB0FGB/B, JO50WB, 55S, 293km (later only 51 tropo); DL0UB/B, JO62KK, 41S, 566km (later nil); OK1KEI/P, JN79CX, 59S, 362km (worked later direct); DD7MH, JN68HD, 55S, 139km (worked later direct). This was my first try for checking RS signals on 13cm. Very nice!" Thanks for the report, Michael, giving us an insight into the fascinating world of rainscatter. This certainly shows that small stations can easily take advantage of these conditions to work some distance. As the UK can be rather wet, it is surprising that more rainscatter operation does not take place. Perhaps it's simply a case of education?

G6VLB's modified 60cm SATTV dish for AO-40.

BEACONS

GB3ZME BEACON became operational at 2020 UTC on 20 June. Its frequency is licensed for 24192.910 MHz (currently approximately 8kHz high - but this is likely to change as the crystal ages). Located in Telford, Shropshire, IO82SQ40, it has 1 watt output to 20 + 20 slotted waveguides, offset 90° to each antenna, 16m AGL. Reports are sought and should be send to Martyn, G3UKV, (tel: 01952 255 416), or e-mail ukv@globalnet.co.uk or QTHR. This beacon has already been received by G3PHO on Sunday 24 June from a /P location at Merryton Low, IO93AD51. Peter reports that it was extremely strong.

News from Scotland now; Mark, GM4ISM, has a 3400MHz personal attended beacon operational on 3400.063MHz. The callsign is GM4ISM/B, and the locator IO86NN (near to GB3ANG). The antenna has 120° beamwidth, bearing 120° and the output power is 14 watts. Reports are sought, and should be sent to gm4ism@bigfoot. com

G4JNT is running a 10GHz personal beacon on Portsdown Hill (IO90KU56) on a frequency of 10,368.9003MHz ±100Hz. Signing as G4JNT/P, it is now operational from his work QTH. Andy says that he hopes to have the frequency Rubidium-controlled, but the synthesiser does not seem to want to accept the 10MHz input from the frequency standard, so will just have to accept the synthesiser's own oscillator.

Those who want to know the frequency more accurately can contact him at home where he can measure it to a few hertz accuracy off-air. EIRP is 0.6W from an omnidirectional antenna - it is actually the old GB3SCX head unit (whose site was lost earlier) but, being located at the western end of the hill, means coverage to the east is blocked, although take off to other directions is satisfactory.

He also adds "... and, before anyone asks, it's under full remote control via a dedicated telephone line!". As always, reception reports are welcome and indeed important. Please send reception

reports to Andy Talbot, G4JNT via ACTALBOT@dstl.gov.uk

G3WDG040 KIT REVIEW

THE RECENT commissioning tests on the AMSAT AO-40 spacecraft have been very exciting and a real demonstration of the capability of the microwave transponders on AO-40. The tests have shown that very small antennas are required to operate via the satellite and that compact, low-power ground stations are easily capable of working the satellite.

This opens a whole new era for amateur satellite operations and gives those who own postage-stamp-sized gardens a real opportunity to work DX using compact equipment that is capable of sitting on a garage roof or small lawn space without looking obtrusive.

Equipment for use on AO-40 has been available for some time and many amateurs are using modified SATTV converters for the 2.4GHz downlinks. Unfortunately, as is typical when interest flares, the source of these converters is drying up and many amateurs are faced with the difficulty of finding a suitable receive converter.

