Satellites for Science Week: 8-15 March 2002

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RadCom

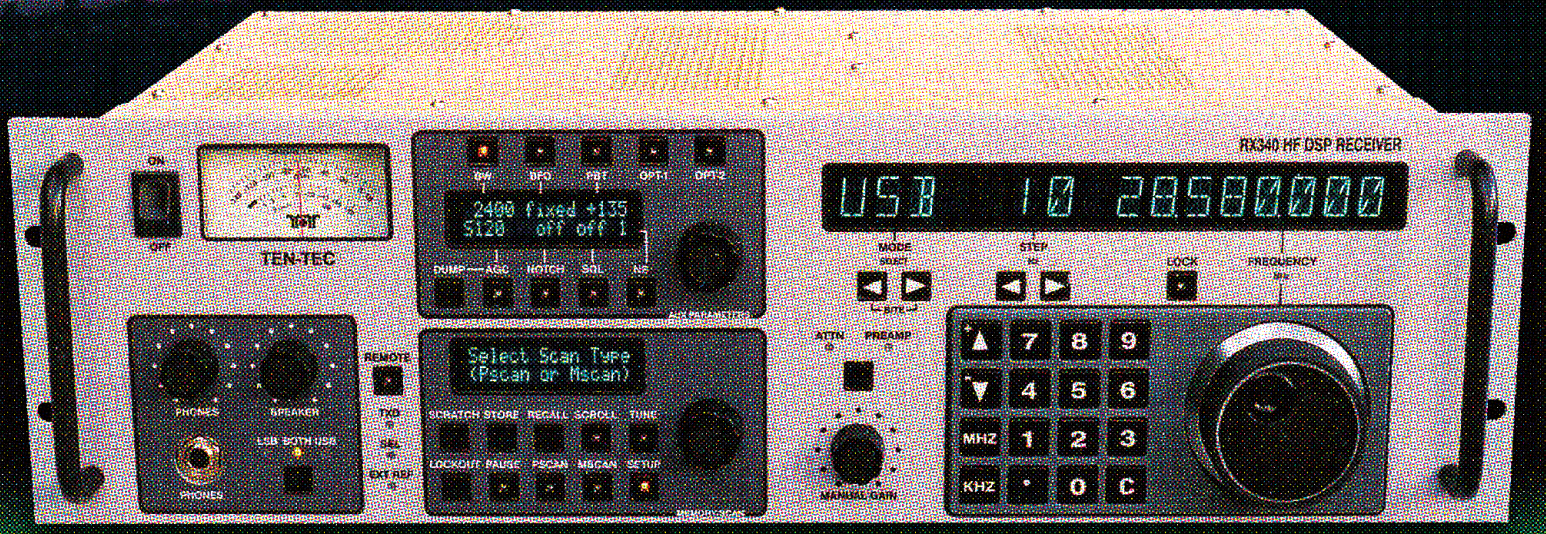
RSGB Sale! Page 60

£3.95 Vol 78 No 3 ♦ March 2002 The Radio Society of Great Britain Members' Magazine

RSGB IOTA Contest 2001 - Results, Commentary, Full Listings

WIN! A YAESU FT-817 TRANSCEIVER

Peter Hart Reviews the Ten-Tec RX340 Receiver



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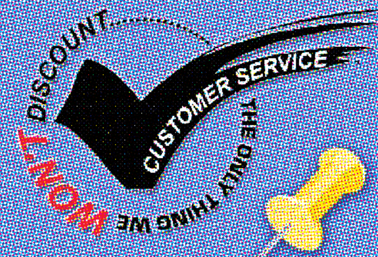


RIGblaster

a marriage of radio and computer

OVER 10,000 ON THE AIR

PSK31, MFSK, MT63, SSTV, RTTY, AMTOR, CW, PACKET-APRS, HELLSCHREIBER, REMOTE BASE, METEOR SCATTER, CLUB QST'S REPEATER CONTROLLER, VOICE KEYER.

TRY THAT WITH A TNC!

All programmes and every lead included. Just change jumper lead to suit rig's mic socket pin-out

RIGblaster Plus	Auto mic switch 8-pin round (software and cables)	£139.95 B
RIGblaster M8	Auto mic switch 8-pin round (software and cables)	£109.95 B
RIGblaster M4	Auto mic switch 4-pin round (software and cables)	£109.95 B
RIGblaster RJ	Auto mic switch RJ45	£109.95 B
RIGblaster nomic 8p	8-pin mic (software & cables)	£62.95 B
RIGblaster nomic 4p	4-pin mic (software & cables)	£62.95 B
RIGblaster nomic RJ	RJ45 mic (software & cables)	£62.95 B

YAESU

FT-1000MP Mk-V 200W HF ALL MODE

3 YEARS FREE WARRANTY

SPECIAL OFFER

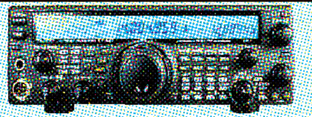
FREE HEIL GOLD LINE MICROPHONE

When you buy the amazing FT-1000 MK V from us, we will offer you FREE the equally amazing Heil Gold Line microphone with dual inserts and matching lead (base stand optional extra).

£2899 Plus £8.00 Carr.

FT-847 160m - 70cm ALL MODE

3 YEARS FREE WARRANTY



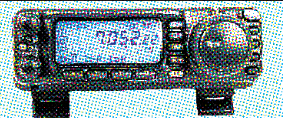
1.8 to 440MHz, this all-in-one station offers unbeatable value. 100W on HF plus 6m, and 50W on 2m and 70cms. You get genuine RF clipping on SSB for up to 6dB gain and there are 4 separate antenna sockets

INTEREST FREE	
DEPOSIT	£120
6x MONTHLY	£42.33
OPTION	£825.02*

£1199 Plus £8.00 Carr.

FT-100 D 160m - 70cm ALL MODE

SAVE



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

£899 Plus £6.00 Carr.

FT- 920AF HF 160m-6m-100W

100 Watts from 1.8 to 54MHZ with dual VFO controls. Supplied with FREE FM unit.

£1099 Plus £8.00 Carr.

W-25SM 25AMP SWITCH-MODE POWER SUPPLY

THE QUIET ONE

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 180mm (D)

£69.95 Plus £6.00 Carr.

KENWOOD

TS-2000 160m - 70cms+23cms OPTION

3 YEARS FREE WARRANTY

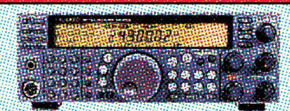
+FREE HEIL MIC

The amazing TS-2000 offers coverage from HF to UHF. And you can go right up to 23cms with the optional module Monitor the DX cluster whilst working other DX, optimise your satellite contacts, enjoy the benefit of built-in ATU. It's all there in one very compact box. Colour brochures available on request.

£1695 Plus £8.00 Carr.

TS-570DG 160m - 10m All Mode

3 YEARS FREE WARRANTY



TS-570 Accessories

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

INTEREST FREE	
DEPOSIT	£85
6x MONTHLY	£29.97
OPTION	£580.18

£849 Plus £8.00 Carr.

TS-870 160m - 10m 100W Advanced DSP

It has IF-stage digital signal processing on transmit and receive. This raises the performance to a level that is impossible for analogue circuitry to achieve. Also features automatic ATU, interactive menu system, built-in electronic keyer and 100 memories.

INTEREST FREE	
DEPOSIT	£135
6x MONTHLY	£47.63
OPTION	£928.22

£1349 Plus £8.00 Carr.

SGC SG-2020 £599 Plus £2.00 Carr.

Ideal for QRP, but with VOGAD and RF speech processing it can sound like 100 Watts! Very low current (4A max) makes it ideal for portable work. Variable selectivity down to 100Hz means no extra filters to purchase.

NEW SG-2020 ADSP now available £799 carriage £8.00

SG-237 mini auto coupler ideal for SG-2020 £369

ICOM

IC-756 PRO II £PHONE Plus £8.00 Carr.

This is Icom's new Flagship.

IC-7400 160m - 2m ALL-MODE

£PHONE Plus £8.00 Carr.

IC-756PRO 1.8 - 52MHz 100W

3 YEARS FREE WARRANTY

INTEREST FREE	
DEPOSIT	£190
6x MONTHLY	£66.89
OPTION	£1303.66

£1895 Plus £8.00 Carr.

IC-706IIG 160m - 70cm ALL MODE

3 YEARS FREE WARRANTY

'£50 HEIL VOUCHER'

The IC-706MkIIG is the latest enhanced version of this popular HF/VHF/UHF mobile rig. It has more features but in the same physical size.

IC-706IIG ACCESSORIES

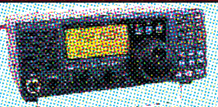
AT-180	Auto ATU	£379	B
FL-100	500Hz CW	£59	B
FL-232	350Hz CW	£59	B
FL-103	SSB 2.8KHz	£59	B
FL-223	SSB 1.8kHz	£59	B
DC Lead	(spare)	£16	A
3.5m	sep. cable	£33	A
5m	sep. cable	£49	A

INTEREST FREE	
DEPOSIT	£100
6x MONTHLY	£35.27
OPTION	£687.38

£999 Plus £8.00 Carr.

IC-718 100W HF £549 Plus £8.00 Carr.

SAVE £150



LIMITED SPECIAL OFFER!

If you are looking for a radio with pedigree, but without a high price tag, then this may the one for you. Covers all HF bands including wide-band receive. Plus auto notch, dual vfo, swr meter etc. Plus options including DSP & filters.

INTEREST FREE OPTION – on SELECTED LINES

Pay 10% deposit and 6 low monthly payments - with OPTION to pay balance* off at ZERO INTEREST or continue monthly payments over 30 months

W & S PLC IS A LICENSED CREDIT BROKER. OFFER IS SUBJECT TO STATUS

FREEPHONE ORDER LINE

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CARRIAGE CHARGE CODES: A=£2, B=£6, C=£8 Others: phone

YAESU

FT-1500M • 2m FM Mobile £159 Plus £5.00 Carr.

SPECIAL OFFER

'SAVE £70'

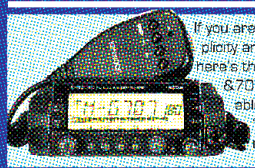
Small, compact yet built like a Battleship! Should last for years. Look at the Price!

KENWOOD

TM-D700E • 2m + 70cm FM £449 Plus £6.00 Carr.

Large detached screen and APRS, make this a firm favourite. 50W on 2m and 35W on 70cms. Features 200 memos, CTCSS, Band Scope, built-in TNC, DX cluster monitor, alphanumeric etc.

TM-G707E • 2m + 70cm FM £289 Plus £6.00 Carr.



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

TM-V7E • 2m + 70cm FM £359 Plus £6.00 Carr.

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

ICOM

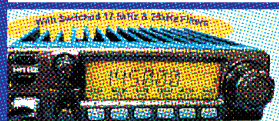
IC-207H • 2m + 70cm FM £279 Plus £6.00 Carr.

A great budget class radio for VHF & UHF use.

IC-2800H • 2m + 70cm FM £419 Plus £6.00 Carr.

Large colour display with video input, and airband rx. 50W/35W and remote head unit.

IC-2100H • 2m FM Mobile £229 Plus £6.00 Carr.



Rugged design with switched receive filters 12.5/25kHz

IC-910 2m + 70cm All Mode £1299 Plus £8.00 Carr.

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

YAESU

FT-7100 • 2m/70cm Mobile £399 Plus £8.00 Carr.

NEW

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

£25 ACCESSORY VOUCHER

AV-40 • VSWR METER £39.95 Plus £6.00 Carr.

- 144 - 470MHz
- Impedance 50 Ohms
- Power 0 - 30W / 0 - 300W switched
- Measures forward / reflected power + VSWR
- Sensitivity 3W for full scale deflection
- Accuracy 10% at full scale
- Sockets SO-239
- Size 85 x 87 x 95mm • Weight 280g

KENWOOD

TH-D7E • 2m + 70cm £299 Plus £5.00 Carr.

DATA COMMUNICATOR

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

TH-F7E • 2m + 70cm £269 Plus £6.00 Carr.

NEW

WITH EXTRA WIDE RX COVERAGE

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

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

HORA

HORA C-408 • 70cm £49 Plus £6.00 Carr.

HOCKLEY ONLY

Very much underrated handy. Covers the full 70cm band. Wideband receive possible. Very compact fits into top pocket. Ideal for use at rallies. Only uses 2x AA batteries (not included).

SPECIAL OFFER

- 230mW, CTCSS
- Digital Display

LINEAR AMPLIFIERS

CHALLENGER II	HF LINEAR AMP 10-160m	£2095	D
EXPLORER	HF LINEAR AMP 10-160m	£1595	D
PIONEAR 572H	HF LINEAR AMP 10-160m	£1295	D
RANGER 811H	HF LINEAR AMP 10-160m	£895	D
HUNTER	HF LINEAR AMP 10-160m	£1195	D
HUNTER 6	6m LINEAR AMP 50-54MHz 800W OUT	£895	D
DISCOVERY 2	2m LINEAR AMP 400-1000W OUT	£1395	D
DISCOVERY 6	6m LINEAR AMP 50-54MHz 400-1000W OUT	£1395	D

ADI

ADI AT-600 • 2m/70cms £179 Plus £6.00 Carr.

HOCKLEY WAREHOUSE EXCLUSIVE

- Dual Band 2m/70cms
- Up to 5 Watts out
- Airband Receive
- Nicad Pack • CTCSS
- Hod Charger

You won't find better value than this. Limited stocks

ADI AT-201 • £99 Plus £6.00 Carr.

- 2m Handy
- 2.5W, 5W (13.5V)
- 1750Hz & CTCSS
- Wideband receive
- Drycell case
- Batteries not included
- Full keypad

Higher power than most palm sized models. Fully illuminated keypad for ease of frequency entry. Channel or frequency readout.

ADI AT-147 • 2m 50W £199 Plus £6.00 Carr.

WITH AIRBAND RECEIVE

2m FM mobile transceiver. Three power levels 50,10,5W. Displays frequency or channel numbers, and offers Airband AM receive.

YAESU VX5R • BLACK OR SILVER £269 Plus £6.00 Carr.

Tiny but incredibly rugged, the VX-5R provides transceiver capability on three amateur bands (50/144/430MHz) and almost continuous reception from 500kHz up to 999MHz.

YAESU VX1R • 2m/70cm £145 Plus £6.00 Carr.

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

SELECTION FROM SECOND HAND LIST

HF Transceivers		Station Accessories	
MX-3.5S	£149.00	PK-900	£299.00
LINC-10	£149.00	ALS-600XCE	£899.00
VHF/UHF Base/Mobile Transceiver		SX-100	£69.00
AR-446	£199.00	AMT-3	£50.00
2001 x4	£145.00	FAX-1	£125.00
7003	£125.00	NTR-1	£99.00
DR-110E	£125.00	KAM Plus	£199.00
IC-275E	£549.00	MFJ-247	£129.00
IC-2100H	£169.00	MFJ-411	£45.00
FT-225RD	£499.00	MFJ-812B	£25.00
FT-29DR x3	£159.00	MFJ-862	£39.00
FT-290R II x2	£249.00	MFJ-1020A	£65.00
FT-690R II	£299.00	MFJ-1274	£100.00
FT-5200	£299.00	MFJ-1810	£4.00
VHF/UHF Hand Held Transceiver		RU-20	£79.00
DJ-460	£99.00	MML-144-30-LS	£59.00
IC-M11	£199.00	3000A +	£289.00
C-108	£89.00	Micro-RF	£69.00
Shortwave Receivers		Pico-2	£149.00
IC-R75	£499.00	PowerClear	£199.00
HF-225	£249.00	W-GMM	£29.00
WR-2085	£29.00	WMM-1	£49.00
R-9914	£69.00	FI-2025 x2	£99.00
ICF-SW7600D	£79.00	*Miscellaneous*	
WA-8000	£199.00	AE-2850	£50.00
Scanners Hand Held		GPS-12CX	£179.00
AR-8000	£199.00	GPS-3000	£89.00

- 3 MONTHS PARTS + LABOUR GUARANTEE.
- PLEASE RING BEFORE SENDING AN ORDER.

PRO USER

PS-1800 PORTABLE POWER STATION £69.95 Plus £8.00 Carr.

This larger capacity portable power supply is ideal for a wide range of field applications requiring 12V. It has a set of jump cables for jump starting engines (400A cold cranking output power). The battery is a sealed lead-acid type for maintenance free service. It can be trickle charged through the provided cigar lighter adaptor or AC adaptor.

- Internal sealed lead acid 18Ah maintenance free batt
- Output Voltage 2x12V cigar lighter sockets 15A 12V +&- Booster cable with clamps
- Protection 15A fuse & 50A, thermal breaker
- Size 355 x 320 x 155mm
- Weight 11.5kg

Accessories: 230V AC Mains adaptor to 15V DC 0.5A Cigar lighter plug to plug

FT-817 'SPECIAL OFFER'

SAVE £100!

INCLUDES AC CHARGER *AND 1 AMP Ni-cad PACK*

The amazing *FT-817* offers all-modes from 1.8MHz - 440MHz with up to 5 watts out. Buy one of our *"WALKABOUTS"* antennas at the same time and *SAVE EVEN MORE!* We will give you an extra *10% DISCOUNT* on the antenna!

YAESU

NEW MINI SM PSU PS-817 £19.95 Carr. £8.00

£699 carr.£8 **'SAVE £100' SPECIAL OFFER**

WATERS & STANTON

WE NOW ACCEPT THE EURO!

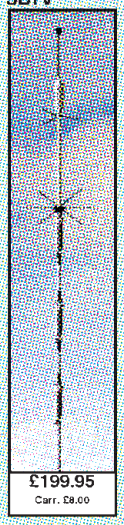
DISCOUNT CUSTOMER SERVICE THE ONLY THING WE KNOW

ORDER DETAILS ON FRONT PAGE.

CARRIAGE CHARGE CODES: A=£2, B=£6, C=£8, D: £12

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	1:1.5:1	1:1.5:1
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	-

"I worked my first ZL while actually on the move using a Hustler whip" - Peter Waters G3OJV. Customers are also telling us how pleased they are with the base verticals. Check the prices!

HUSTLER 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	£25.95 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

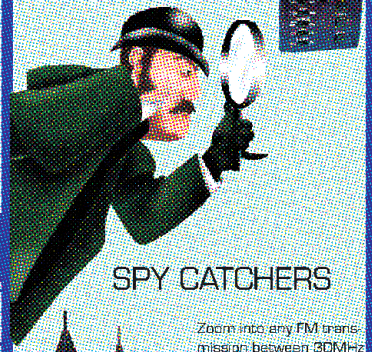
WATSON

CAPTURE THAT FREQUENCY!

Supplied with telescopic antenna and AC battery charger. If you are within 200 ft or so of the hand-held, you should be able to read off the frequency. Note it down and enter it in your scanner. It's that simple and it's pocket sized.

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

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



SPY CATCHERS

Zoom into any FM transmission between 30MHz and 900MHz and monitor the audio. It takes a fraction of a second. The WR-5001 comprises a complete receiver with auto tuning, skip button, squelch adjustment, and built-in speaker. The WR-5002 is similar but adds an auto-hold control and a bargraph signal meter. It also adds a CIV port for reaction tuning Icom and AOR receivers fitted with this feature. These monitor receivers are designed for near-fixed use and the range is from a few hundred metres to around 1km, depending on frequency and power of the transmitter.

WR-5001 £99.95 WR-5002 £159.95

CUSHCRAFT

COMMUNICATIONS ANTENNAS

HF HORIZONTAL BEAMS + DIPOLES

When you buy an HF Yagi, you want quality and realistic performance. You also want to know you can get spares. We offer a wide choice with guaranteed spares availability.

Count on us!

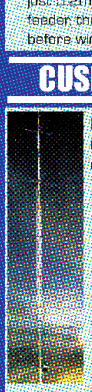
MA5B	10-20m (5 band) 3 el 2.7m radius 1.2kW	£299.95 C
X-7	10-20m 7 el. 12.5 - 13dBi 2kW 6.09m radius	£669.95 D
X-740	40m add on kit for X-7	£269.95 C
A4-S	10-20m 4 el. 8.9dBi 2kW 5.49m radius	£529.95 D
A-744	Gives 40m or 30m operation from A-4S	£149.95 C
A3-S	10-20m 3 el. 8dBi 2kW 4.72m radius	£459.95 D
A-743	Gives 40m or 30m operation from A3-S	£149.95 C
A3-WS	12 & 17m 3 el. 8dBi 2kW 4.4m radius	£349.95 D
A-103	Gives 30m operation from A3-WS	£149.95 C
D-3	10-20m dipole element 7.86m 2kW	£219.95 C
D-3W	12, 17, 30m 17m dipole element 10.37m 2kW	£219.95 C
D-4	10-40m dipole element 10.92m 2kW	£299.95 C
D-40	40m dipole element 12.88m 2kW	£259.95 C
XM-240	40m 2 el. 6dBi 7.3m radius 2kW	£699.95 C
Ten-3	10m 3 el. 8dBi 3m radius 2kW	£189.95 C
ASL-2010	10.5-32MHz 8 el. log periodic 6.45dBi 5.86m radius	£749.95 D

THE MINI-BEAM FOR SMALL GARDENS

Cushcraft MA5B

The best 3 element mini beam you will ever find. 2 element gain on 10, 15 & 20m, and dipole performance on 12m and 17m. Up to 25dB F/B ratio, it accepts 1.2kW yet has a boom length of only 2.2m and element length of just 5.2m. Turning radius is 2.7m. Uses a single feeder, this really works the DX. Get one up before winter! £299.95 C

CUSHCRAFT VERTICALS



R8 (illustrated), covers 8 bands from 6m - 40m, stands 8.7m high and requires no radials. You can feed it with 1.5kW and typical VSWR is around 1.2:1. £459.95 C

R8-GK Optional guy kit for R8 **£49.95 B**

R-8000 8 band 6m-20m that requires no radials and handles 1.5kW. Stands just 5.8m high and was chosen for the RSGB GB4FUN vehicle antenna. It works!! £329.95 C

NEW MA5V VERTICAL 20-10m **£229.95 C**

WATSON

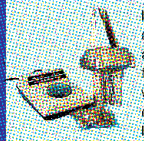
WEP-300B • EARPIECES £2.95 Plus £2.00 Carr.

Over-the-ear earpiece, popular for security and emergency use. Its low cost and firm mounting even in arduous conditions make this a popular item. Fitted with 3.5mm jack plug.

WSA-1 PSK-31 Adaptor £39.95 Plus £5.00 Carr.

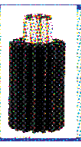
All you need to connect up to your sound card and run PSK-31. Includes CD software.

YS-130 £79.95 Plus £8.00 Carr.



Ideal for medium sized VHF antenna systems, the YS-150 is a good quality Japanese manufactured product. It is supplied with control box with rotary direction setting, plus upper and lower in-line mast clamps.

REVEX • 15W DUMMY LOAD £19.95 Plus £2.00 Carr.



- Range DC - 500MHz
- Power 15W/50W
- VSWR 1.15:1
- Connector PL-259
- 50 Ohms impedance
- Size 34 x 72mm
- Weight 70g

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144-WH10	2m 10 el. 9.7dBd 2.3m	£41.95 B
435-WH8	70cms 8 el. 8.6dBd 0.5m	£28.95 B
435-WH12	70cms 12 el. 12.8dBd 1.51m	£35.95 B
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Also available AV-60 & AV-40 compact meters.

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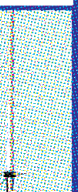

2m / 70cm fibre glass colinears with stainless steel fittings, 3 short radials and SO-239 sockets. These are high performance antennas, pre-tuned and supplied with all hardware for mast mounting.

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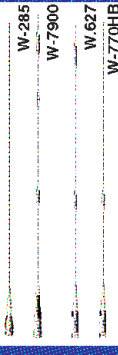
Triple band 6m/2m/70cms

W-2000	0/6/9dB 2.5m long	£69.95 C

GREAT VALUE MOBILE WHIPS



W-285 2m 5/8th whip with PL-259 base £14.95 B

W-7900 2m/70cm 5 & 7.5dB length 1.58m £32.95 B

W-627 6m / 2m / 70cm 2 / 4.5 7.2dB length 1.8m £34.95 B

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RSGB Matters

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

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Details of the Society's volunteer officers can be found in the RSGB Yearbook 2002

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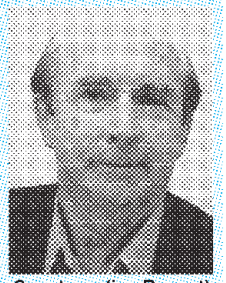
RSGB BOARD MEMBERS' PORTFOLIOS

THE PORTFOLIOS of the new Board were allocated at the RSGB Board Meeting on 19 January. They are shown below, against the photograph of each Board Member.

International and Regulatory - Bob Whelan, G3PJT (Pres)

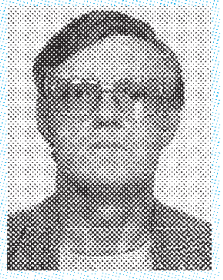
Environment - Robin Page-Jones, G3JWI



Spectrum (inc Raynet) - Gordon Adams, G3LEQ

Amateur Radio Development - Ed Taylor, G3SQX

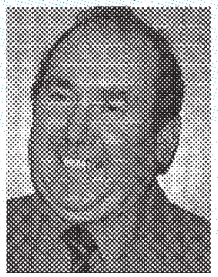
Technical Futures - Fred Handscombe, G4BWP



Sport Radio (HF & VHF Contests, ARDF, IOTA) - Geoff Dover, G4AFJ

Education & Schools - Richard Constantine, G3UGF

Membership Services (Clubs/International) - Liz Cabban, GW0ETU



Membership Services (Financial) - Jeff Smith, MI0AEX

RSGB REVIEWS ITS POSITION ON RAYNET

RECOGNISING THE important role that Raynet groups play in the community, the RSGB Board has agreed to carry out a root-and-branch review of Raynet activity in the UK and the role that the RSGB plays in support. The Society recognises that Raynet was set up initially to be a civil aid in the event of an emergency. However, in many areas, Raynet groups are more involved today in providing communications for community activities.

The review is being co-ordinated by the Society's Spectrum Director, Gordon Adams, G3LEQ, and he would welcome input from all Raynet groups. What would be of particular interest to the review would be the type of activity in which groups are generally involved. Is the group part of the community emergency plan, does the group's activities regularly get recognised in the local press, and what support does the group feel that the RSGB can provide in support of Raynet activities across the UK? Input can be forwarded by e-mail to ar.dept@rsgb.org.uk or by post to RSGB HQ. Please mark your envelope 'Raynet Review'. The closing date for input is 31 March 2002.

HM THE QUEEN'S GOLDEN JUBILEE

WEDNESDAY 6 February marked the 50th anniversary of the accession to the throne of Her Majesty Queen Elizabeth. The Queen's Golden Jubilee is being celebrated in June and the RSGB has negotiated with the Radiocommunications Agency the use of the 'GQ' prefix for UK amateurs **from 1 June until 30 June** inclusive.

The RSGB is organising a special contest on **8 / 9 June** to celebrate the Jubilee. The full rules of the contest were published on page 53 of the January 2002 *RadCom*. Entrants who use a computer for logging will be interested to know that Paul O'Kane, EI5DI, has released a version of his *Super Duper* contest logging program especially for the Jubilee Contest. Known as *SDJ*, the program is freeware and a 285KB zipped file, containing all the program and reference files, together with a manual written in *Word*, can be downloaded from www.ei5di.com *SDJ* is intended for single-operator unassisted entries.

DIGITAL RADIO TUNER COMPETITION

THE LUCKY WINNER of the RSGB VideoLogic DRX-601ES Digital Radio Tuner competition that was run in the November and December 2001 issues of *RadCom* is A G Swanborough, G0JUS, of Maidstone, Kent. The tuner, worth £349, has already been despatched to Mr Swanborough.

RSGB ON THE ROAD

PRESENTATIONS ON the work of the RSGB and its new structure will be given by General Manager Peter Kirby, G0TWW, at the **Bromsgrove & DARC** on **1 March** (details from John, G4OAZ, tel: 01527 871903); and by Board Member Gordon Adams, G3LEQ, at the **Mid-Cheshire ARS** on **20 March** (details from Niall, G0VOK, tel: 01606 871413).

BIDS SOUGHT TO HOST 2002 AGM

FOLLOWING THE success of the AGMs held in Harrogate and Strathclyde, the Board agreed, at their meeting on the January 2002, to hold the 2002 AGM outside London once again.

The date of the AGM is **Saturday 8 December 2002**. The format of the meeting will follow the same pattern as the last two years: a formal AGM in the morning followed by an open forum in the afternoon and a amateur radio dinner in the evening.

Clubs and Societies who would like to bid for the AGM are in the first instance asked to write to the General Manager at RSGB HQ. Following receipt of the initial bid a full planning profile for the day will be forwarded to the bidding organisations for their further consideration. Basic requirements are a venue that can comfortably hold 200 delegates, have full audio-visual arrangements in place, reasonably-priced hotel accommodation near to hand and good road and rail links.

As the last two AGMs have been held in the North of England and Scotland, priority on this occasion will be given to bids from Wales, Northern Ireland and England south of Birmingham.

NEW CHAIRMAN FOR RSGB EMC COMMITTEE

THE RSGB HAS appointed Angus Annan, MM1CCR, to the chair of the EMC Committee. Angus takes over from Hilary Claytonsmith, G4JKS.

REGIONAL VACANCIES FILLED BY CO-OPTION

AT ITS MEETING on 19 January, the RSGB Board agreed the Regional Council's recommendation to fill some of the vacant RSGB Regional Managers' positions by co-option.

The new appointees are: Region 1, Scotland West and the Western Isles - Gordon Hunter, GM3ULP. Region 2, Scotland East and the Northern Isles - Billy Jenkins, MM0WKJ. Region 10, South and South East - Ivan Rosevear, G3GKC, and Region 11, South West and the Channel Isles - Dick Atterbury, G4NQI. All will serve on the Regional Council until 31 December 2002.

At the same meeting, the Board approved a second recommendation from the Regional Council to split the existing Midlands Region into two separate regions - West Midlands and East Midlands. Region 5 becomes the West Midlands and is made up of Staffordshire, Shropshire, Birmingham (West Midalnds), Hereford and Worcestershire, Gloucestshire and Warwickshire. The East Midalnds becomes Region 13 and is made up of Derbyshire, Nottinghamshire, Leicestershire, Northamptonshire, Bedfordshire and Lincolnshire. These changes will be reflected in the *RadCom* 'Club & Regional News' with effect from the April 2002 issue.

Regional Manager vacancies still exist in: East Midlands, West Midlands, and London and the Thames Valley. Those interested in taking up the posts should, in the first instance, contact the RSGB General Manager, Peter Kirby, G0TWW, at RSGB Headquarters.

AROS TALKS

AMATEUR RADIO Observation Service (AROS) Coordinator Barry Scarisbrick, G4ACK, will be giving talks on the work of AROS at the **Maidenhead & DARC** on **7 March** (details from John, G3TWG, tel: 01628 525275); and at the **Lincoln Short Wave Club** on **20 March** (details from John, G1TSL, tel: 01522 793751).

All clubs that have requested presentations on AROS have now been scheduled. Bookings from July onwards should be made with the AROS Coordinator, Barry Scarisbrick, G4ACK. He is available by e-mail to aros@rsgb.org.uk or in writing via the Amateur Radio Department at RSGB Headquarters.

RSGB HQ MORSE CAMPS

THE DATES OF four more RSGB Morse Camps at RSGB headquarters in Potters Bar have been announced. They'll take place over the weekends of **16 / 17 March, 8 / 9 June, 14 / 15 September** and **16/17 November**. The idea of the Morse Camp weekends is to provide sufficient intensive training to get candidates up to speed for the RSGB 5WPM Morse code test which is required for the Full Class A or Intermediate Class A licence. All participants should at least know the Morse code characters for all the letters, numbers and prosigns used in the test at the start of the weekend. For further details, or to book, please contact Fiorina Sinapi at RSGB HQ on 0870 904 7373 or by e-mail: ar.dept@rsgb.org.uk

CALL FOR PAPERS

PAPERS ARE INVITED for the RSGB International HF and IOTA Convention to be held at the Beaumont Convention Centre, Old Windsor, in Berkshire over the weekend of **11 - 13 October**. The Convention covers DXing and technical topics that relate to amateur bands from (and including) 50MHz to 73kHz. This year the organisers will be particularly interested to consider topics of interest to the new Foundation Licence holders. If you have an interesting idea and wish to be considered as a speaker, please submit a brief abstract on the subject matter either by post to the HF and IOTA Convention Committee Chairman, John Gould, G3WKL, c/o RSGB HQ, or by e-mail to HFC2002.Chairman@rsgb.org.uk

RSGB RECOGNISES FOUNDATION LICENCE KEY PLAYER

RICHARD HORTON, G3XWH, who chaired the Future Licensing and Examination Forum, which was responsible for much of the work that went into the design of the new Foundation Licence, has been awarded the Kenwood Trophy for his significant contribution to training and development in amateur radio.

Richard was also a founder member and chairman of STELAR, and responsible for arranging and coordinating schools contacts with the *Mir* space station and the International Space Station.

Richard recently stood down from the Society's Board on which he was responsible for amateur radio development.

FORMER COUNCIL MEMBER GW3KFE SILENT KEY

FORMER RSGB Council Member Paul Essery, GW3KFE, has become a Silent Key. Paul died peacefully on 1 February after several years of failing health. Born in 1927, Paul was first licensed as G3KFE/T (amateur TV licence) in 1954. From the mid-60s he contributed to *Short Wave Magazine* and was at one time editor of the magazine. He also wrote features for *Practical Wireless* until forced to give up by ill health.

Paul was a 'doer', and helped numerous people with Morse training both in person and over the air. He moved to Newtown, Powys, in 1986, where he was a GB2RS newsreader and RSGB Morse examiner until forced to resign by failing health in 2000.

Paul had served as a volunteer officer for the RSGB in a number of capacities, most recently as RSGB Liaison Officer for Mid Wales and then, between 1995 and 2000, as Council Member for Wales. His funeral was held on 11 February, at Shrewsbury Crematorium. Paul leaves a wife, Galina, UR5CMM, three daughters and a son.

Paul Essery, GW3KFE, Silent Key.

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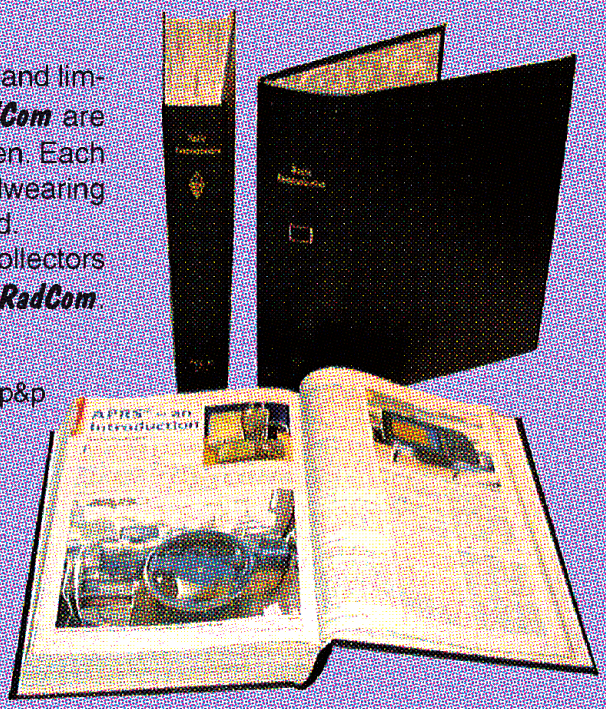

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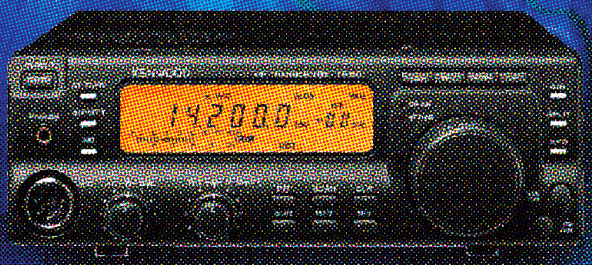

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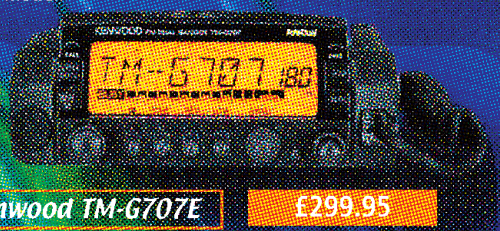

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Front Cover:

The Ten-Tec RX340 professional HF communications receiver is reviewed by Peter Hart, G3SJX on p44. Also, a full report on the 2001 RSGB IOTA Contest and news of an exciting competition can be found inside.

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March 2002

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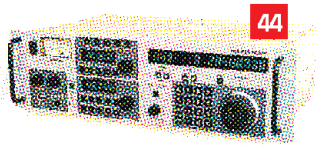
Technical Features

Down To Earth - Amateur Radio From The Ground Up

Reviews



Regulars

RadCom NEWS

Perils of the TV Repair Man

ARE YOU A TV engineer, or perhaps worked in the trade but have now retired? Did you know your health may be at risk? A member recently wrote to the Society pointing out the dangers of working long-term with solder containing rosin. The member, who worked as a TV enginbeer for 37 years, now suffers from occupational asthma and back problems which doctors have put down to his previous occupation. If you suffer similarly, don't despair: help is on hand from a new website - www.toweb.co.uk - which specifically caters for the TV trade and the people who work in it.

Epsom Rally News

THE EPSOM Radio and Electronics Fair takes place at Epsom Racecourse on 16 June. The Worked All Britain awards group and the Radio Amateur Invalid and Blind Club will be holding their AGMs at the rally. In addition to trade stands, the RSGB Repeater Management Committee and the RA will be on hand to answer questions. The Home Counties TV Club will be staging a demonstration.

Free entry to the rally will be given to anyone taking the Morse Assessment or 5WPM test. Ken Mackintosh with his big band will be playing to make sure that the event goes with a swing! For the latest details go to www.epsomrally.co.uk

Bill O Wigg, G5OW, who was made an honorary member of the High Speed Club (HSC) last year. Bill is 91 years old and has been 'key bashing' since 1932. Despite failing health, Bill took part in the HSC's contest in November and won another certificate as leading 'G'! More information on HSC can be obtained by writing to HSC, Waldhouse, D-82343 Pocking, Germany.

Annick's Progress

Annick, now M0HDE, deep in concentration while operating CW from the station of Laurie, G0MRL, shortly after she became 2E0ICK.

READERS WILL remember the story of Annick Morris, one of the most active and well-known radio amateurs in the north-west of England. Annick has been blind from birth, but this didn't prevent her from studying for the Novice RAE, becoming first 2E1HOW, then 2E1HDE, then taking the 5WPM Morse test and becoming 2E0ICK - picking up a 'Child of Achievement' award in the process (see *RadCom News* April 2001).

Laurie Bradshaw, G0MRL, who, along with Dave, G7OBW, and Dennis, M0BUS, helped Annick with the NRAE and Morse, has informed us that Annick has now passed the Full RAE and has recently received the callsign M0HDE. Laurie says "I can't tell you what a delight it has been for me to help Annick through the NRAE and RAE and I'm sure her other tutors would heartily agree with this. Annick has a huge circle of friends, most of whom she has met via amateur radio. These friends range quite literally from nine to 90 years."

Still only 15 years old, Annick can be heard teaching Morse most evenings on 2m and operating CW on the HF bands.

RAEN News

THE RADIO AMATEURS' Emergency Network (RAEN) has announced a national membership recruitment drive for 2002. A free membership 'join us' campaign is available to all amateurs who have never joined a Network group before. They will be able to sample activity with a local group, receive copies of the magazine *RAY-Link* and purchase personal supplies at members' only prices. The free temporary membership ID is valid from 1 January to 30 April 2002. Full details and an application form are available by e-mail from joinus@raynet-uk.net or by writing to 'Join Us', Hunters Moon, Station Rd, Newton-le-Willows, Bedale DL8 1SX.

A NEW RAEN Zone Coordinator for the West Midlands has been appointed. He is David Green, who takes over from Madeley Smith who held the position for eight years. David is a Project Planner in the communications industry in Coventry and was the controller of the Coventry Raynet group for a number of years. The accident involving the Boeing 737 aircraft on the outskirts of Coventry was among the many incidents that he has been involved with.

Get Involved in National Science Week, 8 - 15 March

NATIONAL SCIENCE Week, organised by the British Association for the Advancement of Science, takes place this year between **8** and **15 March**. Last year many radio clubs participated and reported an overwhelmingly positive response, with thousands of people turning out and seeing amateur radio being demonstrated. With the new Foundation Licence there has never been a better time to promote amateur radio and the RSGB would like to appeal to you to organise an event to interest local people *outside* the amateur community. The RSGB is prepared to support your projects with professional leaflets, posters and presentations: contact Commercial Manager Mark Allgar at RSGB HQ for further details.

See pages 52 - 55 of this issue for 'National Science Week: PICsat - a Satellite Demonstrator', a feature on what one group is doing for Science Week this year. However, shortly after the article was sent to press, changes were made to the on-board digipeater configuration on PCSAT. The article suggests the use of *APRSAT*, which was proposed as a standard for all future APRS satellites. However, due to frequent resets it has been decided to switch the alias to 'W3ADO-1' (PCSAT's default) and to use 'NOCALL' for compatibility with the International Space Station. For further info see the PCSAT website at http://web.usna.navy.mil/~bruninga/pcsat.html

For a report on the activities of radio clubs during Science Week last year, please see pages 42 / 43 of the May 2001 *RadCom* or visit www.rsgb.org/scienceweek

Colwyn Bay Wireless College

A WEBSITE has been set up with the aim of reuniting alumni of the Colwyn Bay Wireless College with their old colleagues and friends.

It contains photographs of the college, cabin and equipment from 1923, student galleries, a forum and a chat room. Former Principal Bill Whale has been located, together with several instructors and more than 70 students now scattered around the world.

A college reunion is now planned for April in Colwyn Bay. If you are among this erudite band, visit the college website at http://www.wirelesscollege.freeserve.co.uk You can register free of charge, meet your old friends and instructors and put your name down for the reunion event. Alternatively, call Dave Baker on tel: 01280 703 121.

Foundation Licence Courses

VERY MANY amateur radio clubs are now offering Foundation Licence courses. Listings of the majority of these can be found on page 6 of the January and February *RadComs*. The list of clubs offering courses will be kept up to date on the RSGB website at www.rsgb.org/foundation

ARRL President Re-elected

THE ARRL Board of Directors has unanimously elected its President, Jim Haynie, W5JBP, to a second two-year term of office. Haynie announced that the initiatives for his second term would be headed by a definition of the position of amateur radio within homeland security. "We have a great role to play," he said. "The problem we have is getting amateur radio introduced to the proper agencies. Federal agencies need educating in what amateur radio does."

G3OEP Wins CRACA Award

AT THE END of each year CRACA (Christian Radio and Computer Association) presents the CRACA Award to a person in recognition of outstanding service in the world of Christian Radio and / or Computing. During the course of last year CRACA received several nominations, all of whom were very worthy contenders. The winner was David Buddery, G3OEP, who lives in Great Yarmouth. David is a retired dentist who, over the years, has introduced many people of all ages to amateur radio.

Top Scientists Use Amateur Radio at International Symposium

Radio Astronomer Sir Bernard Lovell Takes to the Air

PROFESSOR SIR Bernard Lovell, former director of the Jodrell Bank Radio Telescope, took the microphone at special event station GB4QQ to send a greetings message to the Poldhu Amateur Radio Club during the Marconi Trans-Atlantic 100th Anniversary [see February *RadCom* page 42 - *Ed*].

GB4QQ was set up at the UK / Ireland Symposium of the International Radio Science Union (URSI) at the Centre for RF Propagation and Research (CPAR) at QinetiQ in Malvern on 11 / 12 December 2001.

Several of the delegates were licensed amateurs and took the opportunity to contact the Marconi site at Poldhu and other stations around the world. Operators during the event were Ian Schofield, M0CGF, and Peter Hampton, G4ADJ, both from QinetiQ.

Professor Sir Bernard Lovell at the GB4QQ station. Sitting behind Sir Bernard is Prof Paul Cannon from QinetiQ and Bath University who organised the symposium, Prof Michael Sexton of the Royal Irish Academy, Dublin, is on the left and Prof Henry Rishbeth of Southampton University to the rear.

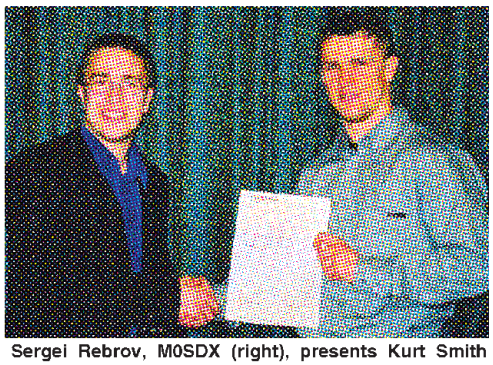
Sir Bernard Lovell was a guest speaker at the symposium and gave an illuminating talk on the development of radar, much of which was carried out at Malvern during WWII, and radio astronomy.

A magnificent display of vintage crystal sets, including one from a 1917 WWI seaplane, and an early Marconi V2 'bright emitter' receiver were kindly loaned by QinetiQ RF Safety Officer, Mike Field.

Sergei Goes Up to Cambridge

ON 4 FEBRUARY Spurs striker and top contester Sergei Rebrov, M0SDX, visited the Cambridge University Wireless Society (CUWS) to present RAE pass certificates to Kurt Smith and Phil Wise, two members of the society. Both Kurt and Phil sat the RAE at RSGB headquarters in December 2001.

Sergei was invited to CUWS by its Chairman, Dominic Smith, M0BLF, who is a second-year modern languages student at the university. Sergei spent a couple of hours discussing contesting and DXing with the club members. Also present were Alan Bain, M5AIQ, and Martin Atherton, G3ZAY. Sergei was also there to launch the publicity campaign for the CUWS Foundation Licence course. It is hoped that both of the Cambridge student newspapers will feature details of the visit and help to publicise the course. Further information about CUWS and more photographs of Sergei's visit can be found on the website at www.cam.ac.uk/societies/cuws/index2.htm



Sergei Rebrov, M0SDX (right), presents Kurt Smith with his Radio Amateur's Examination Certificate.