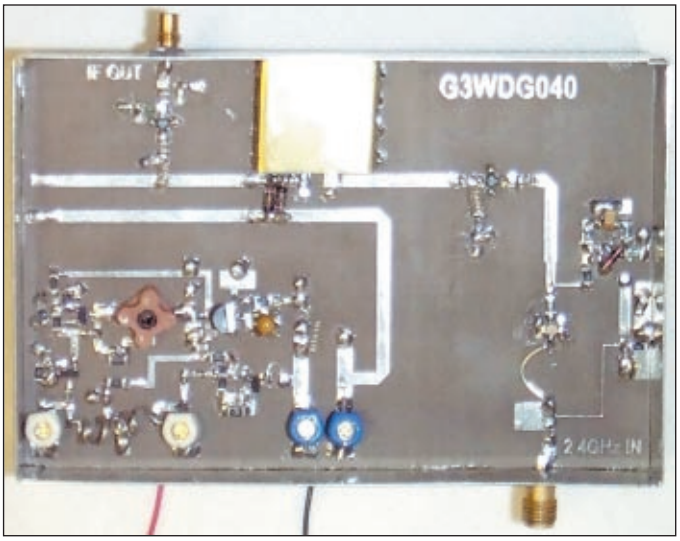
Many amateurs using the AO-40 23cm uplink are using a G3WDG transverter and amplifier combination. Charlie and his wife Petra, G4KGC, are well known by UK microwavers, as they have run the Microwave Committee Components Service from their home in Northamptonshire for many years, supplying kits and components to the growing number of UK and foreign amateurs becoming active on the microwave bands.

Charlie's latest design is similar to his others, in that it is designed to be totally reproducible, give the best possible performance and offer excellent value for money. In fact, the kit has been designed with a newcomer in mind, as it really can be built and aligned with access to nothing more than a DC voltmeter.

The G3WDG040 is supplied as a complete boxed kit minus the RF connectors (these are left out as microwavers use different combinations in their stations). The kit comes packed inside its small tinplate case, complete with a handbook detailing how to build and align the kit. Delivery was quick and the kit arrived safely in a large padded Jiffy® bag.

The converter uses the latest RF technology and components, allowing the best possible performance. Conversion gain is approximately 38dB and the noise figure 0.6dB, very impressive! The IF selected is 144MHz, allowing the converter to be connected to any 2m multimode.

A 70cm IF option should be available by the time this review is published.



The G3WDG040 2.4GHz - 144MHz downconverter.

The converter is built on one double-sided PTFE printed circuit board. Construction is quite straightforward and took me approximately six hours over three evenings. This follows standard microwave techniques that can be found in the kit handbook and also in reference [1].

The kit is very easy to assemble, but could *not* be classed as an absolute beginner's kit for use as part of a Novice course. An 'intermediate' constructor, who can solder correctly and who can follow a simple set of instructions to the letter, can assemble it fairly easily. Some basic hand tools are required along with a fine-tip soldering iron and very fine solder.

Alignment is very simple and requires some basic voltage checks and presetting some trimmer capacitors and a variable inductor to positions described in the instructions.

No test equipment is required if the unit has been built following the instructions and has been designed with the newcomer to microwaves in mind, who will probably not own an array of test equipment. The beta unit supplied was aligned using the procedure given and was almost perfect when tested against full test equipment. A small test circuit uses a 50MHz RF source of about 5 watts or less, ie a 6m transceiver connected to a length of coax. A diode and resistor are connected between the inner conductor and screen. A 1N4148 diode was used by the author. Purists would say a proper Shottky diode would be better, but I had no problem finding the harmonics generated by this very simple and easily-built test rig – it certainly allowed me to test the converter when the satellite was not in view. Transmitting on 50.010MHz at 1 watt produced a strong harmonic at 2400.480MHz (ie the 48th harmonic).

In operation, the beta converter has performed very well. I connected the unit to my FT-736R and supplied the converter with 12VDC. A suitable case is available from RS Components (364-2483). This small IP65-rated diecast box has a nice set of mounting lugs on the case lid to allow it to be mast-mounted and it even fitted a spare clamp I found in a drawer! The inside of the case was insulated with polystyrene and two bags of silica gel were placed inside the case to absorb any moisture. The converter generates a small amount of heat which should ward off any tendency for any dampness to form. A photograph of the completed board is shown before insertion into the diecast box.

The converter is mounted behind an 80cm satellite dish and fed from a small 5-turn helical antenna. This has proved to be very successful and produces an excellent noise-free signal in the shack. Additionally, there is no requirement for a preamplifier, and there is plenty of IF gain to allow for extended cable runs.

Overall the kit goes together easily, is simple to align, even with no test equipment and performs extremely well. It is highly recommended and, with the addition of a simple SKY SATTV dish and easily-built feed, will provide excellent signals from AO-40. The converter provides high performance at a very affordable price and would be my first choice when recommending a downconverter for Mode S.

The G3WDG040 kit is available from the Microwave Components Service.

REFERENCE

[1] *Microwave Handbook*, RSGB, (3 vols), available from the RSGB Shop.

www.

Microwave Components Service, 314A Newton Road, Rushden, Northants NN10 0SY.
Online Catalogue
www.emn.org.uk/mcs.htm

AMSAT-UK
www.amsat-uk.org

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the last Word

The Fifth Emergency Service?

As a regular runner, I often see Raynet personnel on duty and try to introduce myself when the opportunity arises.

However, on the Boreham-wood half marathon in June I fell over some wire and broke my arm. As well as the Red Cross who helped, Raynet were there and I would like to tender my thanks to them, particularly the gentleman who was at the White Horse pub at Shenley. Your efforts were greatly appreciated, as are those of all Raynet personnel who attend races all over the country.

It is a comfort for me at least to know that you are there in case of an accident or injury. One again, many thanks.

Ken Wright, G4EYN

Success at National Space Centre

Thanks for the nice job on the National Space Centre (NSC) article in *RadCom* [July 2001, page 40]. Thanks to amateur radio and the RSGB I am now a published author!

We were running the amateur radio station at the NSC today and digipeating through the ISS. We had a satellite tracking program running, and at the same time on another PC, *UIView* by G4IDE to display the data and callsigns. We had a good deal of interest from the public and a small crowd most of the time. Several people actually came back to the station especially in time to hear the passes and see and hear the signals and data coming down from the ISS in real time.

It proved an important point for me, and something I have believed for a long time. There is quite a lot of latent interest in the hobby, it's just that these days people have no opportunity to be exposed to any form of amateur radio.

John Heath, G7HIA

Advertise Our Hobby

Recently I have been a census team leader. One thing that struck me very forcibly on my rounds was the number of people who now live alone and were only too glad to have someone, *anyone*, to talk to. They had no hobbies, they said, except for TV. I mentioned amateur radio to some. None of them had even *heard* of it.

At a recent Telford club meeting, we had an interesting evening where members spoke of how they got into amateur radio, and by a big majority it was completely by accident!

I first heard amateur radio on my medium-wave crystal set which I had built. One day my mother dusted it and the tuning coil sprang off its toilet roll former and spread itself all over my bedroom, reducing the inductance somewhat. I shall never forget coming home from school that day in the late 1940s and hearing G8VB in QSO with G3EFP on my S G Brown Type F headphones. Magic. Still is!

Our speech cannot be heard on the short-wave bands any more as our SSB transmissions are indecipherable on ordinary receivers. Is there a case for using some AM again, or better, compatible AM, ie SSB with reduced carrier? We certainly need to advertise our great hobby much more.

M J Street, G3JKX

Caution in the Wards

Having spent, during my career, many years associated with EMC problems I felt most uneasy reading recent letters about amateurs being allowed to transmit from hospital premises. Many of us know about domestic EMC. A hospital these days is full of sensitive electronics, much of it to do with life support. Mobile phones are banned due to EMC risk, for example.

Should such operation lead to the demise of a fellow patient, how would the culprit feel? Bear in mind that not many medical staff have any real knowledge of EMC.

The last thing we need these days is detrimental headlines aimed at a public already paranoid concerning perceived radiation risk.

D A Bundey, FIEE, G3JQQ

Voices

What a splendid series the *Voices* by Gordon Adams, G3LEQ, is turning out to be. A well-researched and informative work, if I may say so. I will look forward to the book when it appears.