Handsat Latest

JOHN HEATH, G7HIA, the Secretary of the National Space Centre Amateur Radio Society, reports that Bristol University is asking the worldwide amateur radio community to assist with data capture from their forthcoming Nano Satellite Project. Hand-launched from the Space Shuttle during a space walk, the 6.5kg satellite will send data that can be decoded with software available free from their web site. The software is not yet written because the university wants to give amateurs the chance to have input into how they would like the data stream: 1200 baud AX25 packet, 9K6 packet, Bell 202, or Soundcard etc. More information and an on-line survey form is available at www.handsat.co.uk/

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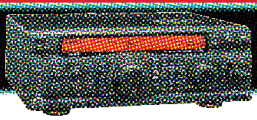

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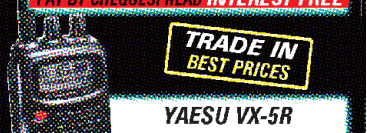

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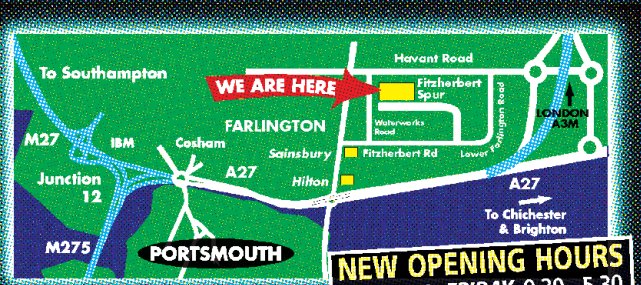

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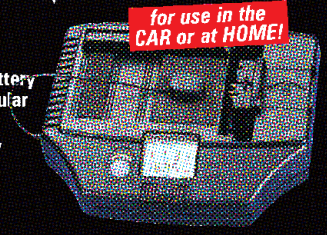

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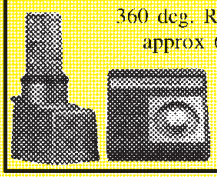

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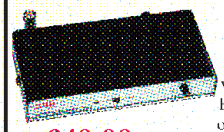

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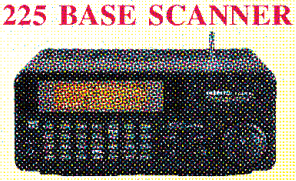

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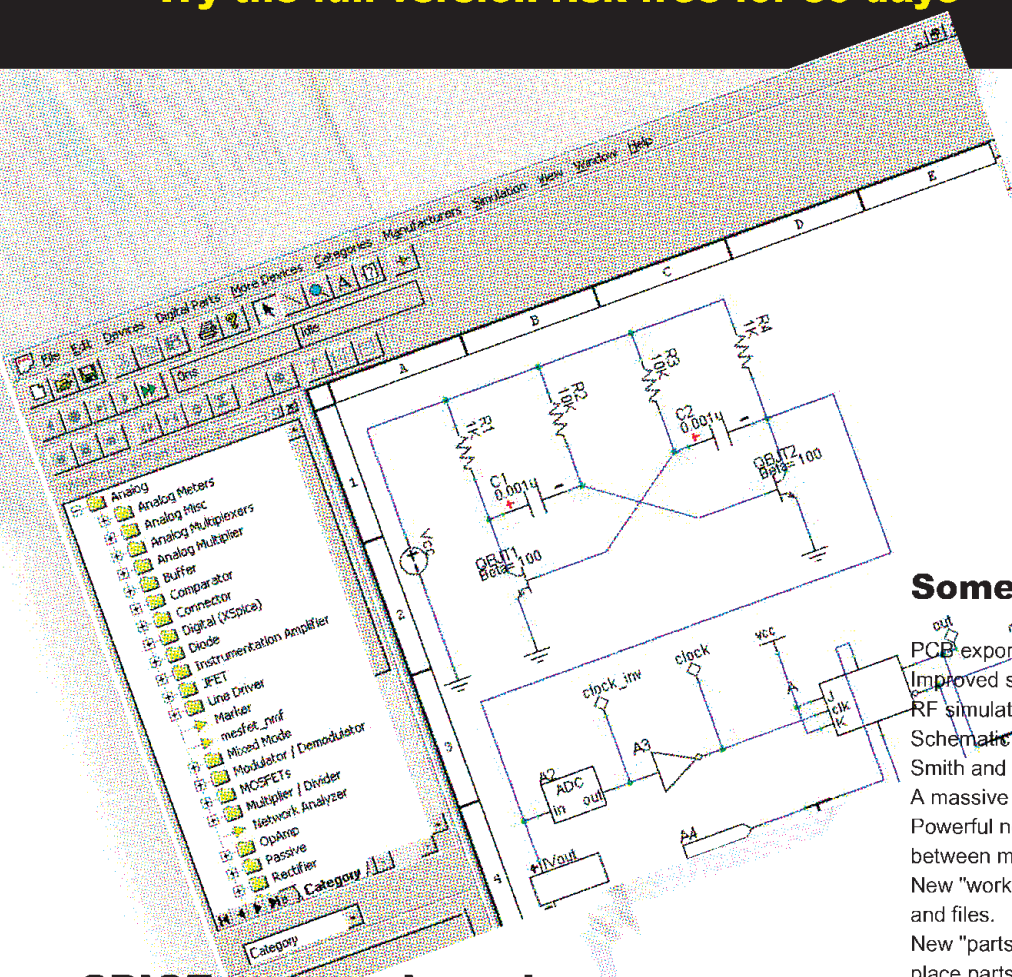

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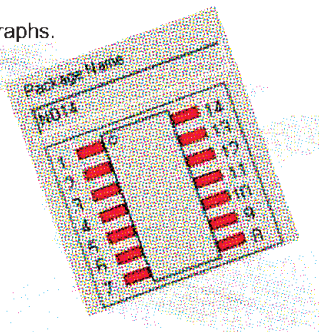

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RSGB IOTA Contest 2001

Reported by Don Field, G3XTT*

The view from KM5VI on Galveston Island, NA-143.

THE RSGB IOTA Contest proved highly popular again in 2001, with 1023 entries in the listings. This is a slight reduction on 2000, partly due to a number of logs having to be reclassified as checklogs (see 'Logging'). Propagation, while not outstanding, was favourable enough to enable some record-breaking scores to be achieved, and for those who were more interested in working some new islands rather than gaining a high contest score there were some rare ones to be worked. A quick count shows that over 260 island groups appeared in contestants' logs, more than enough for new IOTA chasers to make an excellent start in the awards programme. Of these, more than 110 were in Europe, and it is certainly true that the contest continues to have a strong European flavour. European stations also benefitted from Sporadic E propagation, enabling a good number of 10m QSOs. By DXCC country, the highest entry was from UA, followed by DL, SP and G.

RESULTS

THE ISLAND Multi-Operator section is probably the most hotly-contested category, and 2001 saw some outstanding scores being achieved. For the first time, scores broke the 10 million barrier with OH9A achieving an incredible 12m points, with the highest QSO and multiplier totals yet seen in this contest. As the OH0V team said, "We were targetting 10m, which proved quite an accurate prediction, but even this was not enough now that we know what our competitors scored". A key element for multi-operator entrants was logging accuracy, and several teams lost substantial numbers of points as a result of logging errors. Second, third and fourth places were taken by 9A0A, 9A8RR and CQ9K, all with scores which would have won the contest in 2000. It is clear that nowadays there is a huge amount of CW activity in the contest, and a high score can only be made by devoting significant amounts of time to that mode. As an example, some 1400 of OH9A's QSOs were made on CW.

Andy, G4PIQ, at the controls of M6T, wins the Island 24-hour SSB category, with a 1m-point increase on his previous year's score. This result is due mainly to his excellent multiplier total, gained by some slick multiplier passing. Clive, GM3POI, takes the honours in the Island 24-hour CW category, narrowly beating last year's winner, 9H1ZA. Petar, 9A6A, heads the Island 24-hour Multi-Mode category. This is an interesting category to enter, as there is a significant element of strategy in deciding when to switch modes. It is clear from the multiplier totals being achieved in other categories that we could see much higher Multi-Mode scores in the years to come.

The 12-hour categories remain very popular. Here there is a rather different element of strategy which is, quite simply, when to take those breaks. It is not allowable, as some competitors seem to think, to operate more than 12 hours and then simply to submit the 'best' 12 hours' score! Such entries will be reclassified as 24-hour. The island 12-hour SSB category was very closely fought, with Pekka, OH0R, emerging the winner. The top three scores are from north, south and west Europe, so there is no clear geographic advantage at work here. In the 12-hour CW category Laszlo, 9A/HA6NL, takes the honours. The Croatian islands were certainly popular as a contest destination; good propagation and good weather, while enjoying a summer holiday break! The final Island category is the 12-hour Multi-Mode and this was won by Steve, AA4V, from the Isle of Palms. This is an excellent result, showing that North American entrants really can achieve winning scores in this contest.

'World' entrants in the IOTA Contest face a different kind of challenge. It is more difficult and less rewarding to run stations, and much more attention has to be paid to multiplier-hunting. The winning entrants show just what can be achieved. The winning World 24-hour SSB entry is from Thomas, DL4MCF, with a score almost 1m points higher than the previous year's winning total. World 24-hour CW honours are taken by Slava, RA1ACJ, who was obviously determined to improve on his 2000 second-place finish. In the World 12-hour Multi-Mode category, Zoli, HA1AG, takes top spot with a score and multiplier total that would be the envy of many multi-op teams. Romeo, UN5PR, leads the way in the World 12-hour SSB category, with a lower QSO total but higher multiplier score than those in second and third places. Scores in the World 12-hour CW category are almost as high as those on SSB, and Igor, RZ3BW, emerges the winner. In the World 12-hour Multi-Mode category there was a close fight for first place, with Wojciech, SP9HWN, (operating as SP9W) winning by the smallest of margins.

ASSISTED CATEGORIES

FOR THE FIRST TIME a Single-Operator Assisted category was introduced into the contest. The organisers felt that this would be helpful to serious island chasers who want to enter the contest but do not want to miss any rare island counters which are active over the weekend. Just 22 entrants participated in 2001, but hopefully this will increase in 2002. All are listed together but, of course, the scores are not directly comparable as the entries include both Island and World, 12- and 24-hour, and all possible mode options. The results show that *PacketCluster* support really does allow some high multiplier totals to be achieved, and congratulations to Ken, W1NG, for

The impressive antennas at 9A1P on Sveti Nikola island, EU-110.

*iotacontest@rsgbhfcc.org

showing, again, that a winning score is possible from North America.

SWL CONTEST

THERE WERE 24 SWL entries, a slight decrease on recent years. Warm congratulations to all the winners, who will each receive an IOTA Certificate of Merit. Apart from the sections shown, it is worth noting that there are also four other Single-Op Assisted categories that can be entered. Logs were received from 14 DXCC entities, and were of a very good standard and well presented. The majority of entrants lost some points but one fell foul of the '1 in 3' rule - remember that two other callsigns must appear in the 'station worked' column before the same station can appear again - and lost several hundred thousand points!

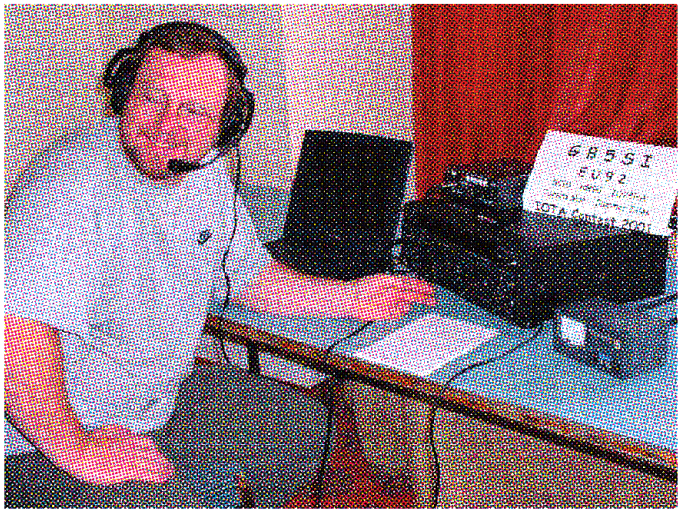
LOGGING AND ADJUDICATION

LOGGING ACCURACY was generally good, considering the complexity of the contest exchange. The greatest number of errors appeared in multi-operator logs. It is certainly a concern that there is no logging software package that fully supports the IOTA Contest for multi-operator entrants, though most teams managed to make one of the main programs (most commonly *Writelog, NA* and *CT*) work for them in an acceptable fashion. Single-operator entrants are better served, with EI5DI's *SDI* (www.ei5di.com) continuing to be the most popular logging software for this contest.

Where entrants' scores have changed substantially from that claimed on the cover sheet, this is usually because they had been incorrectly scored. Some entrants claimed 15 points for every QSO (not just island QSOs) while others were still using the old 2/5/15 point system. Many island entrants were also confused by the rule (introduced for 2001) allowing credit for own-island. All island-station logs were re-scored in accordance with the rules, but this proved very time-consuming for the adjudicators and would not have materially affected the final placings, so the rule has been dropped for 2002. Some 70% of entrants now send in electronic logs, which helps enormously with the adjudication. All paper logs are typed up by a team of volunteers, but this is time-consuming and, because they are all human, errors do creep in. Unfortunately a substantial number of entrants sent in electronic logs which omitted key data (usually serial numbers and / or IOTA references). Where possible, the adjudicators contacted the entrants concerned and requested that a new file be submitted. Due to time and resource constraints this couldn't be done in all cases, and some entrants had, in any case, deleted the logs from their PC. In all such cases, in faimess to other entrants, the entries concerned were re-classified as checklogs. Do, *please*, ensure that your log contains the key information. You cannot simply assume that the logging program will include it in an entry file, especially as some of the major programs still do not offer overt support for the IOTA Contest.

Also, do ensure that your summary sheet is absolutely clear about which section and category you are entering. IOTA categories differ from other major contests, and it is essential that the adjudicators know whether, for example, your entry is 12- or 24-hour, Assisted or non-Assisted.

This year's adjudicators imported all entries to Excel, which enabled a significant amount of analysis and comparison to take place. Penalties were applied for mis-logged calls, mis-logged band and / or mode, and mis-logged contest exchanges (small errors in serial numbers were ignored, as it is clear that multi-operator entrants often have problems keeping serial numbers in step between the run and multiplier stations). While there is currently no equivalent to, for example, the 'UBN' reports available for *CQ* WW contest entrants, I am happy to provide feedback to entrants (in response to an e-mail) on the adjudication of their log. It is worth bearing in mind that the 15 to 3 points ratio for island / non-island QSOs and the importance of multipliers mean that losing a 15-point multiplier is dramatically worse than losing a 3-point non-island QSO.



Jim Martin, MM0BQI, operating as GB5SI from the Summer Isles, EU-092.

RULES FOR 2002

THE RULES FOR this year's contest have already been published in the January *RadCom*, and are available on the RSGB HF Contests Committee website (www.rsgbhfcc.org, also linked from www.rsgb.org) After last year's changes, it was hoped to keep changes this year to a minimum, although there are two significant areas of change which potential entrants need to be aware of. The first is that, for consistency, and to encourage greater participation, all entrants can now choose between high-power and 100-watt categories (this option was previously available only to Island DXpeditions). A World Multi-Operator category has also been introduced (several entries for such a category have been received in the past and have had to be re-classified as checklogs).

Secondly, there have been changes in the definition of an Island DXpedition. This has happened both because it has been increasingly difficult to classify some entries as Island Permanent or Island DXpedition, and also to get back to the original intention of this category, which was to encourage expeditions to remote and rarely-activated islands. Under existing rules, a team of UK operators, for example, could set up a temporary station with multiple towers and antennas from EU-005 (UK Mainland) and be competing with a group which has had to establish a station on an uninhabited rock, accessible only by sea. In future, Island DXpeditions will have to satisfy more strict criteria and will appear in a separate DXpeditions listing, as well as in the main Island Station listings.

TROPHY WINNERS

CONGRATULATIONS TO ALL the trophy winners, listed below. In recent years the W9DWQ trophy has been awarded to the leading North American Island DXpedition station, but the trustees of that trophy have indicated that it should actually go to the leading *Single-Operator* North American Island DXpedition station. As there was some ambiguity in the published rules, a further trophy will, therefore, be issued to the leading Multi-Operator North American Island DXpedition station, which is XM2CWI (operators: VO1NO, VE2AYU, VE2TBH, VE2WHO, VE2SEI, VE2YAK, KA8ZUO, VE2DX). Although the rules for 2002 show only the existing trophies, sponsors are being sought for a much wider range of trophies to reflect the high level of participation in most categories, and details will be published on the web page when available.

TROPHY	WINNER (OPERATORS)
IOTA	OH9A (OH1MDR, OH1NOA, OH1MM)
Geoff Watts Memorial	CQ9K (CT3BD CT3DL CT3EE CT3EN CT3HK CT3IA CT3IQ CT3KU G3KHZ)
Roger Balister, G3KMA	CQ2I (EA2TV, EA4ABE, EA4ST, EA1CA, EA4AHD, CT1CJJ, Filipe)
David King, G3PFS	GW0GEI
G3DYY Memorial	GM3POI
W9DWQ	KP2/AA1BU

Write-up concludes on page 24.
Results over the page.

RSGB IOTA CONTEST 2001 - RESULTS - Islands Section

ISLANDS - MULTI-OPERATOR

Pos	Callsign	QSO	Mults	Score	Section	IOTARef	Island name
1	OH9A	3,456	542	12,064,920	DXpedition	EU-173	Sandström Reef
2	9A0A	2,833	537	10,175,076	DXpedition	EU-170	Vir
3	9A8RR	2,975	502	9,775,446	DXpedition	EU-016	Korcula
4	CQ9K	3,196	463	9,745,224	Permanent	AF-014	Madeira
5	OH0V	3,088	477	9,370,188	Permanent	EU-002	Åland
6	GU8D	2,855	460	8,383,500	Permanent	EU-114	Guernsey
7	G5XV	2,488	472	8,065,536	DXpedition	EU-120	Isle of Wight
8	9A9R/P	2,609	407	6,814,401	DXpedition	EU-136	Krk
9	F/G0MEU/P	2,284	439	6,769,380	DXpedition	EU-068	Sein
10	PI4HQ	2,491	398	6,360,438	DXpedition	EU-146	Goeree Overflakkee
11	SK6M	2,434	390	6,282,900	DXpedition	EU-043	Tjorn
12	DF4XX/P	1,996	420	6,214,320	DXpedition	EU-128	Fehmarn
13	PJ2Y	2,230	347	5,794,206	Permanent	SA-006	Curaçao
14	CS5C	2,454	364	5,789,784	DXpedition	EU-145	Culatra
15	GB3RS	2,409	426	5,711,382	Permanent	EU-005	UK Mainland
16	SM1T	2,488	324	5,050,512	Permanent	EU-020	Gotland
17	C4MG	2,883	295	4,944,495	DXpedition	AS-120	Agios Georgios I
18	EJ4GK/P	1,867	331	4,916,343	DXpedition	EU-006	Inis Mór
19	GM2T	2,005	344	4,797,768	DXpedition	EU-008	Tiree
20	9A1P	2,273	292	4,195,164	DXpedition	EU-110	Sveti Nikola
21	IT9VDQ	2,085	315	4,185,405	Permanent	EU-025	Sicily
22	UU7J/P	2,795	271	4,151,991	DXpedition	EU-180	Tuzla
23	G8A	1,909	333	3,685,311	DXpedition	EU-005	UK Mainland
24	PA6TEX	1,725	314	3,678,510	DXpedition	EU-038	Texel
25	CQ2I	1,777	299	3,502,875	DXped 100W	EU-150	Insua
26	LZ1KSL	1,635	316	3,195,708	DXped 100W	EU-181	Sveta Anastasiya
27	9A3W/P	1,323	334	3,161,310	DXpedition	EU-170	Vir
28	G9Q	2,020	296	3,136,416	DXpedition	EU-005	UK Mainland
29	9A/S55A	2,144	247	3,124,056	DXpedition	EU-136	Krk
30	ES8X	1,976	266	3,041,976	DXped 100W	EU-178	Kihnu
31	RI6AAA	2,350	222	2,899,764	DXpedition	EU185	Dzendzik
32	VY2RU	1,531	250	2,843,250	Permanent	NA-029	Prince Edward I
33	9A7T/P	1,314	299	2,746,614	DXped 100W	EU-170	Zut
34	8S7A	1,972	213	2,612,232	Permanent	EU-037	Öland
35	IA5P	1,991	210	2,448,810	DXped 100W	EU-028	Pianosa
36	XM2CWI	1,336	240	2,407,680	DXpedition	NA-038	Iles de la Madeleine
37	IL7/IK2XYG	1,967	201	2,223,261	DXpedition	EU-050	San Nicola
38	EI0A	1,216	256	2,181,120	Permanent	EU-115	Ireland
39	SK7DX	1,873	195	2,132,315	DXpedition	EU-138	Hanö
40	9A0LH	2,218	178	2,130,660	DXped 100W	EU-110	Veli Brijun
41	M6Q	1,597	241	1,978,851	Permanent	EU-005	UK Mainland
42	YM0MA	2,294	176	1,973,664	DXped 100W	EU-186	Gokceada
43	YM0KA	1,806	185	1,870,350	DXpedition	AS-099	Bozcaada
44	9A/DL8WAZ/P	1,269	234	1,820,286	DXped 100W	EU-016	Korcula
45	CT7A	1,486	178	1,500,540	DXpedition	EU-145	Culatra
46	JW5E	1,478	169	1,473,342	Permanent	EU-026	Svalbard
47	EJ3HB	1,371	154	1,466,850	DXpedition	EU-121	Clear I
48	RZ0ZWA/0	1,302	155	1,412,670	DXpedition	AS-091	Ptichiy
49	IK7FPX/P	1,282	189	1,375,542	DXped 100W	EU-091	Grande di Porto Cesareo
50	DL0KWH	1,122	176	1,302,048	DXped 100W	EU-129	Usedom
51	M0S	1,060	195	1,237,860	DXpedition	EU-005	UK Mainland
52	OZ0Q	1,141	163	1,207,341	Permanent	EU-029	Sjaelland
53	GN0ADX/P	1,021	167	1,202,901	DXped 100W	EU-122	Rathlin
54	IA5G	903	193	1,185,213	DXped 100W	EU-028	Gorgona
55	J48K	1,062	177	1,143,774	DXpedition	EU-113	Kithira
56	M2G	1,326	138	916,596	Permanent	EU-005	UK Mainland
57	YV5JBI/P	1,086	134	902,892	DXped 100W	SA-090	Piritu Afuera
58	C6DX	1,512	114	898,776	DXped 100W	NA-001	Eleuthera
59	AB5EB	995	136	877,608	DXped 100W	NA-143	Galveston I
60	RI1CGG	876	143	753,324	DXpedition	EU-133	Gogland
61	SM3S/3	768	143	705,705	DXped 100W	EU-176	Grimskär
62	VO1SDX	786	137	701,166	Permanent	NA-027	Newfoundland
63	FP/K9WM	1,036	109	659,232	DXped 100W	NA-032	Miquelon
64	GI3XRQ/P	1,014	112	639,072	DXped 100W	EU-115	Ireland
65	BI4U	748	105	608,580	DXpedition	AS-135	Qinshan
66	W4LVS/P	799	117	563,355	DXped 100W	NA-112	Bogue Banks
67	M3S	718	130	521,820	Permanent	EU-005	UK Mainland
68	M2C	683	131	499,503	DXpedition	EU-005	UK Mainland
69	M3C	623	133	478,401	DXped 100W	EU-005	UK Mainland
70	L80AA/D	813	92	401,028	DXpedition	SA-055	Martin Garcia
71	LA6K	423	114	362,178	Permanent	EU-036	Nordlandet
72	W1F	666	86	324,564	DXped 100W	NA-067	Roanoke I
73	GX3SRT	557	101	304,515	Permanent	EU-005	UK Mainland
74	J49ERK	544	85	270,300	DXped 100W	EU-015	Crete
75	W4SAA	447	81	267,543	DXped 100W	NA-141	Virginia Key
76	9A9Z/P	804	69	265,788	DXpedition	EU-170	Krapanj
77	OH5AD	571	74	237,762	DXpedition	EU-140	Kuorsalo
78	7S7B/7	361	69	157,527	DXped 100W	EU-138	Tjurko
79	KM5VI	284	66	129,888	DXped 100W	NA-143	Galveston I
80	KC7WDL	38	8	1,776	DXped 100W	NA-065	Whidbey I

ISLANDS - 24 HOUR SSB

1	M6T	2,323	355	4,834,035	Permanent	EU-005	UK Mainland
2	GM0F	1,719	252	2,705,724	Permanent	EU-005	UK Mainland
3	GM3PPG/P	1,684	226	2,595,384	DXpedition	EU-010	S Uist
4	EI8IR	1,642	223	2,222,418	Permanent	EU-115	Ireland
5	KP2/AA1BU	1,850	194	2,198,796	DXped 100W	NA-106	St John's
6	MI0LLL	1,300	192	1,598,976	Permanent	EU-115	Ireland
7	3E1AA	1,578	164	1,567,512	Permanent	NA-072	Contadora
8	PA/F5PAC	1,208	164	1,210,320	DXped 100W	EU-038	Texel
9	EI8GS	1,318	155	1,098,330	Permanent	EU-115	Ireland
10	F8BDQ/P	1,037	159	1,063,233	DXped 100W	EU-032	Oleron
11	EI7IQ	936	151	983,916	DXped 100W	EU-103	Little Saltee
12	VE1JS	1,000	151	971,232	DXpedition	NA-127	Brier
13	TF8GX	1,068	147	943,740	Permanent	EU-021	Iceland
14	SK0HS/0	722	147	766,458	DXped 100W	EU-084	Blidö
15	F5RYC/P	924	94	531,288	DXped 100W	EU-095	Pomegues
16	KF9YL	857	96	466,848	DXped 100W	NA-076	Cedar Key
17	OZ1LNL	584	89	351,372	Permanent	EU-029	Sjaelland
18	EI2CH	301	116	333,036	Permanent	EU-115	Ireland
19	F/IK1TTD	364	102	288,864	DXped 100W	EU-070	Levant Is
20	IV3NCC/P	359	104	287,976	DXped 100W	EU-130	Isola di Grado
21	JA9SCB/1	450	92	283,176	DXped 100W	AS-007	Honshu
22	GM4EMX	383	104	260,520	Permanent	EU-005	UK Mainland
23	VO1BC	433	85	250,155	Permanent	NA-027	Newfoundland
24	IS0LLJ	392	85	218,280	Permanent	EU-024	Sardinia
25	GW0AJI	242	71	122,262	Permanent	EU-005	UK Mainland
26	LB8RE	452	44	121,440	Permanent	EU-055	Sotra
27	G0PBV	162	77	115,038	Permanent	EU-005	UK Mainland
28	OX3NUK	383	51	100,215	Permanent	NA-018	Greenland
29	9Y4/DL2RVS	251	57	94,221	Permanent	SA-011	Trinidad
30	SP1RWK/1	185	57	78,831	DXped 100W	EU129	
31	VK2CZ	205	52	72,540	Permanent	OC-001	Australia
32	VE7XO	119	49	56,301	Permanent	NA-036	Vancouver I
33	UA0FBS	113	35	37,905	Permanent	AS-018	Sakhalin
34	SM0FM	61	42	32,382	Permanent	EU084	
35	G0DVJ	101	34	25,398	Permanent	EU-005	UK Mainland
36	LA9AU	57	35	22,785	Permanent	EU-033	Vesteralen
37	RV1CC/1	66	32	17,472	Permanent	EU133	
38	JA1PYP	18	12	2,520	Permanent	AS-007	Honshu

ISLANDS - 24 HOUR CW

1	GM3POI	1,963	219	2,664,135	Permanent	EU-009	Orkney
2	9H1ZA	1,668	240	2,583,360	Permanent	EU-023	Malta
3	G0IVZ	1,490	238	2,040,612	Permanent	EU-005	UK Mainland
4	GM4FAM	967	268	1,960,956	Permanent	EU-005	UK Mainland
5	RZ1OA/A	1,291	223	1,813,659	DXpedition	EU-153	Lyasomin
6	DL5XL/P	1,598	178	1,735,500	DXpedition	EU-127	Helgoland
7	G4BJM	1,555	207	1,626,399	Permanent	EU-005	UK Mainland
8	J49R	1,505	165	1,426,095	DXped 100W	EU-015	Crete
9	DL1EFD/P	1,025	169	1,241,643	DXped 100W	EU-047	Langeoog
10	G5LP	1,148	191	1,191,840	Permanent	EU-005	UK Mainland
11	ZC4DW	1,358	134	1,037,964	DXped 100W	AS-004	Cyprus
12	RW3TN/1	1,401	107	721,287	DXpedition	EU-066	Solovetskiye
13	JG6URG/6	1,026	105	644,490	DXped 100W	AS-012	Ikitsuki
14	OZ8SW	759	107	527,403	Permanent	EU-029	Sjaelland
15	DL3NSM/P	695	105	500,850	DXped 100W	EU-057	Ruegen
16	EI4BZ	660	115	477,480	Permanent	EU-115	Ireland
17	DL3KUD/P	774	87	401,418	DXpedition	EU-098	Wangern/Poel
18	G4UCJ	502	122	385,764	Permanent	EU-005	UK Mainland
19	EC8AUZ	848	58	311,112	Permanent	AF-004	Gran Canaria
20	SP6LV/1	561	74	273,726	DXpedition	EU-129	
21	GW3KDB	136	133	263,340	Permanent	EU-005	UK Mainland
22	G3VQO	260	103	228,660	Permanent	EU-005	UK Mainland
23	IS0SDX	475	54	138,510	Permanent	EU-024	Sardinia
24	OZ/SM7GCZ	102	55	64,350	DXped 100W	EU-029	Sjaelland
25	JQ1HIV	129	51	58,293	Permanent	AS-007	Honshu
26	KP4AH	402	30	57,780	Permanent	NA-099	Puerto Rico (op NP4R)
27	SP1EG/1	131	47	48,927	DXped 100W	EU-129	Uznam
28	G3GMM	91	42	33,138	Permanent	EU-005	UK Mainland
29	OZ1BMA	121	31	30,876	Permanent	EU-029	Mon
30	JH6OPP	149	33	30,591	Permanent	AS-077	Kyushu

ISLANDS - 24 HOUR MULTI-MODE

1	9A6A	1,729	266	2,784,222	DXpedition	EU-016	Hvar
2	GJ2A	1,790	236	2,400,120	Permanent	EU-013	Jersey
3	OH6RX	1,430	179	1,562,670	DXpedition	EU-101	Raippaluoto
4	GB5SI	1,410	165	1,531,530	DXped 100W	EU-092	Summer Isles
5	RA0FU	764	191	1,134,540	Permanent	AS018	Sakhalin
6	DL5CW/P	1,130	153	1,122,714	DXped 100W	EU-042	Hallig Hooge
7	OZ/DJ7RJ	939	141	865,881	DXpedition	EU-030	Bornholm

RSGB IOTA CONTEST 2001 - RESULTS - Islands Section

8	FS/N3OC	1,213	126	797,202	DXpedition	NA-105	St Martin
9	RA3NN/1	1,079	128	664,704	DXpedition	EU153	Mudug
10	9A2V/P	660	129	515,484	DXped 100W	EU-170	Vrgada
11	K1VSJ	532	132	489,456	Permanent	NA-046	Martha's Vineyard
12	F5RAB/P	531	121	462,825	DXped 100W	EU-032	Ré
13	JF1SEK	296	134	387,528	Permanent	AS007	Honshu
14	G3YEC	207	143	361,647	Permanent	EU-005	UK Mainland
15	IS0IGV	796	81	337,284	Permanent	EU-024	Sardinia
16	JM6CIP/6	601	66	298,782	DXped 100W	AS-037	Kamikoshiki
17	P29IO	375	87	286,839	Permanent	OC-034	New Guinea
18	WB8YJF/4	662	77	278,586	DXpedition	NA-067	Ocracoke
19	DM5JBN/P	478	61	173,118	DXped 100W	EU-129	Usedom
20	UA1OMS/1	502	55	156,750	DXpedition	EU-102	Dolgy
21	RN2FA/1	481	42	105,840	DXpedition	EU-102	Dolgy
22	ES2/SM0ELV	249	66	102,366	DXped 100W	EU-149	Naissaar
23	K2TV	139	50	58,050	Permanent	NA-026	Long Island
24	G3ECS	65	58	50,286	Permanent	EU-005	UK Mainland
25	JA6SRB/4	77	46	36,570	Permanent	AS-007	Honshu
26	JE3UHV	101	35	24,465	Permanent	AS-007	Honshu

ISLANDS - 12 HOUR SSB

1	OH0R	1,361	161	1,277,535	Permanent	EU-002	Åland
2	IC8WIC	1,312	153	1,272,348	Permanent	EU-031	Capri
3	GW0GEI	1,247	162	1,255,338	Permanent	EU-124	Anglesey
4	SP6ECA/1	801	154	932,316	DXpedition	EU-132	Wolin
5	EA6DD	846	167	868,734	Permanent	EU-004	Mallorca
6	DK8OL	852	133	802,788	Permanent	EU-042	Sylt
7	G4AXX/P	841	143	674,817	DXpedition	EU-005	UK Mainland
8	EI7GL	424	151	612,456	Permanent	EU-115	Ireland
9	G4JFS	307	169	565,305	Permanent	EU-005	UK Mainland
10	GW0ARK	727	132	539,748	Permanent	EU-005	UK Mainland
11	G4KNO/P	762	127	517,398	DXpedition	EU-005	UK Mainland
12	SV1BRL/8	943	98	504,210	DXped 100W	EU-052	Kefalonia
13	G0VVE	570	125	453,750	Permanent	EU-005	UK Mainland
14	GW0ANA/P	583	128	452,736	Permanent	EU-005	UK Mainland
15	EI7CC	400	129	450,468	Permanent	EU-115	Ireland
16	DF6QC	620	97	433,008	Permanent	EU-127	Helgoland
17	F5TYY/P	603	104	424,008	DXped 100W	EU-064	Noirmoutier
18	OZ1ACB	285	129	418,347	Permanent	EU-029	Sjaelland
19	G3PFS	326	118	333,468	Permanent	EU-005	UK Mainland
20	G0DIZ	400	110	300,960	Permanent	EU-005	UK Mainland
21	EI4CF	241	121	286,407	Permanent	EU-115	Ireland
22	OZ4PAX	487	78	274,950	Permanent	EU-171	Vendsyssel
23	MW5EPA	462	95	267,330	Permanent	EU-005	UK Mainland
24	GM0FGI	341	99	264,033	Permanent	EU-123	Bute
25	IV3UHL/P	715	71	254,535	DXpedition	EU-130	Gorghi
26	9A/ON4CJK/P	633	69	243,639	DXped 100W	EU-170	Dugi-Otok
27	G0LUQ/P	165	117	230,607	Permanent	EU-005	UK Mainland
28	G0VBD	154	105	200,970	Permanent	EU-005	UK Mainland
29	YB0A	415	68	199,716	Permanent	OC-021	Java
30	G0WJN	229	94	176,250	Permanent	EU-005	UK Mainland
31	SW8T	480	68	173,808	Permanent	EU-174	Thassos
32	OZ1DYI/P	404	61	173,484	DXped 100W	EU-125	Romo
33	G3PJV	523	67	167,031	Permanent	EU-005	UK Mainland
34	9H4JB	323	78	162,630	Permanent	EU-023	Malta
35	6H3KK	388	62	151,032	DXped 100W	NA-090	Cozumel I
36	G3OHC	150	89	146,850	Permanent	EU-005	UK Mainland
37	EA6TC	507	51	140,607	Permanent	EU-004	Ibiza
38	SV8DTP	264	72	133,056	Permanent	EU-049	Lesvos
39	M0BTO	158	83	124,998	Permanent	EU-005	UK Mainland
40	JA4PXE/4	305	50	117,150	DXped 100W	AS-117	Yashiro
41	G0OYQ	416	50	108,000	Permanent	EU-005	UK Mainland
42	BV2/RK3DT	204	50	102,600	Permanent	AS-020	Taiwan
43	K4RFK	238	59	102,306	Permanent	NA-069	Pine Island
44	GM3RTJ/P	209	60	99,540	DXped 100W	EU-008	Mull
45	9V1RH	139	61	93,513	Permanent	AS-019	Singapore
46	VK6NU	139	60	85,500	Permanent	OC-001	Australia
47	5B4AGX	123	65	81,705	Permanent	AS-004	Cyprus
48	CU3AD	75	73	77,745	Permanent	EU-175	Terceira
49	VE7NS	133	54	73,386	Permanent	NA-036	Vancouver I
50	M5TEM	104	60	69,120	Permanent	EU-005	UK Mainland
51	G4EDR	120	57	62,928	Permanent	EU-005	UK Mainland
52	OZ1LGK	115	49	62,769	Permanent	EU-172	Samso
53	IS0/OE5JKL	250	44	58,344	DXped 100W	EU-024	Sardinia
54	JH1UUT	108	52	57,408	Permanent	AS-007	Honshu
55	M0CAR	108	53	52,788	Permanent	EU-005	UK Mainland
56	G0VDZ	155	44	46,860	Permanent	EU-005	UK Mainland
57	9A/DL1BKK/P	116	43	45,408	DXped 100W	EU-110	Pulari
58	JA5EO	172	34	43,656	Permanent	AS-076	Shikoku
59	N7YX/VE7			43,512	DXpedition	NA-075	Gabriola
60	N0AX	251	35	40,635	Permanent	NA-065	Vashon
61	EA8BXQ	121	42	39,942	Permanent	AF-004	Gran Canaria
62	OH6MIL	74	45	34,290	DXped 100W	EU-101	
63	WP3GW	99	40	32,040	Permanent	NA-099	Puerto Rico
64	VK3MMY	152	23	30,360	DXped 100W	OC-136	French I
65	VK1JDX	62	42	29,484	Permanent	OC-001	Australia
66	CO3JO	145	34	29,478	Permanent	NA-015	Cuba
67	EA8AD	108	35	26,880	Permanent	AF-004	Tenerife
68	JA2GHP	50	32	20,160	Permanent	AS-007	Honshu
69	OZ0AA	66	28	19,992	Permanent	EU-029	Sjaelland
70	GI0OUM	75	30	18,990	Permanent	EU-115	Ireland
71	TF3VS/1	62	29	18,270	Permanent	EU-021	Iceland
72	EA8IN	44	24	10,080	Permanent	AF-004	Tenerife
73	YC4FIJ	127	13	9,477	Permanent	OC-144	Belitung
74	WP4LNY	104	16	8,448	Permanent	NA-099	Puerto Rico
75	ZL1BYZ	51	19	7,467	Permanent	OC-036	North I
76	DL8UTL/P	39	17	6,885	DXped 100W	EU-057	Ruegen
77	JJ3OOZ	22	21	6,426	Permanent	AS-007	Honshu
78	JG2REJ	29	16	5,040	Permanent	AS-007	Honshu
79	VO1RE	26	15	4,410	Permanent	NA-027	Newfoundland
80	DU1DX	23	16	4,368	Permanent	OC042	Luzon Island
81	7N2UQC	24	15	4,140	Permanent	AS-007	Honshu
82	IT9IVN			3,744	Permanent	EU-025	Sicily
83	JH2WHS			3,528	Permanent	AS-007	Honshu
84	V73OD	63	7	2,310	Permanent	OC-029	Majuro
85	JA6QDU	27	11	2,211	Permanent	AS-077	Kyushu
86	JG1GCO	12	11	1,980	Permanent	AS-007	Honshu
87	JA1KK	17	10	1,590	Permanent	AS-007	Honshu
88	JK1BII	8	9	1,080	Permanent	AS-007	Honshu
89	JA3AER	9	6	522	Permanent	AS-007	Honshu
90	EC8ACX	27	4	468	Permanent	AF-004	Gran Canaria
91	JR1BSV	5	6	450	Permanent	AS-007	Honshu
92	JR2TRC	6	4	264	Permanent	AS-007	Honshu
93	K4MG	6	3	126	Permanent	NA-062	Florida Keys
94	JM4UZM	3	3	99	Permanent	AS-007	Honshu

ISLANDS - 12 HOUR CW

1	9A/HA6NL	1,044	126	801,360	DXpedition	EU-170	Pasman
2	G3SXW	660	176	789,888	Permanent	EU-005	UK Mainland
3	SP4JWR/1	719	137	744,321	DXped 100W	EU-132	Wolin
4	SP8RX/1	812	130	695,760	DXpedition	EU-132	Wolin
5	N2GC	896	123	673,056	Permanent	NA-026	Long Island
6	DL5KUD	621	138	666,126	Permanent	EU-057	Ruegen
7	VE7UF	940	104	602,784	Permanent	NA-036	Vancouver I
8	DJ2HW	687	124	597,804	Permanent	EU-128	Fehmarn
9	M0ARC	616	126	489,888	Permanent	EU-005	UK Mainland
10	G4BUO	394	150	483,300	Permanent	EU-005	UK Mainland
11	9A5V/P	784	99	482,328	DXped 100W	EU-016	
12	PY0FF	839	92	463,404	Permanent	SA-003	Fernando de Noronha
13	SQ4GXE/1	891	79	396,027	DXped 100W	EU-132	Wolin
14	ES1RA/1	940	81	394,632	DXped 100W	EU-149	Aegna
15	EA6/DL2DXA	517	105	393,435	DXpedition	EU-004	Formentera
16	G4OGB	171	146	339,450	Permanent	EU-005	UK Mainland
17	GW7X	545	105	321,615	Permanent	EU-005	UK Mainland
18	G3TJE	395	110	291,390	Permanent	EU-005	UK Mainland
19	G3KKP	379	110	278,190	Permanent	EU-005	UK Mainland
20	9A/HA6PS	858	61	276,330	DXpedition	EU-170	Pasman
21	G2HLU	240	118	270,102	Permanent	EU-005	UK Mainland
22	GM3CFS	371	101	249,066	Permanent	EU-005	UK Mainland
23	SV1BSX/8	454	84	240,408	DXped 100W	EU-075	Salamina
24	DJ5DT/P	288	89	237,096	DXped 100W	EU-042	Sylt
25	OY/DF2SS	560	67	228,336	DXped 100W	EU-018	Faroes
26	DL4FCH/P	559	61	212,097	DXped 100W	EU-042	Pellworm
27	G0UKX	231	100	200,100	Permanent	EU-005	UK Mainland
28	JA6LCJ/6	629	56	199,080	DXped 100W	AS-012	Kami-Shima Amakusa
29	G4TSH	243	98	193,746	Permanent	EU-005	UK Mainland
30	EA6/F6GIN	322	73	172,134	DXped 100W	EU-004	Mallorca
31	G3GMS	190	96	171,072	Permanent	EU-005	UK Mainland
32	EI4DW	370	71	170,826	Permanent	EU-115	Ireland
33	OZ4FF	593	49	165,963	Permanent	EU-030	Bornholm
34	G4BGW	168	93	162,936	Permanent	EU-005	UK Mainland
35	GD3UNA/P	320	65	132,600	DXped 100W	EU-116	Isle of Man
36	4A3ZOI	369	46	104,466	DXped 100W	NA-090	Cozumel I
37	G3PJT	280	64	102,144	Permanent	EU-005	UK Mainland
38	GW3KJN	167	73	99,645	Permanent	EU-005	UK Mainland
39	G3JJG	193	65	93,795	Permanent	EU-005	UK Mainland
40	G3HZL	143	66	86,922	Permanent	EU-005	UK Mainland
41	OH0JV	180	44	79,728	Permanent	EU-002	Åland
42	OZ/DL2JRM/P	338	36	68,904	DXped 100W	EU-029	Vejro
43	F/G4CXT/P	362	31	68,634	DXped 100W	EU-064	Noirmoutier
44	G4DDL	152	57	67,032	Permanent	EU-005	UK Mainland
45	IS0UWX	182	44	55,176	Permanent	EU-024	Sardinia

RSGB IOTA CONTEST 2001 - RESULTS - Islands Section

46	DK4CU/P	119	42	46,746	DXped	100W	EU-047 Norderney
47	5B4/SP5UAF	295	30	39,510	DXped	100W	AS-004 Cyprus
48	OZ5RM	259	25	38,250	Permanent		EU-029 Sjaelland
49	JA2KKA	89	42	37,422	Permanent		AS-007 Honshu
50	G4ZME	72	40	27,840	Permanent		EU-005 UK Mainland
51	ZL2III	140	24	20,448	Permanent		OC-036 North Island
52	G3LHJ	105	27	16,605	Permanent		EU-005 UK Mainland
53	GW3SB	70	30	16,380	Permanent		EU-005 UK Mainland
54	DL5SE	127	18	15,282	DXped	100W	EU098 Poel
55	VK4TT	53	27	14,985	Permanent		OC-001 Australia
56	G0WHO	64	27	13,932	Permanent		EU-005 UK Mainland
57	EA8DY	89	23	13,317	Permanent		AF-004 Gran Canaria
58	YB5QZ	147	13	11,661	Permanent		OC-143 Sumatra
59	HS0GBI/P	54	21	10,206	DXped	100W	AS-107 Sichang
60	YV7QP	127	17	10,149	Permanent		SA-012 Margarita
61	JH1PXY	43	19	7,467	Permanent		AS-007 Honshu
62	OZ/HB9DDZ/P	98	10	5,940	DXped	100W	EU-172 Fyn
63	M0C	90	13	5,382	Permanent		EU-005 UK Mainland
64	MM/PA0INA/P	42	15	4,410	DXped	100W	EU-005 UK Mainland
65	M0AXP	31	15	3,735	Permanent		EU-005 UK Mainland
66	G3ZRJ	35	11	1,947	Permanent		EU-005 UK Mainland
67	JR1LEV	25	7	1,197	Permanent		AS-007 Honshu
68	YC3MM/5	20	4	516	DXped	100W	OC-075 Galang Baru
69	JO7BBS	8	4	240	Permanent		AS-007 Honshu
70	JK1LUY	3	3	135	Permanent		AS-007 Honshu

ISLANDS - 12 HOUR MULTI-MODE

1	AA4V	1,224	149	1,126,440	Permanent	NA-110	Isle of Palms
2	P43E	915	145	779,085	Permanent	SA-036	Aruba
3	UA0FZ	714	143	726,726	Permanent	AS-018	Sakhalin
4	PI4EUR	695	115	510,255	DXpedition	EU-146	Goeree Overflakkee
5	RA0FA	642	113	446,802	Permanent	AS018	Sakhalin
6	G0MTN	449	111	304,029	Permanent	EU-005	UK Mainland
7	UA0FDX	478	95	296,970	Permanent	AS-018	Sakhalin
8	EI5DI	567	84	260,820	Permanent	EU-115	Ireland
9	RA3NZ/1	636	69	238,050	DXped	100W EU-102	Dolgy
10	JA7IC	315	93	213,993	Permanent	AS-007	Honshu
11	KA2D	247	95	198,075	Permanent	NA-026	Long Island
12	G4FVK	216	98	186,984	Permanent	EU-005	UK Mainland
13	N2MR	429	71	180,837	DXped	100W NA-111	Long Beach Island
14	G4IUF	385	84	180,684	Permanent	EU-005	UK Mainland
15	KH0/JH0SPE	411	48	153,648	DXped	100W OC-086	Marianas
16	ZL1TM	320	67	146,328	Permanent	OC-036	North Island
17	OH0/DL3SEM	330	62	129,084	DXped	100W EU-002	Åland
18	UA1QV/1	399	59	126,555	DXped	100W EU-102	Dolgy
19	VO1GO	231	67	113,967	Permanent	NA-027	Newfoundland
20	G6QQ	175	75	104,175	Permanent	EU-005	UK Mainland
21	RA2FW/1	388	44	90,288	DXpedition	EU-102	Dolgy
22	N6NF	235	52	75,348	Permanent	NA-092	Padre I
23	JG1OWV	79	60	58,140	Permanent	AS-007	Honshu
24	JM4WUZ	160	45	46,440	Permanent	AS-007	Honshu
25	G0MRH	102	52	45,864	Permanent	EU-005	UK Mainland
26	VO1WET	353	24	42,408	Permanent	NA-027	Newfoundland
27	OZ/DL2AWB/P	101	38	39,786	DXped	100W EU-088	Laesoe
28	SM0/4S7AB	214	30	35,460	DXped	100W EU-084	Muskö
29	JE1REU	145	36	33,804	Permanent	AS-007	Honshu
30	N2US/P	109	40	33,240	DXped	100W NA-139	Assatague
31	VA3PL/W3	118	38	33,060	DXpedition	NA-139	
32	JA0BMS/1	77	12	22,950	Permanent	AS-007	Honshu
33	EA8EY	109	26	22,542	Permanent	AF-004	La Palma
34	JA1XUY	53	37	20,979	Permanent	AS-007	Honshu
35	IT9GAC	46	13	3,354	Permanent	EU-025	Sicily
36	JK2VOC	14	11	1,914	Permanent	AS-007	Honshu
37	JA8GTO	9	7	777	Permanent	AS-078	Hokkaido
38	JA1AAT	7	8	744	Permanent	AS-007	Honshu

The team at L80AA/P on SA-055.