My own experience with a 'voice' happened like this. In 1965 I had moved from Freetown to Marampa in Sierra Leone and kept in contact with Tom, 9L1TL (in Freetown), on a weekly Sunday morning 7MHz CW sked. On one of these skeds a very strong SSB signal appeared. The operator had an American accent and was intoning what could best be described as a shopping list. I carried on calling Tom on CW.

The operator of the mystery station could obviously read CW. He said, "9L1HX, will you clear the frequency, I am trying to pass urgent emergency traffic. . . er, as I was saying Hank, could you add to that list a couple of bottles of Bourbon and a crate of Coke" (no callsign).

I felt particularly incensed at being ordered off the CW section of the 7MHz band by a non-amateur SSB station, so I wound in the selectivity and established contact with Tom and his crystal-controlled DX40. I never heard the 'voice' again or found out what it was doing in that part of Africa at that time.

Peter Dodd, G3LDO

CW For Ever!

After passing my Morse test, my wife went into hospital and I fell by the wayside.

However, with the help of Peter, G0VZX, I got back into CW, very slowly, and asking for "Pse agn es QRS" when a contact was made.

This morning I received a QSL card direct from Jean, F8IL, for a CW QSO on 9 July 2001. Jean is 92 years of age and tells me his first QSO on CW was in 1931! To say I'm thrilled is an understatement. Oh, yes, I'm 73 years young myself. CW is here for a long time yet.

Vic Saundercock, M0AVS

New 'Old' Call G2YT

At 0715UTC on the morning of Saturday 30 June 2001, radio old-timer Bob Wilder, AF2HD, TSgt, USAF (Retired), in Theodore, Alabama, was having trouble sleeping because of the temperature and humidity. Resorting to what many radio amateurs would do under the circumstances, Bob listened to the 20 metre band to check activity, and was surprised to hear a call that he remembered from the distant past, G2YT, belonging to an old friend, Cris Redshaw.

Nothing too unusual in that you might think, but the operator was not the same as the one he associated with the callsign. Checking back, Bob realised that it had been *40* years since he last worked G2YT. Cris Redshaw became a silent key in 1974, and the callsign had been reissued to Peter Fox, in Shefford, Bedfordshire.

G2YT was originally issued in 1920 to Marconi's Wireless Telegraphy Company, and was used for about 10 years from the Marconi station at Poldhu, Cornwall. Cris Redshaw had been a radio pioneer, starting his involvement with the hobby (later to become his career) with the callsign XZT in 1912, later becoming G4VZ, and post WWII as G2YT. For many years, Cris was Chief Engineer for the Imperial Broadcasting station at Dorchester on the south coast of England.

Bob commented that what had really surprised him was the fact that, despite the advance of time, he remembered the callsign immediately!

Peter Fox, G2YT

Apologies

Gremlins crept into the letter 'Radio vs Computer Shows' published in 'The Last Word', August 2001. In the second paragraph, the first sentence should, of course, have read: "In the early days we enjoyed the support of over **100** amateur radio and accessory dealers . . ." Sincere apologies to RadioSport Ltd and to readers for this transcription and proofreading error - *Ed.*

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A4-S	10-15-20m 9dB 2kW 4 el. 5.84m boom	£469.95 D	D4 10-40m 10.92m 2kW rotary dipole £259.95 D
X7	10-15-20m 13dB 2kW 7 el 5.48m boom	£549.95 D	D3 10 - 20m 7.86m 2kW rotary dipole £189.95 D
X9	10-15-20m 14dB 2kW 9 el 8.5m boom	£799.95 D	XM240 40m 2 el £569.95 D
R-6000	6 - 20m vert.	£299.95 D	XM520 5el 20m £629.95 D
			XM515 5 el 15m £359.95 D
			Phone for catalogue.

THE TOUGHEST JAPANESE ROTATORS

These are tough rotators that weigh almost twice as much as similar priced units and have great turning capacity. Made by Create of Japan, they will handle 4 element HF yagis with ease. Our own Create model has been on our roof for 12 years turning a 4-element HF beam. We wouldn't use anything else!

RC5-1 Standard control box, OK for 4-el Yagis - needs 7-core cable £349.95C

RC5-3 Control box features pre-set or manual control. Otherwise the same as RC5-1 above £449.95 C

MC-2 Lower mast clamps £49.95 B

LINEAR AMP UK AMPLIFIERS

British made Amplifiers with a Pedigree

Full Range Stocked

Challenger	HF 2 x 3CX800 AT 1.5kW out	£2095 D
Explorer	HF 2 x 3-500ZG 1.3kW out	£1595 C
Hunter	HF 1 x 3-500ZG 750W out	£1195 C
Hunter	6m 1 x 3-500ZG 800W out	£895 C
Ranger	HF 4 x 811A 800W out	£895 C
Discovery	2m 1 3CX800 400 - 1KW out	£1395 C

NEW **W-40SM** 40 Amp Switch Mode

£149.95
Plus £6.00 Carr.

Digital display, 3 - 15V rated at 40 Amps continuous. Fully protected and very low noise. Ideal for a wide variety of ham applications. Light weight of 3.5kg and measuring 220 x 110 x 300mm Fixed 13.8V switch.

KH-WS1 World Space digital receiver

KH-ANT external antenna kit in stock £49.95

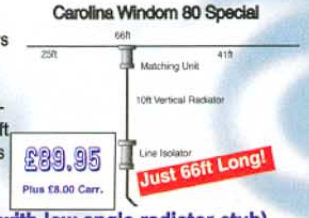
£149.95
Plus £6.00 Carr.

This radio has its own mini satellite dish and receives digital WorldSpace broadcast signals via the AfriStar satellite. As well as all the normal VHF FM programmes, you can switch to satellite broadcast signals from CNN, BBC, Bloomberg (multi language), World Radio networks 1 & 2, and lots more. High quality mono via the internal speaker and stereo via the headphone socket. Runs from AC, 4 x D cells (not supplied), or external 6V.

CAROLINA WINDOMS

CW-80 Special

Just 66ft long yet covers 80m - 10m. It will out perform a G5RV and give lower angle of radiation because of the 10ft vertical section which is forced to radiate. It will handle 1.5kW



£89.95
Plus £8.00 Carr.

Just 66ft Long!

Other Models (all with low angle radiator stub)

CW-160	160 - 10m 171ft long	£109.95
CWS-160	160 - 10m 133ft long	£99.95
CW-80	80 - 10m 133ft long	£84.95
CW-40	40 - 10m 66ft long	£79.95
CW-20	20 - 10m 34ft long	Plus £8.00 Carr. £77.95

80-40-20m Mini Dipole

The "80 plus 2" Mini - Dipole was designed by our Director, Peter Waters, G3OJV. Just 52ft long, it uses linear loading - no tuned traps. It can be directly fed without ATU and also operates at 2.5:1 VSWR on 15m. Amazingly efficient, it handles 400 Watts and is balun fed. Erect it as an inverted V and it takes up less than 40ft of space. If you have a small garden, don't miss out on the LF bands anymore. £79.95 Carr. £6.00

POWER SUPPLIES

WATSON

UK'S TOP SELLING POWER SUPPLIES.

£89.95
Plus £8.00 Carr.

Watson power supplies guarantee the very best performance and value for money. Tried and tested, they have been submitted for independent laboratory testing for safety and electrical performance.

W-3A	3 Amp fixed supply.	£22.95 B
W-5A	5 Amp fixed supply	£29.95 B
W-10AM	10 Amp variable supply	£59.95 C
W-25AM	25 Amp variable supply	£89.95 C
W-30AM	30 Amp variable supply	£119.95 C

Compact 10 Amp Switch Mode PSU

£49.95
Plus £6.00 Carr.