RSGB IOTA CONTEST 2001 - RESULTS - World Section

WORLD SECTION

WORLD - 24-HOUR SSB

1	DL4MCF	1,325	323	3,702,549
2	SN2B	1,738	248	3,099,504
3	LX1NO	1,119	262	2,413,806
4	LY2WJ	1,313	221	2,077,179
5	RV3ACA	912	256	1,959,936
6	DL7FER	947	228	1,944,612
7	9A4SS	751	260	1,889,940
8	ON4ACA	1,216	220	1,832,160
9	IN3XUG	953	231	1,738,737
10	F5SNY	395	285	1,647,585
11	LY2TZ	987	173	1,299,057
12	DJ1AA	791	177	1,152,801
13	UA9ZZ	928	148	1,078,032
14	UR7M	639	181	994,233
15	XO0XN/P	1,267	123	969,363
16	YT1RA	1,089	135	930,285
17	HA9PP	574	154	784,476
18	DL8DXL	404	169	754,416
19	N3FX	736	134	747,720
20	DH9SBL	311	178	689,394
21	RA6LJ	359	152	553,128
22	UA9XMC	40	29	489,132
23	S57UYX	356	130	457,080
24	YO9KVV	345	139	442,437
25	UT1WA	283	143	435,435
26	SP6IEQ	303	129	419,895
27	PA2SWL	176	137	351,816
28	PY7ZY	401	107	340,581
29	RM9A	264	119	335,580
30	SP6NVK	285	108	320,436
31	IV3AJZ	229	121	316,899
32	OK2HBY	200	117	304,668
33	RN3OG	208	125	298,125
34	EA4EFJ	273	108	291,925
35	OM3YK	171	115	278,415
36	SP9HQC	155	115	260,475
37	YT1AT	206	102	260,100
38	W6AFA	317	89	246,975
39	SP1EOI	194	101	244,218
40	SP3NUN	240	87	214,281
41	SP6TRX	159	103	211,047
42	UN8LA	523	67	208,035
43	SP6FJ	136	98	199,920
44	ED1RCM	194	93	191,394
45	UR5WIF	147	95	176,415
46	OE7AJT	218	81	166,698
47	DL7UIO	178	81	156,978
48	EA3GHZ			156,948
49	US1MM	141	88	153,384
50	OK1TFH	139	84	143,892
51	HB9CQS	139	79	127,743
52	OK2BRX	186	65	119,730
53	YV3BKC	163	73	113,661
54	YO7ARY	155	65	101,595
55	SP1EK	157	62	99,882
56	RV6LA	155	63	97,902
57	PY2LED	279	52	95,316
58	LT5Y	438	39	90,558
59	IK0STM	76	74	83,472
60	OK1VHV	110	52	66,456
61	UY2UF	111	55	65,670
62	9A6AJK	141	48	65,232
63	IK8IFW	143	52	64,740
64	OL5ATK	107	46	53,958
65	UA6JAD	124	44	53,328
66	RA9FDR	83	46	45,678
67	SP4SHD	99	38	37,734
68	OK1DCP	97	34	36,414
69	UA1CGF	71	37	33,189
70	EA7FRX			32,637
71	SP6AOI/6	56	40	32,160
72	XL2IC	93	37	31,413
73	SP7TEX	105	32	31,200
74	SP2ATF	57	32	25,824
75	PS8HF	270	20	23,760
76	PS8NF	108	26	18,096
77	UA3LBE	84	26	16,848
78	IK8IOP	42	30	16,380
79	SM0R	78	22	14,124
80	PU7XAF	175	17	14,025
81	PR7FN	70	24	12,528
82	EC3AMJ	174	13	11,466
83	SP9MCU	40	18	7,290
84	IK3SCB	39	12	3,708
85	PY7BEL	39	12	3,240
86	PR7ZZ	44	5	960

WORLD - 24 HOUR CW

1	RA1ACJ	1,523	247	2,551,263
2	UW5Q	1,023	256	2,088,192
3	DJ7IK/P	1,163	237	2,061,189
4	OK2PP	977	217	1,688,043
5	9A1AA	826	231	1,631,322
6	DL6KVA	387	283	1,619,043
7	DL6JZ	728	217	1,460,844
8	UR5FEL	808	203	1,320,312
9	OK1HX	628	210	1,214,640
10	UR3HC	854	177	1,059,876
11	RZ3AZ	884	169	1,034,280
12	PA0RRS	527	193	967,509
13	DJ1YFK	595	156	836,316
14	HB9ARF	443	170	774,690
15	PA3BFH	495	164	745,380
16	YU7LS	515	164	719,796
17	S53F	730	116	567,240
18	OM6RM	410	136	503,472
19	RN9AA	445	129	497,295
20	F5ICC	296	140	493,920
21	OK2SJ	329	137	460,731
22	OK1ZP	369	128	455,040
23	OK1FCA	376	119	436,968
24	UX2RY	285	130	373,230
25	YL2OV	344	110	333,960
26	UA0LCZ	603	72	330,696
27	UA9OA	395	105	329,805
28	UA0KCL/3	306	118	327,804
29	OK1XC	292	114	318,744
30	RA3UAG	253	120	294,120
31	OK1DVK	190	118	276,828
32	RW9QA	415	85	257,805
33	OK2PAE	300	94	239,136
34	RU4LM	363	89	236,829
35	UY5ZI	175	101	219,069
36	UT4NY	437	73	206,955
37	RV3DAK	233	95	204,345
38	HA5JP	301	79	202,161
39	LU1DZ	434	71	200,646
40	UR5ELC	139	96	190,944
41	DL1LAW	262	76	187,416
42	SP8BAB	147	84	181,692
43	IZ1DFI	242	73	166,878
44	SM7EH	166	82	164,328
45	UY5LQ	362	68	161,976
46	HA4YG	231	79	160,923
47	RW4CW	180	82	160,392
48	DL9LR	147	79	142,911
49	DK3KD	374	55	137,610
50	RA6FV	257	72	134,352
51	OK2PBG	159	71	119,067
52	SM6CRM	92	83	114,540
53	LZ9V	462	44	112,728
54	T97C	211	68	112,404
55	UA3UJE	120	73	108,186
56	US9QA	265	60	103,140
57	RA3ANL	197	66	99,198
58	HL5UOG	163	53	83,157
59	LZ2DL	96	63	77,112
60	SP4GHL	224	41	74,784
61	DL7AXM	101	57	72,675
62	OK2PKY	115	49	58,065
63	OK2BJ	64	55	50,160
64	OM7VF			46,206
65	DJ6TK	118	38	40,812
66	HS0/OZ1HET	277	22	37,290
67	PY2EMC	210	29	33,408
68	DL8DZV	52	44	32,736
69	SM5PAX	104	35	31,500
70	EA7CA	82	37	29,970

RSGB IOTA CONTEST 2001 - RESULTS - World Section

71	W9HR	78	36	27,324
72	ON7CC	73	32	21,600
73	F5NLX	64	22	15,290
74	DL1FMG	55	20	11,460
75	ON4KVA	23	23	7,935
76	PY4FQ	75	17	7,293
77	EA1DGG	32	17	5,508
78	VE6YP	17	10	1,650

WORLD - 24 HOUR MULTI-MODE

1	HA1AG	1,507	540	7,489,260
2	K9NW	1,538	304	3,463,776
3	RK4FF	1,134	353	3,335,850
4	YO7LCB	422	325	2,037,750
5	UT5JDS	475	274	1,646,466
6	SP6NIC	491	267	1,457,019
7	7S2E	994	199	1,379,070
8	OK2EC	504	230	1,242,000
9	PA0MIR	411	232	1,149,096
10	W5FO	495	201	973,845
11	RK3DZD	792	173	964,302
12	US2WU	258	238	901,068
13	US7IGF	501	190	871,530
14	SP9KRT	410	182	745,836
15	DL7VOG	352	174	722,448
16	UA3QU	469	172	696,600
17	OK1JN	373	167	669,837
18	SM6WQB	510	149	656,196
19	DL3ZAI	377	168	643,608
20	LZ2AU	351	167	632,262
21	DL5JRA	389	152	615,144
22	OK1AD	268	171	562,248
23	SP2DNI	354	153	540,702
24	UV5U	448	149	534,612
25	UT5JAP	240	176	528,000
26	OK1ZMS	457	139	525,837
27	UT5PW	308	148	507,048
28	DL1ARJ	365	141	469,107
29	9A2WJ	333	134	463,506
30	N4MM	322	144	460,512
31	DL3BRA	332	135	442,260
32	RN9RZ	352	137	426,207
33	OM5NL	260	131	388,284
34	RV6ASU	274	126	362,124
35	UA3XAC	325	122	354,653
36	DL1ASF			348,687
37	4Z5AD	314	114	319,424
38	DL5MO	195	113	280,353
39	EA2BNU	226	114	274,284
40	DL7VSN	129	127	245,745
41	YU1LM	259	99	231,363
42	RX3AEX	280	97	220,287
43	OK2GG	286	81	205,578
44	PA3EMN	205	91	200,928
45	VE4IM	196	95	199,500
46	RK0SXF	151	95	193,515
47	US0YA	132	92	156,768
48	RU3WR	217	84	152,460
49	OM7PY	160	84	149,184
50	US8IZM/P	293	74	145,854
51	YO4AAC	224	73	134,904
52	SP5CGN	125	81	130,491
53	OK1FM	134	83	125,994
54	ES6CO	141	70	98,490
55	BA4TB	125	70	97,650
56	UU2JA	118	69	92,115
57	DJ7LH	72	66	68,904
58	UA4YG	148	47	67,116
59	RW3DY	113	51	53,397
60	OK1NS	153	39	50,193
61	DL1JFM	66	53	47,382
62	UA4LDP	104	44	43,296
63	RV6LFE	56	43	30,444
64	PA7RA	114	35	29,610
65	KF8UN/5	57	38	25,194
66	EA3AXM	50	28	15,960
67	UA9XAB	132	54	14,616
68	RA6AR	47	28	14,364
69	YO9FYP	61	21	9,828
70	OK1CAZ	35	14	4,662

WORLD - 12 HOUR SSB

1	UN5PR	443	174	761,598
2	OK1FFU	651	137	696,645
3	SN4T	535	148	688,200
4	4X4FJ	444	151	654,132
5	I2AT	251	173	574,533
6	IK2ZVU	431	129	502,713
7	DH2SP	390	127	483,870
8	XE1L	704	105	477,540
9	HA8UT	459	118	459,846
10	SP6GF	374	127	451,866
11	9A2BD	412	128	446,976
12	LY1FW	323	128	434,304
13	S51CK	612	98	430,416
14	ON6GB	354	125	413,250
15	RK4FD	381	121	389,862
16	DM4VDE	264	123	370,476
17	ON4ADZ	186	118	289,926
18	RU3DVR	237	109	282,855
19	PA0JNH	187	114	277,362
20	EA5QV	299	103	272,847
21	OH5ZZ	524	74	261,960
22	EX2T	261	94	251,826
23	IK2RPE	186	107	229,194
24	YO5CRQ	207	101	220,887
25	SP6FXY/7	185	96	220,320
26	ON5GQ	154	110	219,780
27	SP3GHK	204	95	219,450
28	UR5AKU	145	104	204,984
29	EA1ACP	207	92	202,860
30	SP5MXA			193,752
31	UY7C	267	81	184,923
32	DH2PL	177	91	182,637
33	SM5ARL	162	90	181,980
34	UA3LHL	200	90	181,440
35	SP1HTS	197	75	150,525
36	PA3GZC	189	73	142,131
37	EA1ET	159	70	123,270
38	RX0AE	161	71	121,197
39	LZ4UU	178	71	109,482
40	SP9X	150	64	102,528
41	SP3BYZ	97	70	90,930
42	PA0RBS	88	69	90,252
43	W8TTS	137	62	88,722
44	VE3YQY			82,695
45	UA3XEV	156	54	79,056
46	EA3AKA	129	59	78,057
47	OK2BHM	112	55	71,280
48	UA9ORQ	132	54	71,280
49	HB9FBI	120	57	71,136
50	SP9MRQ			69,984
51	EA3GHQ	153	48	69,264
52	SP2QVU	113	57	67,887
53	W1DAD	140	55	66,660
54	EA4YK	73	63	65,961
55	OH2NAF	86	56	64,176
56	WB0YJT	118	54	62,856
57	PV2M	247	40	62,760
58	SP4CJA	105	52	58,968
59	SM7AIL	132	46	56,304
60	RK0AZC	126	48	56,160
61	IK3OII	118	49	56,154
62	KD2N	101	48	53,712
63	SP9LDI	81	52	51,012
64	DK8NI	96	50	51,000
65	RK3EXL	110	49	49,686
66	YV5NWG	78	51	49,266
67	EA3NA	75	49	49,245
68	IK5WGK	107	43	46,827
69	UR6MX	176	36	45,360
70	SP5DRE	72	42	44,856
71	DL2AL	78	45	43,470
72	F8AMV	54	49	38,514
73	9A3ND	85	40	37,080
74	F8DFN	105	37	36,075
75	UT7MD	65	43	35,733
76	EA4ABW	71	39	28,899
77	EA4WC	91	37	28,749
78	4Z5FL/M	69	39	28,665
79	EA3DZZ	213	23	28,497
80	UR7UL	75	36	27,540
81	UR7EM	64	38	26,448
82	SP8OOB	88	30	25,560
83	DL7UGH	65	33	25,443
84	K7JWD	75	36	25,380
85	PA3EXS	50	38	24,738
86	RX9UKF	53	37	24,531
87	WB6NFO	73	32	23,136
88	OM4KK	45	34	21,318
89	9A2GA	59	30	21,150
90	N2LQQ	67	30	21,150
91	OH2/ES1QD	185	17	20,655
92	LU7CC	65	29	19,575
93	PA9JAM			18,384
94	PA0FEI	48	29	18,357
95	SP5CEQ	49	33	18,315
96	YO3FLQ			16,992
97	IK2YSJ	69	27	16,929
98	DH5AO	197	76	16,074
99	EA1BZP	49	28	15,204
100	SP6JKH	41	27	14,256
101	RK3LWA	73	23	14,145
102	VE3BUC	61	22	11,418
103	LT2D	42	26	11,388
104	UA0SJ	42	24	11,088
105	CT1ELF	57	23	10,833
106	DL2RZG	36	22	10,560
107	OK2TBC	46	22	10,428
108	EA3LS	30	24	10,224
109	EA2CHL	47	22	8,382
110	EA1WE	28	21	8,316
111	SQ6FHP	53	19	7,809
112	YO8CHF	44	18	7,560
113	RU9UG	31	19	6,783
114	LW1EGD	104	14	6,552
115	KS4JB	30	19	6,441
116	OZ7AEI	21	19	5,529
117	PY7VI	113	10	5,520
118	SP5OXJ	20	18	5,184
119	WA4JA	33	15	4,725
120	3Z6V	20	17	4,488
121	LW7EGO	72	12	4,464
122	RZ3DZZ	18	17	4,386
123	LU5EVK	39	13	3,861
124	UA0IV	17	15	3,825
125	SP6KYU	31	12	2,988
126	SP5NHV/P			2,952
127	EA1DFP	14	14	2,940
128	TA3BN	44	10	2,760
129	SM3T	11	10	1,650
130	UT4MW	15	7	987
131	SM4BTF	14	7	966
132	KD7JJI	11	7	819
133	OK2BHE	9	6	666
134	UR4EI	14	5	570
135	PR7CP	26	2	204
136	KE6GFI	6	3	162
137	CX4ACR	9	1	39

WORLD - 12 HOUR CW

1	RZ3BW	567	150	651,150
2	SP5CJQ	368	154	595,056
3	UA3TU	471	143	557,271
4	XM3KZ	834	106	528,516
5	LZ2PL	577	125	493,875
6	YO6BHN	369	137	450,867
7	HA8VK	468	120	449,280
8	YU1OJ	407	128	435,840
9	OL4M	381	120	423,720
10	RN6AL	569	99	391,149
11	UY0ZG	275	131	376,887
12	OK2QX	320	120	368,640
13	OM4DN	307	115	343,275
14	YO6EX	317	111	308,025
15	N4BP	671	71	292,875
16	HA8FW	199	116	291,972
17	RA3UT	371	104	291,720
18	HA6IAM	179	118	289,926
19	DL6UNF	224	104	289,536
20	RX9FB			278,964
21	HA3JB	316	100	276,000
22	OM1II	354	92	247,848
23	PA5TT	630		238,476
24	YO3BWK	160	114	238,032
25	UA0ACG	511	76	232,104
26	LZ6C	433	78	231,426
27	YU7SF	271	93	225,153
28	OK1HCG	211	92	215,004
29	SM5G	266	90	214,380
30	EA4NP	148	106	211,152
31	RN4SS	364	81	203,877
32	SP9EMI	230	88	201,168
33	YZ1V	276	84	187,488
34	UY5TE	248	88	183,744
35	RW3QF	139	97	175,473
36	OK2BNC	173	89	173,283
37	UR6QS	301	73	169,287
38	SM4SX	182	77	157,311
39	LA2HFA	166	82	154,980
40	YL2PN	226	73	152,862
41	UA1CEC	267	66	130,482
42	RX3AP	281	64	129,984
43	DL5SVB	243	66	128,898
44	YO6ADW	173	76	128,820
45	RV9DL	288	59	119,475
46	LY3ID	212	64	118,080
47	Z33F	211	66	111,672
48	SP7EXJ	121	70	107,730
49	K5XR	184	64	104,256
50	RX3RB	199	63	103,383
51	SP6XP	167	63	99,603
52	UR5FCM	233	58	98,832
53	RZ1ZB	169	60	95,220
54	SP4AVG	215	58	93,786
55	YO5DAS	191	60	92,160
56	UA0ZDA/6	131	66	91,674
57	UX5EF	142	61	86,742
58	SP2MKI/2	118	62	82,956
59	DL3KWR	92	63	80,136
60	OK1AOU			78,435
61	UR6IJ	155	51	71,451
62	DL5YM	217	45	71,415
63	K5NZ	240	45	71,280
64	LY2HN	91	61	70,821
65	LZ1IQ	128	57	70,452
66	SP3VT	209	43	66,822
67	9A3FO	113	56	64,008
68	EA7ASZ	136	53	63,600
69	RU4WE	169	48	62,928
70	UA4QK	127	51	61,659
71	YO7VJ	137	52	60,060
72	OH1BOI	99	53	59,625
73	RN3BK	218	41	58,671
74	EA5EOH	77	50	56,550
75	F/DJ5AA	64	58	54,984
76	DL1CW	130	49	53,802
77	9M2JI	168	34	51,816
78	DL7VOX			51,264
79	LU1EWL	302	29	45,066
80	PA0JED	89	46	43,194
81	IK5RLS	92	47	42,864
82	LU2YA	89	42	39,438
83	K6III	73	45	36,315
84	HP1AC	113	39	35,685
85	F2NZ/P	112	37	35,076
86	SP3JUN			30,600
87	RZ4AA	127	33	30,393
88	SP3LWP	71	36	29,268
89	EA7FZ	131	30	28,350
90	YU1KT	158	29	28,275
91	DL9JON	48	42	28,224
92	SP3CW	135	27	27,135
93	UA1AAF	229	24	26,064
94	DK7ZT	44	40	24,960
95	RA3XO	42	38	23,484
96	DL5ASE	182	18	22,140
97	RZ1AWO	175	25	21,459
98	4K9W	50	34	21,420
99	UR9MM	37	37	20,535
100	DK7ZH	47	33	19,701
101	UA9FEG	75	29	18,618
102	PY7OJ	45	32	17,184
103	UA3UMT	64	27	16,524

RSGB IOTA CONTEST 2001 - RESULTS - World Section

104	OM7AT	82	23	16,146
105	YO8DHD	71	26	16,146
106	KF0U	119	21	16,065
107	RK3AD	123	22	16,038
108	YV1OB	74	26	15,444
109	EA7DIU	60	27	14,580
110	PA3AFF	38	27	14,094
111	W2CVW	35	23	11,247
112	RA9SG	68	21	10,836
113	YO2ARV	47	22	10,758
114	OM3CDN	55	20	10,740
115	K8KFJ	38	22	10,692
116	OK5SWL	50	21	9,450
117	UA1TBK	65	18	9,342
118	SP3GTS	52	17	8,364
119	UA4RF	49	20	7,980
120	DL4JYT	35	20	7,860
121	UA3NFG	46	16	6,816
122	EX2X	75	12	6,300
123	WA3AAN	36	14	4,200
124	SQ9FMU	17	14	3,570
125	EA1FBJ	16	13	3,120
126	DL0AKR			2,013
127	UA3AKI	16	10	1,680
128	DK5ZX	11	8	1,224
129	UN7EX	8	8	960
130	PA3EZC	28	4	780
131	RU6AT	28	5	780
132	OK2OU	16	6	720
133	RK3DOV	12	2	144
134	9A3ZO	3	2	66
135	OE8GHR	6	0	0

WORLD - 12 HOUR MULTI-MODE

1	SP9W	584	240	1,408,320
2	HA1CW	660	235	1,404,360
3	OK2SG	307	200	786,600
4	XL3UZ	706	155	749,580
5	YU7BW	516	151	645,072
6	N4CW	650	123	573,426
7	Z32AF	285	163	537,900
8	OH2FS	188	179	500,484
9	OM7RC	357	140	476,280
10	K1HT	290	147	470,106
11	ES6PZ	321	144	468,720
12	WB2YQH	294	141	454,302
13	RA0BA	375	112	350,448
14	N4UH	308	117	342,576
15	W5GN	263	124	328,848
16	OL7R	501	97	298,857
17	HG8W	295	102	275,094
18	RW3VZ	200	112	254,352
19	US1PM	239	99	252,747
20	K3WW	514	71	232,170
21	OE75CWL	445	81	231,579
22	9A3Z	230	93	193,626
23	DL3JPN	133	93	174,375
24	OK2BJT	126	94	170,892
25	OK1AGA	178	80	159,840
26	OM3PQ	160	82	147,600
27	YO4GDP	265	72	142,776
28	PY2NY	351	65	142,545
29	PA0JR	160	86	142,416
30	OK1AK	133	86	140,610
31	OK2BEM	122	79	129,402
32	SM2LIY	240	68	128,928
33	PY2YU	221	75	127,125
34	DL2GBB	149	72	122,904
35	XM2AWR	219	67	122,007
36	OK1ANN	177	70	121,170
37	UY5ZZ	206	71	116,298
38	DJ5GG	162	71	110,334
39	UA9KJ	212	66	110,088
40	SP5ICS	160	69	107,433
41	UR7IKU	170	65	105,690
42	ES1QD	100	77	100,716
43	RA1QGO	213	66	100,584
44	RU0BB	214	58	100,398
45	OK2SWD/P	146	64	91,776
46	SP6AZT	77	73	84,315
47	IK2WXV	264	47	78,396
48	RZ1AK	96	62	76,632
49	YU1PJ	155	54	69,336
50	DL2MIH	109	57	68,571
51	OZ4RT	84	57	66,348
52	SP7FBQ	72	59	62,304
53	UA9FM	199	42	59,850
54	N6JM	76	49	49,980
55	RA9DZ	124	44	43,296
56	AF4RK	98	43	42,054
57	RV6AB	94	42	41,076
58	Z32XX	99	41	40,221
59	RA6YJ	49	48	35,280
60	DL1EV	53	43	31,605
61	W1TW	81	38	30,780
62	RV9WB	52	43	29,928
63	VE6ZT	45	40	26,040
64	PA0EHF			23,958
65	EU6TV	50	35	23,310
66	PY2NDX	36	36	19,440
67	N4CU	71	31	19,437
68	W6ISQ	35	31	16,275
69	RX3VM/4	43	29	14,529
70	RX3RZ	59	27	14,175
71	VE2OWL	52	27	13,932
72	DJ9AO	73	21	12,159
73	UX8IX	47	25	11,625
74	K0COP/4	49	21	9,891
75	VE6BF	45	20	8,940
76	AC7LX	42	20	8,760
77	EA5VR			7,939
78	W9LYA	34	19	7,866
79	EA5CX			7,248
80	N2JNZ	29	20	7,020
81	OZ1BOH/P	22	21	6,678
82	PY7IQ	22	20	6,120
83	K5ZD	51	16	6,096
84	OK1DXD	27	17	5,457
85	NM1K	33	16	4,848
86	OK2BHL	34	16	4,704
87	VA3IX	22	14	3,738
88	VE5SF	25	10	2,160
89	SP6GNJ	12	11	1,848
90	LZ2UZ	27	7	1,323
91	UA4CIF	9	9	1,215
92	EC5CEK	24	6	936
93	HS0XNO	5	4	300
94	K5EJL	6	4	264
95	OH5PA	3	3	135

CHECKLOGS

CHECKLOGS ARE acknowledged, with thanks, from 4L4KW 9A2TN DH5MM DK3RED DK9EA DL1DTC DL2HWI DL2RYL DL2VB/P DL4NTC/P DL5AWI DL5CX DL5KVV DL5NA DL7UCX DL7VAF DL7VMH DL7VMM DL8DTL DL8UFO EA3CZM EA4DRV EA5DCL EA6BB EA8BIE EA8BVX EU2MM G0JQN G3LUW HB9DCM IV3JVJ JA5APU KF3CV L-481219 LA7FD LA7FJA LA8LA LZ1JZ MM5PSL OK2ZJ OK2ZW OZ0RS OZ5MJ OZ6TL PT2ND PV8DX PY1KX PY2GEC PY3AJB PY3AU PY3MM PY4OY RA0ZN RA1QDP RA3OU RA3TAR RA4UAT RA9AWQ RK9KWB RN3ZZ RN4LP RN9AXX RN9BYL RU3DG RW9AWG RW9BXA RW9BXL RX9AWB RX9BXN SM1ALH SM3NXS SM4AWC SM4BNK SM6AVD SM6BSK SM6BZE SM6DUA SM6PVB SM7BJW SP1DMD SP1JON SP1PBT/1 SP2MEF SP4GDC SP5AHY SP6BEN SP6GTN SP6IHE SP7BDS SP7CKP SP7DTP SP7JKW SP7XK SP9CVY SP9HZF SP9MDY SQ9CAQ UA0FGN UA0ZC UA1ANE UA1ZJW UA3AVR UA3YJU UA4AO UA4ARL UA4LFC UA4UAR UA4YJJ UA9JQN UA9OS UR5EFJ UT7QL UT7WZA UW7W UX3ZW UX7MY W6IXP YO4ASG YO8COK YO9BGV YU1AEK YZ1SG.

RSGB IOTA CONTEST 2001 - RESULTS ASSISTED SECTION

Pos	Callsign	QSOs	Mults	Score		Section		IOTA Ref	Island name
1	W1NG	1,141	370	3,757,350	24hr	Mix	World		
2	4O6A	2,191	261	3,253,365	24hr	CW	World		
3	G3XTT	733	350	2,369,850	24hr	Mix	Permanent	EU-005	UK Mainland
4	G3TXF	1,218	273	2,144,142	24hr	CW	Permanent	EU-005	UK Mainland
5	IK0YVV	513	262	1,421,874	12hr	Mix	World		
6	IK2UCK	565	181	1,053,963	12hr	SSB	World		
7	OH6NJ	360	219	974,988	12hr	Mix	World		
8	OL3E	434	178	749,736	24hr	Mix	World		
9	IK1QBT	447	149	596,745	12hr	CW	World		
10	UU2JQ	209	159	425,484	24hr	Mix	World		
11	DL5AUA	151	130	281,970	24hr	Mix	World		
12	UA3BM	195	114	254,448	12hr	SSB	World		
13	N2ED	198	74	138,972	12hr	Mix	World		
14	RW0AR	271	68	124,644	24hr	Mix	World		
15	N9LF	130	62	85,188	24hr	SSB	World		
16	S53AU	84	70	84,840	12hr	CW	World		
17	JA3YPL	273	52	83,148	24hr	CW	Permanent	AS-007	Honshu
18	W1TO	109	59	70,977	12hr	CW	World		
19	IZ1CRR	58	51	43,146	12hr	SSB	World		
20	JA3PYC	84	33	23,364	12hr	CW	Permanent	AS-007	Honshu
21	K6ACZ	47	28	14,700	24hr	SSB	World		
22	JA1XRH	15	15	3015	12hr	Mix	Permanent	AS-007	Honshu

IOTA CONTEST SWL RESULTS

Category A

Single Op - 24 hours - SSB

		QSO	Mults	Score
1	BRS91529	736	312	1,857,024
2	ONL3647	722	198	1,256,508
3	DE3ARB	392	145	536,790
4	F-11734	403	117	392,478

Single Op - 24 hours - CW

1	UA1-143-1	766	203	1,242,360

Single Op - 24 hours - Mixed

1	UA3-170-847	855	203	1,228,556
2	YU1RS/461	285	116	345,100
3	UU-J-1	249	125	281,250

Category B

Single Op - 12 hours - SSB

1	US-W-5	461	166	679,770
2	ONL3058	282	124	289,416
3	ONL383	308	99	269,379
4	OH2-836	235	77	147,686
5	F-20553	77	69	91,494
6	G6OKU	90	49	39,690
7	SP2-0552-BY	92	37	31,524
8	CX-N-020	80	36	25,740

Single Op - 12 hours - CW

1	UA3-155-28	375	103	329,085
2	DH2URF	297	104	300,456
3	OK1-22119	100	84	124,740
4	JA4-4665/1	62	28	15,288
5	E21EIC/SWL	20	10	2,550

Single Op - 12 hours - Mixed

1	UA3-155-75	203	78	151,866

Category C

Single Op Assisted - 24 hours - Mixed

1	LYR-794	1178	374	4,332,360

Category D

Single Op Assisted - 12 hours - SSB

1	RS177448	325	108	307,670

CONTINUED FROM PAGE 19

PUBLICATION OF RESULTS

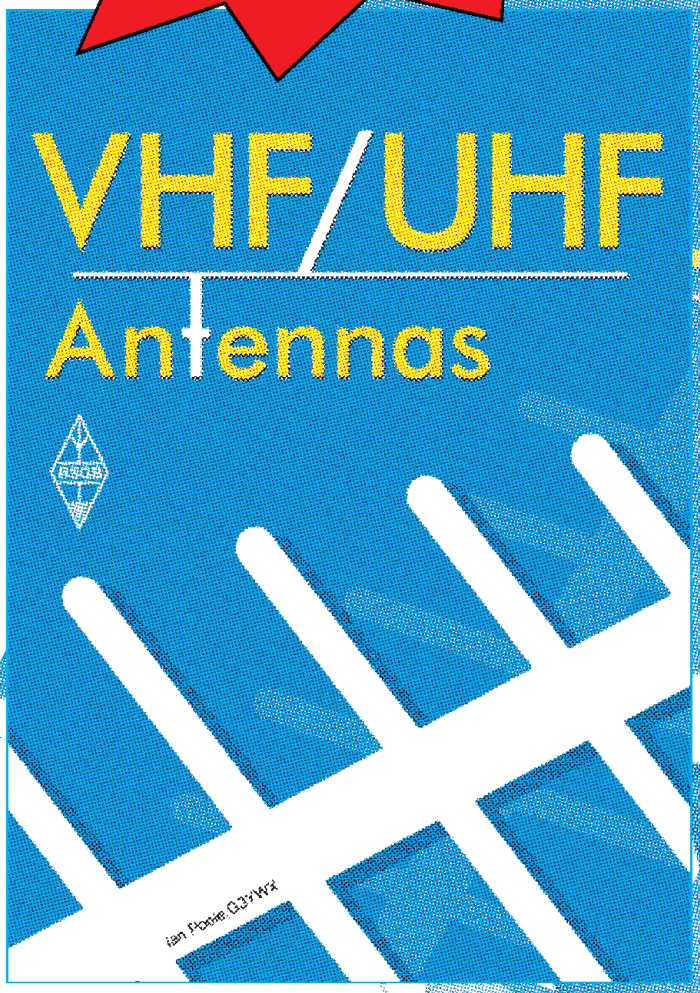
AS WELL AS this write-up (which will also appear in the *RSGB IOTA Directory 2002*), 2001 entrants will, in due course, receive a results booklet with a more detailed analysis of the 2001 contest, full rules for this year's contest and further information about the IOTA programme as a whole. A full listing of results will also be posted on the RSGB HFCC web pages, to allow entrants to download and analyse them at will (for example, by country or continent).

THANKS

I WAS ASKED to take on the management of the RSGB IOTA Contest in 2001, never having previously managed a contest of any sort, never mind one as popular as this! That we have been able to prepare and publish the results within the usual timescale is due entirely to the support and help I have received from a number of people including Catherine at RSGB HQ, G4ZFE, GM4FDM, MM0BQI, GM4UZY, GM0CLN, GM0NTL, GW4VEQ, G4PDQ, G4IIY, G3LZQ, G3NKC, G0JQN, G4BUO, G3ZBE, M0ACC, G4CZB, GM4SID, EI5DI and, for all matters relating to the SWL entries, Bob Treacher, BRS32525. Also to the HF Contests Committee, and especially its Chairman Justin, G4TSH, for its unfailing support. My apologies if I have omitted anyone. Credit for a successful outcome goes to them, any errors and omissions should be laid at my door. Finally, I want to thank Chris Burbanks, G3SJJ, who preceded me in this role. Chris, I didn't realise what a major job this was, and all credit to you for bringing the RSGB IOTA Contest to where it is today. ♦

NEW

VHF/UHF ANTENNAS



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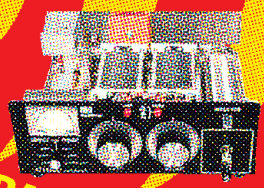

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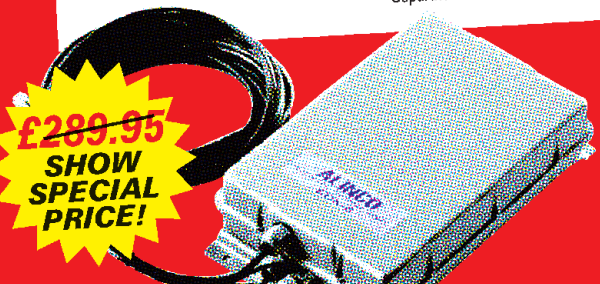

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31 Amberley Road, London N13 4BH.
e-mail: steve.white@rsgb.org.uk

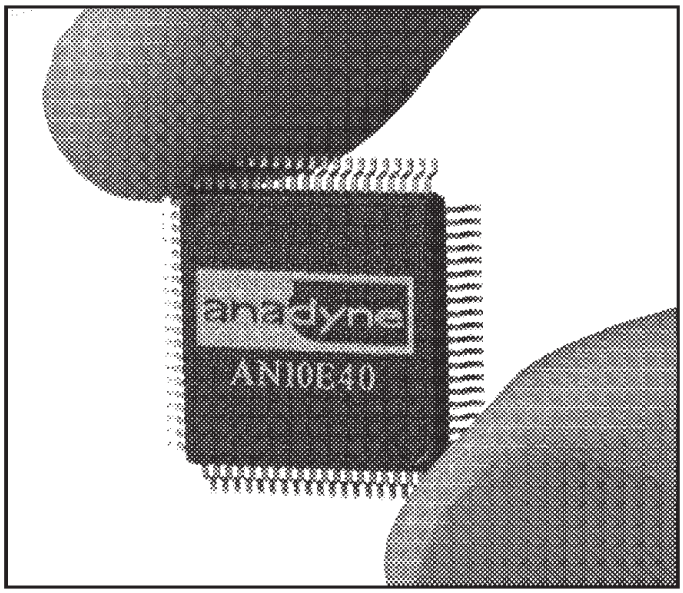
IAN WHITE, G3SEK, sent me an e-mail recently. In it he asked the question "Have you ever wired up a filter with a board-full of op amps, and weird resistor and capacitor values... and then wished you'd done it differently?" The answer, Ian, is "yes, I have!", so I really appreciated the information which accompanied the e-mail, which means that I don't have to do so again.

ANALOGUE ARRAY

THE PROBLEMS of designing, say, an audio filter which uses op amps, are that precise values of resistor and capacitor are required.

Whilst these days such filters can be computer-designed and modelled, you still have to build it, which invariably includes a number of components. If it then doesn't perform quite as expected or required, you have to modify it, and this is likely to involve changing several of them.

The new Anadyne Microelectronics AN10E40 is a field-programmable analog array (FPAA) chip that introduces a radically different approach to filter design. Starting a CAD program on a computer presents the user with a graphical interface to a matrix of 20 op amps (see photo below).



The AN10E40 - a powerful analog package.

Anadyne Microelectronics call them Configurable Analog Blocks, or CABs, and the characteristics of each of them can be separately defined by means of drag-and-drop functions. In addition to the op amps (each of which has programmable capacitors) there are buffers, programmable voltage references and programmable clocks. Each can be interconnected via software, simply by dragging a line between the points that are to be joined. Furthermore, the whole thing can be dynamically reconfigured if the results are not as desired, or if circumstances change and different characteristics are required.

The AN10E40 can be used to form high pass, low pass, band pass and band stop filters, oscillators with different output waveforms, rectifiers, equalisers, comparators, integrators, differentiators, and sample-and-hold functions.

Depending on how many CABs are used, duplicate circuits can also be created, so stereo functions are possible. And with so many building blocks available, extremely complex functions can be implemented.

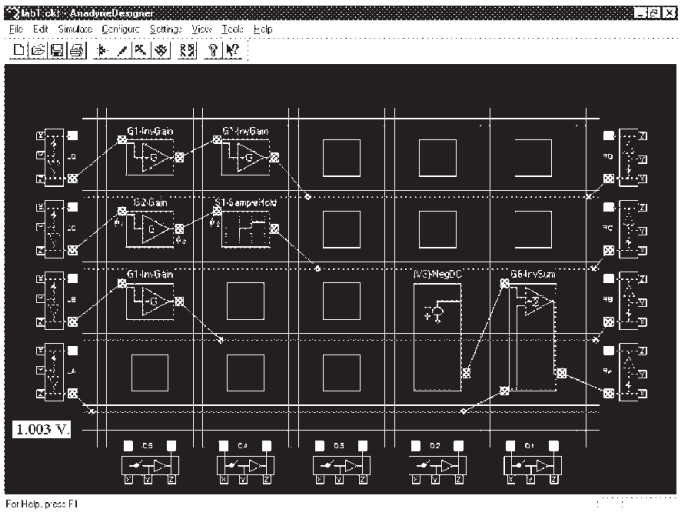
As the photo above shows, the AN10E40 is currently offered in a 100-pin QFP package, which keeps the size down, but (being surface mounted) requires skilled soldering. It can operate up to 500kHz. Not bad for the first product from a company, although it is very similar to a Pilkington Microelectronics device of the 1990s, which was then acquired by Motorola. Interestingly, the founders of Anadyne, Ludwig Klingenbeck and Ian Macbeth, are both former Motorola employees. Apparently they left after purchasing its FPAA technology.

NO-FLY ZONE

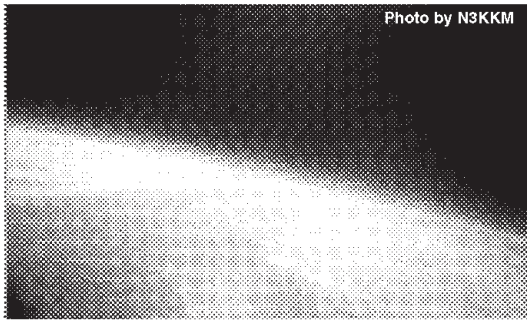
I RECENTLY came across an interesting website associated with amateur radio. Nothing uncommon in that, of course, but the activity being undertaken by the group of amateurs in question *is* uncommon - sending amateur radio into the upper reaches of the atmosphere using weather balloons.

The Near Space Balloon Group is based near Kansas, and over the past two years has released, tracked and recovered a number of payload capsules containing SSTV and telemetry transmitters, voice repeaters, cameras, GPS receivers and computers to record the flights and aid recovery. Incredibly, some of these balloons have reached altitudes of over 90,000ft before bursting and returning their payloads to earth by parachute.

Some flights have lasted over three hours and capsules have



How the 'Anadyne Designer' CAD package appears on screen.



With the earth 90,000 feet below, the Near Space Balloon Group's onboard camera looks eastward toward Clinton Lake in central Missouri.

been recovered over 150 miles from the launch point.

Unfortunately, such activity is not permitted in the UK. The reason for this is given in the licence schedule (BR68/F). It states: "The Licensee shall not establish the Station in any aircraft or airborne vehicle."

I spoke to the RA and asked if the reason for this restriction was purely historical.

Their response was that it was not, indeed they informed me that this rule was reviewed by the Civil Aviation Authority (CAA) not long ago, who decided that the ban on aeronautical mobile operation should be retained on the grounds that problems might be caused to aircraft systems if an amateur transmitter was operated in an aircraft and that it would not be practical to test and type approve every commercial piece of amateur equipment.

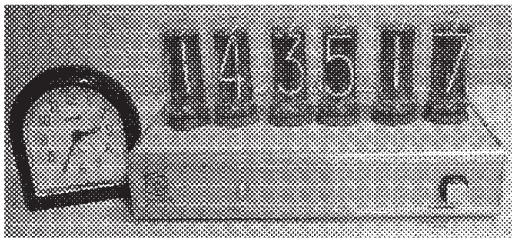
Although I'm sure safety considerations were at the heart of the CAA's decision, in my opinion it is not an entirely sustainable argument, because several other countries do allow aeronautical mobile operation. Anyway, all is not lost. I was informed that experiments similar to those conducted in the USA *could* be conducted in the UK, as long as a Notice of Variation was obtained first. The CAA might also express an interest in such experiments, but amateur radio needn't necessarily remain grounded.

POSITIVE FEEDBACK

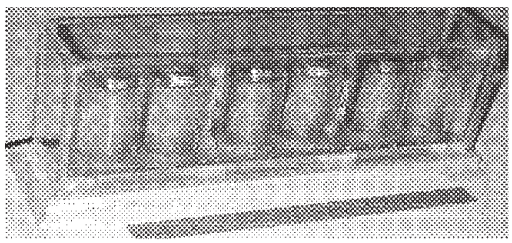
I WAS GENUINELY surprised at the level of feedback which the January item on Nixie clocks (*Fashionable 'Valves'*) generated. It seems that several readers have built themselves clocks that employ these elderly tubes to form the display.

David Taylor, G4EBT, brought to my notice the 'wacky website' www.electricstuff.co.uk, on which there are projects for several Nixie clocks, one of which he is currently building from a commercially-available PCB. Others also mentioned the same website.

David describes the project as "an interesting and compact design, with which caution needs to be exercised as most of the PCB is at mains potential. It uses direct mains - no transformer, and drops the voltage via resistors to several ICs and 28 transistors to drive the tubes. Hence, caution is needed when, for example, using a 'scope, in which case an isolating transformer is of course a must.



G0HJC's Nixie clock, that uses 1.8in-high tubes that he bought new over the Internet from a supplier in Russia.



G0UPL's Nixie clock, using 4in-high Z568M tubes. They were obtained over the Internet from a German supplier.

"It also has an interesting feature to set the time. It uses two reed switches (more glass!) on the PCB, which are set from outside the case by switching them on and off by use of a magnet. Neat, eh?" Yes, 'neat', and in view of the fact that there is no mains transformer a sensible precaution.

Gary Bleads, G0HJQ, wrote to say that he has built two Nixie clocks. "Both clocks use a PIC16F84 microprocessor", he says, "with the 200Volts @ 10mA for the Nixies being generated from a diode-capacitor multiplier from a low voltage (24-0-24V or 9-0-9V) transformer. Both clocks have an alarm and hourly chime (daytime only!) and dim automatically at night. I use the larger one as my main bedroom alarm clock, and it's worked perfectly since I built it five months ago. The smaller one is in my shack. I find the orange glow of the properly formed digits is very pleasant to look at and easier to read than LED displays." Gary agrees with my suspicion that Nixies are not being made any more, although there was apparently a factory in Russia making them until the mid 1990s. The larger of Gary's clocks, which uses IN18 displays, is pictured above left.

Even bigger are the digits of the Nixie clock built by Hans Summers, G0UPL (see photo above right). He sourced some "Giant East German Nixie tubes, which must have been intended for use in railway station clocks and such like. The tubes are some four inches high." Once again, he purchased them over the Internet.

Finally, on this subject at least, Enver H Chaudri, G3DCS, wrote to say that he had read the article on Nixie tubes "... with great interest, as I was in charge of the technicalities of Nixie tube production when I worked as Head of the Works Technical Department at Hivac Ltd in the early 1960s." He went on to add: "They were made for the Bell Punch Company at Uxbridge, who had developed the world's first electronic calculator just before the Japanese brought them out. The machine was the size of a typewriter. It used Hivac cold cathode tubes in the counter section and the 'number tubes' (or numicators) as we called them, as the readout.

"While at Hivac we introduced mercury to the interior of the tube. This covered the nickel cathodes with a replaceable surface, which was self-replenishing. It gave the tube a slightly blue / pink tinge when it was illuminated, instead of the bright orange of the neon gas with which it was filled. The addition of mercury greatly prevented sputtering of the cathode, hence considerably increasing the life of the tube. Later on, one potential customer wanted radioactive tritium gas added to the filling mixture, to aid priming and produce better tube striking characteristics. It is not generally known that without a priming source, cold cathode tubes will not readily work in the dark. Many a circuit has been developed in the daylight of a laboratory and has foxed the engineers because as soon as it was put into a black box it would refuse to work! I had to prepare a cylinder of neon gas to which was added tritium, for use on a 24-head automatic vacuum pump. Needless to say, a great deal of ventilation was required to ensure that the radioactive gas did not escape into the factory air. I do not recollect that we ever tried the experiment."

DISPOSABLE PHONES

CELLPHONE SECURITY has been making it into the news recently, as the incidence of theft has risen sharply. The government response to this has been to call for such phones to be made less attractive to thieves, by making them more difficult to re-chip or swap SIM cards between. However, it has come to my attention that we are on the verge of the launch of a new kind of cellphone that is disposable.

Apparently this new generation of phones will have:

a) a (lithium) battery that cannot be removed - when it is worn out you throw the phone away

b) no SIM card

c) a single chip that does everything.

Clearly the cost of producing this new kind of phone will have to be very low. They may have cardboard cases, rather than plastic. In any case, who would want to steal one? Moreover, who would want to own one? ♦

WWW.

Nixie clocks (and other things):	www.electricstuff.co.uk
Near Space Balloon Group:	www.kcnet.com/~n3kkm/nearspace.html
Anadyne Microelectronics AN10E40:	www.anadigm.com/an10e40_data.pdf

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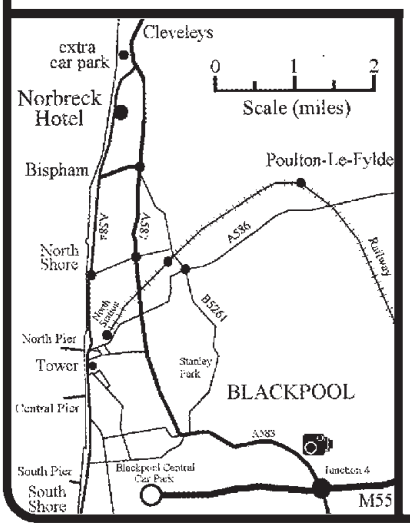

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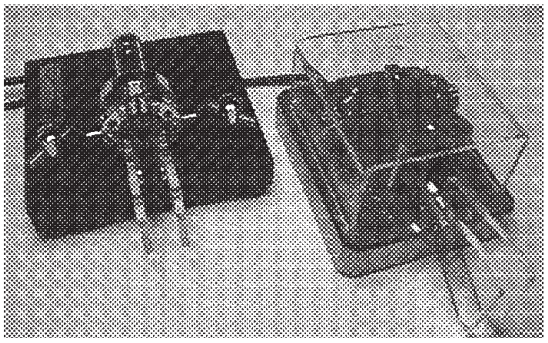

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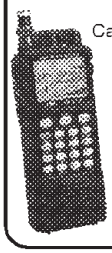

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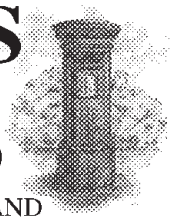

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Newcomers' News

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

CHOCKS AWAY! The Foundation Licence took off on 1 January and I was proud to have played my part in running one of the pilot courses. 10 students started the classes in Bath, nine completed all the work and all nine passed the assessments.

I managed to work a couple of M3s on New Year's Day and I heard lots more doing a great job on 7MHz. Well done to everyone concerned at RSGB headquarters, the Radiocommunications Agency (RA), the pilot tutors, the Morse assessors and, of course, the students.

DX WITH A HAND-HELD?

IAN ABEL, G3ZHI, has been busy promoting the idea of linking amateur radio stations through the Internet. I have to confess to being somewhat puzzled by the whole thing until I had a lengthy chat with Ian who explained how it all works.

Apparently there are several linking schemes on the go, some require you to have a computer linked to the Internet, others need no more than a 145MHz or 433MHz hand-held transceiver. For me it is the latter that holds most fascination and I will attempt to pass on Ian's explanation.

There are now some 300 'Gateways' across the world that are linked to the Internet. Some Gateways are established repeaters, others are run by amateurs who have a Notice of Variation to allow their station to be connected to the Internet. If you can access one of these Gateways and you have a keypad on your radio to transmit tones, like a tone-dial telephone, you can open up the Internet link to any one of the other 300 Gateways.

If you do not have a tone pad you might still hear someone from the other side of the world calling CQ through your local Gateway and be able to reply, just as you would if they were across town.

All this means that you could be walking the dog with your hand-held in the Yorkshire Dales and have a crystal clear FM contact with another amateur on the beach in Sydney. Amazing!

There are some that say that this is not 'real' amateur radio, but the Internet is merely acting as a long connection wire between the input (your local Gateway) and the output (the Gateway on the other side of the world). As far as I can see, this is little different from extending your range over the local hills using a nearby repeater.

Ian tells me that more details, including a list of UK Gateways, can be found on his website www.qsl.net/g3zhi and that he is more than willing to give talks to local clubs, via the Internet perhaps. For those who do not have Internet access Ian can be contacted on tel: 01709 799911.

I wouldn't for one minute expect, or want, the Internet link to replace 'traditional' radio contacts, but I applaud those like Ian for embracing new technology and pushing forward to bring new ideas and possibilities to the hobby.

EXAM NEWS

RUMOURS THAT City & Guilds was to pull out of the amateur radio examinations have now been confirmed. When the current contracts for Novice and Full Radio Amateurs Examinations (NRAE and RAE) expire they will not be renewed. That does not mean that the exams will disappear or that there will be no new radio amateurs, two more rumours I have heard on the air!

I understand that the RSGB Amateur Radio Development Committee is currently working with the RA to ensure that whatever changes occur there will be a seamless transition. It seems that the three exams, Foundation, NRAE and RAE will be with us for some time to come.

Two further pieces of news about City & Guilds come from David Pratt, G4DMP. The first to say that the Novice RAE will continue with its current title even though the licence has been changed to 'Intermediate'. I am sure candidates will be far more interested in the content than the title, but it is worth noting for anyone booking a place at an exam centre not run by amateurs.

The second snippet is very important for NRAE students and Intermediate licence holders alike. The Notice of Variation for the Intermediate licence issued in November last year includes some anomalies in the schedule. The maximum power on 1.95 - 2.00MHz is shown as 50 watts, whereas the Full licence schedule limits power to 15dBW, or 32 watts. The version sent to City & Guilds for inclusion in the March and June NRAEs has similar discrepancies for 430 - 432MHz.

It is understood that the schedule published in November will be used in the exams so candidates should check the papers provided rather than rely on memory. Intermediate licence holders may need to keep an eye open for a revised schedule.

RAE QUESTION SOFTWARE

FOR THOSE preparing for the exams you could do a lot worse than try the QRAE software written by Murray Ward, G3KZB. Murray has been providing this training aid for a few years now and it just keeps getting better and better. His latest version should be available to download from the web by the time you read this and it includes new questions and sound for questions on the Morse code. The choice of practice questions on specific topics or the whole syllabus remains, as do the links back to the *RAE Manual*.

In the 'true spirit' of amateur radio Murray is content to share his ideas and does not charge for the software but he does ask that users make a small donation to charity. A small price to pay for an excellent training aid.

For those with Internet access, QRAE can be downloaded from http://freespace.virgin.net/murray.g3kzb and for those with a PC but no modem, you can obtain floppy disk copies from Murray Ward, Hartley, 4 Green Lane, Milford, Godalming, Surrey GU8 5BG. He doesn't ask, but I suspect he would appreciate it if you sent him a couple a blank disks with your request. ♦

The author and fellow tutor Mike Coombs, G3VTO (the tall one), with six very happy M3s (see opening paragraph).

Spread The Word!

Send your news and colour photos to: Steve Hartley, G0FUW, QTHR.

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

* 5 Sydenham Buildings, Lower Bristol Road, Bath BA2 3BS; E-mail: newcomers.radcom@rsgb.org.uk

Down To Earth

QSLing Hints and Kinks

... or, all you wanted to know about QSLing direct but were afraid to ask, the second and final part, by Phil Whitchurch, G3SWH *

In the second and final part of this article, Phil Whitchurch, G3SWH, concludes his discussion of the use and misuse of International Reply Coupons - IRCs - and then looks at alternatives to their use.

WHEN PRESENTED in exchange for postage stamps, the receiving office should *legibly* date stamp the right hand box. This is a *mandatory* requirement to validate the IRC. This box is marked *"Timbre de bureau qui effectue l'échange"*. This means: *"Stamp of the office making the exchange"*. One IRC is currently exchangeable in the UK for 45p-worth of postage stamps, or an aerogramme.

The centre box is intended to show the price paid for the IRC and is marked *"Prix de vente (indication facultative)"*. This means: *"Selling price (optional information)"*. The post office *may* fix a postage stamp in this box, but only to indicate or supplement the price of the IRC (**Fig 7**), but *not* a date stamp such as would be used in the left hand box. The price of IRCs in the USA recently rocketed from $1.05 each to $1.75 and the US postal authorities are using up their old stock by fixing additional stamps to make up the value. In many countries this value is already pre-printed, usually in red; in others it is left blank. Either is acceptable.

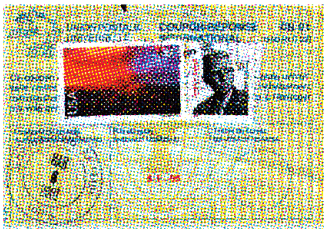


Fig 7: Postage stamp(s) may be affixed to the IRC to indicate or supplement the price of the IRC.

* 21 Dickensons Grove, Congresbury, Bristol BS49 5HQ; e-mail: Phil@g3swh.demon.co.uk

Unfortunately, many post office employees in many countries do not understand the rules and stamp the wrong box by mistake, fail to stamp any box at all, or refuse to exchange IRCs (whether or not they are correctly stamped) for postage stamps. The official policy of the UPU is that "if the IRC is incorrectly stamped, the validity or otherwise of the coupon has to be examined on a case by case basis." However, it is fair to say that unstamped or incorrectly stamped IRCs are generally worthless and, under normal circumstances, cannot be exchanged for postage stamps. Local and unofficial exceptions to the rules do exist but do *not* expect to receive a direct reply to a QSL request if you use worthless IRCs. Examples of potentially worthless IRCs are shown in **Fig 8** and **Fig 9**.

Some administrations, such as that of Germany, require the actual postal items to be handed over the counter at the same time as the IRCs and will not merely exchange them for loose stamps.

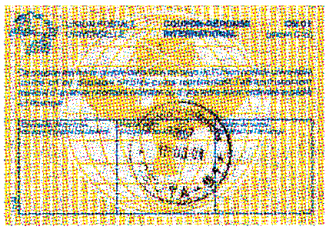
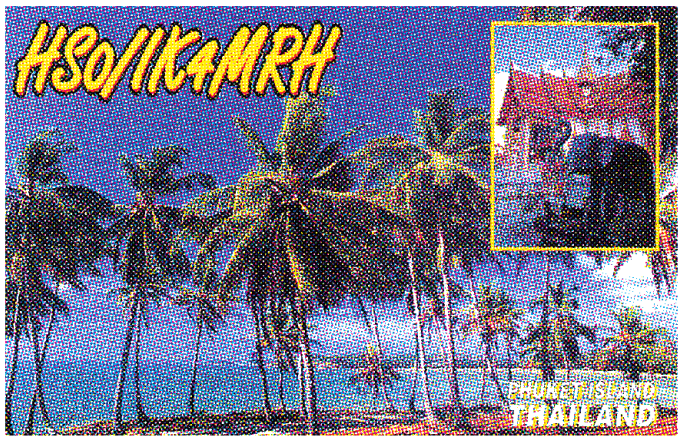


Fig 8: A potentially worthless IRC.

Fig 9: Another potentially worthless IRC: both this one and the one shown in Fig 8 are stamped in the wrong place.



Many amateurs collect QSL cards specifically for awards. This is a 'good one' for DXCC (Thailand), Worked All Zones (Zone 26) and the RSGB's Islands on the air (IOTA) programme - Phuket Island counts as AS-053.

To account for variations in international currency exchange rates, administration costs etc, 'new' IRCs generally cost over 70% more than the face value of postage stamps for which they can be exchanged. The actual selling price is fixed by the postal administrations concerned, but must not be less than an internationally agreed minimum value. IRCs purchased new in the US for $1.75 can still only be exchanged for 80c-worth of postage stamps. Second-hand IRCs circulate widely in the US for $1 each. Recently, I have had several American amateurs approach me to buy 'second hand' IRCs at about 90c each! However, this only becomes economic when large numbers of IRCs are involved.

QSL managers will usually filter out and dispose of incorrectly-stamped IRCs but will offer for sale correctly stamped and valid 'second hand' IRCs. Such 'second hand' IRCs are sometimes available from UK-based QSL managers at around 55p each. These circulate widely within the amateur radio community as 'ham currency', without ever being

Fig 10: IRC first issued in 1969 - still valid and received just recently, having circulated as 'amateur radio currency' for three decades!

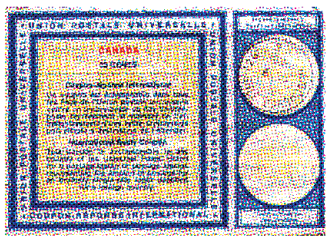


Fig 11: An even older IRC, from 1963.

exchanged for postage stamps and it is not uncommon to receive IRCs with date stamps several years old. In 1998, whilst processing QSL cards for the 9M0C DXpedition, I received some IRCs originally issued in 1963 and 1969! - see **Fig 10** and **Fig 11**.

Some difficulties arise in deciding exactly how many IRCs to send with an application for a DX station's QSL card, as the definition of *"minimum postage"* var-

ies widely between postal administrations.

In the UK, it currently means 20 grams to a European destination or 10 grams to an intercontinental destination. In the USA, it currently means 0.5 ounces to an intercontinental destination. Other criteria apply in Germany and Japan, for example. The best approach is to include a minimum of one IRC if you require a single card from an address in the same continent, and a minimum of two IRCs if you require a single card from an address in another continent. If you make more than one QSO or require more than one card, then you should increase the number of IRCs accordingly on the basis that each, additional, one or two-sided QSL will weigh approximately 5 grams and a four-sided one approximately 10 grams. If you are in any doubt, then include an additional IRC!

ALTERNATIVES TO IRCS

THE UPSHOT OF all this, is that IRCs are not particularly good value for money, especially when bought over the post office counter, or even on a 'second hand' basis. You cannot then rely on them being accepted for exchange for postage stamps in the foreign country.

Consequently, many people use US dollars (often euphemistically referred to as 'green stamps') instead. A very broad rule of thumb says that buying a new IRC costs the same as US $1. Although US dollars are not so readily available as IRCs, they can be purchased from most high street banks or bureau de change, although they do attract a small surcharge as commission. Some UK-based QSL managers currently offer surplus US $1 bills for sale at around 70p each.

Generally, all QSL managers prefer to receive US dollar bills than IRCs, as they can be turned into cash rather than postage stamps. Quite apart from anything else, no-one is likely to argue that a $1 bill is not valid! However, the new $1 coins and low-value hard currency notes other than US dollars are especially unwelcome, simply because such notes as 1000 Italian Lire, 25 Austrian Schillings and the like are of so little value that they are not accepted for exchange by banks and are thus worthless to the manager. Applications containing such currency are sometimes returned via the bureau (with or without the money and an explanatory note).

Many stations, particularly those in Eastern Europe, send mint or used postage stamps from their own country with their cards. Even if the QSL manager is known to be a keen philatelist (and even then he probably already has dozens of identical stamps), this is not a practice that generates reliable replies. If you do want to send mint stamps, carefully research the correct minimum amount of postage from the manager's country to your own and enclose loose stamps to *slightly in excess* of this sum in your return envelope with your QSL card. Postal rates change regularly, but this way, even if you send the wrong value, or if your reply exceeds the weight limit, you have supplied the necessary extra postage. If not, you have made a modest contribution and the QSL manager can use the excess for bureau mailings and the like. Remember that British stamps definitely do not work if posted outside the UK! Nor do US or other countries' stamps work if posted within the UK!

Some managers openly state that they will not directly reply to applications enclosing anything other than IRCs or US dollars. Some may send the DX station's card back via the bureau system, others will not.

Be cautious about sending hard currency to some countries, such as India, where it can actually be illegal for the recipient to own it. IRCs are preferable in these circumstances.

Never send cheques to a foreign country unless it is drawn in the local currency on a bank in that country. Quite apart from the problems of identifying the correct payee's name (I received several foreign cheques made payable to "9M0C"), the time involved and the bank charges for changing, say, a US dollar cheque (or "check") into sterling are wholly disproportionate to the value of the cheque.

	EUROPE	OUTSIDE EUROPE
Cards cost £50 per 1000 approx	£0.05	£0.05
Postage	£0.36	£0.45
Labels, sundries etc (say)	£0.02	£0.02
Total	£0.43	£0.52

Table 1: The cost of sending a single 10g card from the UK to Europe and the rest of the world.

Table 1 shows the cost of sending a single 10g card from the UK to various destinations. It is clear that one IRC barely covers the cost of a card to a European destination, and does not cover the cost to a destination outside Europe. US $1 adequately covers the cost to any destination.

DECISIONS

SO, HAVING decided to opt into the QSL exchanging game, when should you rely upon the bureau system and when should you send direct?

In broad terms, exchanging cards with stations in 'the developed world' is fairly reliable if sent via the bureau. If you really do need a card from a certain station as a 'first', then do write something to that effect on your card. Otherwise a lot of operators won't reply. One of my personal interests is collecting cards for the US Counties award on CW (I must be some sort of a masochist!) and the number of operators who refuse to QSL via the bureau regularly surprises me, usually claiming that it is too expensive.

Certainly, if you are in any way regularly active of the HF bands you can expect to receive a lot of cards for 'run of the mill' QSOs. It is very clear that a large number of stations, particularly those in Western Europe, send a card via the bureau for each and every QSO, especially in contests. If you read them carefully, most of these cards do not invite a reply. Some of them even say so! I strongly disapprove of those stations whose record keeping is so poor that they will send you a second card confirming receipt of the one that they originally requested! I further disapprove of the practice of sending QSLs via the bureau for 100% of QSOs. Experience and statistics suggest that some 50% of such cards are not collected and do little more than unnecessarily clog up the bureau system and waste a lot of people's time. For example, since 1998 I have confirmed only 65% of the total QSOs made by the 9M0C expedition to the Spratly Islands on the basis of replying only to requests received, either direct or via the bureau.

The bureau system is often claimed to be slow and inefficient. It is certainly slow, and the minimum delay expected is about six months, with three years or more being not uncommon. Any single card passes through a large number of pairs of hands, and mistakes do occur, possibly of the order of 2%. Given the number of cards handled and the fact that bureau staff are largely volunteers, they do an excellent and often thankless job. If we continue to increase the volume of cards for which there is no real demand, then sooner or later the RSGB, like the ARRL, will be forced to introduce charges for using the outgoing bureau [it should be stated that there are no plans for the RSGB to do this - *Ed*]. ♦

Jan Mair sorting cards at the RSGB QSL bureau.

Just part of the mountain of QSLs awaiting sorting at the RSGB QSL bureau in mid-December. How many of these cards are unwanted? Wouldn't it be better to QSL *only* if you *really* want one in return?

Down To Earth

Permeability Tuning For Simple AM Radios

by Don Breen, G0FQI *

WHEN WORKING on a new project I have spent a lot of time using commercially manufactured slug-tuned coils. The slug is a threaded iron-dust or ferrite core screwed up and down inside the former to tune to the desired frequency. As a design is being developed, it is quite common for the internal core to be re-adjusted many times in order to get things just right. Commercially manufactured components do not stand up well to this sort of treatment. They are quite delicate.

One day, having damaged yet another core, I decided to spend some time on making a more suitable adjustable inductor for my experimental designs. This variable inductor and its associated circuit (or permeability tuner) are the results of my endeavours. While it is not appropriate for every type of RF application, it works well with many. It is most suited to applications at the low-frequency end of the HF spectrum and the medium-wave broadcast band. The permeability tuner has worked particularly well in many receiver applications. [A precision version of the same technique was used successfully for many years in the revered Quad FM Tuner. See also the last paragraph of column two on p61 of this issue - *Ed.*]

Nivea Lip Care is shown in the middle of the picture, together with two similar products.

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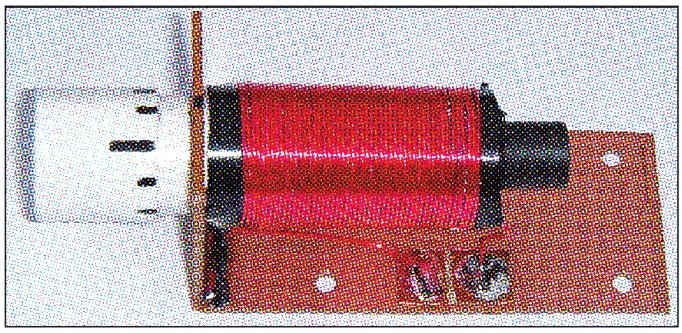


The value of the inductance is changed by screwing the ferrite core in and out of the coil. In a radio where this coil is part of the tuning circuit, tuning is accomplished by this action, and is known as permeability tuning.

A COSMETIC APPROACH

THIS DEVICE is inexpensive to make. It allows accurate and stable adjustment of the ferrite core. The rotary tuning knob can be calibrated so that positions can be rapidly found or re-adjusted as necessary.

The design is based around a cosmetic product used for protecting lips against the extremities of the elements. There are several similar such products on the market and any one that has a similar type of container could be used. The product chosen (**Fig 1**) for this example is 'Nivea Lip Care'. It is inexpensive and is widely available in supermarkets and other outlets. A slight disadvantage is that the cap is of a more brittle plastic than similar products of different manufacture.

Lipstick containers could also, in theory, be used. However, lipstick is a comparatively expensive product, and some lipstick containers have a metallic content rendering them useless for this purpose. They have therefore not been considered for this project.

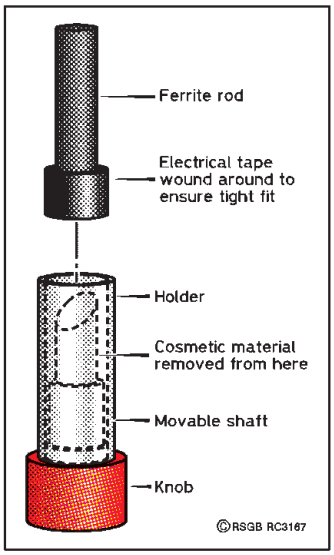


Fig 1: Cutaway view of the cosmetic holder.

MATERIALS

GET THESE together before you start.

1. You will need a ferrite rod. The diameter of the rod used for the project was 9mm, but this is not critical.
2. An empty Nivea Lip Care container is used to form the main body of the device.
3. Electrical tape is used to adjust the diameter of the ferrite rod.
4. The diameter of the insulated copper wire used to wind the inductor for this example was 0.56mm or 24SWG. It is possible to close-wind 50 turns of wire on the former. If more turns are required, a smaller gauge would be appropriate.
5. Finally, a single-sided plain PCB measuring at least 100 x 30mm.

First, assemble your components.

CONSTRUCTION

THIS IS BEST done in stages.

THE BRACKET

This is made from single-sided copper-clad board. The base section measures 65 x 30mm. The vertical section measures 35 x 30mm.

Cut a hole in the vertical section to fit the barrel. If you do not have a suitable drill, place the barrel on the PCB and draw around the circumference. Drill a series of small holes around the inside of the perimeter. When a sufficient number of holes has been made, press out the inner section.

The barrel should fit reasonably tightly into the hole. If necessary, electrical tape can be used to increase the diameter of the barrel to achieve a tight fit. The two sections of the PCB are soldered together to form the bracket.

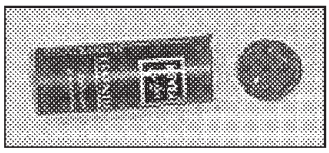
THE FERRITE STUB

A 35mm-long stub of ferrite rod is required. Make this stub by scoring around the ferrite rod with a junior hacksaw and carefully snap off the section. The end does not have to be perfectly formed. Electrical tape is wound around one end

of the stub to give it an overall diameter of 12.5mm. This will allow it to fit tightly into the base located in the inner section of the barrel. Rotate the knob to bring the base to the end of the barrel. Remove any of the jelly-like substance that may remain. Insert the taped end of the ferrite stub into the base with a twisting action. Take care in fitting the stub. If the diameter seems a little too big remove half a turn of tape and try again. The base is easily split with excessive force.

THE COIL FORMER

The cap of the cosmetic container is used as the coil former. If you are using the Nivea product, this provides a former 48mm long and has an approximate diameter of 19mm. The cap varies very slightly in diameter from end to end. Electrical tape secures the coil winding at each end of the former.



The end of the cap has to be removed in order to allow the ferrite slug to pass in and out of the coil. This is best done with a junior hacksaw. Be careful not to split the plastic.

WINDING THE COIL

The device works well over the low-frequency end of the III² band and the entire medium wave band. You can use **Table 1** to determine the number of turns required and the relevant capacitor value. The values shown in the chart are for fixed capacitors and are for guidance only. The frequencies quoted assume that a 35mm-long, 9mm-diameter ferrite stub has been used. If the diameter of the stub is one or two millimetres thicker or thinner, the values will still give you a good approximation of coverage.

Start the winding as close as you can to the base of the former. The base is the end that is closest to the knob on the barrel. You will find that the former can only be fitted to the barrel one way. The reason for keeping the windings close to the end is to make the device tune from the lowest frequency to the highest frequency. If the ferrite core can emerge from the coil winding at the base end you will notice that the lowest frequency is half a turn or so from the minimum position of the tuning knob. After the coil has been wound it can be fitted onto the barrel.

A small piece of single-sided PCB is used to make two solder pads, see the photo. These pads will retain the ends of the coil windings. Any small offcut of PCB board can be used. In this case it measured 10 x 15mm. A slot is cut into the copper cladding with a hacksaw to form the two insulated pads. The section of board is then stuck to the bracket (copper side up) with a drop of 'super glue'. The ends of the coil are soldered to the pads. Hold the wire ends with a pair of thin-nosed pliers when soldering. This will prevent heat travelling back up the wire and melting the electrical tape that secures the ends of the winding.

TURNS	SWG	CAPACITOR pF	MHz (min)	MHz (max)
80	30	47	1.09	1.96
80	30	100	0.86	1.52
80	30	220	0.63	1.10
80	30	470	0.45	0.76
50	24	47	1.86	3.30
50	24	100	1.48	2.60
50	24	220	1.08	1.87
50	24	470	0.79	1.30
30	24	47	2.81	5.28
30	24	100	2.22	4.07
30	24	220	1.65	2.94
30	24	470	1.20	2.12

Table 1: Choose your fixed capacitor, wire gauge and number of turns for the frequency range you require. The capacitor is C1 in Fig 2.

USING IT

THIS crystal set design is included to demonstrate the tuner's application. A typical circuit is shown in **Fig 2.** A pair of high-impedance headphones or a crystal earpiece is attached to the two terminals. In order to obtain good results from a simple set like this it is essential to have the correct type of headphones or earpiece and a good antenna and earth.

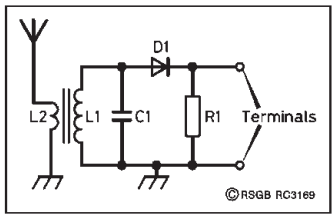


Fig 2: The basic crystal set. See text and Table 1 for component values.

The diode should be the germanium type shown, not a silicon device, and must be fitted the correct way round. The component is marked with a coloured band at the cathode end. Hold its ends with a pair of long-nosed pliers when soldering to prevent excess heat damaging it.

High-impedance (4000Ω or more) magnetic headphones have been used in the past with this sort of receiver. These are not commonly available these days, so the circuit has been slightly modified. A resistor (R1, 100kΩ) has been added. This will enable the receiver to work properly with a crystal earpiece or a pair of crystal headphones. These are currently available from a number of retail outlets. If you are fortunate in having an old-fashioned pair of high-impedance headphones of the magnetic type, R1 may be omitted.

Use as long an antenna as you have room for, and mount it outside if at all possible. The earth should be a metal cold-water pipe, *not* a mains earth.

Coupling the antenna directly to L1 has a damping effect on the circuit, resulting in poor selectivity. In order to give the receiver a reasonable degree of selectivity a second coil, L2, consisting of between four and six turns is wound over the earth end of L1 and connected as shown in Fig 2. The number of turns for this coil is not critical. However, it is important to have the turns of this secondary winding made in the same direction as the turns on the main winding. The best way to make this small coil is to wrap a thin piece of card around the inductor. The ends of the card and winding are secured with electrical tape. Once the coil has been wound, the protruding wires can be soldered to pads made in the same fashion as for the main inductor winding.

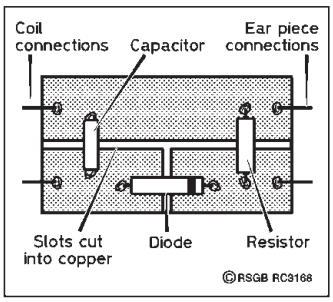
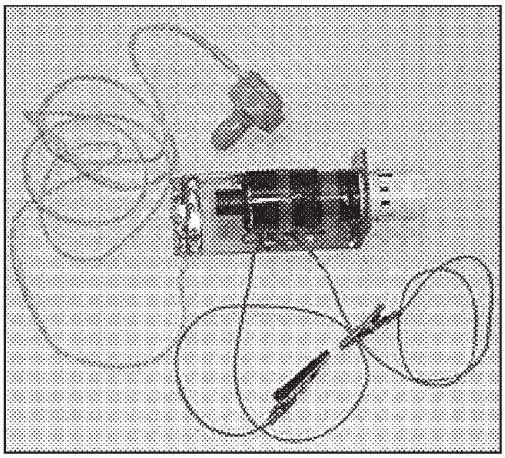


Fig 3: The layout of the components.

The components for the set are soldered to a small piece of single-sided PCB board, as shown in **Fig 3.** The size of this piece of board can be larger than specified in order to make soldering easier. The copper cladding has been cut through with a junior hacksaw to form three isolated solder pads. A spot of 'super glue' is used to secure the PCB to the bracket of the inductor. The calibration points on the adjuster knob are made with a marker pen.

The smooth but firm action of the rotary knob allows for adjustments to be made that will not be upset too easily by small vibrations . ♦



The completed receiver with crystal earphone and crocodile clip connections for antenna and earth

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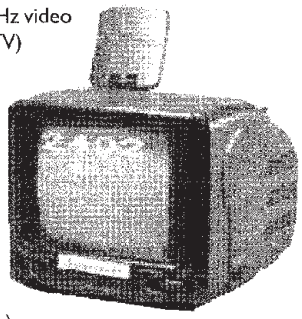

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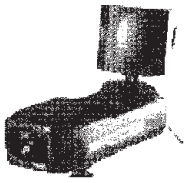

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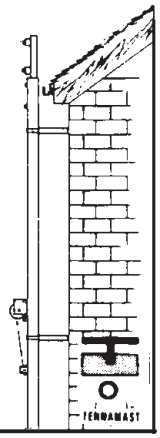

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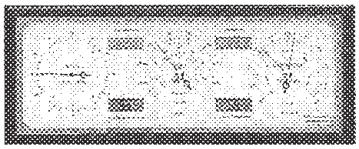

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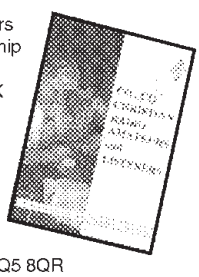

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WIN! A YAESU FT-817 TRANSCEIVER in the RSGB / ML&S 'MIRACLE WHIP' DX COMPETITION

First Prize: Yaesu FT-817 HF / VHF / UHF Multi-Mode Mini Transceiver worth £799, courtesy of Yaesu (UK)

Second Prize: Maldol HF Mobile Antenna System, courtesy of Martin Lynch & Sons

THE NEW 'Miracle Whip' antenna was designed specifically for use with the Yaesu FT-817 transceiver but can, of course, be used with any low-power (5 watts continuous, 10 watts CW / SSB) transceiver. It was reviewed in the February 2002 *RadCom* by Chris Lorek, G4HCL (see page 29), who described it as "possibly one of the very best accessories you could get for a portable QRP transceiver".

Our competition, exclusively for RSGB members and run in conjunction with Martin Lynch & Sons, aims to see just how well the 'Miracle Whip' can perform. The full rules are below but, simply, the prizes will be awarded to those who make the two longest-distance QSOs *using only a 'Miracle Whip' as the transmit antenna.*

New Foundation Licensees take note: the rules of the competition are such that you are competing on a level playing field with all other licensees!

COMPETITION RULES

1. The aim is to make the longest-distance two-way amateur radio contact possible using only a 'Miracle Whip' as the transmit antenna.
2. The claimed contact must be made between 0000UTC on 1 March 2002 and 2400UTC on 31 July 2002.
3. Any band or mode permitted by your licence may be used.
4. The maximum power to be used is 10 watts RF output, or 10 watts PEP output on SSB.
5. Entries must be posted on or after 1 August and must be received at RSGB HQ by first post on Monday 2 September. The winner will be announced at the RSGB International HF and IOTA Convention, to be held at Old Windsor over the weekend of 11 - 13 October 2002, and in the November *RadCom*.
6. Send entries to: 'Miracle Whip' Competition, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE, England ***on a postcard or the back of a sealed envelope*** (no letters accepted). The following details must be provided:
   - Your callsign
   - Your location (town or lat / long)
   - Date of claimed contact
   - Time (UTC) of claimed contact
   - Frequency (kHz) of claimed contact
   - Mode of claimed contact
   - Callsign of station worked
   - Sent and received RS(T) reports
   - Location (town or lat / long) of station worked
   - Distance of claimed contact (or estimate of distance)
   - A signed statement, as follows: "This is to certify that I have operated my transmitter within the limitations of my licence and have observed fully the rules of this competition. (Signed)"
   - Your name, address, and phone number and / or e-mail address.
7. Confirmation or proof of contact may be required.
8. The short-path Great Circle distance between two points will be used to calculate the distance of the contact (irrespective of whether the claimed contact was made via the short path or the long path).
9. The person entering the competition must be a current paid-up RSGB member and must only be using a 'Miracle Whip' as the transmit antenna. There is no restriction on the power level or the type of antenna used by the station contacted.

Only one entry per member (multiple entries will be disqualified). You should decide before sending in the entry which is your best contact during the competition period. No other correspondence can be entered into. All entries will become the property of the RSGB and ML&S; please state on your entry if you do not wish to receive further promotional material or offers from the RSGB or ML&S. Employees of the RSGB or of Martin Lynch & Sons are not eligible to enter.

RadCom Helplines FOR MEMBERS

● Grant, G8UBN, is looking for a service manual for an **Adret 7100D signal generator**. All costs paid. G8UBN, QTHR. Tel:01256 364 539 evenings/ weekends.

● Denzil, G3KXF, is replicating the S-meter according to the circuit of the **Eddystone S-640**. Can anyone advise if the currents stated for each S-point are (a) the actual meter current before its zero is mechanically offset 1/8in below zero, or (b) the current measured after mechanical offset? He also needs the manuals or circuits for a **Maplin Gold MF100 Multi-function Counter** and for a **Delristor 0110 Digical**, a device that produces standard voltages and currents for meter calibration. All costs will be defrayed. G3KXF, QTHR. Tel: 01903 764 599 or e-mail: denzil-roden@lineone.net

● John, GM3ZXG, needs the circuit, wiring diagram or other information on the **Cossor Empire Melody Maker model 235**, mains version. GM3ZXG, QTHR. Tel: 01475 781 568.

● Brook, G0VEB, is seeking a copy of the manual and circuit with internal battery details, of a **Marconi TF1065A transmitter and receiver output test set**. Any expenses will be reimbursed. G0VEB, QTHR. Tel: 020 8882 4110.

● Ted, G8HLJ, would like a copy of the handbook or circuit diagram of the **Hallicrafters SX130 valve receiver**, and will meet all expenses. G8HLJ, QTHR. Tel: 0151 632 0614.

● Bruno, G4FZG, requires the circuits of the **Heathkit RG-1 general-coverage receiver**, and of the X-amplifier module of the **Telequipment D755** oscilloscope. He will meet all expenses. G4FZG, QTHR. Tel: 01242 256 295.

● Pat, G3MA, is looking for a **KW77 receiver** manual (or copy) with the circuit diagram. He also needs four push-button control knobs for the receiver. All exprenses paid. G3MA, QTHR. Tel: 01452 539 519.

● Tom is looking for a circuit diagram or workshop manual for an **AOR AR280** 2m handportable. GM3PXK, QTHR. E-mail: t.coates@gcal.ac.uk

● Paulo, PY2PH, needs a copy of the instruction manual for the **Sadelta Field Strength Meter model TC402D**. PY2PH, e-mail: pemazzei@ccinet.com.br

RSGB Annual Meeting a Success North of the Border

RSGB Annual Meeting

Saturday 1 December 2001
Strathclyde Fire Brigade HQ, Bothwell Road, Hamilton, Scotland

THE FOLLOWING IS a report on the 75th Annual General Meeting of the RSGB. The report is not the formal minutes of the meeting: this year the formal minutes of the AGM will be included in the Society's Annual Report which will be published in the November 2002 edition of *RadCom*.

One hundred and one members gathered on a bright but cold morning for the Society's 75th Annual General Meeting at the Strathclyde Fire Brigade HQ in Hamilton. As at the previous year's meeting in Harrogate, the annual meeting took the form of the formal AGM in the morning followed by a open forum in the afternoon, which was open to members and non-members, and an 'amateur radio dinner' in the evening.

Opening the meeting, the Society President Don Beattie, G3BJ, welcomed everyone and outlined the agenda for the meeting. The first item under discussion was the confirmation of the minutes of the 74th annual meeting held in Harrogate in December 2000.

Calling for comments on the minutes Harry Bellfield, G3SBV, an AGM regular, observed that at the Harrogate meeting he had raised a question regarding *Radio Today* magazine. He pointed out that there was no reference to this question in the minutes, although he did accept that he was given a full and frank reply by the President. In answer to the question, the President pointed out that the minutes contained a full statement about *Radio Today* and that it was not necessary for the Society to record verbatim the detail of every question. Mr Bellfield accepted this explanation. There were no further questions on the minutes.

The motion to accept the Board's recommendation to accept the minutes was proposed by Mr Johnson, G1GNS, and seconded by Mr Biddulph, M0CGN. The motion was carried on a show of hands with one abstention.

Item two was the adoption of the Society's accounts for the financial year ending 30 June 2001. Reporting on the accounts, the Society's Treasurer Ken Ashcroft, G3MSW, highlighted a number of key areas. Subscription income was slightly down on the previous year, but success with mailshots to lapsed members had maintained the membership figure. On advertising, marketing conditions were very difficult at present, but book sales was an area where there had been some growth. Overall the Society had reported a surplus of £2.9k. Taking questions from the floor, Mr Bellfield, G3SBV, asked the Treasurer to explain the position of the stock held away from HQ. In answer, the Treasurer explained that the stock was still owned by the Society and that we now used an external source to pack and despatch book orders. Using an outside source reduced HQ overhead costs. There were further questions on the availability of the agenda and minutes in a format to assist the visually-impaired to follow the meeting.

It was pointed out that although the agenda for the meeting was not available on tape at today's venue, the minutes of the previous meeting and the agenda for this meeting was printed in *RadCom* and that *RadCom* is available on tape for the visual impaired.

A further observation from the floor was that quite possibly the reason for the fall in subscription income was because of the ageing membership profile of the Society.

There being no further questions on the accounts, the President again reiterated that there was no formal requirement to adopt the accounts, and moved on to item three on the agenda: the results of the recent Board and Regional Council elections.

The President welcomed the successful candidates to the Board and Regional Council (the results published in full in the January 2002 edition of *RadCom*) and thanked the unsuccessful candidates for their interest in standing for election.

The fourth item of the agenda was to call for volunteers to act as scrutineers for the 2002 Board and Regional elections. At this point Mr Bellfield, G3SBV, from the floor indicated that following many years of service as a scrutineer, he would not be volunteering this time around. The President thanked Mr Bellfield on behalf of the membership for his contribution in this year's election as Chief Scrutineer and for his past service in this field.

From the floor, three members present volunteered, Mr Brothwell, G4EAN; Mr Betts, G0HIQ, and Mr Biddulph, M0CGN.

The last agenda item of the formal AGM was to vote on a resolution to reappoint the auditors KPMG and to authorise the Board to fix their remuneration. The motion was carried with one abstention.

There were two more informal items before the break for lunch: the trophies and awards ceremony (full details published in the February 2002 edition of *RadCom*) and the Presidential review.

In his review of the year, the President highlighted the significant changes and activities that had taken place in the last 12 months. The new Board and Regional structure which was voted on at last year's meeting was already achieving a great deal, including greater management control and strengthening links with the membership. He emphasised the need to promote amateur radio more vigorously and to a wider audience. Great interest has been shown in the new Foundation Licence and it is vitally important to the future of amateur radio that this interest is fostered and maintained. The Society's work in the promotion of amateur radio is taking a lot of effort, energy and commitment, but this needs to be maintained if we are to be successful. He also emphasised the need to be aware of the threats to the hobby, including PLT, the radiation issue, the creation of OFCOM and changes in planning legislation. All of these issues were focussing the Society's attention at this time. Much work will be required in the coming 12 months in preparation the IARU Region 1 Triennial conference and for the World Radio Conference in 2003. On closing the President spoke of the pleasure amateur radio had given him over the past 41 years, of how it had taken him to some remote and exciting parts of the world, and of his wish to see amateur radio flourish and be enjoyed by future generations. The President then took the opportunity to 'lift the weight' off his shoulders by inviting Bob Whelan, G3PJT, to take the Presidential chain of office.

On taking up the chain, Bob Whelan spoke of the great honour of being President for the next two years and of the importance that we carry on the work we have started.

Following a very enjoyable buffet lunch, the 'open forum' covered such subjects as the new Society structure, the future of amateur radio licensing in the UK, and the threats the hobby is currently facing. There was lively debate on all the issues, particularly in the areas of licensing and the threats to amateur radio operation such as PLT.

It would be extremely difficult to report all the issues raised in this brief report, as the transcript of the AGM and open forum runs to 52 pages. However, for those members interested in reading the full transcript, it is available on either paper or cassette tape from the General Manager's Dept, RSGB HQ. The paper version is £5.00 inc P&P and the tape version £12.00 inc P&P.

A very successful AGM day was rounded off with the amateur radio dinner. Around 60 guests gathered at the Bothwell Bridge Hotel for a traditional Scottish supper followed by an entertaining after-dinner speech by Gaston Bertels, ON4WF, the Chairman of the IARU Region 1 Eurocom Committee. Gaston entranced the audience as he explained that the success of the American Space Shuttle was due entirely to the invention of the wheel and the horse-drawn cart!

The Society would like to thank Geoff Ord, the Chief Firemaster of the Strathclyde Fire Brigade, for the use of the excellent facilities afforded to the Society to hold the AGM, and Elvin Bailey and his team of helpers for the organisation on what was a very successful and enjoyable day.

RADIO SOCIETY OF GREAT BRITAIN

Unaudited Income & Expenditure Account
For the six months ended 31 December 2001

	Six months ended 31/12/01		*Six months ended 31/12/00*	
Gross Income	£	£	£	£
Subscriptions	429,961		*419,622*	
RadCom Advertising	89,230		*94,022*	
Basic Membership Income		**519,191**		***513,644***
Books and Products Sales	196,630		*204,444*	
Other Activities	70,736		*50,478*	
Total Gross Income		**786,557**		***768,566***
Contribution from Activities (ie Basic Membership Income less Direct Expenses)				
Expenses Charged direct against Basic membership Income				
RadCom Production	(226,336)		*(231,555)*	
Amateur Radio Costs	(33,632)		*(21,824)*	
Council & Committee Expenses	(24,490)		*(19,809)*	
QSL Bureau Running Costs	(16,022)		*(14,507)*	
IARU Payments	(9,339)	(309,819)	*(9,597)*	*(297,292)*
Surplus from Basic Membership Income		**209,372**		***216,352***
Contribution from Book and Product Sales and Other Activities				
Books and Products Contribution		46,170		*39,295*
Other Activities		18,398		*(2,847)*
Total Contribution before Overheads		**273,940**		***252,800***
Less Overheads (ie Cost of General Administration and HQ Operating Costs)				
Finance, Legal & Administration	(154,609)		*(149,252)*	
Office Stationery, Telephone etc	(66,619)		*(66,572)*	
Despatch Costs	(36,016)		*(37,632)*	
HQ property costs, rates, power etc	(22,677)	(279,921)	*(20,899)*	*(274,355)*
Net Contribution from Operations		**(5,981)**		***(21,555)***
Financial and Other Items		20,491		*15,788*
Non-recurring Items		(28,500)		*(4,564)*
Net Income/(Expenditure) for the half Year		**(13,990)**		***(10,331)***

Commentary on the Income & Expenditure Account for the six months ended 31 December 2001

THE SOCIETY REPORTS a deficit in the un-audited Income & Expenditure Account for the six months to 31 December 2001 of £13,990, after non-recurring items of £28,500. This compares with the prior year deficit of £10,331 after non-recurring items of £4,564.

The non-recurring costs in the half to 31 December 2001 refer to the costs of re-structuring at Headquarters. These actions have resulted in lower operating expenses during the year.

As a result of the subscription increase, subscription income increased by £10,339 compared with the prior year. Membership numbers were 24,722 at 31 December 2001 compared with 25,270 in the prior year, with new members of 726 compared with the prior year of 844. Advertising income continues under pressure as the businesses serving the radio hobby continue to run at a lower level of activity than has been the case historically. An increase in revenue on books and other products was recorded, but this was the result primarily of a high-priced low-margin product. Nevertheless, this category generated a small increase in contribution.

The accounts carry the initial costs of GB4FUN, which became operational during the half, and has provided the Society with an opportunity to introduce amateur radio to schools and other sections of the community.

Other Activities produced an increase in revenues. This category of revenue mainly comprises the reimbursement of expenses for services rendered and includes the increase in activities associated with the Foundation Licence and related issues.

Current indications are that the deficit after the non-recurring items will be reduced by the end of the financial year.

Signed: Dr R C Whelan, BSc, MSc, PhD, G3PJT, President
K Ashcroft, FCA, FCMA, G3MSW, Treasurer

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MR268S 2 Metre 5/8 wave 3.5dBd Gain (Length 51") SO239 fitting £19.95
MR280S 2 Metre 6/8 wave 5.8dBd Gain (Length 58") SO239 fitting £29.95
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MR 444 4 Metre loaded 1/4 wave (Length 24") (3/8 fitting) £12.95 (SO239 fitting) £15.95
MR 614 6 Metre loaded 1/4 wave (Length 56") (3/8 fitting) £13.95
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(without ground planes)

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BM45 3 x 5/8 wave, (Length 62") 8.5 dBd Gain £49.95
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MRW-232 Mini Miracle TX 2 Metre 70 & 23 cms RX 25-1800 MHz (Length just 4.5cm) BNC fitting £19.95
MRW-250 Telescopic TX 2 Metre & 70 cms RX 25-1800 Mhz (Length 14-41cm) BNC fitting £16.95
MRW-200 Flexi TX 2 Metre & 70cms RX 25-1800 MHz (Length 21cm) SMA fitting £19.95
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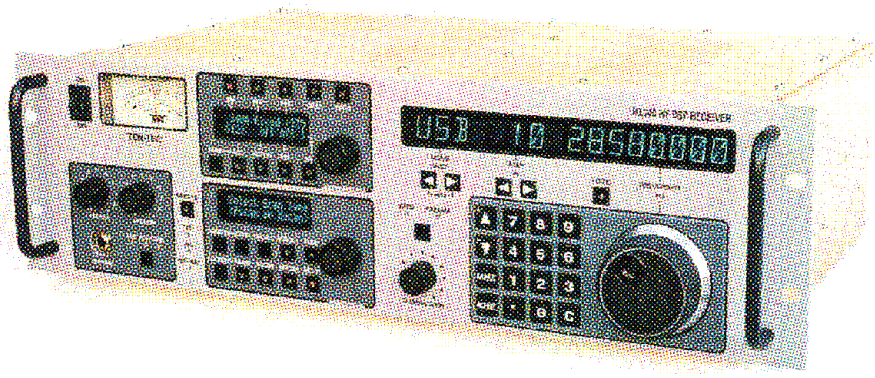
TEN-TEC RX340

professional HF communications receiver

Reviewed by Peter Hart, G3SJX *



THE HF communications receiver is, and always has been, the testing ground for proving the very best in receiver technology. HF radio, by its nature, requires the highest performance in terms of dynamic range and adjacent channel characteristics, coupled with great flexibility, ease of use and ability to deal with interference and distorted signals. Performance in these areas can make all the difference between a good and a really fine receiver.

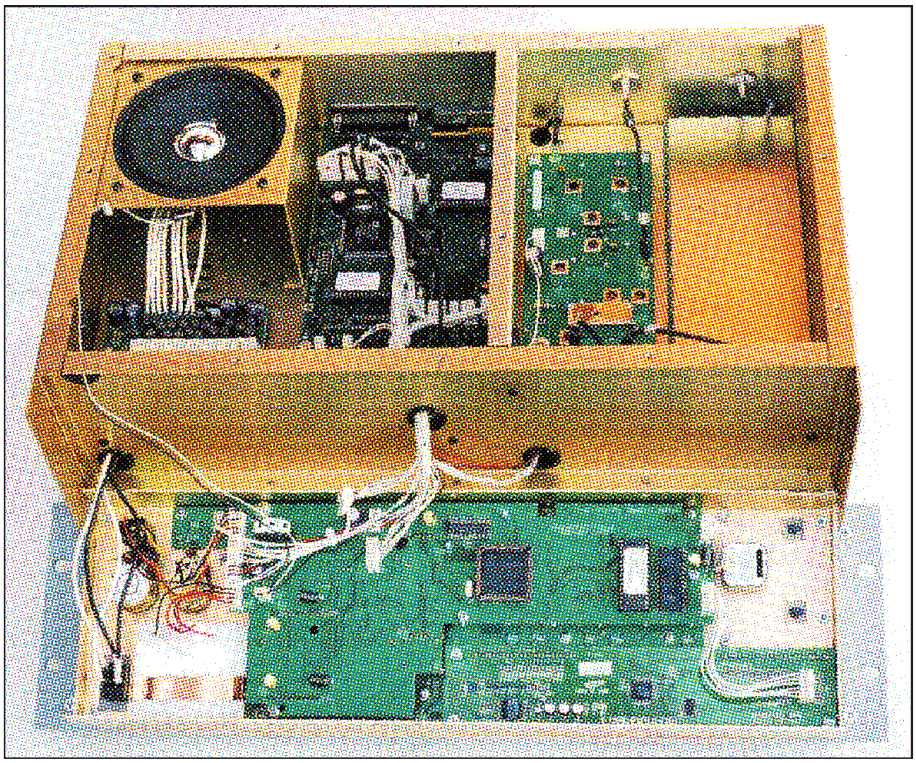
The market for high-performance professional communications receivers is relatively limited, being primarily monitoring, surveillance, test and measurement, but the price tag is normally beyond the range of most enthusiasts. Names such as Racal, Rohde and Schwartz, Rockwell Collins and Watkins-Johnson are all well known in this field and, occasionally, used receivers appear on the surplus market at more affordable prices. Ten-Tec has a good reputation for making high performance amateur transceivers and, indeed, some of the best performance figures I have measured over the last 20 years have been from Ten-Tec radios. They are also active in the professional market, and with the recent introduction of the RX340, a DSP receiver based on an earlier established design (RX331), I was particularly interested to see how such a 'Ferrari' of a receiver would compare with lesser mortals.

* *The Willows, Paice Lane, Medstead, Alton, Hants GU34 5PR.*

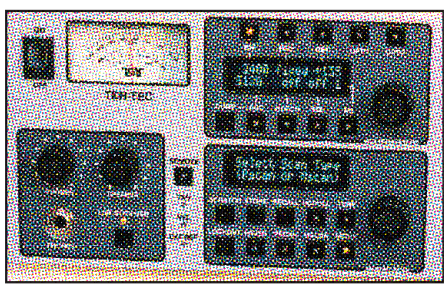
PRINCIPAL FEATURES

THE RX340 IS AN AC mains-powered receiver intended for 19-inch rack mounting with 3U height. It is not fitted with a desktop cabinet, but instead a functional well-shielded case with overall dimensions of 483 x 133 x 320mm (WHD) and with a weight of about 5.7kg. The receiver is specified from 50kHz to 30MHz, but does, in fact, tune down to 0kHz with degraded performance. Detection modes include AM, FM, CW, USB, LSB, ISB and synchronous AM. ISB allows both upper and lower sideband signals to be processed separately through to the audio output, and synchronous AM allows either the upper, lower or both sidebands to be used for counteracting interference or distortion.

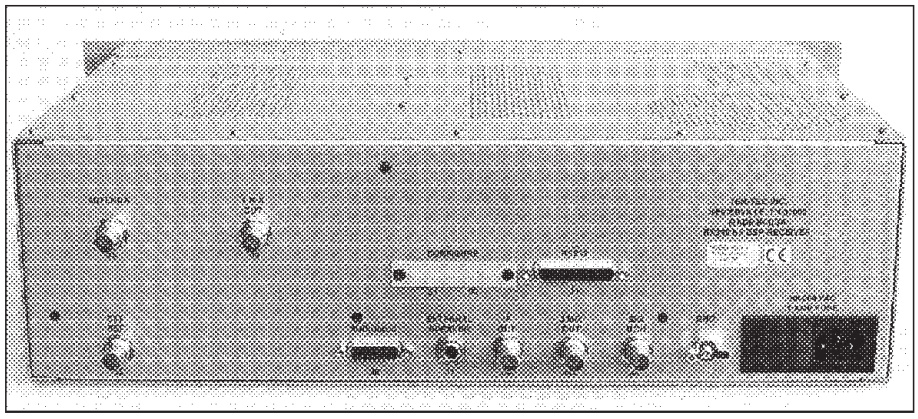
There are two main ways of setting the frequency from the front panel, either via a conventional rotary tuning knob or via a numeric keypad. There is no bandswitch, but the keypad is very quick and easy to use. Just key in the frequency to any number of digits, with or without decimal points, and press kHz or MHz. No 'enter' or 'select' keys are needed. The rotary tuning knob, at 50mm diameter, has a good feel and size and is nicely weighted.



The front panel hinges down to reveal the front panel CPU and control. Visible in the main body are the front end and DSP circuitry.



The uncluttered subsidiary displays and controls on the RX340.



The rear panel connectors.

It tunes in a variety of step sizes from 1Hz to 1MHz per step including 9kHz for the LF and MF broadcast bands. Any step size is selectable on any mode. However, there are only 42 steps per knob revolution, unlike many amateur transceivers, which have 1000 steps per revolution, and this means that tuning rates on SSB and CW can be rather slow or, alternatively, step sizes can be rather coarse. This is perhaps one area where amateur priorities differ from the commercial needs. In commercial usage, the keypad and remote operation are the normal methods of frequency control, the rotary knob being used primarily for fine tuning only.