The W-10SM is small enough to fit in a brief case. Measuring just 230 x 100 x 65mm, it's ideal for 50 Watt mobile's etc. Over voltage and current protection.

vsplc.com
5/204965

on-line catalogue: www.wsplc.com

freephone orders: 08000 73 73 88

..... SEE INSIDE FRONT COVER FOR DETAILS

MFJ-Cubs *Single band QRP Rigs*

OUR PRICE £89.95 (KIT) £139.95 BUILT Carr. £8.00

VFO controlled up to 2W(1W on 15m), you can adjust it down to milliwatts. Measure just 90 x 47 x 98mm and requires 12v DC. Models for 80m, 40m, 30m, 20m & 15m. Order **9380, 9340, 9330, 9320** or **9315** (plus "**K**" for kit).

Case etc. included.

MFJ 5W QRP *Low Power CW Transceivers*

OUR PRICE £189.95 Carr. £8.00

VFO control, single band, 12V 750Hz xtal filter, sidetone, break-in, speaker, 162 x 60 x 150mm. Great value! Order **MFJ-9040, 9030, 9020, 9015** or **9010**. All ready built.

MFJ-989C ATU

OUR PRICE £349.95 Carr. £8.00

3kW 1.8- 30MHz "T" Match

This design has a roller coaster coil and a 4:1 balun to match balanced line. Ideal for coax, end fed wires and open wire feeder. Features PEP or RMS power measurement VSWR, antenna switch, bypass, built-in dummy load etc. Size 270 x 375 x 115mm.

MFJ-986 ATU

OUR PRICE £319.95 Carr. £8.00

3kW Differential 1.8 - 30MHz

One less knob to twiddle, but all the facilities of the MFJ-989C

MFJ-969 ATU

OUR PRICE £319.95 Carr. £8.00

HF + 6m! 300W "T" Match ATU

It has a very accurate PEP meter built-in, (PP3 battery needed) Includes VSWR cross needle meter, dummy load and lovely roller coaster for critical adjustment. Handles coax, balanced an wire. Size 268 x 242 x 95mm.

MFJ-949E ATU

OUR PRICE £149.95 Carr. £8.00

1.8 - 30MHz 300W "T" Match ATU

Our most popular ATU because it covers all HF bands and matches anything from coax to long wire to balanced feed. Take a look at the price and then consider that it even includes a dummy load plus power and VSWR meter. Measuring 260 x 190 x 83mm, it really is great value.

MFJ-934 & MFJ-931 ARTIFICIAL GROUNDS

OUR PRICE MFJ-934 £169.95

MFJ-931 £89.95 Carr. £8.00

Removes RF hot spots and offers a true ground, even when operating upstairs.

If you operate upstairs or well away from an earth, you will know that trying to use an end fed long wire is a problem!

Now MFJ have solved the problem. With the MFJ-931, you just run out a random length of wire and connect it to the transceiver chassis via the MFJ-931. Then adjust as per instructions and you have guaranteed zero RF potential at the chassis and a good antenna earth. Can also be used with an external counterpoise. The MFJ-934 operates exactly the same but also includes a built-in HF ATU for wire, coax and balanced feed. Maximum power is 300W.

MFJ-8100 *Short Wave Receiver*

Ready built or kit

OUR PRICE £79.95 (KIT) £99.95 (BUILT) carr. £6.00

Experience the thrill of short wave listening on this regenerative receiver that has amazing sensitivity. Brand new solid state design. Just a short length of wire will bring good signals in. Covers all the major short wave general and ham bands. Simple to build and operate.

Case etc. included.

MFJ-962D ATU

OUR PRICE £259.95 Carr. £8.00

1.8 - 30MHz 1.5kW "T" Match

For use with medium linears. Using the famous "T" Match design, this ATU will cope with any antenna whether it be coax, end fed wire or balanced feed. You can monitor your power (average or PEP 200W or 2kW max))and VSWR. Antenna switch selector is included for two antennas. Size 270 x 375 x 115mm.

MFJ-941E HF 300W *Budget ATU*

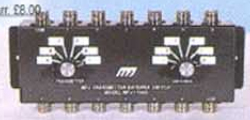
OUR PRICE £109.95 Carr. £8.00

Matches all types of antennas.

At this price there is no excuse for not having an ATU and offering your transceiver a perfect match. Covering 1.8 - 30MHz, rated at 300W and having built-in VSWR and power meter. it will match wires, coax systems and balanced feed.

MFJ-1700B *Tx - Rx 6-way Switch*

OUR PRICE £79.95 Carr. £8.00



2kW from 1.8 - 30MHz, use it to select up to 6 antennas and 6 transceivers in any combination. Unselected terminals are automatically grounded

MFJ Dummy Loads

MFJ-264 or MFJ-264N	
1.5-150MHz 1.5kW	£64.95
"N" version of above	£69.95
MFJ-260C or MFJ-260CN	
1.5 - 150MHz 300W	£32.95
"N" version of above	£39.95

Carr. £8.00

MFJ-914 *Auto ATU Extender*

OUR PRICE £49.95 Carr. £8.00

Match into that G5RV or similar

If your internal auto atu is having trouble matching your G5RV or similar antenna. this should solve the problem. Just place it in series with the coax feed to the rear of your transceiver. Magic!

MFJ-382 Amp & Speaker

OUR PRICE £39.95 Carr. £8.00

This desktop speaker will amplify and improve the audio of scanners and QRP radios etc. Powered from 9V batt (extra) or external 12V supply, it measures 89 x 45 x 114mm comes with mono - mono lead.

MFJ-418 *The easy way to learn CW*

OUR PRICE £69.95

Unlike other tutors, this one sends true text and full length QSOs, just like the real test. The massive database avoids frequent repeats too! Will also send groups and displays the text.

Carr. £8.00

MFJ-269 and MFJ-259B

The most advanced antenna analysers

MFJ-259 £249.95 Carr. £8.00

MFJ-269 £329.95 Carr. £8.00

Connect it to your antenna and get all the information you need to optimise it for best performance including resonance, VSWR and impedance. Totally portable (using AA cells), you can work right up by the antenna. The MFJ-259 is the basic design covering 1.8 - 170MHz. The MFJ-269 has extended coverage up to 470MHz and gives an extremely wide range of measurements, even indicating where a break is in a coax cable.

MFJ-1704 *4-way switch*

OUR PRICE £59.95 Carr. £6.00

DC - 500MHz 2.5kW

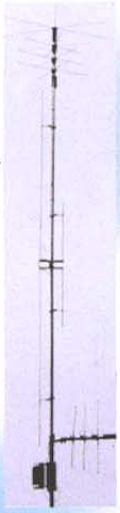
This is a heavy duty die-cast 4-way switch with SO-239 sockets, central earth position and built-in static discharge protector. Makes changing antennas a breeze!

MFJ-1025 "Local Noise" Canceller

OUR PRICE £119 Carr. £8.00

Kills local noise, but lets signals through. Handles electrical noise, TV time-base etc. Short length of wire picks only local interference and cancels it out.

MFJ-1026 As MFJ-1025, but has active whip antenna for picking up noise signals (as illustrated above). **£159.95** Carr. £8.00



MFJ Compact Verticals

MFJ verticals are compact, yet offer a large number of bands. Being vertical dipoles, they offer exceptionally low angle of radiation for DX. They are rated up to 1kW on the HF bands.

MFJ-1796 (40, 20, 15, 10, 6 & 2m)
Just 3.65m long, it is the ideal antenna for really small spaces.VSWR typically 1.2:1 **£209.95** Carr. £8.00

MFJ-1798 (80, 40, 30, 20, 17, 15, 12, 10, 6 & 2m!)
Only 6.7m long, it covers every popular band. No radials and no ground needed. **£269.95** Carr. £8.00