All IF bandwidth functions are implemented by DSP and this provides 57 different bandwidth settings between 100Hz and 16kHz. These are available on all modes with some restrictions on FM, synchronous AM and ISB. In addition, for bandwidths between 200Hz and 4kHz, a 'fast filter' profile may be selected. This gives a flatter group delay characteristic for minimum distortion of signals in data modes, which are more critical in this respect. Passband tuning and a tunable notch are both provided over the range of ±2kHz in 5Hz steps and function on CW and SSB modes. A tunable BFO on CW allows the CW pitch to be set according to the operator's preferences, with both USB and LSB CW selectable by setting the BFO to positive or negative offsets as appropriate.

A switchable 10dB preamplifier and a 15dB attenuator are provided to accommodate different signal levels. There is a manual IF gain control and two audio volume controls, one for the speaker output and the other for the headphone output. Both speaker and headphones may be used simultaneously. There is an all-mode squelch, which is continuously adjustable to trigger at specific input levels from -140dBm to +10dBm, and an adjustable noise blanker is also included. An analogue signal level meter is provided calibrated directly in dBm and S units with S9 at -73dBm (50µV) and 6dB per S unit. The calibration is independent of the front-end preamplifier or attenuator setting.

The AGC system is switchable between slow, medium and fast settings, and there is a programmable setting where the attack, hang and decay times are adjustable over very wide limits. A 'dump' button instantly restores full receiver sensitivity, particularly applicable with slow AGC settings, when a very strong signal temporarily desensitises the receiver. This can also happen when certain front panel pushbuttons are pressed.

100 memories are provided storing frequency, mode and basic operating parameters, and some very comprehensive scanning features are included. There is a built-in test mode for carrying out self-diagnostic tests and a multi-drop RS-232 remote control interface is also fitted. Multiple receivers may be addressed on a single bus (capable of addressing up to 127 receivers) at speeds of up to 38,400 baud. Virtually every receiver parameter is remotely accessible.

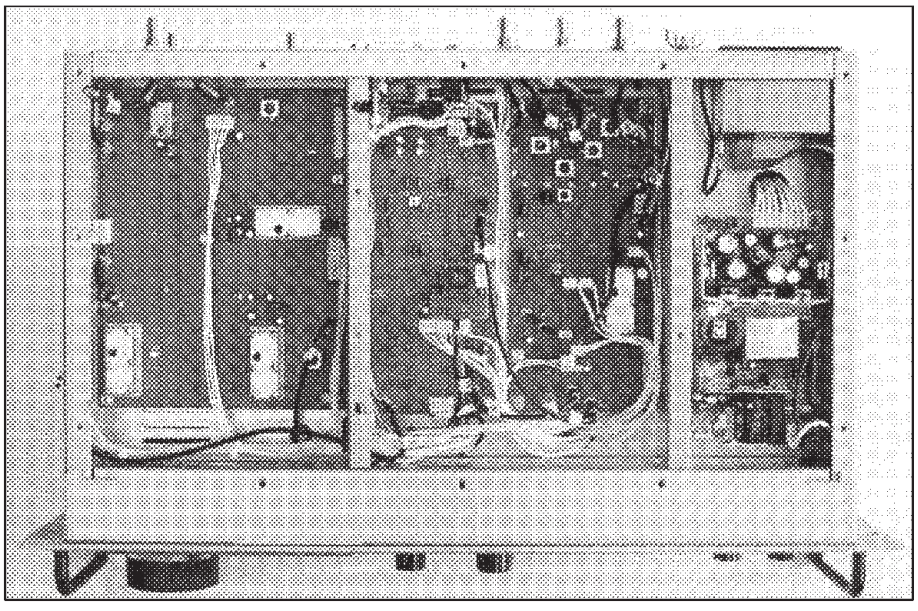
The frequency to a resolution of 1Hz, the mode and step size are continuously displayed on a blue fluorescent panel giving a bright and clear readout. Most of the remaining receiver functions are split into two groups on the front panel, and each of these groups has a number of pushbuttons, a rotary controller and a small fluorescent panel to display parameters as appropriate. The control functions are very logical, easy to use and well displayed. Overall, the front panel is well laid out and the ergonomics are excellent.

The receiver is provided with a substantial manual, which includes a full set of circuit diagrams, board layouts and parts lists. Operation of the receiver is well covered, together with technical descriptions and test procedures.

UNDER THE BONNET

THE RECEIVER uses a triple-conversion superhet architecture with IFs of 45.455MHz, 455kHz and 16.667kHz. Eight half-octave bandpass filters are used in the front-end, and a wide dynamic range is preserved by the use of high-level diode quad rings for the first and second mixers. High-level push-pull parallel FET amplifiers, each using six FETs, are used in the fixed preamplifier and first IF amplifiers. All channel selectivity functions, IF filter bandwidths, passband tuning, notch etc, are implemented by DSP at the 16.667kHz IF. The DSP also handles all demodulation and AGC shaping functions. The filters used in the first and second IFs are roofing filters with nominal bandwidths of 16kHz. The AGC is applied partly at the second IF (80dB control range) and partly accommodated within the DSP process (40dB range).

The receiver incorporates a temperature-compensated reference oscillator maintaining a frequency accuracy of 1ppm over the temperature range of 0 to 50°C, and it can also be locked against external



Underside view with the cover removed, showing the synthesiser, IF and PSU circuitry.

standards. The main frequency synthesiser is a triple-loop PLL. The local oscillator drive for the first mixer tunes in 1kHz steps from a single wide-range VCO. Smaller step sizes down to 1Hz are implemented either within the DSP or by shifting the local oscillator drive to the third mixer (it is not clear to me from the manual precisely how this is done). Hence the first and second IFs effectively move within their passbands by up to 1kHz. The Icom IC-720A used a related technique some 20 years ago.

The receiver is constructed on a number of printed circuit boards well screened and shielded on a multi-partitioned anodised aluminium chassis. Much filtering is in evidence, particularly on the outputs of the switched-mode power supply. The rear panel carries the usual connectors for antenna, external speaker, remote control and audio / auxiliary outputs and, in addition, there are monitor points at the outputs of the mixers and IFs used for signal and spectrum monitoring.

LABORATORY MEASUREMENTS

THE MEASURED performance results are shown in the table. The sensitivity is well maintained across the whole frequency range down to 50kHz and holds well at even lower frequencies. The AGC comes into action at quite low levels, at around 7dB SINAD with a fairly soft threshold. The S-meter calibration is within 3dB across the whole frequency and signal range and, between 1 and 20MHz, it is within about 1dB, a very accurate result. Primary image and IF rejection were better than 100dB, with the second IF image rejection at 90dB. There was a spurious response only 60dB down 200-250kHz away from the on-tune frequency, probably due to a spur on the first LO frequency synthesiser (a reference component within the PLL).

The main DSP channel filters had a superb characteristic. The tops were flat with no ripples and the 6:60dB shape factors were typically an incredible 1.3 or better over most of the bandwidth settings. The table shows the results of a representative selection. The third order intercept was in excess of +30dBm above 1.8MHz, corresponding to a dynamic range of over 100dB in SSB bandwidths. Below 1.8MHz, where the front-end filter switches to a low-pass design, the intercept and dynamic range reduced noticeably. The dynamic range figures hold well at close spacings down to the bandwidth of the IF roofing filters. However, when a strong signal falls inside the roofing filter bandwidth, ie within some 10kHz of the receive frequency, but outside the main DSP filter bandwidth, some AGC action occurs, reducing gain and sensitivity. This prevented meaningful close-in measurements from being made.

ON-THE-AIR PERFORMANCE

THE AREA WHERE the RX340 particularly excelled was in the reception of AM broadcast stations. This is certainly the finest receiver I have used for this purpose. The excellent selection of channel filters gave great flexibility in widening the bandwidth on strong transmissions to enjoy the audio quality or narrowing the bandwidth in difficult conditions for better readability. The synchronous AM mode was particularly impressive, with the ability to select the sideband; the audio quality was very high through the headphones or external outputs. The internal 4-inch speaker in the case top lacked bass and tended to resonate but, for a rack-mounted radio, this is not the normal output device. The receiver performed extremely well on receiving the time and data transmissions in the VLF part of the spectrum.

The results on SSB and CW were good, but this is also the field where amateur HF equipment is optimised so the difference between the RX340 and top-flight HF transceivers was not so great. The main plus points here are the excellent channel filters and high audio quality. Although the receiver was not used on data modes, the filters again will prove a key feature. The strong-signal handling was very good, although some desensitisation was noticed on strong close-in signals, as observed during the measurements.

CONCLUSIONS

THE RX340 IS AN EXCELLENT receiver for general and specialist HF use, excelling particularly with its filters and AM broadcast performance. Priced at £3995 through the UK agents Waters and Stanton PLC, it is aimed at the professional market although there are already quite a number in use by dedicated enthusiasts. ♦

TEN-TEC RX340 RECEIVER - MEASURED PERFORMANCE

SENSITIVITY SSB 10dB s+n:n

Frequency	Preamp in	Preamp out
20 kHz	0.32µV (-117dBm)	1.1µV (-106dBm)
50 kHz	0.22µV (-120dBm)	0.63µV (-111dBm)
100 kHz	0.20µV (-121dBm)	0.56µV (-112dBm)
500 kHz	0.16µV (-123dBm)	0.56µV (-112dBm)
1.5MHz	0.16µV (-123dBm)	0.56µV (-112dBm)
3.8MHz	0.20µV (-121dBm)	0.63µV (-111dBm)
7MHz	0.20µV (-121dBm)	0.70µV (-110dBm)
14MHz	0.18µV (-122dBm)	0.56µV (-112dBm)
21MHz	0.20µV (-121dBm)	0.70µV (-110dBm)
28MHz	0.20µV (-121dBm)	0.63µV (-111dBm)

AM sensitivity (28MHz): 1.3µV for 10dB s+n:n at 30% mod depth
FM sensitivity (28MHz): 0.4µV for 12dB SINAD 3kHz peak deviation
AGC threshold and control range: see text
AGC attack time: approx 4ms
AGC decay time: 30-40ms (fast), 400-700ms (med), 2-3s (slow)
Maximum audio before clipping: 1.5W into 4Ω at 10% distortion
Inband intermodulation products: -45dB to -55dB

Filter	IF Bandwidth -6dB	-60dB
16 kHz	16.3kHz	21.2kHz
10.4kHz	10.9kHz	15.8kHz
6 kHz	6.3kHz	8.6kHz
3.2kHz	3.6kHz	4.0kHz
2.4kHz	2.5kHz	3.3kHz
1 kHz	1.0kHz	1.2kHz
500 Hz	510 Hz	605 Hz
300 Hz	310 Hz	415 Hz
100 Hz	110 Hz	190 Hz

INTERMODULATION (50kHz tone spacing)

	Preamp in		Preamp out	
Frequency	3rd order intercept	2-tone dynamic range	3rd order intercept	2-tone dynamic range
500 kHz	+11dBm	96dB	+15dBm	91dB
1.5MHz	+10dBm	95dB	+12dBm	89dB
2.0MHz	+18dBm	99dB	+35dBm	104dB
3.8MHz	+18dBm	99dB	+35dBm	104dB
7MHz	+18dBm	99dB	+33dBm	102dB
14MHz	+15dBm	98dB	+30dBm	101dB
21MHz	+16dBm	98dB	+30dBm	100dB
28MHz	+15dBm	97dB	+29dBm	100dB

Frequency offset	Reciprocal mixing for 3dB noise	Blocking preamp in	Blocking preamp out	3rd order intercept preamp out
3kHz	see text	see text	see text	see text
5kHz	see text	see text	see text	see text
10kHz	see text	see text	see text	see text
15kHz	86dB	+2dBm	>+6dBm	+33dBm
20kHz	89dB	+2dBm	>+6dBm	+33dBm
30kHz	94dB	+2dBm	>+6dBm	+33dBm
50kHz	101dB	+2dBm	>+6dBm	+33dBm
100kHz	109dB	+2dBm	>+6dBm	+33dBm
200kHz	115dB	+2dBm	>+6dBm	+33dBm

NOTE: All signal input voltages given as PD across antenna terminal. Unless stated otherwise, all measurements made on SSB with receiver preamp switched out and bandwidth setting of 2400Hz.

in practice

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LOSSES FROM HIGH SWR

INSTEAD OF USING a remote ATU for my antenna down the garden, like you described in December 2000, can I use low-loss coax and an ATU in the shack? I know the losses will be higher, due to the high SWR on the coax, but where is the break-even point?

WE'RE OFTEN TOLD that coax should be operated at low SWR because the additional losses on a mismatched line are much greater - but we also know that a short length of coax is a good way to bring open-wire feedline indoors, almost regardless of the SWR ('In Practice', August 2000). So how much length can we use, and how high an SWR can we tolerate, without the losses becoming unacceptable? To make the questions clear, we're comparing the difference between **Fig 1(a)** and **Fig 1(b)**, which all comes down to the location of the matching unit - in the shack or out at the antenna. How many decibels will it cost us to have the matching unit conveniently in the shack?

Words alone can't answer this question. We need to look at each situation individually, and see what the numbers say. The relevant equation was not hard to track down: it relates the total power loss L_T to the matched line loss L_M and the reflection coefficient, ρ (rho). You may recall from earlier columns that the magnitude of ρ (written as $|\rho|$) varies from 0 for a perfect match, up to 1 for complete reflection. $|\rho|$ is also the quantity that your 'SWR' meter actually measures - the meter would be scaled linearly from 0 to 1 for $|\rho|$, and the conventional non-linear SWR scale is actually computing the relationship:

$$SWR = \frac{1+|\rho|}{1-|\rho|} \text{ so that}$$

$$|\rho| = \frac{SWR-1}{SWR+1}$$

If a is the matched loss, L_M, converted from decibels into a power ratio,

$$a = 10^{\frac{L_M}{10}}$$

the total power loss, L_T, is given by:

$$L_T = 10\log_{10}\left(\frac{a^2-|\rho|^2}{a(1-|\rho|^2)}\right)$$

The 'mismatch loss', L_S, due to the non-zero SWR is simply:

$$L_S = L_T - L_M \text{ dB} \qquad [1]$$

The only virtue in deliberately operating a coax line at high SWR is its multiband capability, but since the matched loss L_M will increase with frequency, it needs a little thought to present this information in a useful way. In the end I used an *Excel* spreadsheet to generate two sets of graphs, one for RG213 coax as a reference, and one for any other type of transmission line - including open-wire.

Fig 2 applies only to RG213, and shows a series of graphs of 'mismatch loss', L_S, for 3m, 10m and 30m lengths. Three separate graphs are required because, under mismatched conditions, the loss is not simply proportional to the length (as it would be if the line were perfectly matched). Each graph is a family of curves showing L_S against frequency, for different values of SWR. The first thing you notice is that if the SWR is low, the additional mismatch loss, L_S, is low under all circumstances. For moderate values of SWR, around 5 - 10, L_S remains fairly low unless the line is very long, in which case the loss starts to creep up on the higher HF bands. This confirms G6XN's dictum that all you really need from a multiband antenna is a 'tendency to match' [2]. In other words, so long as the antenna impedance is not too high or low, you can feed the antenna with low-loss coax for convenience, and do the final match to 50Ω in the shack. This is an ideal role for the built-in ATUs in modern transceivers, which are not capable of wide-range impedance matching but are usually quite comfortable with moderate SWR values.

However, if the SWR is high *and also* the line is long, we're in very different territory. The losses increase alarmingly, even with RG213 which is normally regarded by HF users as 'low-loss coax'. Even down at 1.8MHz, where the matched line loss is least, SWRs greater than about 10 are pretty intolerable for long runs of RG213. Up at 28MHz, more than half your transmitted and received signal power is disappearing in the cable. Changing to a low-loss hardline such as LDF4-50 improves the situation somewhat, but it's not a cure-all. The results for RG213 in Fig 2 should be enough to confirm that thinner and lossier coax such as RG58 should never be operated at a high SWR!

As you may already have gathered, these calculations are not restricted to coaxial lines - they apply equally to open-wire and ribbon cables. Data on the matched losses of these lines are harder to find than for coax, and the losses probably depend on the weather, because water collects on the spacers [3]. **Fig 3(a)** is for 30m of typical 450Ω 'window line' which, under ideal conditions, may have lower loss than large

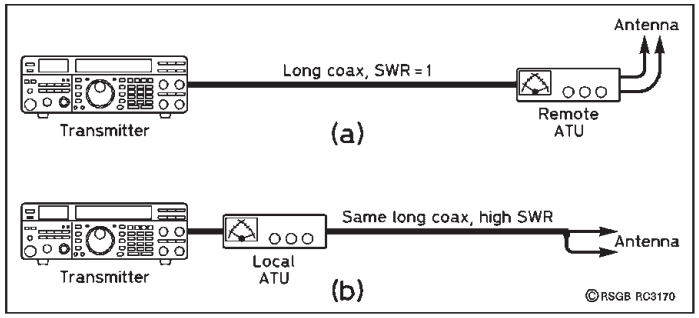

Fig 1: (a) Remote ATU with coax operated at SWR = 1, (b) ATU in shack, with coax operated at high SWR. This article is about the additional loss in the coax for (b) relative to (a).

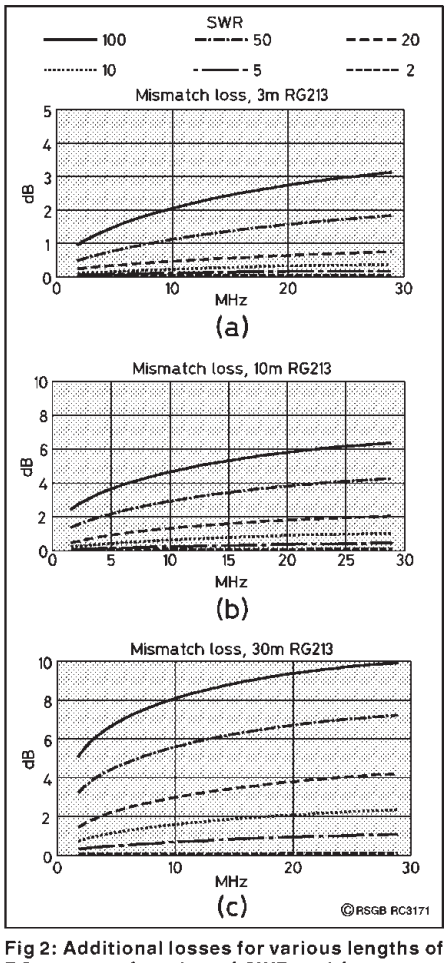

Fig 2: Additional losses for various lengths of RG213, as a function of SWR and frequency.

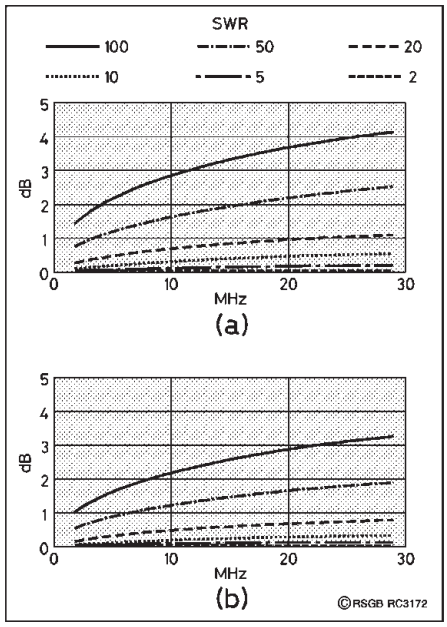

Fig 3: Additional losses for 30m of (a) typical 450Ω 'window' line, and (b) high-quality 600Ω open-wire.

coaxial hardline. This is because of its much higher impedance, which means that the power is transmitted at lower currents, so the I^2R losses are greatly reduced. If the insulation on the wires is thin, and there are few spacers where rainwater and dirt can collect, the dielectric loss can also be very low. Taking these principles to their practical limit, **Fig 3(b)** is for wide-spaced 600Ω line made from heavy copper wire with very few spacers. But even top-quality open-wire line has significant additional losses under the worst combinations of high frequency and high SWR - and open-wire almost inevitably *will* be operated at a high SWR.

I'd like to close with one simple generalisation to cover the whole subject - but I can't, because there are too many different factors involved. In particular, it's up to you to decide how much loss you're prepared to tolerate for the convenience of using coax and having the matching network in the shack. If you can, download the *Excel* spreadsheet from the 'In Practice' website (see 'WWW.' below) and plug in your own numbers for line length and SWR. The graphs in the spreadsheets will update automatically. There are separate pages for RG213 and 'generic' lines including open-wire, and notes with the spreadsheet explain how to change the type of line. You'll learn much more by playing with the numbers yourself!

STRIPPING ENAMELLED WIRE

HOW DO I strip the enamel off very fine wire?

MODERN ENAMEL COATINGS for wires are far more advanced than the old-fashioned brown varnish and/or silk. The most common type of enamelled wire for general electronic work uses polyurethane-nylon coatings which are easy to identify by their bright colours - most often pink. These can be stripped without scraping because they are 'self-fluxing'. Simply dip the end into molten solder, and it comes out stripped and tinned in a single operation. This works even for stranded litz wire.

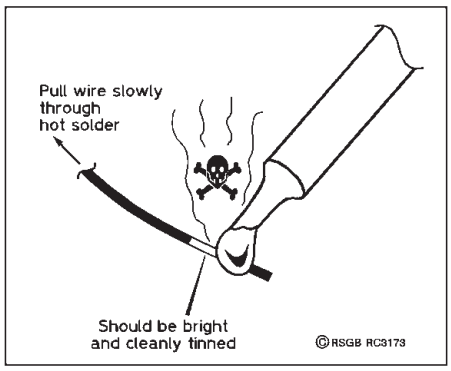

Fig 4: Stripping and tinning 'self-fluxing' enamelled wire using a soldering iron. Wait for the enamel to disappear in smoke - and don't breathe the toxic fumes.

A heated solder pot is the preferred way to do this, but for fine wire you can often manage with a large blob of solder on the tip of the iron (**Fig 4**). However, the tip temperature may need to be rather higher than usual, preferably 400°C rather than the more normal 300 - 350°C used for routine wiring work. Be patient, and wait until the enamel bubbles up, darkens and disappears in smoke, leaving the wire brightly tinned with solder. Do take care to avoid the toxic fumes from the enamel - at the very least, use an old computer fan to blow the fumes away from you, and make sure the room is well ventilated.

Another warning: don't try to solder 'self-fluxing' enamelled wire directly on to a PCB pad or terminal tag. You're most likely to end up with a bad joint, or to damage the other components by overheating. Strip and tin the wire end separately first, and then connect it up.

WHAT SOLDERING IRON?

I'M FED-UP with cheap and nasty soldering irons, and want to buy a better one. What do you recommend?

WELL DONE - you've realised that your 10-quid 25W mains iron is making easy jobs difficult. A 'real' soldering iron has interchangeable tips and variable tip temperature, so that the same iron can cover all kinds of jobs from delicate SMD up to soldering sheet metal or PL259 plugs. There are many irons that meet this specification, at a widely varying prices. I've had good experience over many years with the Weller 24V range, so those are the ones I generally recommend. The best value for money is the 45W TCP range. I've included the stock codes and prices from Farnell Components (0870 1200 200, and see 'WWW.' below) but all the following are available from a number of dealers.

- TCP Iron, 415-522, £37.11 (includes one fairly small bit for general use).
- Power unit - you can save a lot here, because it's only a 24V 2A transformer in a box with a mains lead, a switch, and a 3-pin Bulgin socket which you can eliminate if necessary.
- Stand with sponge pad, 454-734, £9.83.

Then you need a range of interchangeable tips (all at £2.17 each):

- For SMD: PT-O7, 416-654.
- General light wiring: PT-AA7, 416-290 (included with iron).
- Power wiring, tin boxes etc: PT-C7, 800-510.
- The Brute - biggest and hottest available: PTDD-9, 903-978.

Ouch - I don't dare to add all that together, and then add the VAT! However, you won't ever regret having it, and will be able to buy individual spares indefinitely. A friend who has been licensed over 50 years has just invested in this kit, and wishes he'd done it decades ago!

Tip: to make a smaller iron perform like a big one for 'heavy metal' soldering, pre-heat the work with a DIYer's hot-air gun.

NOTES AND REFERENCES

[1] This definition of 'mismatch loss' does not include the reflection loss due to the mismatch itself, because we're assuming there is always a matching network at one end of the line or the other. L_S is the *additional* loss if the matching network is at the transmitter end, causing the line to operate at a higher SWR. The current and voltage maxima of the standing waves lead to higher I^2R and V^2 / R losses than the optimum case where there are no standing waves - or at high power levels these maxima may ultimately lead to local overheating or voltage breakdown. Overheating of coax is almost always due to skin-effect losses on the inner conductor, which then heats the dielectric and everything else.

[2] *HF Antennas for All Locations*, by Les Moxon, G6XN (RSGB Shop).

[3] *The ARRL Antenna Book*, recent editions (RSGB Shop).

WWW.

Line loss spreadsheet **www.ifwtech.com/g3sek/in-prac**

Farnell Components **www.farnell.co.uk**

(if using this website, omit the hyphens in all stock codes).

The 'In Practice' website (see the previous page) contains a cumulative index from 1994-2001, and links to component suppliers, etc. ♦

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 answer questions through this column only, so they need to be on topics of general interest.

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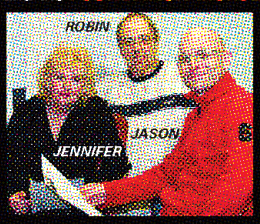

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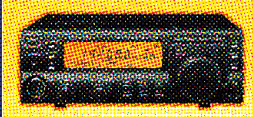

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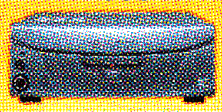

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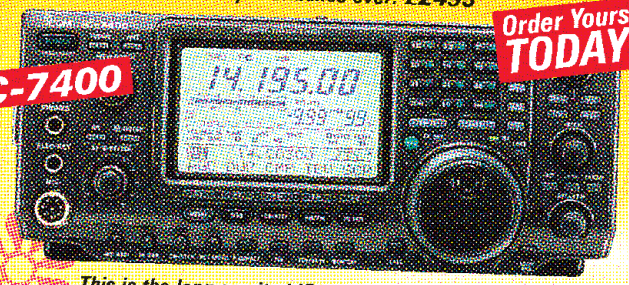

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national science week

'PICSAT': a Satellite Demonstrator

By Andy Russell, G0VRM * and Luke Church †

TO MOST people, setting up an amateur radio station to operate routinely through packet satellites sounds at best challenging and, in the worst case, expensive. However, a project being run successfully at a secondary school in Hull is doing just that and going one stage further by designing and building their own working 'satellite'.

The 'satellite' is a working model being used to introduce the PIC microcontroller into the 'Electronics Products' GCSE course at St Mary's College, Hull. It is based conceptually on the systems of the APRS satellite, PCsat, and makes use of two PIC microcontrollers and analogue components already covered in the curriculum. Its purpose is to transmit data on the performance of its solar cells and batteries in a format compatible with the APRS packet radio network, thus allowing the experiment to be monitored by the students from home via the Internet.

An amateur radio satellite ground station will be set up at the school and operated by students during National Science Week, which runs from 8 to 17 March. This will enable the students to track and monitor PCsat in orbit, and try their hand at sending and receiving greetings messages using PCsat and the packet transponder on the International Space Station (ISS). These provide opportunities to introduce amateur radio as a viable medium for science and technology to an audience of future engineers, scientists and potential radio amateurs.

GCSE students at work at St Mary's College, engaged in the task of measuring the voltage developed by the solar cells of 'PICSAT'.

* 126 Boothferry Road, Hessle, E Yorkshire HU13 9AX. E-mail: g0vrm@rsgb.org.uk
† St Mary's College, Cranbrook Avenue, Kingston-upon-Hull HU6 7TN. E-mail: luke_church@hotmail.com

THE BEGINNINGS

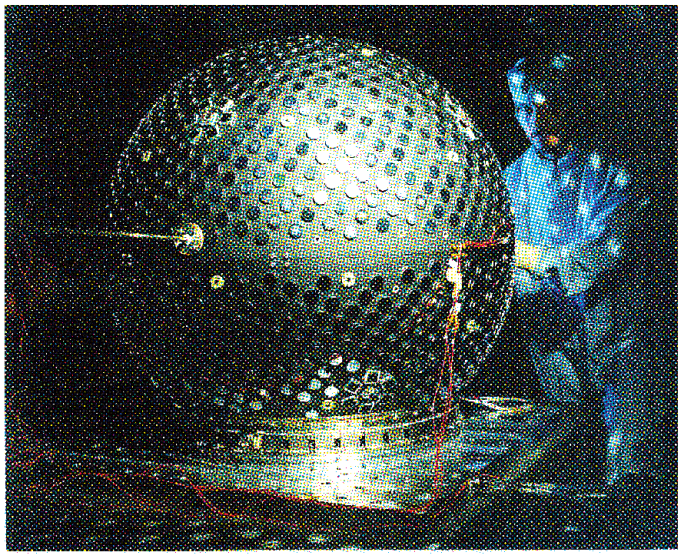
THE PROJECT BEGAN as a discussion between the two authors, a sixth former at St Mary's College in Hull, and an engineer from BAe Systems, already working with the school as part of 'Ambassadors in Schools' - a scheme designed to promote engineering within schools. The starting point was a question on how information could be obtained on satellite design to assist with a project to construct a Space Mission Simulator, a project linked with the Hungarian Astronautics Society Magyar Asztronautikai Társaság - MANT.

This question did not remain unanswered for very long, as one author had been busy investigating the workings of PCsat in readiness for its launch. It is of relatively simple design, and technical information is publicly available from the Internet. Furthermore, telemetry data can be easily obtained using simple equipment and its format is again well documented. Access to this live data was considered to be an extremely valuable asset for the development of the Space Mission Simulator.

Following further discussions with the school, it was agreed that a project to design a working satellite model would make an excellent education liaison project, encompassing many disciplines relevant to the curriculum (eg system design, telecommunications, electronics, physics, information technology and project management), and also include technical challenges suitable for the age ranges involved (14- and15-year-olds).

The satellite is based conceptually on the design of PCsat and supported by observations from it. It is the first satellite to be launched which is dedicated to serving the Automatic Position Reporting System (see the sidebar).

Probably the first questions that come to mind are: what exactly is APRS, and, how can something as complex as the internal workings of a satellite be simplified so that it can be explained to and understood by the target audience of electronics students? The sidebar helps to



The satellite Starshine before its launch, showing some of the 1500 mirrors (polished by students world-wide) designed to reflect the sun's light. Also shown are the clusters of solar cells which power the on-board electronics.

answer these questions. [Readers are also reminded of the article 'APRS - An Introduction', featured in the December 2000 *RadCom*, p18 - *Ed*]

PCSAT

PCSAT, OR the ***Personal Communications*** satellite, was designed and built by Midshipmen at the US Naval Academy, Annapolis, Maryland, under the supervision of retired US Navy Commander Bob Bruninga, WB4APR, the inventor of APRS, with the primary mission of extending this network to the far corners of the globe.

This is fulfilled by providing a digipeater that can be operated by remote handheld and mobile radio users. Its secondary use is to downlink packets directly onto the US APRS frequency – this is restricted to authorised 'special events' such as the recent US Navy/Army football run, where the position of the ball is relayed via satellite.

Despite world events, it was successfully launched at 0240UTC on 30 September 2001 from Kodiak in Alaska, after several abortive attempts due to technical difficulties (not least the weather!). It was successfully deployed into a low-earth orbit at an altitude of 500 miles with an inclination of 67.1°, providing a footprint of approximately 5,000 square miles. On the same launch was Starshine, a NASA-sponsored project to provide a visible satellite that could be tracked by students – the mirrors being polished by schools worldwide (see the photo).

PCsat differs from previous amateur satellite experiments in that it was designed to operate with a world-wide network of stations linked via the terrestrial APRS network. During the early days of its life, a 'Launch Information Network' of volunteer ground stations was set up to assist the Naval Academy ground station by relaying signal reports and captured telemetry data.

One notable feature of PCsat is an onboard GPS receiver that will be used to enable ground stations to determine its availability without having to resort to satellite tracking software, although it may not be routinely enabled due to the significant amount of the available power it consumes. It also has an LED array used to dissipate excess electrical power – these high-brightness red LEDs may be switched on during a night-time pass to make PCsat visible from earth with a pair of binoculars.

USING PCSAT

PCSAT IS PROBABLY one of the easiest of the amateur radio satellites through which to operate; anyone who has worked the packet transponder on the Space Shuttle, MIR or the International Space Station (ISS) has already made the first step and has the necessary experience and equipment.

PCsat can work exclusively on the 2m satellite allocation, where the effects of the satellite's Doppler shift and the ionosphere (such as Faraday rotation) are less pronounced than on higher frequencies. It is based on standard packet radio hardware and was designed with the mobile or handheld user in mind; hence it can be used without having to resort to the large antenna arrays and azimuth-elevation rotators normally associated with satellite operation.

It operates by simply retransmitting any packet that it successfully decodes containing, within the path, either its own call sign (`W3ADO-1` on 2m) or the generic alias `APRSAT`. It substitutes the call sign `W3ADO-1*`, indicating that the packet has been digipeated. Although it has an onboard mailbox and stores emergency status bulletins, it does not normally operate in 'store-and-forward' mode.

However, there are far more features available than just this simple 2m digipeater. The original design catered for the requirements of two user networks: a network of low-power handheld transceivers operating on 148.825MHz at 1200 baud; also a network of mobile transceivers and base stations with higher powers and antenna gains in their favour, using uplinks of 435.250MHz and downlinks of 145.825MHz at 9600 baud.

Table 1 shows some of the possible routes through the system, selected by using the appropriate path. For example, **XBAUD** allows a cross-baud contact to be made between the 9600 baud and 1200 baud networks – useful if the 2m uplink channel is busy.

Transmitter	Power	Uplink	Path	Downlink	Receiver
Handheld (TH-D7)	5W	145.825MHz 1200 baud	APRSAT W3ADO-1*	145.825MHz 1200 baud	Handheld (TH-D7)
			XBAUD W3ADO-2*	145.825MHz 9600 baud	Mobile (TM-D700)
Mobile (TM-D700)	50W	435.250MHz 9600 baud	APRSAT W3ADO-2*	145.825MHz 9600 baud	Mobile (TM-D700)
			XBAUD PCSAT-2*	145.825MHz 1200 baud	Handheld (TH-D7)
Base Station	50W	435.250MHz 9600 baud	XBAUD W3ADO-1*	145.825MHz 1200 baud	Handheld (TH-D7)
			APRSAT W3ADO-2*	145.825MHz 9600 baud	Mobile (TM-D700)
Legacy Packet	50W	145.825MHz 1200 baud	APRSAT W3ADO-1*	145.825MHz 1200 baud	Legacy Packet

Table 1: Available routes through PCsat's digipeater, selected by using the appropriate path.

To avoid conflict due to over-use, it is essential that the current operating procedures are followed, these are posted on the PCsat website and are frequently updated. A rule of thumb for base stations is to aim to get your APRS position/status report relayed through the satellite *once only* during its pass - leaving time for others.

PCSAT HARDWARE

THE PRIMARY and secondary missions of PCsat are performed by duplicate systems, as shown in **Fig 1**, made up of two Kantronics KPC-9612+ packet controllers operating independently. Full use is made of the available radio ports of the KPC-9612+, one being configured to operate at 1200 baud (normal AFSK) and the other at 9600 baud (G3RUH-compatible frequency-shift keying).

System 'A' is dedicated to the primary mission of extending the APRS network operating on the ITU satellite allocation of 145.825MHz, whereas System 'B' is used

WHAT IS APRS?

THE AUTOMATIC Position Reporting System (APRS) is a system designed to relay messages such as position reports, status information, one-line text messages, weather information and a whole series of other items in real-time using packet radio as the transmission medium.

Packet radio operates digitally by breaking down the messages to be sent into segments called 'packets', each encapsulating the original message, together with additional information such as the addresses of the sender and receiver, routing information, data flow and error-correction information. The resulting data stream is converted into a pair of audio tones, representing the binary '0's and '1's, which are then frequency-modulated onto a carrier (the process being known as Audio Frequency Shift Keying – AFSK).

APRS messages are simply 'broadcast' onto a network, subsequently to be received, decoded and checked for errors by the recipient. This method does not use the usual back-and-forth coordination to ensure complete transmission of the message, it is simply repeated several times.

To extend the range of transmission beyond normal line-of-sight reception, **digital repeaters** (digipeaters or 'digis' for short) are set up to relay any packet they hear which contains a generic routing address. This network has grown over recent years, so that it now extends almost nation-wide. In those areas served by an Internet Gateway (IGate), the coverage is extended continent-wide.

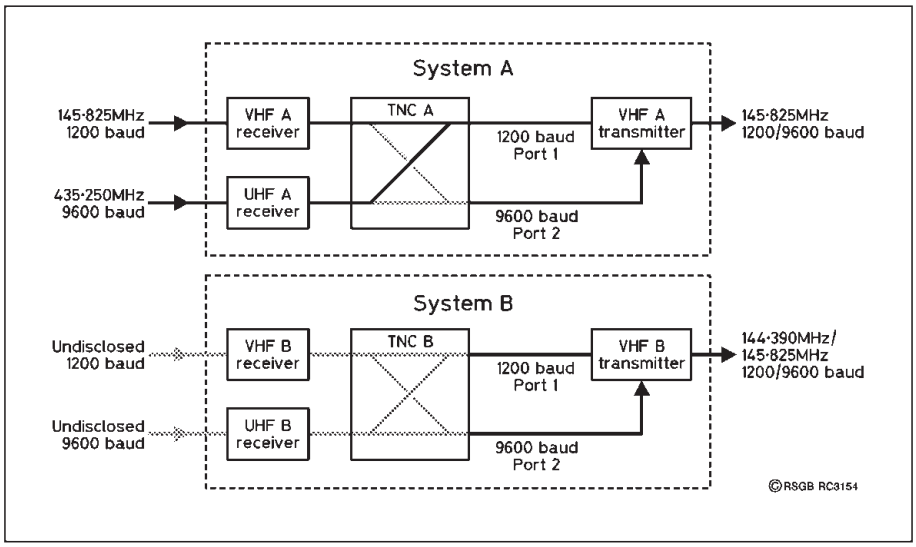


Fig 1: PCsat's duplicate radio systems based on the Kantronics KPC-9612+ packet controller, satisfying the requirements of both world-wide digipeater coverage and linking into the US APRS network.

to downlink reports from 'Special Events' onto the US APRS frequency of 144.390MHz, little used outside of the US and Australia.

Under low-power conditions, the systems are automatically switched into 'Safe Mode', sharing the batteries, cross-connecting the downlink transmitters and switching to 145.825MHz. This configuration ensures that the satellite can be recovered from a failure of one of the transmitters by reconfiguring it to operate in a limited capacity. Similarly, all four of the receivers are active, allowing an uplink to be made in the event of one of the receivers failing.

REMOTE CONTROL AND TELEMETRY

ALL THE FUNCTIONS of interfacing to the mission electronics and the acquisition and transmission of the system data are performed entirely by existing features of the Kantronics KPC-9612+ packet controller, which supports remote control and telemetry.

Commands sent to the packet controller from the ground station are used to switch digital outputs on and off remotely. These output lines control the various systems of the satellite and also report back their current status. The telemetry circuits are responsible for remotely measuring the conditions of the on-board systems using transducers built into the satellite power systems allowing these currents, voltages and temperatures to be measured. However as the Kantronics KPC-9612+ has only four available analogue inputs, these must be multiplexed (switched) and transmitted in sequence.

Telemetry packets (**Fig 2**) are normally transmitted automatically at one-minute intervals so, over a four-minute period, an assessment of the status of all the systems can be made. However, to gain a further insight into the detailed operation, it is perhaps a good idea to read the relevant portions of the manual, downloadable from the Kantronics website as an Adobe Acrobat pdf file.

Software to convert the raw transmitted data into meaningful units that can be displayed and logged has been written by Roger Barker and is available either as a stand-alone application or as a plug-in for *UI-View32*.

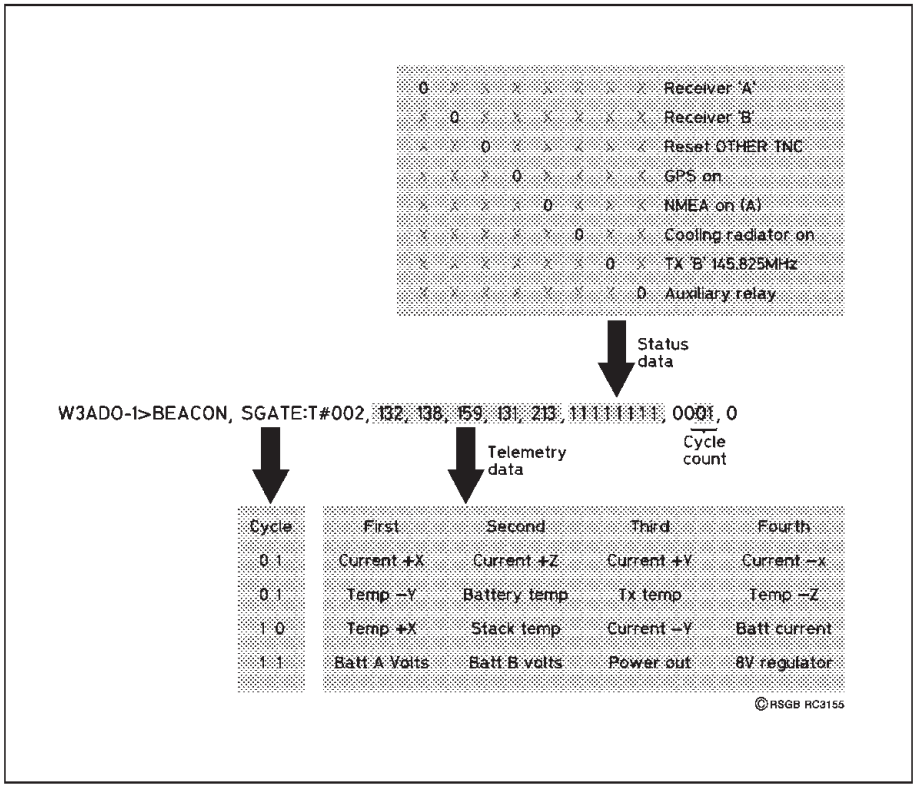


Fig 2: De-scrambling a typical PCsat telemetry packet shows the measured data from its onboard systems, the status and sequence number.

STARSHINE 3

THE STARSHINE SATELLITES are part of an all-volunteer project, with headquarters in Monument, Colorado, to measure the effects of atmospheric drag, a phenomenon causing the orbits of all low-earth-orbit satellites to decay, the satellites eventually burning up in the earth's atmosphere. The satellite is designed to be tracked by students world-wide, and consists of a hollow aluminium sphere covered in small reflective mirrors (see the photo) designed to catch the sun, the 1500 or so required for each satellite being polished by schools around the world.

Starshine 3 was launched aboard the same Kodiak Star mission as PCsat. The launch vehicle deployed PCsat (and two other payloads) at an altitude of 500 miles and then finally descended to approximately 300 miles to deploy Starshine 3.

The solar cells visible on the surface of Starshine 3 are used to power a telemetry system, transmitting packets on the performance of the integrated solar cells and lithium batteries at one-minute intervals at 9600 baud on 145.825MHz, the same frequency as the PCsat downlink.

To allow the participants to predict when Starshine 3 sightings are likely to occur, on-line predictions (complete with star charts), customised for any location, are available from Heavens-Above, a website specialising in visible sightings of satellites. Little else was known by the authors about the internal workings of the Starshine telemetry circuits at the time of launch; this has since been published on the web and is based surprisingly on the PIC 16F876 microcontroller, the detailed operation being beyond the understanding of the student audience.

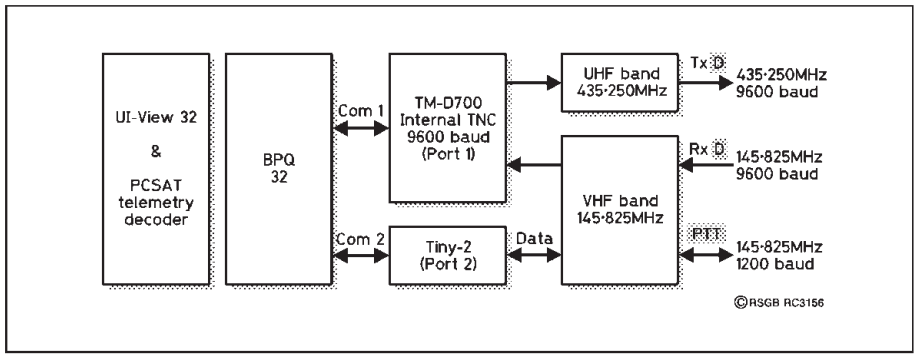


Fig 3: The author's configuration, allowing simultaneous monitoring and operation at both 1200 and 9600 baud, using one Kenwood TM-D700E dual-band transceiver.

GROUND STATION

THE AUTHOR'S ground station was hastily set up to monitor PCsat's 1200-baud telemetry during the weeks before the scheduled launch, making use of a Kenwood TM-D700E dual-band transceiver which could be operated either with the shack computer (using *UI-View 32*) or simply left to monitor the activity using its internal APRS terminal.

As the interest broadened to include the students, it was felt that the ability to monitor both the 1200- and 9600-baud VHF downlinks from PCsat simultaneously would be useful to the project (also enabling Starshine 3 to be monitored). After several days of experimenting with Kenwood's Memory Control Program (MCP-D700), a configuration was eventually found where its internal TNC could be persuaded to operate in a mode where 9600-baud data are received on the VHF band and transmitted on the UHF band - the auxiliary data input socket on the transceiver body being active only on the selected band. **Fig 3** illustrates the system.

With the Kenwood TM-D700E configured to operate at 9600 baud, all that was required was to connect a 1200-baud Tiny-2 into the auxiliary socket. The final configuration was done on the shack computer, setting up *BPQ-32* to enable *UI-View 32* to communicate with both the TNCs operating on their own COM ports.

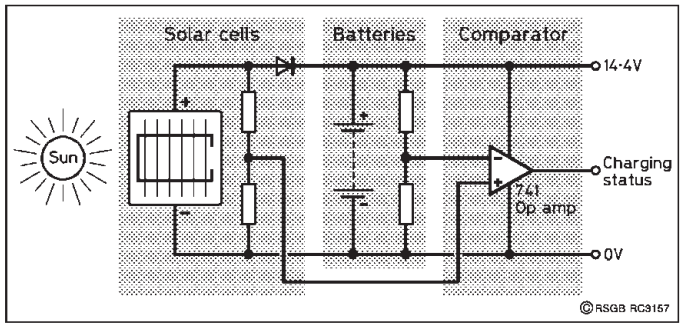


Fig 4: Simplified telemetry circuit designed and built by the students to determine if the solar cells are supplying charging current to the NiCd batteries aboard 'PICSAT'.

'PICSAT'

GOING BACK to our theme of education, the students were given a presentation outlining the Kodiak Star mission and its payloads, PCsat and Starshine. They were asked to consider what rigours the payloads would have to endure from launch to deployment and in what environment they would eventually operate. They were presented with the challenge of designing their own working satellite model over the coming months, based on the material covered in their GCSE Electronics coursework.

The group, many of whom had not encountered the PIC microcontroller before, were surprised to find out that such a small component as an 18-pin chip could be programmed in the classroom to handle the complex functions they were talking about and were surprised when shown the TAPR PIC Encoder (PIC-E) circuit, assembled and programmed (in 'C') by the authors, transmitting APRS position reports from a GPS onto a laptop.

Their first step, which defines the direction of their project, was to establish the mission that their model should perform. The following represent some of the less zany (and therefore more achievable) suggestions:

- Measuring and reporting the environmental conditions.
- Measuring and reporting the satellite's position with GPS equipment.
- Sending a greetings message in Morse code using LEDs (surprised us!).
- Taking pictures using a digital camera (although no thought was given to the complexities of transmitting the images).

All their suggestions could be suitably simplified, and achieved easily in the classroom environment using the PIC. An example is a circuit, used to provide an indication to the system that the batteries are being charged by the solar cells, shown in **Fig 4**.

In operation, when the solar cell voltage is greater than the battery voltage, the current generated is used to charge the batteries – the diode in the circuit both prevents the batteries from discharging back through the solar panel and provides a measurable voltage drop. The voltages are scaled down using potential dividers and then compared by the operational amplifier, providing an input for the PIC. Similar comparator circuits using a Zener diode may be used to indicate if the batteries are fully charged or near full discharge – the appropriate action is programmed by the students, such as shutting down the system.

'PICSAT' will use two PIC 16F84 microcontrollers, one being used continuously to control the satellite and to monitor the status of the solar cells, on-board battery voltages, temperatures etc, outputting data in the form of serial data. This part will be designed, built and programmed by the students. The PIC encoder and a low-power 433MHz module will handle the complexities of encoding and transmitting the serial data into APRS-compatible packets which are then filtered and gated onto the APRS network.