MFJ-392 *Mono Padded Communications Earphones*

OUR PRICE £22.95 carr. £3.00

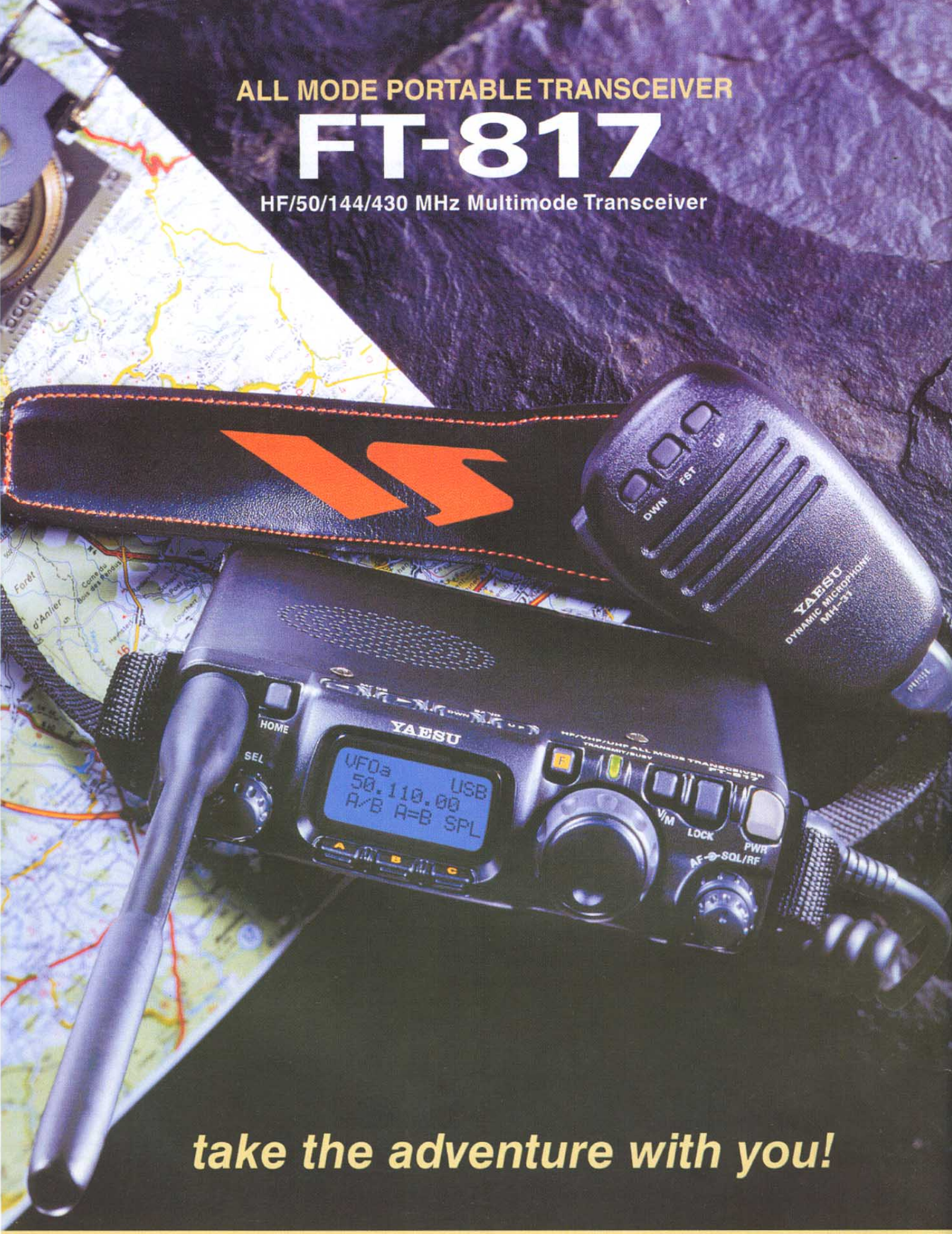
These are purpose designed communications padded headphones that are ideal for all the modern transceivers and receivers. Suits 3.5mm and 1/4" jacks - adaptor provided.

MFJ-616 *Speech Intelligibility Enhancer*

OUR PRICE £169.95 carr. £8.00

Designed to enhance the audio of your transceiver. MFJ President, Martin Jue suffers with deafness and said that this has put the enjoyment back into radio for him!

Hear Signals Better



YAESU