Thanks to the APRS network, the students are able to display telemetry data from PCsat, Starshine and 'PICSAT' at home on their computers - without needing any radio equipment! This is done by using *Alogger*, a read-only Internet APRS client designed to log selected packets to disc, and written by Bill Diaz, KC9XG. This can be downloaded from the Starshine website.

To conclude the project, a simplified version of the Space Mission Simulator will be set up in the classroom, using incandescent lamps and a time switch to simulate the cycling from daylight to darkness - the eventual aim of their completed satellite being to endure the rigours of the MANT Space Mission Simulator. ♦

WWW.

PCSAT	http://web.ew.usna.edu/~bruninga/pcsat.html
User contract	http://web.ew.usna.edu/~bruninga/pcsat/contract.txt
KPC-9612+ User Guide	www.kantronics.com
UI-View	www.packetradio.org.uk
Starshine	www.azinet.com/starshine/
Heavens-Above	www.heavens-above.com/
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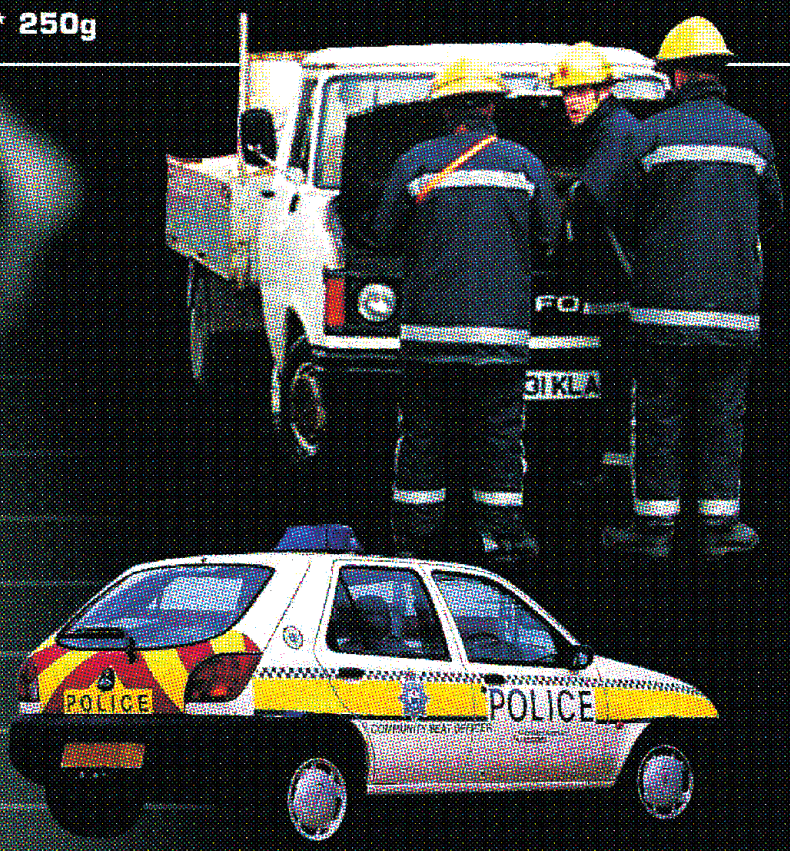

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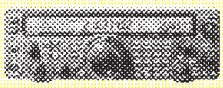
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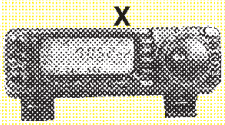
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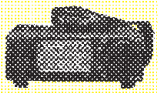
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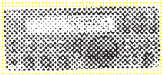
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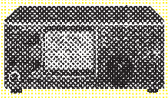
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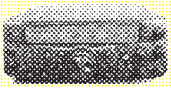
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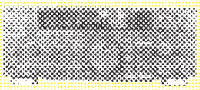
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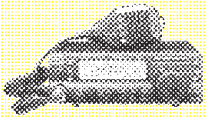
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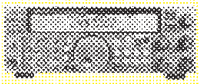
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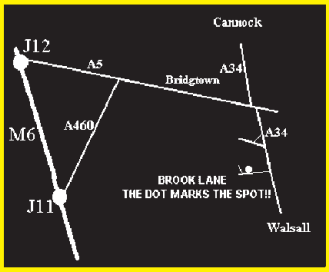

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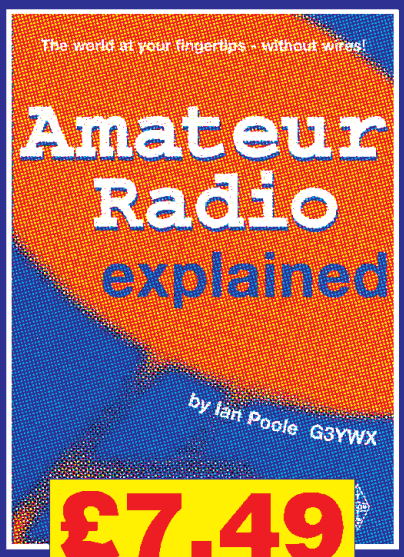

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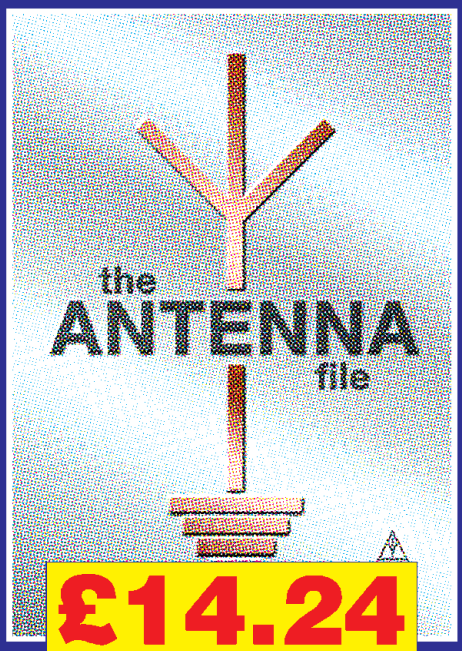

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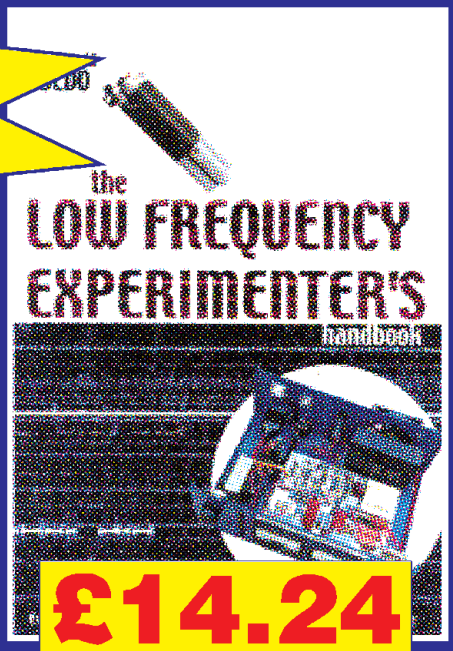

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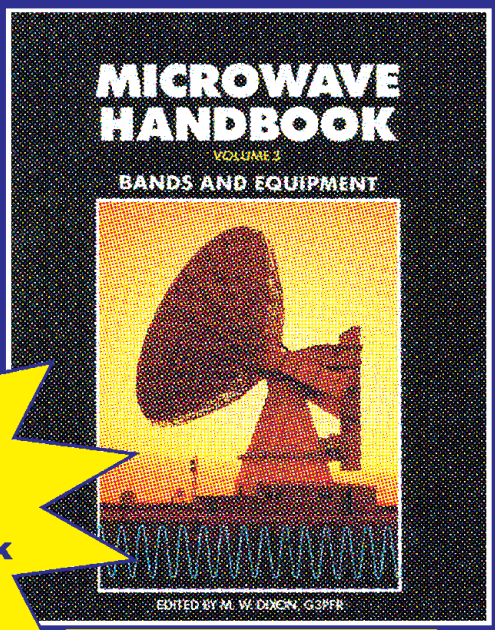

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Technical Topics

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VALVES & VALVE AMPLIFIERS

AS WE APPROACH the centenaries of first the 1904 Fleming diode (utilising the Edison effect of 1895) - and then the 1905 de Forest triode (avoiding the question of whether de Forest understood the real potential of his grid or regarded this as a means of defeating the Fleming patents), we can but marvel at the way in which the thermionic valve has remained an important contribution to radio communications for more than 50 years after the introduction of the transistor.

The RF power valve still remains the popular choice for high-power linear amplifiers. Triode-pentode valves such as the ECL80, ECL82 or the higher rather higher-power ECL86/6GW8 remain valid approaches for simple one-valve QRP rigs. The ECL86/6GW8 (anode dissipation 9W) can, as G4QK explained in 'TT' (December 1996, see also *Technical Topics Scrapbook*, 1995-1999, p130), be run in Class C at up to 25W DC input, making a very serviceable one-valve, two-stage, CW transmitter.

Fig 1 shows a recent circuit diagram of such a 3.5/7MHz 'Harass' transmitter based on the 6GW8 valve (the American equivalent of the ECL86) from the 'World of Ideas' column by Dave Ingram, K4TWJ (*CQ Amateur Radio*, November 2001, p54), based on details supplied by Mike Zane, N6ZW. The maximum DC rating of the anode (plate) is 500V but, even with the 200-300V used by N6ZW, there should be no difficulty in obtaining some 5 to 7.5W RF output (10W DC input). As shown, the transmitter is 'rock-bound' to the crystal frequency, but there seems no reason why some flexibility should not be obtained by adding a VXO such as that shown in **Fig 2**, reproduced from a short article by PA0LH in the Dutch *Electron* (January 2002, p42). The output could be plugged into the crystal socket of the one-valve transmitter. The PSU used by N6ZW has a 115VAC 1:1 transformer with a voltage-doubling arrangement and a separate 115:6.3V 0.5A (0.75A would be better) heater transformer. For 230VAC, any arrangement providing, say, 300V at about 40mA and 6.3V at 0.75A could be used (provided it is isolated from the mains supply).

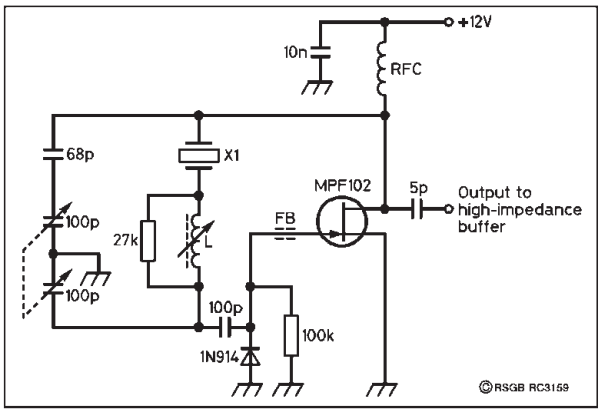

Fig 2: VXO circuit attributed to W7ZOI/W1FB that could be used with the 1-valve ECL86 transmitter. A wider variation of frequency would be possible using a ceramic resonator rather than a quartz crystal. (Source *Electron*)

The same issue of *CQ* also has a detailed article by Mike Bryce, WB8VGE, on restoring the Heathkit HW-101 SSB transceiver for which some 40,000 kits were sold (many in the UK). Also in the 'Radio Classics' column by Joe Veros, N4OB, a survey of such post-war valve equipment as the Collins 75A receiver and 32V-2 transmitter as well as equipment by Drake, (TR3), National (NC-300), and the Hunter Cyclemaster 20A (not well known in the UK) with its Collins-type permeability tuning. Altogether, there seems to be quite a revival of interest in valve equipment originally developed in the 1930s, 1940s and 1950s. Perhaps the computer fraternity has written off valves too soon - my PC spellchecker does not recognise such words as thermionic, tetrode, pentode, hexode etc, although it accepts triode and, of course, diode with its solid-state connection.

Electrically, valves tend to be more rugged than transistors, but they do tend, over the years, to lose emission. Although, as noted by Peter Chadwick, G3RZP, in the February 'TT', it is remarkable how many 50- or 60-year-old valves still function efficiently - and furthermore, most popular types are still available with a little searching as NOS (new old stock) replacements. On the other hand, many of the much later linear ICs etc of the 1970s and 1980s are already no longer available!

'TT' has described several times how the life of high-cost directly-heated RF power valves with thoriated-tungsten filaments can be extended by very careful control of the filament voltage, initially slightly under-running, then nominal voltage, and finally slightly over-running (see Fig 1, p53 of 'TT', May 2000). It is, however, most important to note that this trick does not apply to *indirectly*-heated metal-oxide-cathode valves. This, plus other important points on valve practice are described by Tom Rauch, W8JI, in the 'Hints & Kinks' column of *QST* (September 2001, p63).

He writes: "One should *never under any circumstances* reduce the filament voltage of an indirectly-heated tube below the manufacturer's minimum recommended operating voltage. Any reduction below that point in a metal-oxide-cathode (MOX) tube can 'poison' the cathode and permanently damage the tube. [It is worth remembering that, with any high-consumption heater or filament, the AC voltage should be measured directly at the valve socket, after the heater/filament has reached its operating temperature, to avoid errors due to the voltage-drop in the leads - *G3VA*].

"Secondly, MOX cathode tubes can re-

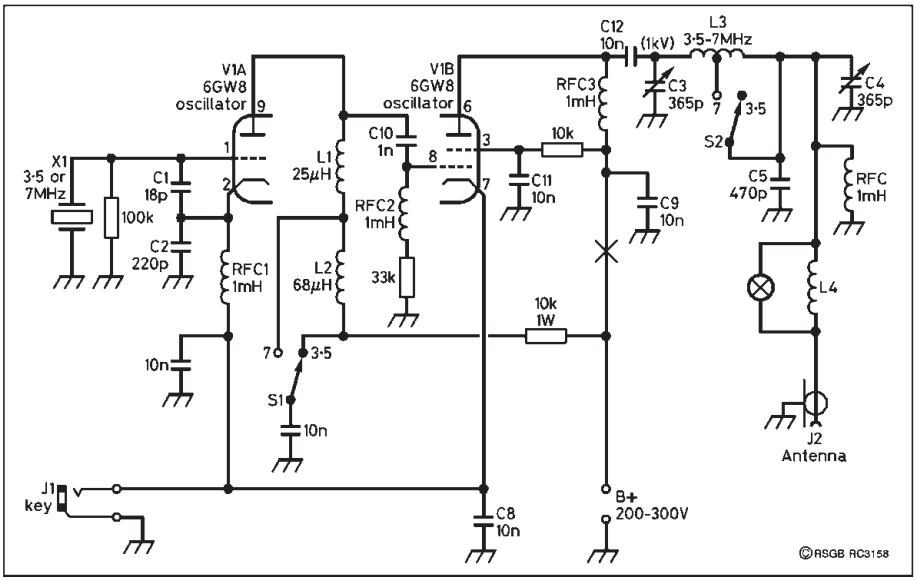

Fig1: Circuit diagram of the 'Harass' two-stage, single-valve CW transmitter. Intended for use on the 3.5 or 7MHz bands, it can be easily modified for use on 10MHz. A pilot lamp or small 50 or 100mA meter can be inserted at point 'X' to monitor PA input current which should be around 30mA with 250 or 300VDC. (Source *CQ*)

quire inrush limiting and are sometimes as much or more susceptible to damage than directly-heated tubes. The indirectly-heated cathode has a long thermal lag, causing heater areas in closer contact to the cathode to remain cold for a long time, while areas further away from the cathode instantly heat. This causes hot spots in the heater, where resistance and heater dissipation is much higher than normal. The problem is not the same as in directly-heated tubes, where the filament can mechanically distort and short to the grid, but rather one of reduced heater life from opening of the heater.

"Some indirectly-heated tubes with larger cathodes, like the 3CPX5000 or its little brother, the 8877, have a tendency to maintain high starting current for a very long time, until the heater temperature equalises along its length.

"One of the best guarantees of proper inrush performance is to *not* use 'overkill' filament transformers, chokes and wiring. Use the minimum size components necessary, and you will have built-in filament-inrush protection. Many amplifiers, such as the SB-series Heathkits, the Ameritron series with separate transformers, and so on, have no problem with inrush, despite not having a filament step-start. Transformer and component resistances limit inrush current without external circuits. It is true that amplifiers using filament windings on large high-voltage transformers are begging for problems unless a step-start is added."

In drawing attention to earlier dubious advice given in 'Hints & Kinks', July 2001, W8JI stresses that: "It is unwise randomly to modify amplifiers based on folklore and popular opinion unless we thoroughly understand what we are really doing... Reducing filament voltage can reduce tube life as well as the emission quality in linear modes. In amateur service, there are very few (if any) tube failures due to voltage-correctable emission life of the tube, unless the filament or heater is operated *above* or *below* its rated voltage."

METERING HIGH-POWER VALVE AMPLIFIERS

BRIAN HORSFALL, G3GKG, raises a topic that has long been debated among those who build or use high-power linear valve amplifiers with their HT supplies often exceeding 1500V. Recently, he was taken to task by several 'Cassandras' regarding his use of an *anode* current meter in his home-built power amplifier, as opposed to a 'safer' cathode current meter. He writes: "I was informed by several participants in our 7.1MHz group that it is not safe to use any meter in the HT positive line of a valve amplifier, especially with a voltage of 1.5kV

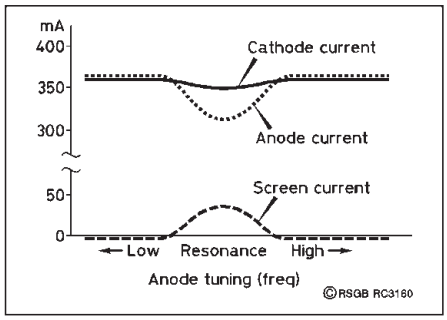

Fig 3: G3GKG believes that an anode current meter used in a high power tetrode/pentode linear amplifier provides a convenient means of tuning a pi-network tank for optimum RF loading. This facility would not be available with a 'safer' cathode-current meter.

or so. Now, apart from having been doing just that in my various amplifiers for over 50 years, without experiencing any of the 'explosive' results that were forecast, I *do* have at least one good argument in support of this supposedly-lamentable practice.

"My amplifier uses a pair of 4CX250B (tetrode) valves in Class AB1 with separate, stabilised voltages for both grid 1 and grid 2, each feed incorporating its own current meter (the grid 1 meter is used only to set the maximum drive to just below the point where grid current is produced). With the PA keyed up but no drive applied, grid 2 current is a couple of mA *negative*. As RF drive (two-tone, to grid 1) is increased, screen current initially goes more negative and then swings rapidly positive, and shows a sharp peak at resonance. The current can be very high if the loading is too light. As the loading is increased (by *reducing* the capacitance of 'C2' in the pi-tank), the actual reading at the peak reduces and eventually coincides with the published data when loading is correct, ie when RF output is at maximum.

"With full drive applied and correct loading, the situation on tuning through resonance is as shown in **Fig 3**. The value of the peak screen current is slightly less than the value in mA of the anode current dip.

"A hypothetical *cathode* current meter (the 'safe' option) would show a barely discernible dip. With lighter loading both the peak in the screen current and the anode current dip are more pronounced but always tend nearly to cancel each other, leading to a similar, very flat cathode current curve at resonance. It is clear that the screen current meter is by far the most sensitive and discriminating indication of both loading and resonance, that the anode current meter augments the information, while a cathode current meter would be virtually useless for either purpose.

"I realise that most valve linears these days employ triodes in the ubiquitous grounded-grid configuration and that these are also usually driven into considerable grid current. As I have no experience of this approach, I have no knowledge of what happens to this 'negative' current on tuning through resonance. (Nor, even more, what happens to the individual grid currents when multi-grid valves are strapped as triodes in this application - only that the *control* grid of such valves as the 4CX250 can easily be destroyed by *excessive* grid 1 current, rendering it unsuitable for such use.) The fact remains that, even here, a cathode current meter does *not* provide the same amount of information as an anode current meter.

"If anyone can come up with a practical way of subtracting all the individual currents at electrodes other than the anode from the cathode current reading (apart from complicated analogue or digital computing techniques) I might just be persuaded to mend my ways!"

THE FUTURE – PROBLEMS OR CHALLENGES?

THERE CAN BE little doubt that, viewed technically, amateur radio is facing future problems almost as serious as those that faced the hobby in the late 1940s and early 1950s when the national spread of VHF 405-line television and the consequent TVI from virtually unscreened HF transmitters, radiating harmonics up to or beyond 100MHz, threatened to close down the bulk of on-air activity. The problem was tackled energetically by a number of mostly-professional engineers who showed how harmonic radiation could be greatly reduced. I recall the early designs by the late Louis Varney, G5RV, the RSGB booklet *Transmitter Interference*, and a more exhaustive treatment in booklet form by Philip Rand, W1DBM, of the Rand Corporation. See, for example, **Fig 4**, and dozens of useful contributions in the amateur radio journals and magazines. In the UK, the adoption of UHF for terrestrial television broadcasting eased the problem, although semiconductors proved more easily overloaded than valves. By then, however, the earlier work by dedicated amateurs had shown that TVI could be successfully tackled, even with VHF TV broadcasting, with both home-built and factory-built transmitters. TVI is still with us, but no longer the hobby-threatening prospect it seemed in the late 1940s.

ULTRA-WIDE BAND COMMUNICATION

A new millennium is bringing new problems and new regulations that some believe could gravely affect traditional amateur radio. The threat of Power Line Transmission (PLT) has not gone away despite the expressed fears not only of amateurs but also of broadcasters and military communicators that this is likely to produce damagingly high levels of interference throughout the LF/MF/HF spectrum. A

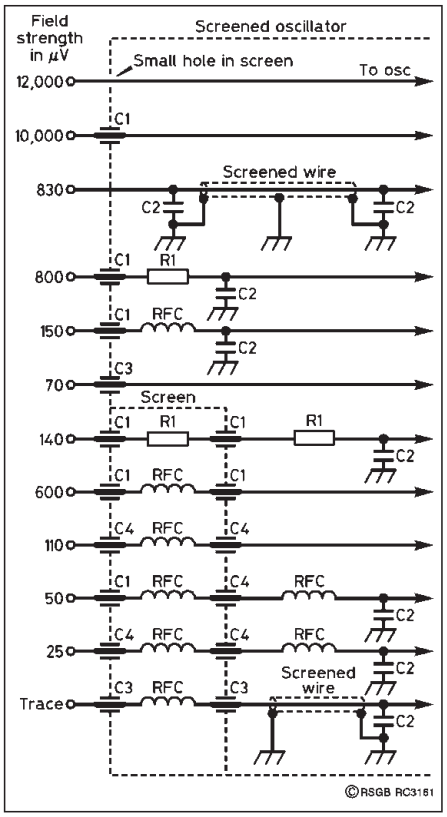

Fig 4: A historic comparison of filtering arrangements when leads emerge from a screen 80MHz transmitter enclosure, as published in the late 1940s by Philip Rand, W1DBM, in the early efforts to minimise the impact of TVI on amateur radio. It still provides a useful guide to effective RF filtering. The 1940s component data given by W1DBM:

R1	1kΩ carbon
RFC	Ohmite Z-50
C1	75pF feedthrough ceramic
C2	5nF disc ceramic
C3	10nF Sprague high-pass
C4	5nF feedthrough ceramic.

lesser, but still significant, problem seems to be emerging with what is termed Ultra-Wide Band (UWB) communication, intended to permit data transfer rates up to several hundred Mbit/s.

An article "New Problems for Amateur Radio?" by David A Pilley, VK2AYD (*Amateur Radio,* August, 2001, p17), has been compiled from a report by Dr H Cuno, DL2CH (*CQ-DL* 6/2001) on a Workshop held by the German Telecommunication Authorities in March 2001. UWB apparently is a modulation method where a low-power transmitter produces a signal of extreme bandwidth. UWB transmitters produce very short pulses of only 0.5ns, radiating the signals through wideband antennas. The intended output level is between 1mW and 20μW but, even with this small amount of power, the energy produced during the duration of the pulse is quite high. The transmission rate of the pulses is controlled by a random generator; the resulting signal can spread over the entire spectrum. Modulation may be AM, pulse-position or by reversing the polarity of the pulses.

Apparently in the USA, the FCC has already set the maximum allowable values for this type of emission. But, VK2AYD reports, "Even applying very strict rules, one problem still persists - the level of noise generated will be far above the galactic noise level. Due to the large bandwidth, it will be impossible to spare any frequency range".

The British Radiocommunications Agency has conducted its own investigation, but the results are not known yet. Radio astronomers and the European Air Traffic Control Authority are strongly against this new mode. A permanent increase in noise level would make their work very difficult. At the Workshop, the other participating groups announced that they could live with UWB. DL2CH, as a participant at the Workshop, raised the question whether the Amateur Radio Service could participate in the investigation; this was rejected, the Workshop being limited to ten participating groups. It was acknowledged that the Amateur Service would hold the same position as the radio astronomers and Eurocontrol.

It would appear that, unlike the more serious PLT threat, UWB would tend to be largely confined to the UHF spectrum. According to the July 2001 *QST,* the ARRL has joined a coalition to give further study to UWB. It is accepted that the new technology could offer significant benefits to data communications, but it has not yet received adequate investigation as to its interference potential, with concerns on its effects not only on the amateur service and radio astronomy, but also on GPS etc. The coalition proposes that the system should be restricted to systems above 6GHz.

THE 'e'-MARK FOR MOBILES

Following the publication of the 'TT' item 'The New EC 'e'-Mark for Mobiles' (January 2002, 0p71), the editor received an e-mail from Terry Beadman, M1BKQ, the Certification and Inspection Manager of MIRA. MIRA is one of the few UK-appointed Technical Services for the EC Directive 95/54/EC. The letter was carried in the 'Last Word' of February's *RadCom.*

M1BKQ does not dispute the main details of the Directive as set out in the Radiocommunications Agency document summarised in 'TT', other than that he is aware of radio equipment (presumably professional rather than amateur) that complies with the directive.

Terry Beadman writes: "Only the Technical Services appointed by the UK's Vehicle Certification Agency can provide correct advice on the directive. The RA is not the expert on automotive matters." He lists as facts: "The RA has been aware of this directive since 1995. Meetings occurred between RA, DoT, VCA, and MIRA throughout 1995/6 to discuss and agree interpretations. It was referred to in MPT 1362 1997 with an explanation of its requirements."

Terry Beadman stresses that "Any equipment fitted to a modern motor vehicle may affect its safe operation; this has to include amateur equipment. This despite the modern vehicle already meeting the most stringent EMC specifications, significantly higher than industrial and even higher than any ETSI standards for radio equipment. The automotive approval of any equipment is to ensure that road safety is not affected when the equipment is fitted to a vehicle. UK law from 1995 took all equipment intended for vehicle use out of 89/336/EEC and effectively identified that the CE mark was not the correct compliance mark (see UK SI 1995:3180)."

He concludes: "I do not believe that this directive will stop [mobile] amateur radio, but it will require better understanding and control of vehicle installations by all concerned. An explanation of the vehicle EMC legislation can be found on the website www.mira.uk/certification"

Nobody would disagree with making safety a priority for all mobile installations, but the EC Directive would seem to rule out any further technical investigations or experimentation with mobile installations (amateur or professional) with new vehicles manufactured after October this year.

Hilary Claytonsmith, G4JKS, Chairman of the RSGB EMC Committee comments that the current position notified by the Department of Transport states: "Even though we have given six years for everyone to prepare for the implementation of the Directive, it has recently become evident that this has not happened. In response to representations we intend to modify the construction and use regulations to:

1. allow vehicles first used before October 2002 to be exempt from the Directive;
2. allow the continued fitting of 'legacy' equipment (equipment first sold before October 2002) to continue to be used even in new vehicles.

"The effect of this will be to allow continued use of old equipment in both old and new vehicles. From October 2002, any new equipment and new vehicles will be up to the new EU standard.

"It should be noted, however, that this position is subject to consultation by the Department of Transport before it is confirmed, and it may be amended before it becomes UK law."

Hilary further comments that the Committee is working with the RA to establish the scope of the new Directive in respect of amateur radio. It is hoped that this will result

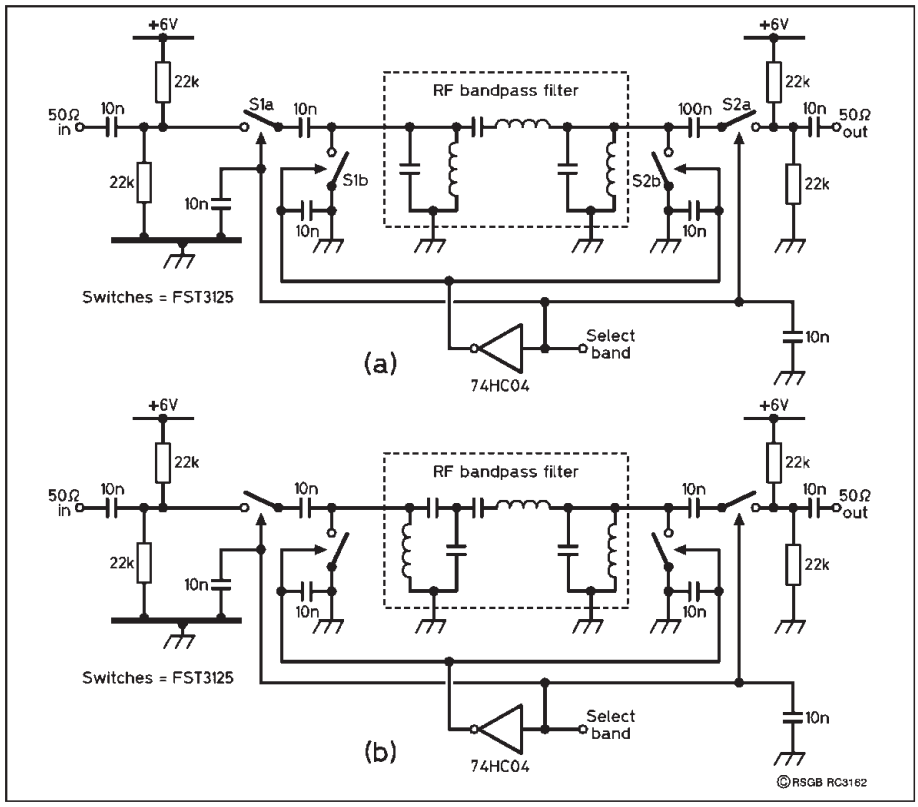

Fig 5: I7SWX's amended diagram (Fig 4 of the December 2001 'TT') of the use of fast bus switches such as the SMD FST3125 or equivalent, would reduce switch attenuation compared with diode switching of front-end filters. (b) Shows the use of capacitors to ground the filter without involving direct current surges. For details see December 2001 'TT' and this month's text.

in some form of code of practice of use to amateurs, and also possibly including exemption from aspects of the Directive for amateur radio equipment.

FOLLOW-UP ON RF IC SWITCHING

GIAN-CARLO MODA, I7SWX/F5VGU, in a follow-up to his comments on the use of fast bus IC switches ('TT' December 2001, pp62-64), regrets that his original circuit diagrams (Fig 4) contained errors. These omitted biasing resistors, though he believes that they could work as shown due to resistive leakage of capacitors: **Fig 5** is the amended diagram.

He provides additional comments stemming from Peter Rhodes, G3XJP, who e-mailed: "I received my *RadCom* yesterday and read with interest your piece in 'TT'. By amazing coincidence last week I completed a 9-way switch for my transceiver front-end using FST3125 devices. A conversation with Bill Carver, W7AAZ, showed that he used the FST3126 to ground the unused filters. This is very convenient since you can mount a 3126 on top of a 3125, with one going to the RF bus-bar and the other going to an earthed bus-bar (saves the inverter). It also seems the best layout to have a little box of filter input switches – and another little box of filter output switches rather than distributing the switches around the filter band. Each 'little box' has nine switched coax leads, one common coax, nine band-select lines, +5V and 0V/ground. It works well. Most important, it still works well on transmit when there are many volts of RF. I also plan to use these devices for low-level T/R switching. They *are* available (very cheap!) from Farnell. I have not made any measurements yet on the switches as I am in the middle of designing/breadboarding a completely new DSP transceiver. I cannot source good switching diodes any more at acceptable prices, so these FST devices *have* to work!"

I7SWX provides **Fig 6**, showing a filter switching arrangement using both the FST3125 (normally open) and the FST3126 (normally closed).

He agrees that this type of approach is more likely to appeal to the remaining minority of amateurs building their own advanced transceivers than to those who would like to modify their factory-built rigs. He feels sure, however, that those who, like himself, are prepared to risk putting their hands in their black boxes will be rewarded with equipment performance that the commercial manufacturers may rarely or never equal. If the quad switch is seen as complicated to use, he suggests we could use single fast bus switches that are smaller than diodes. Although these will increase the cost slightly, they might make modifying commercial equipment much easier at a very reasonable cost.

I7SWX has received several e-mails from 'TT' readers asking for a 'proper part number' for these components, as they are finding it difficult to buy them. He gives the following list covering different manufacturers: *Fairchild* FST3125 (normally open) and FST3126 (normally closed). *Texas Instruments* SN74CBT3125D and SN74CBT3126D. *IDT* 74FST3125 and 74FST3126. *Pericom* PI5C3125Q-ND and PI5C3126Q-ND. All these fast bus switches are for 5V Vcc (max 7V Vcc). There are also equivalent switches for 3.3V (max 4.6V) which provide even faster enabling and disabling (about half the switching time of the 5V types) and nearly-zero capacitance switching times, but less than ideal for large-signal applications (max 3V p-p), example *Pericom* PI3B3125Q-ND, PI3B3126Q-ND. A single FET bus switch is the *Texas Instruments* SN74CBT1G125DBVR in a 5-pin TSSOP package. ♦

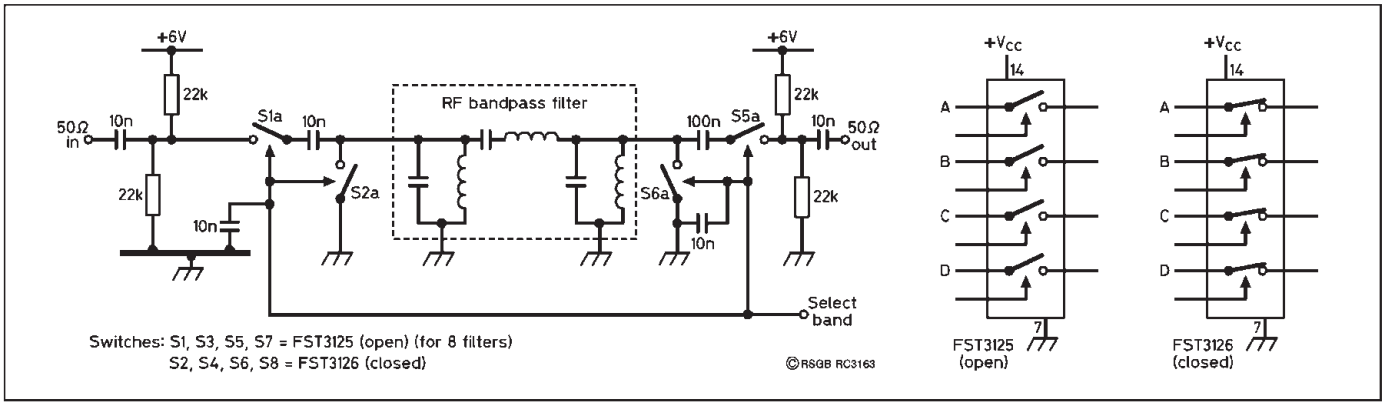

Fig 6: Filter switching arrangement based on combinations of normally-open and normally-closed fast bus-switching IC devices.

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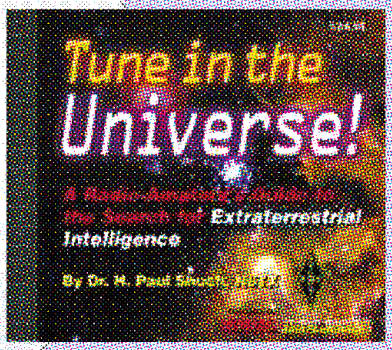

Are we alone in the Universe? Are the stars teeming with intelligent life, or does human civilization exist in absolute solitude? Either alternative has profound implications for the future of humanity. Scientists throughout the world are working to answer this question—and Amateur Radio can play a vital role.

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Essentials of the Communications Revolution
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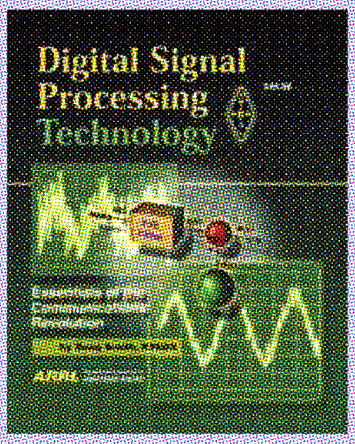

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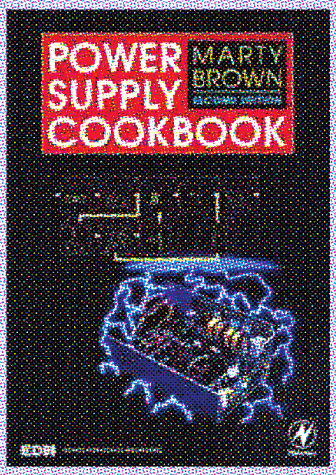
2nd edition
By Marty Brown



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* 8 Ohms
* Power rating 1.5W
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* Adjustable mobile mount
* Size 97 x 67 x 27mm
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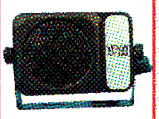

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* 8 Ohms
* Power rating 1.5W
* 3m of lead
* Fitted 3.5mm mono jack plug
* Adjustable mobile mount
* Size 97 x 67 x 27mm
* Weight 165g (approx)

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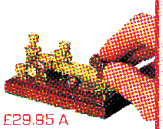

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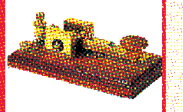

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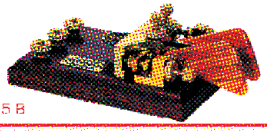

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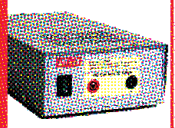

£79.95 B

* Output Voltage 13.8V DC
* Output 20A Continuous
* Over voltage & over current protected
* CE & LVD Approval
* Switch Mode
* Front set terminals
* Front Panel Switch
* Supply 230V AC 50Hz
* Size 135 x 65 x 270mm
* Weight 1.3kg

W-40SM 40A 3-15V Digital Display

£149.95 C

* Output Voltage 3 - 15V DC
* Output Current 40A (60A peak)
* Ripple noise: 10mV
* Over current protected
* Digital AV Readout
* Variable voltage control
* Supply 230V AC 50Hz
* Size 220 x 110 x 300mm
* Weight 3.5kg approx.

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* DC - 500MHz
* SO-239 sockets
* Thru power rating of 400W
* Insertion loss < 0.1dB

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Coax Connector Kit

£49.95 B

Kit comprises:
2 x N plugs
2 x N sockets
2 x BNC plugs
2 x BNC sockets
2 x PL259 plugs
2 x SO239 sockets
2 x SMA plugs
2 x SMA sockets
2 x Mini UHF plugs
2 x mini UHF sockets
2 x TNC sockets
2 x TNC plugs
6 x interconnectors

WSC-3 Case

£12.95 A

This case is designed for the new range of miniature handhelds such as the FT-50R and the Icom IC-Q7E.

The construction and finish is similar to the WSC-2 described above.

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QS-400 Mobile Mount

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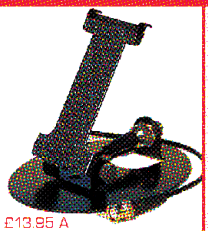
This mount clips on to the dash grille and the sprung fingers and bottom support hold any size of handheld firmly in place. What is more, the handheld can immediately be removed as when necessary. The angle of this mount is adjustable.

QS-300 Base Mount



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Ideal for using any handheld or scanner as a base station. Measures approx. 150 x 110 x 160mm and comes with BNC lead to attach to handheld and SO-239 socket for external aerial. The tilt and rotation angle are fully adjustable.

WHX-7000 Dual Band

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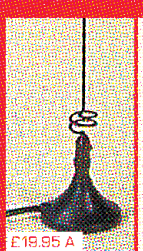
* Tx: 144 & 430MHz
* Rx: Tx bands only
* 10W Max power handling
* 21cm long
* BNC fitting

WSM-270 Mini-Mag



£19.95 A

* Tx 144-146 & 430-440MHz
* 2.15dBi, 6.15dBi.
* 50W max
* Micro magnetic 29mm base
* Element length 0.46m
* 2.75m mini coax with BNC

Base Plate for 3/8th Ants

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* 4 x 15.24cm spikes
* Standard 3/8in socket
* 5m coax & PL259
* Provision for radials
* Two handles

WMM-3401-38 Maxi Triple Mag

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The WMM-3401-38 'Maxi' Triple Magnetic Mount comprises 3 x 127mm magnetic mounts and accepts 3/8in stud mount antennas. The WMM3401-38 version has 3/8in socket. Supplied with 5m of coax cable. Super adhesion.

WMM-3401-23 Maxi Triple Mag

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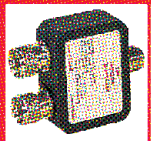
WD-25 Duplexer

£24.95 A

* 1.3 - 35MHz 500W
* 50 - 225MHz 300W
* 350 - 540MHz 300W
* Insertion loss 0.2dB
* VSWR <1.2
* SO-239 Sockets
* Wall or mast mounting
* Mast size 58mm
* 98 x 35 x 70mm

WD-24 Duplexer



£22.95 A

This has the same specification as the WD-25, but is designed for indoor use only. Fitted common port SO-239 socket and dual port PL-259 plugs.

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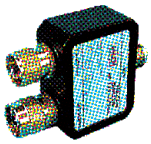

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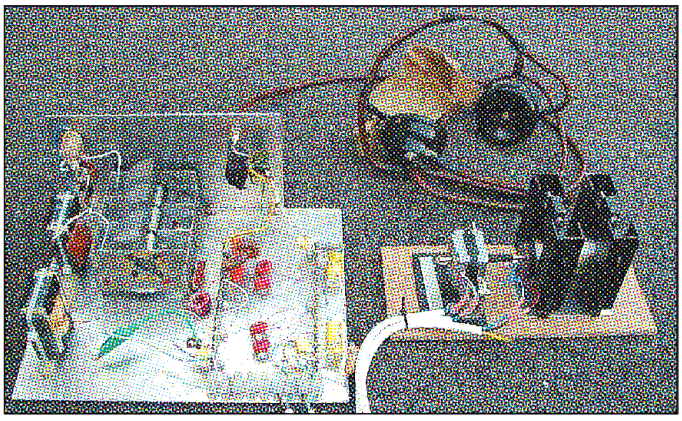
An Electro-Mechanical VLF Receiver

By Jim Moritz, M0BMU *

MANY READERS will be aware of SAQ, the historic Grimeton radio station near Varberg in Sweden. Once belonging to the Swedish government, SAQ is the last operating radio station using an Alexanderson high-frequency alternator to generate VLF radio signals. Today, it is run by volunteers as a museum and memorial to the Swedish electrical engineer and inventor, E F W Alexanderson.



The complete receiver. The BFO assembly is at the right, with the preselector, mixer and filters to the left.

The transmitter is run up on special occasions and anniversaries, and greetings messages are broadcast using CW on 17.2kHz. The author, marvelling at the 599 signal generated without the use of any valves or semiconductors, soon began to wonder if these broadcasts could be heard using a receiver that was also entirely electro-mechanical, without any active electronic devices. At first, it seemed that this project would require exacting mechanical engineering, but in the end it proved possible to build it using components from the junk box, and it was successfully used to receive the SAQ broadcasts on 1 July 2001. The electro-mechanical receiver has generated considerable interest, and so this article sets out to describe how it was designed, together with some history of the Alexanderson alternator.

THE ALEXANDERSON ALTERNATOR

IN THE EARLY 1900s, the American inventor R A Fessenden carried out pioneering experiments in radio telephony. To generate the radio frequencies, Fessenden enlisted the aid of Ernst Alexanderson, a young Swedish engineer, working for General Electric in New York. The alternators Alexanderson developed were used for the first radio telephony broadcasts from Brandt Rock in 1906.

Following the work of Marconi and his contemporaries, frequencies in the range 15 - 50kHz were selected for long-distance telegraphy. However, with the high atmospheric noise and low antenna efficiencies occurring at low frequencies, hundreds of kilowatts were required for successful communications. Sufficiently powerful valves were not then available, so Alexanderson and General Electric turned again to the high frequency alternator, and developed it into a huge 50 tonne machine, generating 200kW (see the photo). By the mid-1920s, about 20 giant Alexanderson alternators had been installed in the USA and Europe, including two at Marconi's 'Carnarvon Station' at Waunfawr, north Wales. SAQ was inaugurated in 1925.

These stations operated very effectively, but were largely obsolete by the late 1920s Since then, many nations maintained VLF transmitters for communications with their submarines. SAQ, still equipped with the original Alexanderson alternator, was operated by the Swedish Navy until the 1970s, before becoming a museum.

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E-mail: j.r.moritz@herts.ac.uk

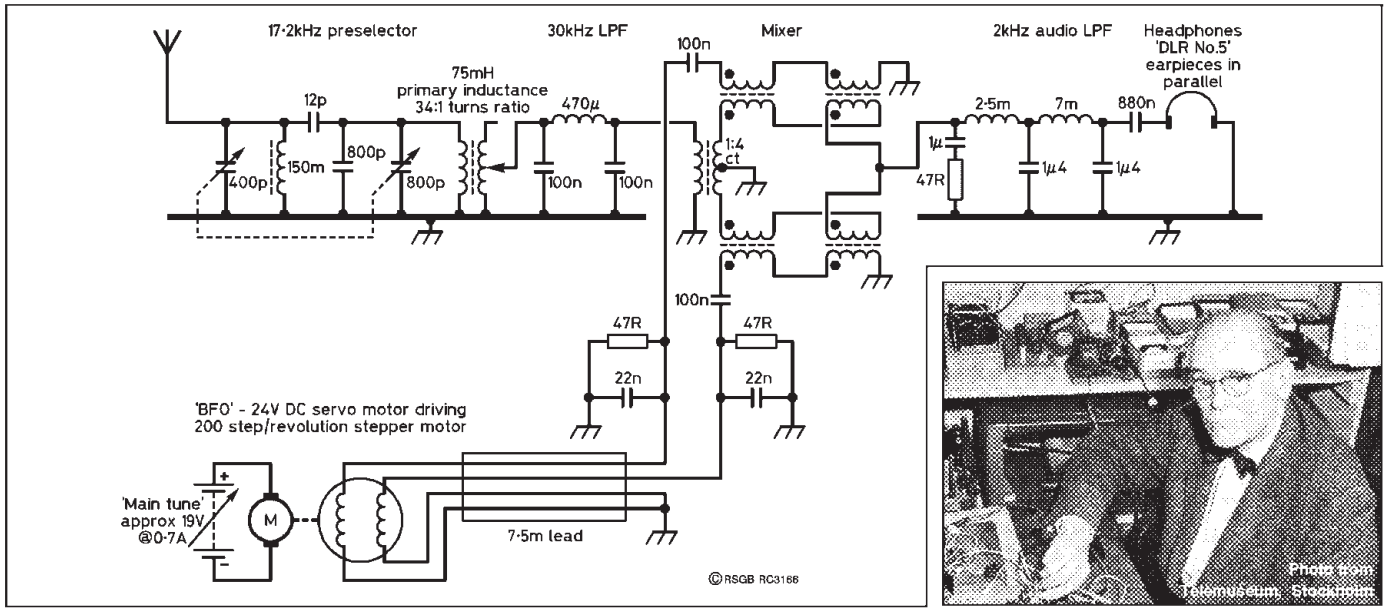
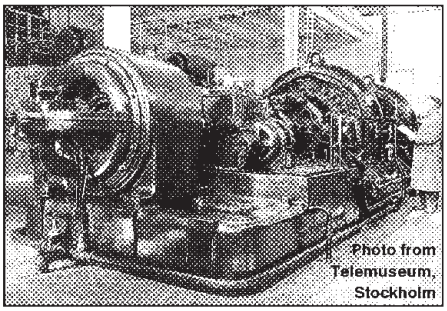


Figure 1: Complete circuit diagram of the VLF electro-mechanical receiver.

Photo from Telemuseum, Stockholm

E F W Alexanderson, 1878 - 1975.



The Alexanderson alternator - 50 tonnes of it!

THE ELECTRO-MECHANICAL RECEIVER DESIGN

THE COMPLETE circuit diagram is shown in **Fig 1**, and described in detail below. It is essentially a simple direct-conversion design, but with the usual active-components approach replaced by the concepts used in the SAQ transmitter. A passive preselector provides selectivity and antenna matching. The 17.2kHz signal passes to a mixer using saturating ferrite cores as non-linear elements, an idea borrowed from the keying circuit of SAQ, in which saturating reactors control the power reaching the antenna. The signal is mixed with a 16kHz beat frequency oscillator to produce a 1.2kHz audio output. The 1.2kHz audio frequency was chosen to put the strong 16kHz signal from the GBR transmitter at Rugby at zero-beat, where it causes no interference to the weaker SAQ signal on 17.2kHz. The 'BFO' is a small high-frequency alternator, and tuning is achieved by varying the supply voltage to the motor driving it. The audio output is filtered and applied to a pair of headphones. The following detailed description refers to Fig 1.

PRESELECTOR

The preselector uses two tuned circuits, coupled by a small capacitor to give a bandpass response with roughly 800Hz bandwidth. At 17.2kHz, the author's 40m-long, 8m-high inverted L antenna has an impedance that is approximately equivalent to a 300pF capacitor in series with a few hundred ohms resistance, so the antenna effectively forms part of the tuning capacitance of the first tuned circuit. The second tuned circuit has a low-impedance link winding, with different taps that can be selected for the best impedance match to the mixer. The preselector output passes through a further low-pass filter, to eliminate medium-wave broadcast interference.

MIXER

The inductance of a winding on a magnetic core depends on the permeability of the core material and the magnetic flux inside the core. A small magnetic flux has little effect on the permeability of the core material, whereas a large flux causes magnetic saturation, which reduces the effective permeability of the core material and with it the inductance. This effect is used in the mixer. The BFO signal is applied to a winding on a small ferrite toroid, and the magnetic field so generated saturates the ferrite at the peaks of the BFO signal. The inductance of a secondary winding on the toroid therefore varies at the BFO frequency. With the secondary winding in series with the signal path, the signal is amplitude-modulated by the BFO, producing the mixing action.

In the receiver, pairs of ferrite cores are used, with primaries and secondaries in series, but with the connections of one of the secondary windings reversed. This results in a balanced-mixer action that minimises feed-through of the BFO into the signal path. Since the BFO signal saturates the cores at both positive and negative peaks of the waveform, the mixer effectively doubles the BFO frequency, and the required BFO frequency is halved to 8kHz. A resonating capacitor in series with the primary windings maximises the BFO current.

BFO

The 8kHz signal is generated by a small high-frequency 'alternator'. This is actually a small stepper-motor, salvaged from a scrap hard-disc drive. The armature of the motor consists of a permanent magnet fitted with a large number of pole pieces which, when driven as a generator, induce an alternating current in the stator windings. The 200 step/revolution motor used generates 100 cycles per revolution. When driven at 4800RPM by a conventional DC motor, 8kHz is generated. The motor construction is quite similar to the Alexanderson alternator, although of course on a much smaller scale. About 1W output power is available from each of the two windings, the signals from which are 90° out of phase with each other. In an attempt to reduce insertion loss, two mixers were used in a push-pull configuration, each driven from one winding. The frequency-doubling effect of the mixer also doubles the phase shift to 180°.

The motor and alternator produce a great deal of mechanical noise, and it was necessary to fit the BFO with long extension leads and locate it in a different room from the rest of the receiver, so that weak signals would not be drowned out!

The audio output from the mixer is passed through a 2kHz low-pass filter, in order to remove the residual 8kHz BFO signal, and fed to the headphones. A series capacitor resonates the inductance of the headphone coils at 1.2kHz. The headphones used are WWII vintage 'DLR No 5' which, with the earpieces connected in parallel, have an impedance near 50Ω at resonance.

NO GAIN?

YOU WILL HAVE NOTICED that there is no amplifier in the receiver. In fact, there is about 20dB of insertion loss between antenna and headphones, so would it be possible to hear signals? The field strength of the SAQ signal in southern England was measured at about 750µV/m, and the available signal power from the antenna calculated as approximately 100nW. This would result in 1nW (-60dBm) audio output, which does not sound very much but, in experiments with the DLR No 5 headphones, a 1.2kHz signal of as little as -100dBm was audible in very quiet surroundings. This is only 0.1pW, so the combination of the human ear and the old-fashioned type of headphones is remarkably sensitive, and it was concluded that signals from SAQ should be easily audible.

RECEPTION

THE ELECTRO-MECHANICAL receiver shown in the photograph was completed just in time for the broadcast from SAQ on 1 July 2001. Copying the SAQ 76th anniversary message presented no problems. Parts of the broadcast were recorded by connecting a tape recorder to the headphone output, and a short excerpt of this recording can be accessed via G3YXM's LF web pages. The received audio note was somewhat unsteady due to the lack of any feedback motor speed control but, due to the low signal frequency, drift was not a significant problem.

The electro-mechanical receiver can be tuned from about 15 - 20kHz, and it is possible to receive a number of other signals in this range. Best DX so far is VTX3 on 18.2kHz, operated by the Indian Navy and located in southern India.

CONCLUSIONS

THIS IS NOT the first electro-mechanical receiver to be described; several quite similar techniques were devised by Fessenden and others [1] around the time of the invention of the high-frequency alternator. However, the development of valve receivers had rendered these obsolete by the time SAQ was built, so perhaps this is the first time since then that radio signals have been transmitted and received by entirely electro-mechanical methods. The author would certainly be interested to hear of other similar instances.

WWW.

SAQ	www.telemuseum.se/grimeton/defaulte.html
also	www.alexander.n.se/
SAQ audio (from G3YXM)	www.wireless.org.uk/mechrx.htm

FURTHER READING

[1] *Early Radio Wave Detectors*, by V J Phillips. Peter Peregrinus Ltd, 1980. ♦

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E-mail: g3wdv@freenet.co.uk

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TRIO TR-9000 2m multimode, £100. Yaesu FT-707 HF 80-12m, £180 ono. M0CYZ, 01677 423 349 (N Yorkshire).
TS-830 hardly used due to VHF preference, £295. BBC headphones, very old, leather headpiece, £5. Marconi dictionary, last year's RSGB *Callbook*, slow-motion drives. Offers? 5- or 7-ele parabeam for 88-108MHz, never used outdoors, as new. Offers? Various new batteries cheap. 01246 291 076.
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YAESU FT-1000MP, SP-8 ext spkr, MD-100 mic, 500Hz CW filter. Immaculate cond, £1450. 07867 677 381 (Pewsey).
E-mail: pete@p.a.white.freeserve.co.uk
YAESU FT-101ZD all bands, excellent cond and working order, £195. Buyer collect or carriage extra. G3KAE, John Rowley, 01723 864 236 (Scarborough).
E-mail: g3kae@aol.com
YAESU FT-290 R with mobile mount, £125. Packet KPC-2 with book and leads, £40. 70cm tcvr, £25. Power supply PL320, £20. 07850 060 748 (Huntingdon).
E-mail: g3rpv@aol.com
YAESU FT-290R Mk2 with FL-2025 PA, £250. FT-690R Mk2 with FL-2020PA, £250. 01582 713 970 (Harpenden).
E-mail: bob@g3nrt.freeserve.co.uk

CONGRATULATIONS

to the following
whom our records show as having reached
50 years' continuous RSGB membership this month:

50 years

G3ICH	Mr P N Pitt
G3IFB	Mr F H Bliss
G6UQ	Stockport Radio Society

YAESU FT-736R 2m/70cm boxed, man, circuit, mic MH-IB8, immaculate condition, £600. Yaesu FT-767GX HF + 2m module built in ATU, mic MH-IB8, man, circuit, vgc, £525. Inspection working invited, delivery by arrangement. John, M0ANM, QTHR, 01925 723 946 (Warrington).
E-mail: jb@blake9041.freeserve.com.uk

YAESU FT-817 HF, VHF, UHF all-mode tcvr with charger, nicads, mic etc, four months old, £625. Kenwood TS-50 tcvr, complete, mint cond, £400 ono. 0141 561 9855 (Paisley).
E-mail: t.hughes7@ntlworld.com

YAESU FT-990DC, good cond with mic, box and man, £575. G0BOR, 01942 874 936 (Manchester).
E-mail: bms@zen.co.uk

WANTED

EARLY crystal and one-valve sets wanted, all early valve equipment is of interest including valves, speakers, components and catalogues. Very keen for early Marconi items, still want a good Hallicrafters SX42 or similar top-end valve comms, rcvr. G4ERU, QTHR, 01202 510 400 (Bournemouth).

BENDIX Tx type TA-2J (Ex RAF). Does anyone have one? Also Bendix Interphone 3611- and 3610-series control boxes. Trevor, G4OEY, 01482 867 327 (E Yorkshire).
E-mail: trevor.sanderson@esa.int

DRAKE Q-Muliplier/speaker unit, 2AQ/2BQ. Also wanted Mimco 2235 ship's broadcast rcvr, made by Dynatron. Any Mimco gear, WHY? 01789 293 375 (Stratford-upon-Avon).
E-mail: g0ogn@aol.com

ERA Microreader, large digital display. Mike Webb, G3OOQ, QTHR, 01789 205 973 (Stratford-upon-Avon).

FILTERS for Trio TS-830S, CFJ455V12 or -K12 and YG455-C (not -1). G4CLY, QTHR, 01372 279 532 (Ashtead).
E-mail: gazelle6@hotmail.com

HALLICRAFTER Sky Buddy S-19 or S-19R, any cond. G3ASE, QTHR, 01480 463 129 (Huntingdon).
E-mail: g3ase@waitrose.com

HEATHKIT AM crystal filter, 3.75kHz bandwidth, as supplied for SB301 receiver. G3WCE, QTHR, 01692 538 794

HIGH-voltage probe (DC multiplier 372) for Racal 314A electronic voltmeter (GPO test meter electronic 1A). Also electrostatic voltmeter. 01335 324 393 (Ashbourne).
E-mail: tonyparkerg3kag@lycos.co.uk

ICOM IC-706 MKIIG, must be mint cond, cash or PX 2m FM mobile. 01452 855 339 (Cheltenham).
E-mail: g4ili@the-maples.com

KANTRONICS KPC-4 TNC must be in good working order. Garry, G4FLY, QTHR, phone after 4pm, 01189 672 885 (Reading).
E-mail: garry.haynes@ntlworld.com

KENWOOD AT-230, matching ATU for 530SP. Good condition. 07711 443 076 (Harrogate).
E-mail: g4cwb@qsl.net

MANUAL for Casio FX-880P required and any accessories. Microwave Modules RTTY decoder model MM4001 wanted with keyboard. Call Lee, G0PVO, 01706 842 355 (Oldham).
E-mail: lee.hewitt@bun.com

MANUALS for Avometer 8 IV and Drake TR4 tcvr and ex-govt sig gen CT211 osc test No1. G3UZB, QTHR, 01642 470 623 (Redcar).

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

SPEAKER to match FT-101ZD, external VFO to match FT-101ZD or anything else to match a FT-101ZD line up. 028 2076 2196 (Ballycastle).
E-mail: kevin@ballycastle.com

WANTED in good condition, Collins TCS-12 Tx, Collins 75A4 rcvr, Collins 51S1, 51J4, KW Vanguard, HRO, AR88D, Heathkit DX100U. Martin, G0WVX. 07754 414 382 (Derby).
E-mail: martin.suckling@tesco.net

WIRING diagrams required for the following two aerial rotators. Kenrotor model 400RC Kenpro Industries, Japan. Emotator model 103SAX Emotator Antenna Mfg, Japan. All expenses paid. G3LJN, QTHR, 01983 872 220.

Rallies & Events

6 MARCH 2002

SURREY IEE MEETING - 7pm free admission. 'History of the Croydon Tramlink', by Jim Snowdon, Tramlink. John Stevens, jstevens@iee.org

9 MARCH 2002

CRYSTAL PALACE & DARC Spring Fair - St John's Hall, Sylvan Road, London SE19. OT 10.30, £1 (inc free drink), under 16s free. C. Bob, G3OOU, 01737 552 170.

LAGAN VALLEY ARS Rally - Conference Centre, Lagan Valley Hospital. OT 12 noon. Ron, GI4NTO, 028 9260 1941 or ronnie@mccaughey2.freeserve.co.uk

10 MARCH 2002

WYTHALL RADIO CLUB 17th Radio & Computer Rally - Wythall Park, Silver Street, Wythall, on the A435 2 miles from M42 jn 3. OT 10am, £1.50. TS, LB, C, B&B, TI on S22, free park-and-ride. Martin, G8VXX, 0121 474 2077 (eve), fax 0121 742 3471 (OH), or enquiries@wrcrally.co.uk [www.wrcrally.co.uk]

17 MARCH 2002

BREDHURST R & TS Rainham Radio Rally - Rainham School for Girls, Derwent Way, Rainham, Kent. OT 9.30/10am, £2. TS, SIG, C. Microwave ATV, TI on S22. Martin, M0AAK, 01634 365 980 or martinm0aak@yahoo.co.uk [www.the-brats.com]

NORBRECK Amateur Radio, Electronics & Computing Exhibition - Norbreck Castle Exhibition Centre, Blackpool. OT 10.45/11am, £3, OAPs £1.50, under 14s free. TS, B&B, RSGB, CP free, DF. TI on S22. MT. Peter, G6CGF, 0151 630 5790.

20 MARCH 2002

SURREY IEE MEETING - Visit to Surrey Satellite Centre, University of Surrey. Pre-registration required through Abhaya Sumanasena, abhaya@iee.org

23 MARCH 2002

SOUTH NORMANTON & DARC and G QRP CLUB Junction 28 Mini-Convention - Village Hall Community Centre, South Normanton, 5 minutes from jn 28 of M1 and A38. OT 10am, £1. TS, SIG, LEC, B&B, LB, C, disabled CP free, and free local parking. TI on S22 via GB0LOW. Duncan, G4DFV, 01623 465 443 or pentode@ntlworld.com [www.qsl.net/snadarc]

WREXHAM ARS Wrexham Science Festival - special event station GB2WSF from 10am until 5pm, on HF and VHF, using *UI-View* and ATV. Full details and contacts on website. [www.qsl.net/gb2wsf or www.qsl.net/wars]

23 / 24 MARCH 2002

LONDON COMMUNICATION & 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). RadioSport 01923 893 929. [www.radiosport.co.uk]

7 APRIL 2002

45th NORTHERN MOBILE RADIO & COMPUTER FAIR - Sports Hall, Harrogate Ladies' College, Clarence Drive, Harrogate. Gerald, G0UFI, 01765 640 695. [www.harrogaterally.co.uk]

14 APRIL 2002

CAMBRIDGESHIRE RG Annual Rally - Bottisham Village College, Bottisham, 6 miles east of Cambridge via A14 and A1303. OT 10.30am, £1.50. A, TS, B&B, CBS, CP, C, TI on S22. Paul, G0LUC, 01462 683 574 or g0luc@btinternet.com [www.gb3pi.org.uk]

LOUGH ERNE ARC Annual Rally - Killyhevlin Hotel, Dublin Road, Enniskillen. OT 12 noon. Herbie, 028 6638 7761 or Frank, 028 6632 9507.

18 APRIL 2002

WORLD AMATEUR RADIO DAY - theme: 'Amateur Radio: continuing innovation in communications technology'.

21 APRIL 2002

THE SOUTH YORKSHIRE RG & RSGB Region 4 Hamfest - Metrodome Leisure Centre, Queen's Road, Barnsley, less than 2 miles from M1 jn 37, and 5 minutes' walk from train and bus stations. Follow the brown Metrodome signs from all directions. OT 10am, £2.50. DF, TS, SIG, B&B, TI via GB3NA on 145.675MHz. Ernie, G4LUE, 01226 716 339 or 07787 546 515 (6pm - 8pm) or e-mail ernest.bailey1@virgin.net

YEOVIL & DARC 18th QRP CONVENTION – Digby Hall, Hound Street, Sherborne, Dorset. OT 10am. LEC, C, TS, B&B, TI on S22 by GB2LOW. Derek, M1WOB, 01935 414 452, m1wob@tiscali.co.uk

26 - 28 APRIL 2002

53rd INTERNATIONAL DX CONVENTION - Visalia, California. [www.qsl.net/visalia2002]

27 APRIL 2002

CORNISH RAC International Marconi Day - John, G4LJY, QTHR. [www.users.globalnet.co.uk/~straff]

28 APRIL 2002

ALDRIDGE & BARR BEACON ARC Surplus Radio & Electrical Sale - Aldridge Community Centre, Anchor Meadow, Middlemore Lane, Aldridge, Walsall. OT 10.30am, 50p. John, G0SWZ, 01922 458 014.

ANDOVER RAC Spring Boot Sale - Village Hall, Wildhern. OT 10am, £1 per vehicle, boots £5. TI, CP. Terry, G8ALR, 01980 629 346 or Jim, G4NWJ, 01980 610 594.

6 MAY 2002

DARTMOOR RADIO CLUB Radio Rally - Pannier Market, Tavistock, Devon. OT 10.15/10.30am. DF, CP, C, TS, B&B, TI on S22. Ron, G7LLG, 01822 852 586.

MID-CHESHIRE ARS Rally - Civic Hall, Winsford. OT 10.30/11am. C, CP. David, G4XUV, 01606 77787.

WEST WALES AMATEUR RADIO & COMPUTER RALLY - Penparcau School, Aberystwyth. OT 10.30am, £1. CP, DF, TS, B&B, SIG, C, TI on S22. Ray, GW7AGG, 01686 628 778, fax 01686 621 880 or mwmg01@aber.ac.uk

11 MAY 2002

YORKSHIRE DX CLUSTER SUPPORT GROUP Convention - John, G3LZQ, g3lzq@john-dunnington.freeserve.co.uk

12 MAY 2002

DUNSTABLE DOWNS RC 19th Amateur Radio Car Boot Sale - Stockwood Country Park, Luton, Beds. CBS, DF, C, CP. [www.ddrcbootsale.freeserve.co.uk]

19 MAY 2002

MIDLAND ARS Drayton Manor Radio & Computer Rally - Drayton Manor Park, Fazeley, Tamworth, on A4091 close to M42 jns 9 & 10. OT 10am. TS, FM, B&B, SIG, Clubs. Peter, G6DRN, 0121 443 1189 (eve).

22 MAY 2002

SURREY IEE MEETING - Theatre M, University of Surrey. 7.30pm, free admission. 'Time and the BBC', by Geoffrey Goodship. R Longman, rlongman@iee.org

25 MAY 2002

RADIO FLEA MARKET - Beetsterzwaag, the Netherlands. OT 9am. TS, C, FM, TI on 145.650MHz. [www.veron-a63.tmfweb.nl]

26 MAY 2002

SPALDING & DARS Annual Rally - Springfields Exhibition Centre, Spalding. OT 10am. CBS, C, CS by arrangement, DF. Ray, M0CTM, 01775 711 953, or John, G4NBR, 07946 302 815. [www.sdars.org.uk]

WEST MANCHESTER RC 6th Red Rose QRP Festival - Formby Hall, Alder Street (off High Street), Atherton, Manchester. OT 11am, £1. TS, RSGB, G QRP, FISTS, B&B, C, LB, DF, CP, TI on S22. Les, 01942 870 634 or g4hzj@btinternet.com

5 JUNE 2002

SURREY IEE MEETING - jstevens@iee.org

9 JUNE 2002

33rd ELVASTON CASTLE National Radio Rally - Les, G4CWD, 01332 559 965 or les@g4cwd.demon.co.uk

15 / 16 JUNE 2002

INTERNATIONAL MUSEUMS WEEKEND - Harry, M1BYT, 0113 286 6897 or harry_m1byt@ntlworld.com

16 JUNE 2002

BRITISH AMATEUR TELEVISION CLUB Convention

EPSOM Radio & Electronics Fair - Paul, M0CJX, m0cjx@lineone.net [www.epsomrally.co.uk]

NEWBURY & DARS Boot Sale - Mark, M0CUK, 01635 36444. [www.nadars.org.uk]

23 JUNE 2002

MID-LANARK ARS Scottish Convention - Elvin, GM8BBA, 01698 748 616 or elvin8bba@blueyonder.co.uk

29 JUNE 2002

REDDISH RALLY - John, G4ILA, 0161 477 6702.

30 JUNE 2002

ALEXANDERSON DAY - [www.telemuseum.se/grimeton/defaulte.html]

CITY OF BRISTOL RSGB GROUP Longleat Amateur Radio & Computer Rally - Ron, G4GTD, 0117 985 6253 or ronford@g4gtd.freeserve.co.uk [www.longleatrally.co.uk].

13 JULY 2002

CORNISH RAC Radio & Computer Rally - Ken, G0FIC, ken@jtarry.freeserve.co.uk or John, G4LJY, g4ljy@hotmail.com

21 JULY 2002

HULL & DARS 9th Humber Bridge Radio Rally - Leigh, G0UBY, leigh@sydney.karoo.co.uk

McMICHAEL RALLY & BOOT SALE - Dave, G4XDU, 01628 625 720 or g4xdu@amsat.org [http://go.to/mcmichaelrally]

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.

26 - 28 JULY 2002

RADIO AMATEURS OF CANADA National Convention - [www.rac2002.org/]

28 JULY 2002

COLCHESTER RA Amateur Radio Rally & Computer Fair - Ron, G4JIE, 01206 826 387 or ron@g4jie.freeserve.co.uk [www.g3co.ccom.co.uk]

9 AUGUST 2002

COCKENZIE & PORT SETON ARC 9th Annual Junk Night - Bob, GM4UYZ, 01875 811 723 or bob.gm4uyz@btinternet.com

11 AUGUST 2002

FLIGHT REFUELLING ARS Hamfest - Keith, G1VHG, 01202 577 937 or keithg1vhg@netscapeonline.co.uk [www.qsl.net/g4rfr]

17 / 18 AUGUST 2002

INTERNATIONAL LIGHTHOUSE / LIGHTSHIP WEEKEND - [www.vk2ce.com/illw/index.html]

24 - 31 AUGUST 2002

NORTH WALES RRC Bardsey Island DXpedition - Ted, GW0DSJ, 01745 336 939.

25 AUGUST 2002

TORBAY ARS Communications Fair - rally@tars.org.uk

1 SEPTEMBER 2002

TELFORD & DARS Rally - 01952 299 677 or e-mail mstreet@g3jkx.freeserve.co.uk

8 SEPTEMBER 2002

LINCOLN SWC Hamfest - Dave, 01522 878 481 or 07961 961 494.

14 / 15 SEPTEMBER 2002

TRANSMISSION 2002 - John 01634 832 501.

15 SEPTEMBER 2002

BARRY ARS Welsh Amateur Radio Show - Richard, GW4BVJ, 01656 658 830 or 07971 017 148.

20 / 21 SEPTEMBER 2002

LEICESTER Amateur Radio Show - Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or g4afj@argonet.co.uk

13 OCTOBER 2002

NORTH WAKEFIELD RC Radio Rally & Computer Fair - 01924 824 451. [www.nwrc.org]

27 OCTOBER 2002

GALASHIELS & DARS Annual Rally - Jim, GM7LUN, 01896 850 245 or gm7lun@qsl.net

2 / 3 NOVEMBER 2002

16th NORTH WALES RADIO & ELECTRONICS SHOW - Muriel, GW7NFY, tel/fax: 01745 591 704

10 NOVEMBER 2002

12th GREAT NORTHERN HAMFEST - Ernie, G4LUE, 01226 716 339 or 07787 546 515 (6pm - 8pm) or e-mail ernest.bailey1@virgin.net

23 / 24 NOVEMBER 2002

LONDON COMMUNICATION & COMPUTER SHOW - RadioSport 01923 893 929. [www.radiosport.co.uk]

1 DECEMBER 2002

BISHOP AUCKLAND RAC Rally - Mark, G0GFG, 01388 745 353 or Brian, G7OCK, 01388 762 678.

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, 37 Highfield Gardens, Blackburn BB2 3SN, 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 Mar	GB0AAW: Air Ambulance Wales. Upper Killay, Swansea. LH (MW0CNA)
2 Mar	GB4SUB: Submarine. Holyhead, Anglesey. LH2 (MW0AQZ)
4 Mar	GB0BTC: Belfast Titanic City. Belfast. LHV2 (GI0VAB)
9 Mar	GB2EVR: Eden Valley Railway. Nr Appleby, Cumbria. LH2 (G0NRK) GB2RAF: Royal Air Force. Norfolk. LH2 (G4PSH)
11 Mar	GB0SMC: St Mary's College. Hull. 27PS (G0VRM)
16 Mar	GB0OKS: Oldham's Knowledge Service. Oldham. LH27 (G0BJR) GB0PPE: Portpatrick Event. Portpatrick, Nr Stranraer. LH27 (GM4LQS)
17 Mar	GB2NRS: Northern Radio Societies. Blackpool. 27 (G4BFH)
18 Mar	GB2WSF: Wrexham Science Festival. Wrexham. LHV27P (GW0VML)
23 Mar	GB0LOW: Low Power. South Normanton, Derbys. LH2 (M5SRE)

SILENT KEYS

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

EI8CP	Rev P M Kelly	03/01
G0AES	Mr NHM Richardson	05/01/02
G0CKC	Mr E Horsey	22/12/01
G0DAA	Mr D Oakley JP	
G0RKA	Mr O Selden	15/01/02
G0ROR	Mr S Lidster	10/01/02
G0TGV	Mr L C Wilson-Dutton	12/10/01
G0TNA	Capt R K Nicholls	05/01/02
G1MYD	Mr F J Carsboult	
G1ORD	Mr W J Roberts	05/12/01
G2BCY	Mr J Corston,	09/01/02
G2CVA	Mr H Collard	15/12/01
G3ACT	Mr F Owen	19/01/02
G3AJP	Mr J Baker	08/01/02
G3ALC	Mr P C Spence	16/11/01
G3EVC	Mr D J Pye	31/12/01
G3OGW	Mr H Wilson	28/12/01
G3TSW	Mr L Pierce	13/11/01
G3VQ	Mr E Taylor	17/01/02
G4KFR	Mr A L Hodges	20/12/01
G4MMB	Mrs M Brown	06/01/02
G4NJP	Mr N Bedford	01/01/02
G4XSL	Mr L Wagstaff	10/12/01
G4ZEF	Mr A Rostron	29/11/01
G5GZ	Mr G Grisdale	27/12/01
G7GXO	Mr G Angelou	10/01
G7NDP	Mr M Marsden	16/12/01
G7VOC	Mr M Fishburn	07/01/02
G8PP	Mr LAG Parnell	25/01/02
GW0UKE	Mr D Lewis	20/11/01
GW3GKZ	Mr M Fowler	14/01/02
GW3KFE	Mr E P Essery	01/02/02
GW3JUN	Mr JOD Jenkins	
GW4GSL	Mr R Prince	11/12/01
RS91444	Mr J A Dinnes	01/11/01
RS93866	Mr N F Grice	07/01/02

Club & Regional NEWS

Region 1: Scotland West & Western Isles

PAISLEY (YMCA) ARC

6, Simple vertical aerials. 20, 'Watts' in a Decibel?, GM4GZQ. Jim, GM3UWX, 01505 862817.

Region 2: Scotland East & the Highlands

ABERDEEN ARS

1, Junk sale. 8, Falklands DXpedition, Tom, GM4FDM. 15, Surface mount devices demo. 22, 'Foxhunt'. 29, On air. Robert, 01224 896 142.

COCKENZIE & PORT SETON ARC

15, VP8SDX DXpedition to the Falkland Islands, Tom Wylie, GM4FDM. Bob, GM4UYZ, 01875 811723.

LOTHIANS RS

13, DAB radio, Simon Lloyd Hughes, GW0NVN. 27, Junk sale. Peter, 0131 446 0155.

Region 3: North West

MID CHESHIRE ARS

6, Activity night & committee meeting. 13, Blackpool rally preparation. 20, New structure of the RSGB, Gordon Adams, G3LEQ. 27, HF on air. Niall, G0VOK, 01606 871413.

STOCKPORT RADIO SOCIETY

5, Preparation for *CQ* WPX contest. 19, Demo of Internet Linking and GB3PZ repeater, Graham, G4HFG. David, M1ANT, 0161 4567832.

THORNTON CLEVELEYS ARS

4, Final preparation for NARSA rally. 11, Advanced driving, Alistair Wareing. 18, History of computers, John Radoway, G4FRK. 25, Introduction to ATV, Dave, G8KBH. Jack, G4BFH, jack@jduddington.fsnet.co.uk

Region 4: North East

DENBY DALE ARS

6, *UI-View* for beginners, Tony, G4LLZ. 20, Surplus sale. Tony, G4LLZ, 01484 318750.

GRIMSBY ARS

7, John Whitelam SWL construction night. 21, HF on air. Brian, G4DXB, 01472 231383.

HALIFAX & DARS

19, Visit from Waters & Stanton, Matlock, Chris Wilkins, M0KIT. R E Nolson, G0PMU, 01274 600297.

HORNSEA ARS

6, Committee meeting. 13, 'Ask the panel' (round table). 20, Activity night. 27, Club's website, G3ZTR. Andy, G0VRM, 07050 287279.

KEIGHLEY ARS

14, On air. 21, Pie & pea supper, raffle. 28, Presentation by British Nuclear Fuels. Ian, M1BGY, 01274 723951.

NORTH WAKEFIELD RC

7, 'Reptiles', Chris, M1BKY. 14, On air. 21, Mills on the Air. 28, On air. Jim, G3YDL, g3ydl@nwrc.org

Region 5: Midlands

ALDRIDGE & BARR BEACON ARC

4, Demo gateway mode to worldwide stations. Charles, G0NOL, 01922 636162.

BROMSGROVE & DARC

1, Talk on the RSGB, by General Manager Peter Kirby, G0TWW. 8, On air. 22, Construction evening. John, G4OAZ, 01527 871903.

BROMSGROVE ARS

12, 'Wartime Radio', Leslie Hare. 26, DF hunt. Angus, G8DEC, 01257 875573.

CHELTENHAM ARS

1, Constructors' exhibition. Derek Thom, G3NKS, 01242 241099.

GLOUCESTER AR & ELECTRONICS SOCIETY
4, Fractal antennas. 11, Science Week school demonstration. 18, 25, Workshop / HF on air. Tony, 01452 618930 (office hours).
KIDDERMINSTER & DARS
5, Members' on-air activity night. Tony, G1OZB, 01299 400172.
LINCOLN SHORT WAVE CLUB
6, G5FZ on air. 13, Committee meeting. 20, Talk on AROS, Barry Scarisbrick, G4ACK. 27, Hamfest discussion. John, G1TSL, 01522 793751.
LOUGHBOROUGH & DARC
5, On the Internet at the college. 12, 'Rule Britannia', John, G8CGW. 19, Annual inter-club quiz. 26, On air. Chris, G1ETZ, 01509 504319.
MAXPAK
4, Digital satellite TV: things you can do with your Sky & ITV Digiboxes. Miles, G4GSB, 01952 585447, milesclifford@aol.com
MELTON MOWBRAY ARS
15, Weather satellites, C J Thomas, G1ETX. Geoff, G3STG, 01664 480733.
MIDLANDS PACKET USER GROUP
6, Pre-AGM discussion, nominations and suggestions. Miles, G4GSB, 01952 585447, milesclifford@aol.com
MID-WARWICKSHIRE ARS
12, AGM. 26, Using OICs, M1AUK. Bernard, M1AUK, 01926 420913.
RAF WADDINGTON ARC
7, RAE course. 14, Amateur TV, Bob, G7AVU. 21, 28, RAE course. Bob, G3VCA, 01522 528708.
SHEFFORD & DARS
7, AGM. 14, G8EMJ construction challenge (bring along your winter projects). 21, 'Digital communications on HF - it's not just CW and RTTY' 22, Annual club dinner. Derek, G4JLP, 01462 851722.
SOLIHULL ARS
21, Circuit simulation, Dennis, G1ZQE. Roger, G4BBT, r_a.hancock@which.net
SOUTH NORMANTON, ALFRETON & DARC
4, Talk by RSGB / inter-club quiz via FSTV. 11, On air. 18, QRP Convention planning. 23, QRP Convention. 25, On air. Lyn, M0BMY, 01773 520353.
SOUTH NOTTS ARC
6, Open forum (members only). 13, On air. 20, Construction project pt 3. Tel: 01509 569679.
STRATFORD UPON AVON & DRS
11, 'Ask the Experts', Terry, G3MXH. 25, Annual dinner. David, 01926 642858 or 07816 550075.
TELFORD & DARS
6, Open evening, on air. 13, Construction competition. 20, Pre-AGM and contest discussion, G3UKV. 27, AGM. Mike, G3JKX, 01952 299677.

Region 6: North Wales

DRAGON ARC
4, Discussion night. Stewart, GW0ETF, 01248 362229.
WREXHAM ARS
23, GB2WSF at Wrexham Science Festival. Glyn, MW0BNB, glyn.mw0bnb@btinternet.com

Region 7: South Wales

BARRY ARS
5, On air. 12, Training and familiarisation session for 2002 RSGB IOTA contest. 19, Planning meeting for Welsh Radio & Computer Show on Sunday 15 Sep. 26, Discussion on general computing issues, John, GW0ACH. Richard, GW4BVJ, 01656 658830.
NEWPORT ARS
18, Marine photography, Dennis Jackson. 25 , 'Mysteries of the Still', by Roy Francis. Paul, nars@gw4ezw.fsnet.co.uk
SWANSEA ARS
23, Coach trip to Pickett's Lock. Roger, GW4HSH, 01792 404422.

Region 8: Northern Ireland

BANGOR & DARS
6, Shack security. Mike, GI4XSF, 028 42772383.

Region 9: London & Thames Valley

AYLESBURY VALE RS
13, AGM. Roger, G3MEH, 01442 826651.
CHESHUNT & DARC
6, Members' forum. 20, Junk sale. Jim, G0JXN, 01992 468204.
COULSDON AMATEUR TRANSMITTING SOCIETY
11, *I-Link*, Terry Giles, G4CDY. Steve, G7SYO, 01737 354271.
CRYSTAL PALACE & DRS
1, SWR bridge project. 9, Spring fair at St Johns Church Hall. 15, Weather images from satellites, Keith Holland, G3MCD. Bob, G3OOU, 01737 552170 or Victor, 020 86532946.
ECHELFORD ARS
14, Bring and buy sale. Robin, G3TDR, 01784 456513.
EDGWARE & DARS
14, D68C Comoros DXpedition, Steve Telenius-Lowe, G4JVG. 28, Video. David, G5HY, 01923 655284 (day)/02089549180 (eve).
MAIDENHEAD & DARC
7, Amateur Radio Observation Service, Barry Scarisbrick, G4ACK. 19, AGM. John, G3TWG, 01628 525275.
NEWBURY & DARS
27, Getting started on APRS, Roger, G6IBI. Mark, M0CUK, 01635 36444.
RADIO SOCIETY OF HARROW
1, Visit to Wycombe Astronomical Society observatory. 15, Preparation for open day. 16, Radio Society of Harrow open day. Jim, G0AOT, 01895 476933 / 0207 278 6421.
READING & DARC
14, Annual junk sale. Pete, G8FRC, 0118 969 5697.
SILVERTHORN RADIO CLUB
15, *RMS Titanic*, Terry White, G0BXL. 22, On air. 23, Club quiz. David, G0KHC, 020 85042831.
SOUTHGATE ARC
14, Show briefing and equipment sorting. 23, 24, LARCS. Mike, M0ASA, 020 8366 0698.
SUDBURY & DRA
5, 'The Science of Secrecy - from Caesar to VISA', Jonathan Mitchener, G0DVJ. Bryan, G1TWY, 01787 247893.
SURREY RADIO CONTACT CLUB
4, Spring surplus equipment sale. 16, SRCC Dinner at Windmill Pub, Wallington. Ray, G4FFY, 0208 6447589.
SUTTON & CHEAM RS
21, The Remote Imaging Group, Keith Holland, G3MCD. John, G0BWV, 020 86449945.

Region 10: South & South East

CRAWLEY RC
27, Worthing Repeater Group, TV repeaters. Derek Atter, G3GRO, 01293 520 424.
FAREHAM & DISTRICT ARS
6, On air. 13, SSTV, Mick, G4ITF. 20, Junk sale. 27, Quasi-synchronous FM systems, Dave, G7CFR. Steve, G7HEP, 01329 663673.
FARNBOROUGH & DRS
13, Receivers, John, G3KND. 27, Brainstorm Q&A evening. Norman, G0VYR, 01483 835320.
HASTINGS ELECTRONICS & RC
21, RSGB's new responsibilities and licensing changes. R C Gornall, G7DME, 01424 444466.
HORNDEAN & DARC
5, Social evening. 26, 'History of Scalextric / scaled-down models', Brian Parks. Stuart, G0FYX, 02392 472846.
ITCHEN VALLEY RADIO CLUB
8, AGM. 22, Surplus junk sale. Details: Mike, G6AIQ, mamjh@yahoo.com
SOUTHDOWN ARS
4, The early days of SSB, John Kirby, G3JYG. John, G3DQY, 01424 428064.
TROWBRIDGE & DARC
6, Tabletop surplus equipment sale. Ian, G0GRI, 01225 864698 (evenings / weekends).
WATERSIDE ARS
5, Weather sat reception, equipment etc, Francis Greaves, G7POA. Tony, G0LKG, 023 80844316.
WORTHING & DARC
6, Picture quiz. 13, Getting started on ATV. 20, Surplus equipment sale. 27, Discussion evening. Roy, G4GPX, 01903 753893.

Region 11: South West & Channel Islands

APPLEDORE & DARC
2, AGM. Brian, M0BRB, 01237 473251.
BLACKMORE VALE ARS
5, VHF on air. 12, 1930s HF Beam Radio, Paul, G4KHU. 19, HF on air. 26, CW class, G4AQ. Tony, G0GFL, 01258 860 741.
BRISTOL RSGB GROUP
25, Discussion on new Foundation Licence. Martyn, G3RFX, 0117 973 6419.
CORNISH RADIO AMATEUR CLUB
7, Amendments to the constitution, arrangements for IMD. 11, Wartime electronics, by Bert. John, G4LJY, 01872 863849.

EXMOUTH ARC
6, 'Whitestick Operating'. Alec, G8GON, 01395 264872.
POLDHU ARC
12, Matching antennas, David, G3NPB. Keith, G0WYS, 01326 574441.
POOLE RADIO SOCIETY
1, On air. 8, Electrical Discharge Machining, John, G4XGM. 15, Construction. Phil Mayer, G0KKL, 01202 700903.
SOUTH BRISTOL ARC
6, DIY PCBs by PC. 13, Radio books buy, sell, exchange. 20, Club quiz. 27, On air. Len, G4RZY, 01275 834282.
TORBAY ARS
22, Annual presentation and buffet. Ged, G6CLD, 01803 812117.
WEST SOMERSET ARC
5, Digital radio and TV, Ken, G0NKZ. Jean, G0SZO, 01984 633060.
YEOVIL ARC
7, Quiz, M1WOB. 21, Constructors' contest adjudication. 28, On air, committee meeting. Derek Bowden, M1WOB, tel: 01935 414452.

Region 12: East & East Anglia

BRAINTREE AR & COMPUTER CC
4, Sausage supper. Keith, M0CLO, 01376 347736.
BURY ST EDMUNDS ARS
19, Cruising the Western Baltic, and electronics on yachts, Adrian, N1QGA. George, G3LPT, 01359 259518.
CAMBRIDGE & DARC
1, Foundation Licence course, shack evening, projects, HF operating. 8, Foundation Licence course, shack evening, general discussion, ATV. 15, Experience with WaveLAN 2.5GHz project, John Fawcett. 22, AGM. Ron, G3KBR, 01223 501712.
CHELMSFORD ARS
5, Marconi veterans and early experiments, Prof Roy Simons. David Bradley, M0BQC, 01245 602838.
EAST KENT RS
4, Annual junk sale. 18, Astronomy and radio astronomy. Paul, G3VJF, 01227 365384.
FELIXSTOWE & DARS
4, Rig clinic, Iain, G0OZS. 18, Soldering: kit building part 1. Paul, G4YQC, 01394 273507.
GREAT YARMOUTH RC
8, Operating evening. 22, Construction evening. A D Besford, G3NHU (no contact details provided).
HARWICH AR INTEREST GROUP
13, Suffolk Data Group roadshow. Eugene, G4FTP, 01206 826633.
IPSWICH RADIO CLUB
6, Construction competition / Foundation Licence help. Keith, G7CIY, 01394 420226.
LEISTON ARC
5, The SAQ radio station, Andy, G8AXO. David, G1YRF, 01728 833202.
LOUGHTON & EPPING FOREST ARS
8, Loughton radio nostalgia night. 22, HF on air. Marc, G0TOC, 07803 023501.
MAIDSTONE YMCA ARS
1, Dummy RAE tests. 8, RAE operating for beginners. 15, Antennas, Peter Pickering. 22, Practical: wiring plugs. 29, Antenna workshop. Andy, M0CST, 01622 661035.
MORSE RADIO CLUB (Kent)
21, Spring junk sale. Ken, M1CZA, 07951 815413.
NORFOLK ARC
6, Exhibition of members' QSL cards and diplomas. 13, Informal Morse practice and instruction. 20, Computers in ham radio, computer clinic, Colin, M1FXY. 27, Informal Morse practice and instruction. Peter, G3ASQ (no contact details provided).
RAF AIR DEFENCE RADAR MUSEUM RAF NEATISHEAD
3, GB2RAF RAFARS permanent special event station. Terry, G4PSH, 01692 582064.

Region	RSGB Regional Manager
1. Scotland West & Western Isles	Gordon Hunter, GM3ULP
2. Scotland East & the Highlands	Billy Jenkins, MM0WKJ
3. North West	Kath Wilson, M1CNY
4. North East	Geoff Darby, G7GJU
5. Midlands (East & West)	Vacant
6. North Wales	Liz Cabban, GW0ETU
7. South Wales	Simon Lloyd Hughes, GW0NVN
8. Northern Ireland	Jeff Smith, MI0AEX
9. London & Thames Valley	Vacant
10. South & South East	Ivan Rosevear, G3GKC
11. South West & Channel Islands	Dick Atterbury, G4NQI
12. East & East Anglia	Malcolm Salmon, G3XVV

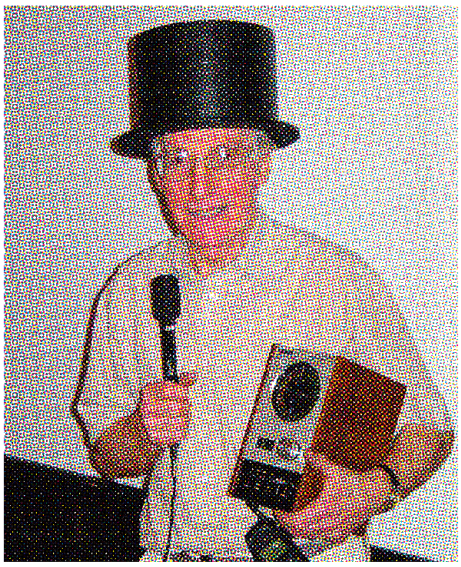
RSGB Regional Managers as of 8 February 2002.

NEWS FROM CHELMSFORD

THE CHELMSFORD Amateur Radio Society junk sale was held on 8 January. The event, attended by 50 members, was a great success and Colin Page, G0TRM - complete with a splendid top hat - did an excellent job as auctioneer.

The club's recent Foundation Licence course ended up 100% oversubscribed and it is hoped to hold another course over a weekend in the near future.

The Chelmsford ARS meets at 7.30pm on the first Tuesday of each month at the Marconi Social Club, Beehive Lane, Great Baddow, Chelmsford. For further information contact the secretary David Bradley, M0BQC, on tel: 01245 602838; by e-mail to: DavidWBradley1@activemail.co.uk or by visiting the club's website at www.g0mwt.free-online.co.uk/



Colin Page, G0TRM, the top-hatted auctioneer.

WREXHAM ARS AT SCIENCE FESTIVAL

WREXHAM ARS (GW4WXM) will be attending the Wrexham Science Festival. The club will be in attendance on Saturday 23 March as part of the Festival's 'Scientriffic' event - this is held at the end of the week-long festival, and is a hands on-exhibition for people of all ages, attended by some leading scientists and celebrities in the scientific world.

The club will be running special event station GB2WSF throughout the day and will be operating on HF / VHF, *UI-View* and ATV, with possibly more modes to follow. There will also be a webcam running throughout the event.

For more information, see either www.qsl.net/gb2wsf or the club's main site at www.qsl.net/wars The club meets on the first and third Tuesday of each month from 7.30pm at Maesgwyn Community Centre, off Lilac Way, Wrexham.

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

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

VHF/UHF

NORMAN FITCH, G3FPK
40 Eskdale Gardens,
Purley, Surrey CR8 1EZ.
E-mail: g3fpk@compuserve.com

IT HAS BEEN another good period for VHF/UHF DXers with more 50MHz openings to North America, the Caribbean, Russia and the Middle East and some good tropospheric periods. Some meteor scatter (MS) activity is reported.

All times are in UTC, ODX indicates best DX and QTHR signifies that the operator's address is in the current *RSGB Yearbook*. An asterisk (*) after a callsign denotes a CW contact, (AB), (BR) etc refers to the postcode area and (IO78), for example, is the Maidenhead grid.

THE ANNUAL TABLE

AS THERE IS still a demand for it, I will be running the Annual Table again this year, the first listings appearing in the May column. The deadline for entries is 15 March, by which time there will have been a number of RSGB contests and activity periods - see page 59 in the January 2002 *RadCom*. If you want a copy of the rules for the Annual Table, I can either e-mail them or send them by 'snail mail' upon receipt of an SASE.

BEACON NOTES

THE GB3SSS BEACON is now operational (QRV) on 144.407MHz from Poldhu (IO70IA). It was on in time to commemorate the 100th anniversary of Marconi's first trans-Atlantic signals on 12 December 1901 [see February *RadCom*, page 42 - *Ed*]. The transmitter is a Pye T402 with a 100W PA feeding a pair of 8-ele slot-fed Yagis beaming across the Atlantic at 284º. The location is the Poldhu Amateur Radio Club, Poldhu Cove, Mullion, Cornwall and the keeper is L Davey-Thomas, G3AGA.

John Wilson, G3UUT, the IARU Region 1 VHF Beacon Co-ordinator, reported hearing GB3SSS above the noise for quite long periods in the morning of 11 December from his Cambridge QTH. Congratulations to John and all others involved in bringing this project to fruition.

If you've worked Malta on 2m EME, the chances are it was Philip, 9H1PA, seen here with his impressive array of 4 cross Yagis at Mosta.

MOONBOUNCE

HOWARD Ling, G4CCH (IO93), operates on 23cm and in the evening of 1 December completed six CW QSOs with JA6CZD, IK3COJ, HB9BCD, IK2MMB, DL4MUP and WA1JOF. He got up early on the 8th and worked OK1CA, DK5MV, DJ5MN, F6ETI, SM2CEW and OZ4MM, again all on CW. Icing of the dish next day delayed activity but subsequent morning completions were with F6ETI on CW and later SSB and I0UGB. On the 12th, the Marconi anniversary day, the Marconi Foundation was using the VLBI 32m dish near Bologna and he worked the special station IY4FGM/4 on SSB (58/57) and CW (599/599).

On 28 December his dish was tossed around wildly in heavy gusting winds but everything survived. In the evening of the 28th he worked OZ6OL*, HB9BBD* also on SSB, N2IQ*, W2UHI* and K5JL*.

He had to clear about 3in of overnight snow next morning for the sked weekend. The dish was pointing low so he had to reset the elevation calibration for the evening session when he completed with HB9BCD*, GW3XYW, F6ETI*, IK2MMB* and K2UYH.

On the morning of the 30th he worked SM2CEW (CW/SSB), ZS6AXT*, K5JL* also on SSB, W2UHI*, K9BCT*, W7BBM* also on SSB. The evening session brought QSOs with JA6AHB*, F2TU, F6ETI and IK2MMB. After several failed attempts, he finally made it with GM0ONN on 1 January for initial number 165.

The following reports are taken from the January *432 and Above EME Newsletter*. Peter Blair, G3LTF (IO91), was QRV on 23cm on 1 December and worked GW3XYW*, IK2MMB*, OZ6OL* and on SSB, F/G8MBI*, HB9BCD*, G3LQR* and WA1JOF*. He was looking for West Coast USA stations next morning but nobody was on. He later worked SM2CEW* and JA6AHB*. A successful sked on the 8th brought GM4ISM for #187 and OZ4MM was also contacted. A QSY to 70cm resulted in QSOs with G3HUL* and NC1I*. On the 9th on 70cm DL7GK was #353.

Mark Hughes, GM4ISM (IO85), was temporarily QRT on 23cm as he was carrying out shack work over the Christmas holiday. He is up to 13 initials - OX2K, OE9ERC, OE9XXI, HB9Q, HB9BBD, OZ4MM, G4CCH, G3LTF, K5JL, K0YW, DJ9YW, W5LUA and DJ5MN. He runs 125W to a 2.4m dish but has a minimum antenna elevation of 25º. He reports that GM4LBV may be QRV later.

On behalf of Mario Alberti, I1ANP, the Italian EME Manager, Roy Reed, G3ZIG, has forwarded the results of the 8th Italian EME Contest held last year. UK participation was low and, as previously reported, G3ZIG (JO02), was winner in the 2m Category D section with Conrad Farlow, G0RUZ (IO93), runner up, while G4CCH won the 23cm section. This year's event is scheduled for the 48 hours beginning at 0000 on 18 May. The rules are quite complex and you can get them from Mario at i1anp@lunigiana.it or mario.alberti8@tin.it

The first leg of this year's European World Wide EME Contest, sponsored by the French national society REF and *DUBUS* magazine, is on the 23/24 March weekend when London latitude stations will have 32.7 hours of Moon time. The bands are 432MHz and 2.3-5.7GHz. The declination varies from +24.65º to +21.09º and the signal degradation, referred to perigee, ranges from -0.58dB to -0.22dB. The 432MHz sky temperature varies from 34K to 16K and the Sun offset at Saturday midnight is +114º. The second weekend is 20/21 April, the bands being 144MHz, 1.3GHz and 10GHz. The rules are in *DUBUS* issue 3/2001.

Regarding DO6ME, a YL operator in the Munich area recently worked on 23cm by G4CCH, Martin Hengemuehle, DL5QE, e-mailed to confirm that DO licensees are restricted to 2m and 70cm *only* and with just 10W EIRP. He says that the German licensing authorities would never issue a special permit for DOs to run higher power.

GEOMAGNETIC AND SOLAR ACTIVITY

SOLAR ACTIVITY REMAINS very high and in the 30-day period to 15 January the 10.7cm radio flux was well above 200 on 27 days, reaching 275 units on 24 and 27 December. The minimum value was 189 on 7 January, giving an average of 232.6. 41 new sunspot regions were recorded. The sunspot area in millionths of the visible disc was only below 1000 on four days with a minimum of 570 on 7 January, the maximum being 2410 on Christmas Day.

The geomagnetic data reveal that the middle latitude A-index at Fredericksburg was in the quiet category (0-10) on 21 days, the remainder being unsettled with a maximum of 16 on 10 January when the K-index reached 5 in one three-hour period. Consequently, little auroral activity has been reported.

The November 2001 issue of *SunMag* starts with 'What lies beneath a sunspot' describing the results of scientists' research gathered from the Michelson Doppler Imager (MDI) on board the SOHO spacecraft. There are the usual tables of daily solar, particle, geomagnetic and sunspot group data and a solar flare list. There are graphs of GOES X-Ray plots for 22 November and ACE solar wind parameters for 24 November. The latter is the Bz parameter referred to in the weekly GB2RS solar factual data section. Neil Clarke, G0CAS (QTHR), compiles and distributes *SunMag* and for subscription details telephone him on 01302 531925. He has a website - see the list - and his e-mail route is neil@g0cas.demon.co.uk

BAND REPORTS

50MHz

December was a terrific month on 6m with openings across the Atlantic almost every day, as chronicled in Ted Collins's, G4UPS (EX), seven-page report. DX beacons heard were FY7THF, K2ZD, OD5SIX, S55ZRS, VE1SMU, VE9MS, VO1ZA, WA1OJB, W1RA, W3VD, 4X4SIX and 9A1CAL. He reports that Chris, VE3FU, operated as VO2AC (FO73) while on holiday and gave many a new grid; QSL to his home call.

John Hoban, G0EVT (WF), submitted a big list of DX worked; 19 new grids and seven new DXCC countries from 1 December. The former were AA6TT (FN34), KJ9I (EN53), VE2PEP (FN46), A45XR* (LL93), WZ8D* (EM79), N1RZ/P* (FN45), K2RTH* (EL95), VY2SS* (FN76), FY5KE (GJ35), 9Z4BM (FK60), KP4EIT (FK58), NP2BT (FK78), N4IS* (EL96), P43JB* (FK42), AE4SW* (EL97), VO2AC* (FO73), C6AGN* (FL16), W4WA* (EM84) and HZ1MD (LL34). The new countries were A4, FY, 9Z, NP2, P4, C6 and HZ.

Ken Punshon, G4APJ (BL), happened across the opening to North America on 27 December and worked K1ISR (FN41) using just 15W for his first trans-Atlantic contact. Bryn Llewellyn, G4DEZ (JO03), finally managed to work ZF1DC for a new one on 31 December and his first entry in a new log book for 2002 was 4Z5FC. He has a new 7-ele Yagi on a 30ft boom, which could be in use by now.

Welcome back to Dave Toombs, G8FXM, after an absence of about 15 years. On 2 January he found the band wide open and managed to work VE1YX (FN74) and K3KYR using an IC746 and an HB9CV antenna 6ft AGL mounted on a step ladder inside the garage. He mentions the excellent DX spotting web site of N1RZ, which has been revamped and moved - see the list.

Bob Harrison, G8HGN (CM), worked VE1YX on 8 December for his 500th grid. Nyall Davies, G8IBR (TA), lives on the eastern side of a hill on the Devon/Somerset border. The slope is 6º and it rises to 300ft above his QTH. So he was delighted to work a couple of VEs from 1600 on 12 December and to get RS59 reports from his 40W. The MUF was very high that day so it would have been F-layer propagation, Nyall.

Andrew Sellers, G8TZJ (LA), had his first taste of 6m DX on 27 December when he had expected to work a few locals in the Christmas Cumulatives. So he was pleasantly surprised to contact K1GUP (FN54) and K1ISR. He was using an FT-847 at 70W to a loft dipole. That antenna was intended for DX TV reception and is 15 years old. It consists of aluminium foil wrapped around a bamboo cane - almost the "piece of wet string" idea as he remarks!

Mike Johnson, GU6AJE, sent in a very long report covering his recent operation from Guernsey and his ocean-going activity as MU5MUF/MM. From home between 21 December and 13 January he added 10 new DXCC countries thanks to UN6P* (MO60), D44TD (HK86), FY5KE, RU4CE (LO31), JY9NX* (KM71), OD5/OK1MU (KM73), YV4DDK (FK60), C6AIE (FL16), P49MR (FK42) and WP4N* (FK78). These were worked in openings on December 21, 23, 24, 26, 27, 29-31 and January 1-3, 6, 10-13 bringing his country tally to 83. He has been trying WSJT mode for trans-Atlantic paths, usually when there is F_2 propagation around but not 'accessible' from IN89. So far he has been heard by KC5OAO (EL39) and by N6RMJ (DM14) in California who detected a ping by a combination of Es, F_2 and MS. On 14 January he had a QSO with VE1RG using WSJT on 50.270MHz via F_2 propagation. His MU5MUF/MM operation aboard the *MV Greenpeace* around West Africa resulted in just over 200 QSOs in the 18 August to 12 October period last year. ODX was G0KZG/MM (LH38UP) from one end of Africa to the other. Mike activated 18 mostly 'wet' grids. The Mediterranean leg of the tour was cancelled following the 11 September events, so the ship was tied up on an inland canal in Zeeland (JO21AL) for two months. He managed a few QSOs as PE/GU6AJE/M. Full details of his logs, with maps and a few photographs, are available on his website - see the list.

Jamie Ashford, GW7SMV (NP), collared some of the best DX around in the 5 December to 15 January period. New DXCC countries were P49MR, KP2BH (FK77), FM5AD (FK94), YV1DIG (FK68), PJ2MI (FK52), HK4CZE (FJ26) and 9Y4TL (FK90). Other countries worked included FG5, FY, JY, OD5, OE, PY, PZ, RU4, UN6, UR3, UY5, VE, VP5, VU2, W, YU, 4X, 5B and 9A. Charles Coughlan, EI5FK, has updated maps for all grids worked last year on his website - see the list. He would like to see others publish such data.

As always, G4UPS's report records propagation and DX heard and worked in great detail, with comparisons of what others were working but which were not audible in Devon. In this respect 6m is different from the lower HF bands in that F-layer propagation can be quite selective. Typically, North American stations seem to have a good path to northern England but are quite weak in the south-west of the country and vice versa.

Ted lists a great deal of DX worked throughout December, mostly trans-Atlantic, but also to the Middle East. On the 5th, UN6P* (MO60) was a new field and grid. Other new grids were K0KP* (EN36) on the 10th, W5UN* (EM23) of EME fame on the 12th, W5UWB* (EL17) on the 24th, VO2AC on the 29th and N5RZ (DM81) on the 30th.

70MHz

Mike Kerry, GW1SXT (NP), reports on FM activity from South Wales. He worked G7CIY/M in Bedfordshire on 8 December. He has also worked G3NKS (GL) and GW0GHF and GW6CUR in the Cardiff area. He still makes a few AM QSOs and would like to see more 4m activity reported. G0EVT hopes to be QRV by the summer and G8TZJ is also QRV.

144MHz

Steve Bunting, M0BPQ operated

ANNUAL VHF/UHF TABLE
JAN TO DEC 2001 - FINAL PLACINGS

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Points
G4DEZ	71	83	24	6	85	17	29	14	23	9	361
G4ZTR	50	44	38	7	102	32	13	5	-	-	291
G3FIJ	34	40	21	3	67	13	17	4	6	2	207
G4APJ	6	16	-	-	62	14	24	7	-	-	129
GU6AJE	34	66	4	3	-	-	-	-	-	-	107
G6TTL	10	35	-	-	34	8	14	4	-	-	105
G7CLY	8	16	-	-	30	12	4	5	-	-	75
G1UGH	1	15	-	-	8	9	-	1	-	-	34

The District Codes were the 124 listed on page 53 in the October 2000 *RadCom*. Up to 6 different GI stations and up to 3 different GM stations in each Scottish district were counted. Countries were the current DXCC ones plus IT9. The deadline for the 2002 table is 15 March.

portable from a car park (IO91XL) during the tropo opening on 9 December. Running 70W into a 9-ele Yagi 5m AGL he worked 63 stations on SSB between 1536 and 1813 in DL, G, ON, OZ and PA, many of them over 600km distant. On MS, he had a good Leonids shower with three new countries contacted, ODX being 1900km.

G0EVT was also QRV on 9 December and enjoyed some tropo across the North Sea working DK5DQ (JO31). DLs and LAs were heard next day. There was an aurora on 24 December with GM3POI (IO88) heard.

Angie Sitton, G0HGA (SG), reports that the Monday CW activity nights are running from 1930 local time. Don't forget that every first Tuesday of the month there is an activity contest 2000-2230 local time - see page 59 in the January *RadCom*.

Dave Newton, G3JJZ (BR) is QRV with 25W to an old 8-ele Jaybeam and his December ODX were DL3BCR and DK1AQ (JO43). G4APJ has been experimenting with WSJT to good effect. In the Geminids shower on 12 December, running 25W to a 9-ele Yagi with a poor VSWR, he was pleased to work DL4ANT and S51DX. F6FHP (IN94) heard Ken so they made a sked for the 27th and completed in just over 30mins.

Colin Smith, GM0CLN (EH), was QRV in the selective tropo opening on 10 December for about five hours from 1810. He worked 11 LAs and another seven G, GM and PA stations on SSB. Propagation was odd in that stations to the south were strongest when beaming north-east. Clive Penna, GM3POI in Orkney, suggested they could have been experiencing some form of backscatter from a tropo duct.

Stewart Cooper, GM4AFF (DD), has some VHF gear for sale as he has decided he has had enough of 2m. Check out his website and follow the link - see the list. Brian Waddell, GM4XQJ (FK), asks, "Anyone in Central Region of Scotland interested in setting up a regular PSK31 sked? I propose using 144.610MHz USB (in line with IARU Region 1 recommendations) on Monday evenings from 2000 using 5W to an 8-ele Yagi 50ft AGL." His e-mail address is gm4xqj@btinternet.com

GW7SMV worked 61 stations in DL, ON and PA in the 9 December tropo lift, ODX being DG9BEM (JO43), DL3OT (JO44) and DL3KVR (JO64). Next day brought QSOs with LAs in JO28 and 38. During the Geminids Jamie completed on SSB with IK2YXK (JN45) on the 13th and next day via WSJT with SP9LCV (JO90) and SP2IQW (JO94) both new grids. In the Quadrantids he made it with WSJT to S52LM (JN65) on 2 January and IZ4BEH (JN54) completed in 5mins and OE1SOW (JN88) next day.

430MHz AND UP

G3JJZ worked DL5NAV (JO33), DK5DQ (JO31) and OZ1FF (JO45) on 70cm in the December tropo lifts with less than 1W output to a 19-ele Yagi. On 9 December, Geoff Grayer, G3NAQ (RG), worked seven countries, DL, F, G, GD, ON, OZ and PA, on 23cm using 10W. ODX was into JO54.

DEADLINES

THE MAY deadline is **12 March** and the June date is **19 April**. My CompuServe ID is g3fpk and the telephone answering and fax machine is on 020 8763 9457. ♦

WWW.

G0CAS *(SunMag)*	**http://www.g0cas.demon.co.uk/main.htm**
N1RZ (DX spotting)	**http://6m.dxers.info/spot/**
GU6AJE logs, etc	**http://www.gu6aje.thersgb.net/mm2001/gu6ajemm.htm**
EI5FK (grids/maps)	**http://www.qsl.net/ei5fk/**
GM4AFF gear for sale	**http://www.qsl.net/gm4aff**

CONTEST

TIM KIRBY, G4VXE
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Windsor SL4 5BZ
E-mail:tim@ukgateway.net

THE PICTURE (right) shows Frank Cooper, G2QT, being presented with the Commonwealth Medal by Chairman of the HF Contests Committee, Justin Snow, G4TSH. The medal was awarded in recognition of Frank's long-standing support for the RSGB Commonwealth Contest. Frank first entered 'BERU' in 1935 and has only missed one year since then. Frank is active daily from his Kent QTH which has an impressive array of antennas [see *RadCom* February 2002 page 39 - *Ed*].

Frank's other passion is cricket and his one missed BERU was in the 1960s, when he was in the West Indies watching England in the test series. He had arranged to enter the contest from a station in Barbados, but a mix-up on the part of the station owner left him unable to enter the contest and spoiled his 100% record.

A second Commonwealth Medal was awarded to John Tutton, VK3ZC, also a BERU stalwart who has given invaluable help with publicity in Australia.

Commonwealth Contest enthuasists will need no reminding that this year's contest takes place on **9/10 March** and we look forward to a bumper entry. RSGB President, Bob Whelan, G3PJT, who has worked hard to publicise the contest in recent years, is planning to operate from Barbados, 8P9.

LOGGING ACCURACY

REGULAR READERS of the column will know that we have visited the subject of logging accuracy several times before. Clearly, it's key to a good entry in a contest.

A interesting message to the uk-contest reflector from Jim, MM0BQI, recently showed another slant to the importance of accuracy. Jim says, "My QSO count would have been higher but I deleted any QSOs where I could not get my QSO partner to acknowledge my exchange. How am I supposed to know that he has all my details correct if when I switch back to receive all I hear is him calling QRZ? No 'QSL' or 'TU'."

How indeed? This might have been stations not sending a 'TU', or conceivably, if relays are slow in the receive chain, then the acknowledgement was sent before Jim could get back to receive. In any event, he's right to look for more certainty that the QSO was complete.

On RTTY, the issue is interesting anyway, because quite often it takes a moment or so for the decoder to settle down when it goes back to receive, so quite frequently the first few characters are rubbish. RTTY contesters might consider sending a CR/LF character before the 'TU QRZ?' message. On CW, I always like to confirm with the QSO with a TU before calling QRZ? On phone, I always think 'Thanks' is nice, but others use 'QSL'. Whatever you do, though, ensure that your QSO partner goes away, knowing that the QSO is complete.

ARI CONTESTS

IT IS ALWAYS nice to receive an enthusiastic letter or e-mail from someone who is new to contesting and who has achieved a result better than he or she expected. I had such an e-mail from Kit, GM4EMX, who had entered, for the first time, the ARI SSB Contest.

Kit says, "The thing that I found a delight with this contest was the politeness of the Italian operators, and the activity on all bands. Though I was suffering from a heavy cold, which got to me in the latter part of the 24 hours. I thoroughly enjoyed it, and EI5DI's *SuperDuper* logger helps fantastically with the multipliers. When I received my certificate of merit today I was delighted! But also, I was surprised to see no logs submitted from GI or GW, and the few logs from GM and G. Along with my certificate came a small booklet with all the results in many formats from the Italian to foreign participants and how they had done."

It's good to see that the ARI is encouraging entrants with such a professional results service, and it sounds like Kit had a great time in the event itself. If you're not into the big CQWW events, or IOTA, you might consider starting off in an event like this. Foundation and Intermediate licensees, in particular, may gain valuable contesting experience from their own stations. Well done Kit, and we hope to see you in the results table again this year!

Justin Snow, G4TSH, presents the Commonwealth Medal to Frank Cooper, G2QT (see text).

LF Cumulative Contests – January 2001

SEVERAL ENTRANTS noted enjoying the opportunity to test antennas and CW skills alike. Some competitors did find activity lacking towards the end of some of the two hour sessions.

It was a two horse race for the finish. Top dog this year is Clive Penna, GM3POI, thanks to his excellent performance on 160m. Close behind is John Muzyka, G4RCG, who was ahead of the rest of the entrants by a good margin.

A few entrants were, as usual, able to make some DX QSOs on 160m, but several USA stations were worked by many on 40m. The third 40m session also coincided with the REF CW contest which resulted in more QSOs but at the risk of more errors on a crowded band!

Mention must be made of Gediminas, LY3BA, for a great score from overseas, and to Andrew, M5ACR, for representing the Class A/B ranks – I hope we have more entries from you soon. The part time and single band entries were appreciated as were the checklogs.

Thanks again to John, G3MCX, and Jan, G0IVZ, for checking the 19,000 or so contest QSOs from the different logs.

Lee Volante, G0MTN

SSB Field Day 2001

THIS WAS the first event in the portable calendar to be reinstated after the outbreak of Foot and Mouth Disease. Barely one month's notice could be given and large areas of the countryside remained closed. Even so, a total of 23 groups, evenly split between the Open and Restricted sections, took to the fields and were rewarded with fair weather and some brisk competition.

Conditions on the HF bands were generally a little improved over last year. The leading Open section scores were up by about 15% as operators took full advantage of easterly openings on 20m and 15m, running off scores of JAs at a time. For once, the All-Asian contest proved an asset rather than a liability. (Note that it is perfectly acceptable to work stations participating in other contests and to send them the information which they require, as long as the RSGB contest exchange is sent as well and any number received is correctly logged.) No such good fortune for those without beams and amplifiers, however. Restricted section scores, always heavily reliant upon LF conditions were, if anything, down a trifle.

Logs were of a high standard with fewer errors detected than in the 2000 event. Where points were lost, this was almost always due to mistakes in receiving callsigns, the most common problem being the confusion of similar-sounding letters: 'M' and 'N'; 'S' and 'F' and so on. It may be slower to use full phonetics but it is certainly more accurate. Probably for the first time ever, all the logs were submitted in electronic form, either on disk or by e-mail. This was a godsend to the adjudicator, who was relieved of the chore of typing paper entries into the computer. Even a log which is not in a recognised format (and there were a couple of those) can be manipulated with comparative ease in a word processor.

In the Open section, Lichfield ARS stormed into the lead by a margin of around 30% from G3TBK/P, with last year's winners, the Bristol Contest Group, G6YB/P, in third place. The average QSO rate at G3WAS/P was 77 per hour!

Success in the Restricted section is much more dependent upon tactics. Granta Contest Group, M0CAM/P, submitted a superbly accurate log and amassed some 300 more QSO points than G3GRS/P. But the Gravesend Radio Society's operators found 35 extra multipliers - more than sufficient to retain their hold on the trophy. Third place in this section went to Addiscombe ARC, G4ALE/P, who commented, "Only entered as a replacement for CW NFD. Enjoyed it so much we are already talking about next year."

Steve Knowles, G3UFY

SSB Field Day, 2001

Open Section

Pos	Group	Call	3.5 Qs	3.5 Ms	7 Qs	7 Ms	14 Qs	14 Ms	21 Qs	21 Ms	28 Qs	28 Ms	QSOs	Points	Mults	Total Claimed	Errors	Final Score
1	Lichfield ARS	G3WAS/P	116	24	176	38	838	69	630	70	83	46	1863	6207	247	1533129	82	1457542
2	G3TBK et al	G3TBK/P	157	39	216	29	836	69	358	53	95	31	1662	5883	202	1147966	49	1108562
3	Bristol CG	G6YB/P	108	19	151	25	802	63	388	55	86	28	1735	5836	190	1108840	51	1070779
4	GM5VG	GM5VG/P	120	19	278	43	397	45	556	44	91	28	1442	5058	179	905382	54	874305
5	North Wakefield RC	G4NOR/P	129	16	176	29	486	46	395	48	63	25	1249	4383	164	718812	48	687732
6	South Notts ARC	G8DDP	98	13	204	28	485	33	501	47	112	25	1400	4716	146	688536	40	664902
7	Cockenzie & Port Seton ARC	MM0CPS/P	159	19	134	18	452	47	261	48	66	31	1072	3762	163	613206	32	592137
8	Swansea ARS	GW4CC/P	131	21	180	21	183	34	386	40	125	31	1005	3620	147	532140	37	510737
9	Ipswich RC	G4IRC/P	109	13	155	21	495	46	337	34	25	14	1121	4022	131	526682	35	509507
10	Clifton ARS	G3GHN/P	115	11	126	22	435	48	175	34	55	23	906	3307	138	456366	44	430140
11	Edgware & DRS	G3ASR/P	138	14	142	27	257	43	34	15	43	16	614	2419	115	278185	21	268636
12	Melton Mowbray ARS	G4UOX/P	71	8	126	19	85	23	364	31	32	14	678	2440	95	231800	20	229465

Restricted Section

Pos	Group	Call	3.5 Qs	3.5 Ms	7 Qs	7 Ms	14 Qs	14 Ms	21 Qs	21 Ms	28 Qs	28 Ms	QSOs	Points	Mults	Total Claimed	Errors	Final Score
1	Gravesend RS	G3GRS/P	140	16	179	30	139	45	118	59	51	27	627	2394	168	402192	15	394144
2	Granta CG	M0CAM/P	139	17	171	29	232	44	98	39	34	13	674	2693	133	358169	4	355908
3	Addiscombe ARC	G4ALE/P	201	22	138	24	180	33	75	26	36	18	630	2511	123	308853	23	296430
4	Wisbech AR & EC	M5ARC/P	156	14	159	23	219	36	63	27	39	18	676	2455	118	289690	14	283306
5	Queen Mary CG	G6QM/P	159	18	150	21	169	33	110	30	17	11	605	2461	113	278093	9	273347
6	Echelford ARS	G3UEN/P	129	18	129	21	210	42	60	25	32	17	560	2235	123	274905	15	266787
7	RAF ARS	G8FC/P	110	13	118	24	151	34	69	25	24	12	472	2004	108	216432	17	209062
8	Gloucester ARTS	G4AYM/P	151	13	109	14	203	30	58	20	5	3	527	2155	80	172400	12	168160
9	Stockport RS	G6UQ/P	90	9	47	9	120	32	124	38	19	15	400	1701	103	175203	16	167787
10	Havering & DARC	G4JTRC/P	139	12	154	24	44	19	61	19	14	13	411	1757	87	152859	22	144420
11	Ilchen Valley ARC	G0IVR/P	33	8	67	14	146	42	36	16	18	13	300	1249	93	116157	11	111879

LF Cumulatives, 2001

Pos	Call	40	80	160	Total
1	GM3POI	534	642	627	1803
2	G4RCG	630	633	522	1785
3	G0CKP	486	555	501	1542
4	G3UZQ	516	522	465	1503
5	G3GLL	450	552	471	1473
6	M0EEE/P	486	519	414	1419
7	G3IZD	462	558	396	1416
8	G3KNT	489	537	387	1413
9	G0IQW	477	501	429	1407
10	G3YEC	477	525	396	1398
11	G4OGB	432	543	414	1389
12	G3ZBE	468	528	381	1377
=13	GW3NTW	429	540	393	1362
=13	G2HUU	462	522	378	1362
15	G3YAJ	447	516	357	1320
16	G3RSD	474	486	330	1290
17	G2AFV	420	522	333	1275
18	G3NKS	372	579	312	1263
19	GM4SID	342	564	354	1260
20	G3TJE	417	480	345	1242
21	G4BIY	393	519	324	1227
=22	G3ZGC	417	492	303	1212
=22	G4EBK	444	471	297	1212
24	G4CWH	399	468	309	1206
=25	G3KKP	387	480	321	1188
=25	G3HZI	333	453	402	1188
27	G3DG	510	387	255	1152
28	G3UIK	324	528	237	999
29	G3GMS	351	402	240	993
30	GM0CUN	222	471	267	960
31	GW3WWN	426	480	-	906
32	GM3CVI	309	357	210	876
33	GW3PRL	186	363	312	861
34	G3AWR	255	342	213	810
35	LY3BA	165	330	240	735
36	GW3SB	249	312	171	732
37	G0VYR	231	270	180	681
38	GW0KZW	258	225	198	681
39	G4BLL	141	405	-	546
40	G4PHT	288	222	-	510
41	G4ENA	-	-	372	372
42	G4XPF	186	-	141	327
43	G4BIM	-	324	-	324
44	G3YHC	-	312	-	312
45	GM0IKP	-	237	-	237
46	G3WQO	-	-	231	231
47	G0IBN	189	-	-	189
48	M5ACR	-	138	-	138
49	G3KAP	129	-	-	129
50	G3ZDD	-	102	-	102

Checklog gratefully received from G3LUW

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest	Bands	Exchange
2/3 March	*0000-2400*	*SSB*	*ARRL Phone*	*1.8-28*	*RS + Power*
9/10 March	1000-1000	CW	RSGB Commonwealth	3.5-28	RST+Serial
16/18 March	*0200-0200*	*RTTY*	*BARTG Spring RTTY*	*3.5-28*	*RST+Serial+Time*
25 March	1900-2030	CW	RSGB Slow Speed Cum	3.5	RST+ First Name
30/31 March	*0000-2400*	*SSB*	*CQ WPX SSB*	*1.8–28*	*RST + Serial*

VHF Contests

Date	Time	Mode	Contest	Bands	Exchange
2/3 March	1400-1400	ALL	RSGB 144/432MHz	144/432	RST+Serial+Locator
5 March	2000-2230	ALL	RSGB 144MHz Activity	144	RST+Serial+Locator
12 March	2000-2230	ALL	RSGB 432MHz Activity	144	RST+Serial+Locator
19 March	2000-2230	ALL	RSGB 1.3/2.3GHz Activity	1.3/2.3	RST+Serial+Locator
26 March	2000-2230	ALL	RSGB 50MHz Activity	50	RST+Serial+Locator

Microwave Contests

Date	Time	Mode	Contest	Bands	Exchange
24 Mar	0900-2000	ALL	All-Band Activity Day	All	Non-competitive

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in January 2002 *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.rsgbhfcc.org and www.blacksheep.org/vhfcc

HF HF HF HF

DON FIELD, G3XTT
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e-mail: hf.radcom@rsgb.org.uk

THERE HAS been some correspondence recently from Monk Apollo, the only resident of **Mt Athos** (who usually operates as SV2ASP/A). Apollo is trying to secure the SY prefix exclusively for use from Mt Athos, whereas the Greek authorities use SY for a number of special event operations. It appears that, while discussions are in progress, Apollo will remain inactive.

Bruno, F5DKO, will be active 4 - 16 March from **Madagascar**. He expects to be active during the first week of his trip from Madagascar's Coastal Islands West Group (AF-057), and the second week from Madagascar's Coastal Islands East Group (AF-090). QSL to IZ8CCW.

Mirek, SP5IXI, has been working in **Algeria** since June 2001 and has now obtained a licence, probably with the call 7X0DX. He hopes to be active until about May.

Several stations are now active from **Afghanistan**, in addition to YA5T (see February HF). Karl, K4YT, is operating from the US embassy as YA0USA and Nick G4KUX, who is involved in a telecommunications project, has been signing G4KUX/YA.

Stig, LA7JO, is the first foreigner to obtain an official operating licence in **Iran** since 1979. He is allowed to use the PTT club station (using the callsign EP3PTT) and has been active on 40, 20, 15, 12, 10. QSL Stig's operations only to his home call.

Hrane, YT1AD, and Voja, YU7AV, returned from a visit to **North Korea** on 26 December. They were unable to get permission to operate on that occasion, but they say they have a licence to operate from North Korea with two additional operators starting 5 March. Hrane and Voja will be asked to train at least 20 new North Korean ham operators. They promise more details will follow.

Ray, G3NOM, writes from Bangkok about his recent visit to **Bhutan** (where he operated as A52OM). Ray says, "The main task was to train 20 Bhutanese teachers and students for novice and general class examinations. The invitation came from the Bhutan Telecommunications Authority (BTA)." Ray continues the voluntary work started by Glenn, W0GJ, last year, when seven students were trained to novice class level. Some provincial technical college teachers were invited to attend the training course so that they can teach their students about amateur radio, and possibly set up club stations. The impetus for the training has come to a certain extent from a donation of equipment to set up club stations, and the opening of the Bhutan Amateur Radio Club (BARC) club station within the BTA HQ. Yeshey Dorji, A51AA, has been instrumental in setting this all up.

La Gazette du DX reports that Jacques, F6BUM, plans to be active on CW and SSB from the **Vietnamese** islands of Tam (AS-157) on 14-16 March, Cham (AS-???) on 21-23 March and Cat Ba (AS-132) on 3-5 April. QSL via F6BUM.

Nick, VK1AA, and Ranko, YT6A, will operate from **Temotu** (H40) between 28 March and 12 April. Since all past operations have concentrated on the higher bands, they plan to spend as much time as possible on 40, 80 and 160, the WARC bands, CW and RTTY.

Michel, F6COW, and Dominique, F6EPY, were due to operate from **Samoa** and **Vanuatu** during February and March. First stop was Upolu, Samoa (OC-097) from February 19 to 28 as 5W0MP and 5W0DA. Then it's on to Efate and Espirito Santo, Vanuatu (OC-035) as YJ0AOW and YJ0APY from 4 to 15 March. The operation will be mainly CW with an emphasis on Europe on 12, 17, 30, 40 and 80. They will have an IC-706MkIIG, FT-100D and two FL-2100B amps. Look for them to be active also on RTTY, PSK31, MPSK and MP63. Suggested frequencies are as follows: CW - 3515, 7015, 10115, 14015, 18095, 21015, 24905, 28015; datamodes - 7035, 10145, 14085, 21085, 28085; SSB - 3780, 7075, 14215, 18135, 21215, 24985, 28465.

German operators Rudi, DL7VFR, and Tom, DL2RUM, have rescheduled their trip to **Midway Island** for this month. They had originally planned an operation in late September but had to cancel at the last minute. They now expect to operate from Midway between 10 and 23 March, signing KH4/homecalls on 10 - 160, CW, SSB and RTTY. QSLs go via their home calls. However, a planned operation by Phil, G3SWH, and Jim, G3RTE, has had to be cancelled due to a running down of flights and hotel facilities on the island, so the status of future Midway operations is in doubt. Midway was ranked number 27 in Europe and number 55 worldwide on the *425 DX News* 'Most Wanted DXCC Countries Survey' in 2001 and number 89 on the ARRL list in 2000.

As mentioned briefly last month, there will be a second attempt to activate **Ducie Island** this month. The group will depart from Mangareva on 12 March, on the ship *Braveheart* (recently used for the South Georgia / South Sandwich expedition). Operators will be: VP6TC, VP6DB, VP6AZ, VP6MW, VP6BK / JA1BK, JA3USA, JF1IST, K9AJ, and K5VT. Randy, an SWL, will be going to provide additional logistical support. QSL Manager is Garth Hamilton, VE3HO. Log checking will be available on the web page. To give out this new counter to as many people as possible, the plan is to be active on 21020 and 21295 24 hours a day. Other prime frequencies will be 28495 and 14195 for SSB and 14020 for CW. Once the pile-ups begin to diminish, attention will turn to other bands and modes.

David, M0CNP, writes that he will be visiting **Bermuda** between 9 and 16 March, and hopes to operate M0CNP/VP9 or even a VP9 callsign with CW and SSB.

David, G0RWY, writes that he has been maintaining skeds with Don, V31PC, in **Belize**, but that their last sked was cut short when Don's home was hit by a 140MPH hurricane which took the roof off his house and devastated the orange grove which is his livelihood. Although the rig and antenna remain intact, it will be some time before Don is back on the air.

Ken, G3OCA, and Les, G4CWD, will attempt to activate a number of rare **Mexican** island groups this month. Basing themselves at XE2MX's QTH, they hope to operate from at least four of the following: NA-162, NA-163, NA-164, NA-165 and NA-167. No dates can be given at this stage, but they leave the UK on 2 March and return on 24 March. The same call (hopefully a special call, which is being requested) will be used from all of the islands. QSL via G3OCA either direct or through

COUNTRIES WORKED, 2001 (FINAL)

CALL	CW	SSB	DATA	MIXED
G4DUW	224	251	0	285
M0CTQ	44	261	0	284
G4PTJ	249	247	0	274
G4OBK	242	148	94	272
M0BIB	-	-	-	265
M0AWX	0	261	0	261
G0NXX	260	0	0	260
G0TSM	208	202	105	259
M0BZQ	46	239	0	258
G0VFH	0	250	0	250
G3SXW	232	0	0	232
G3YVH	184	131	2	228
G3TXF	217	141	3	226
G0MSM	35	222	37	222
G3IGW	221	0	0	221
G4EDG (QRP)	221	0	0	221
ZC4BS	152	202	52	219
G3LHJ	204	107	78	216
G3JFS	184	171	134	211
M0LLW	0	209	0	209
GM0VIT	141	134	2	196
G0CAS	-	-	-	194
ZC4DW	170	100	106	188
MU0FAL	157	158	0	183
G3XTT	164	92	2	181
M5PLY	0	181	0	181
MM0BQI	106	137	120	173
G0ARF	0	0	171	171
G4IRN	152	111	0	163
M0CNP	-	-	-	148
GW4SKA	0	0	142	142
G4FVK	50	125	0	131
GU0SUP	-	-	122	122
M0CAL	0	121	0	121
G3WP	119	0	0	119
GM4ELV	45	118	-	118
GM4OBK	113	13	0	118
G4YWY/M	0	111	0	111
G3MDH	0	103	0	103
GM4FAM	-	-	-	102
M5AEF (QRP)	22	92	0	94
G4MUW	0	91	0	91
G4DDL	60	39	23	72
GI0NQC	0	49	47	71
M0ASJ	14	66	0	66
G3URA	0	0	63	63

the RSGB bureau.

There will a large operation from **San Felix** Island (IOTA SA-013), off Chile, starting around 12 March for two weeks. The callsign will be XR0X and the operators include NP4IW, K5AB, I8NHJ, N7CQQ, DJ9ZB, CE0YWS, N6MZ, KO4RR, KK6EK, W6KK, HB9AHL, K5AND and N6TQS. Expect plenty of activity on all bands and modes.

There was a late announcement of an expedition to **Trindade Island**, to sign PW0T until 2 March. Normally operations are confined to just a day or so, while the supply vessel is anchored there, but an opportunity came available at short notice to mount a longer operation. The team is largely the same one which activated St Peter and Paul Rocks last year. KU9C will handle QSLs (see November 'QTH Corner').

'MOST WANTED'

THE RESULTS OF two 'Most Wanted' surveys have been published recently, by *The DX Magazine* and *425 DX News*. Both are similar, though the former probably reflects a greater response from US operators, while the latter has a stronger European flavour. The 'top ten' from each list is as follows: ***DX Magazine***: 1. P5 North Korea; 2. BS7 Scarborough Reef; 3. VU4 Andaman; 4. VU7 Laccadive Is; 5. 7O Yemen; 6. VP8/S South Sandwich; 7. YA Afghanistan; 8. FR/J Juan De Nova; 9. 3Y/P Peter 1 Island; 10. VP8/G South Georgia; ***425 DX News*** - 1. VP6D Ducie Island; 2. P5 North Korea; 3. VU4 Andaman; 4. BS7 Scarborough Reef; 5. VU7 Laccadive Is; 6. VP8/S South Sandwich; 7. 7O Yemen; 8. 3Y/P Peter 1 Island; 9. FR/J Juan de Nova; 10. KP5 Desecheo Island. The recent South Sandwich and South Georgia operations should make a difference, and Afghanistan is currently seeing daily activity. Ducie and North Korea also ought to see a drop in the near future. Which means that Scarborough Reef, the Andamans and the Laccadives will be heading for the top of both lists. In all three of these the problem is political rather than the physical difficulty of mounting an operation, and it may be some years before any activity takes place. Indeed, Peter 1st looks like the only one on both lists where an operation depends more on logistics than permits (though, even there, environmental considerations are becoming more and more of an issue as the years go by). Further breakdown of the two Most Wanted lists can be seen on the web.

Bert, PA3GIO, back home in the Netherlands, with his incoming QSLs (see 'QSO Records' below).

QSO RECORDS

FOLLOWING ON FROM the piece 'QSO Record?' in January HF, Vlado, Z35M, writes that his end-of-year QSO total was 43,300 QSOs from his home station and under his personal call Z35M for a new 'European Year QSO Record' and is among the three best results ever in the world (VP6BR in 2000 made 56,059 QSOs and KV4AA (SK) in 1978 made 48,100 QSOs). Vlado says he was active for 350 days (over 1000 hours), with a daily average of 118.6 contacts. Most of the contacts were on 10, 15, 20 and 40m. Vlado gives the background information that he is 35, with a family and full-time job, and thanks his wife and daughter for their tolerance!

Bert, PA3GIO, writes that, as a result of his many DXpeditions in recent years, his annual QSO totals for 1999, 2000 and 2001 are 30,675, 47,089, and 39,825 respectively.

I have to say, though, I was more in sympathy with one of my correspondents who, in response to the January item, suggested that anyone who tries to set a record of this kind must be more than a little mad!

TABLES

FINAL TALLIES FOR the year table appear this month. As might be expected at this stage of the sunspot cycle, 2001 saw many DXpeditions to rare and less rare DXCC counters, so it was possible to achieve a very high in-year country score. Congratulations to John, G4DUW, second last year, but first by the slimmest of margins this time. Of course, this isn't about winning as such, but it's certainly interesting to see what is achievable within a year's operating. I am particularly impressed by some of the datamode totals and by G4EDG's score with QRP.

Robin, M5AEF, reports that 17m worked very well for him with his QRP (usually 1 watt or less) operation, as there is less noise and QRM than on 15 and 20m. For example, in December, his 1 watt signal brought him contacts with BA4RF (China), WP4U (Puerto Rico) and KL7J (Alaska). A large number of entrants were running just 100W, but with good results. David, G4FVK, for example, writes that he has a TA33 about 10m above ground, which he also persuades to load on 12m with a little help from his ATU. An 80/40m trap dipole is also persuaded on to 17 and 30m. The driver is a TS-850. Mike, G3IGW, used just wire antennas, none above 25ft high, to work 221 countries on CW. He says that 199 were worked in the first six months of the year, with

9 BAND TABLE No 41

MIXED MODE

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
G3KMA	251	301	327	318	333	323	333	318	329	2833
G4BWP	244	305	332	319	333	327	332	309	321	2822
G3XTT	231	276	316	281	332	311	329	291	310	2677
G3GIO	150	245	302	262	333	314	331	296	324	2557
GW3JXN	179	251	291	280	325	314	311	285	293	2529
G4OBK	162	216	272	273	325	300	312	293	293	2446
G3SED	231	251	284	267	303	275	276	245	274	2406
G3TXF	127	232	291	271	324	279	321	253	297	2395
G3TBK	119	231	273	243	324	286	310	272	285	2343
G3YVH	125	154	254	276	318	310	304	272	278	2291
G3LAS	95	186	232	233	306	290	305	279	280	2206
G3IFB	62	221	287	228	325	242	304	238	286	2193
G3VJP	107	182	256	190	326	276	313	245	286	2181
GM3PPE	148	210	251	263	314	244	270	226	224	2150
G3KMQ	59	210	264	206	324	240	281	248	242	2074
G3IGW	129	198	315	237	288	246	257	128	234	2032
G4PTJ	35	168	208	151	322	251	317	235	297	1984
G5LP	67	222	281	202	309	181	276	116	239	1893
G0JHC	1	29	151	234	260	287	302	279	303	1846
G3VKW	47	159	215	105	319	188	316	187	300	1836
G3NOF	5	126	131	0	332	298	330	263	305	1790
M5ACC	34	105	195	170	262	223	229	199	237	1654
M0AWX	45	115	138	0	277	219	263	204	225	1486
G4NXG/M	24	58	137	0	287	199	274	178	247	1404
G4OWT	2	44	151	77	302	55	288	59	257	1235
GM4OBK	43	97	134	77	163	117	157	127	188	1103
G0LRX	1	95	124	0	233	53	251	52	227	1036
G4FVK	40	78	103	57	183	104	185	66	165	981
M0CNP	10	65	91	7	175	62	150	37	100	697
AVERAGE	*96*	*173*	*228*	*180*	*295*	*235*	*284*	*214*	*264*	*1968*

CW ONLY

G3KMA	245	281	324	318	332	321	330	304	320	2775
G3XTT	221	245	303	281	303	286	298	264	278	2479
G4BWP	214	220	286	318	289	300	283	277	241	2428
GW3JXN	176	220	275	280	303	298	298	263	267	2380
G3TXF	127	225	289	271	319	277	315	252	283	2358
G0NXX	169	232	276	282	292	281	272	255	259	2318
G4OBK	150	195	263	273	301	284	282	271	273	2292
G3YVH	124	150	250	276	309	297	288	256	258	2208
G3SXW	96	201	259	251	316	268	298	241	276	2206
G3SED	230	236	280	267	276	242	237	202	213	2183
G3NOH	49	124	208	257	301	283	294	248	261	2025
G3VJP	106	147	245	190	298	253	285	221	251	1996
G3LAS	93	104	204	233	260	253	268	239	240	1894
G5LP	67	217	281	202	298	181	264	116	228	1854
G4PTJ	33	105	175	151	232	214	258	205	238	1611
G3VKW	41	84	160	103	223	140	243	138	187	1319
G4OWT	0	43	116	77	221	38	222	44	188	949
GM4OBK	36	79	117	77	138	99	137	109	138	930
AVERAGE	*121*	*173*	*240*	*228*	*278*	*240*	*271*	*217*	*244*	*2011*

NEXT DEADLINE: 8 April 2002. Prepared by G3GIO (HenryLewis@compuserve.com)

2001 CQ WW 160 Contests

CW – single-op	
GW3JXN	211922
G3XTT	179376
MU2K	174955
*G4VGO	164700
*GM3CFS	95400
G3NAS	30316
*M4T	21056
*G3KKQ	20808
CW – multi-op	
G3N **	659834
G3LZQ	441024
SSB – single-op	
*G4VGO	55248
G3NAS	45637
*G3VAO	11625
G4BJM	4255
*GW4BLE	3675
SSB – multi-op	
GU8D	137704

** 1st Europe

just 22 added after that. He comments that scores seem to suggest that the DX possibilities on SSB and CW were very similar. Well done to all of you, and thanks for your participation. The first 2002 scores will appear next month. I know that some of the new Foundation licensees have been having a ball on HF, perhaps some of you would like to take part? I have also received the first five entries for 2002, three of them from ZC4-land. I look forward to seeing what 2002 will bring, and whether we will see totals exceeding those of 2001.

The latest 9-band tables appear on page 81 this month, with thanks as always to Henry, G3GIQ, for their compilation. Henry writes that many people updated this time and he is considering (once a year) including an extra column showing each participant's yearly progress. On the question of whether to include 6m, there has been little response and that which he has received is predominantly against a change, so the table remains a 9-band one.

CONTESTS

THIS MONTH LET me draw your attention to the BARTG HF RTTY Contest 2002, which runs from 0200 on 16 March for 48 hours. Single operator and SWL stations are permitted a maximum 30 hours operation. Rest periods may not be less than 3 hours per period. Multi-operator stations may work the full 48-hour contest period. The contest takes place on 10, 15, 20, 40 and 80m, and the contest exchange is RST/message number/time (UTC, four figures). This is one of the oldest-established RTTY contests and always attracts a high entry. If you need further details, let me know, or check the BARTG website. There are several other contests worthy of note in March: the ARRL event on 2/3 March, the RSGB Commonwealth Contest the following weekend, and the *CQ* WPX SSB Contest on 30/31 March (last year's results will appear in my April column). During the Commonwealth contest I expect to be operating from Ghana (9G) and G3PJT's travels for that contest take him this year to Barbados (8P). In the WPX contest a large group will be active as D44TC and J6DX will be a multi-multi operation from St Lucia.

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 **May** issue by **16 March**. ♦

WWW.

BARTG:	http://www.bartg.demon.co.uk/
CE0Y/DM5TI:	www.qsl.net/dm5ti/ce0y/
Ducie logs:	http://www.big.or.jp/~ham/dx.html
Other Ducie information:	http://www.qsl.net/wd4ngb/ducie.htm
	http://www.ve3ho.com/ve3ho-qslmgr.htm
DX Magazine Most Wanted:	www.dxpub.com/dx_news.html
H40 by VK1AA/YT6A:	http://www.qsl.net/vk1aa/temotu/
PA3GIO:	http://www.pa3gio.nl/
PW0T:	www.Trindade2002.com
XR0X:	www.cordell.org/SFX/
Z35M:	www.qsl/net/z35m
425 DX News Most Wanted:	www.425dxn.org/surv2002/most_to.htm
5W / YJ DXpedition:	http://perso.wanadoo.fr/dominique.auprince/
7X0DX:	www.7x0.sp5xcc.waw.pl

HF F-Layer Propagation Predictions for March 2002

	3.5MHz	7.0MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	86......7778	883....28888	..7777788621	.17999999632	..69999984..	...368862...	....3553....
*** Asia							
Yakutsk	.........2..	4642	227667786664	..377752.2..	...7773.....	...484......	...252......
Tokyo	........12..	.......2671.	....122454..	...143222...	....42......	...263......	....4.......
Singapore	....	14431	......27852.	.....27882..	.....4786...	...126774...	...13666....
Hyderabad	....	1123	1.....167765	..2113799732	..55568984..	..48889993..	..3888997...
Tel Aviv	77......6456	882....18888	656755789798	2..766788843	...57778462.	...4566635..	...3344423..
*** Oceania							
Wellington	........2...	.......68...	...477789...	...255546...	....44323...	....553.2...	....33......
Perth	....	........344.	......16642.	.....277752.	.....4664...	..1357752...	...56652....
Sydney	....	.......165..	.....15773..	....378882..	....57876...	...478875...	...57775....
Honolulu	....	..2.........	...55211....	....3.......	....	....	....
W. Samoa	....	..1.........	...56675....	....5673....	....366.....	.....45.....	.....23.....
Ducie I DXpedition	....	.211........	22.77.......	...272......	....63......	....532.....	....222.....
*** Africa							
Mauritius	....	5.......1455	2......37653	.......6752.	.......762..	......264...	......252...
Johannesburg	77.......466	99......8999	771....29999	226311289987	..5655689874	..487889983.	..27888996..
Ibadan	.1..........	451.....1333	6283..127877	426987889965	2.4988889843	2.4999999742	..299999962.
Nairobi	....	21........11	77.....13467	4251..146777	2.6311367864	..565667763.	..27677784..
Canary Isles	565......665	788.....5887	867853568888	534988888985	3.2898889953	...7888886..	...5888884..
*** S. America							
Buenos Aires	223........2	888.......78	5336.....164	42282...1774	...75212575.	...5554566..	...2465565..
Rio de Janeiro	....	555.......34	3221.....542	523741.15975	...56434786.	...2765677..	....776676..
Lima	....	433........2	1..6......11	2..832..1562	...7.522453.	...3.65564..	.....65553..
Caracas	....	111.......12	3.14......33	....3....33.	....221225..	....277777..	.....77775..
*** N. America							
Guatemala	....	211........1	...2........	....	....	.....23331..	......222...
New Orleans	....	111........1	1..3......2.	2..3.6656742	.....577772.	.....38886..	.....28884..
Washington	1..........1	545.......15	522251..1477	2....6566752	.....777783.	.....37775..	.....27782..
Quebec	763.......47	8871.....588	...22.12262.	...37888883.	...2678886..	....577874..	....466763..
Anchorage	....	465........1	........223.	........473.	........23..	....	....
Vancouver	....	121.........	....	.......566..	.......263..	.......363..	........4...
San Francisco	....	121.........	....	.......333..	.......342..	........34..	.........2..

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 January 2002 issued by the Sunspot Data Centre, Brussels, was 113.9. The maximum daily sunspot number was 142 on 4 January and the minimum was 74 on 17 January. The predicted smoothed sunspot numbers for March, April and May are respectively: (SIDC classical method – Waldmeier's standard) 110, 107, 105 (combined method) 92, 91, 88.

Antennas

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THE MOXON Rectangle antenna, described in the January 'Antenna' column [1], created a lot of interest. As Ryan Pike, G5CL noted, "the appeal of this antenna is that it very simple to build and does not take up that much room. I should imagine many new Novices [now Intermediate - *Ed*] and Foundation Licence holders have been glad to get the 'low-down' on it, as home construction should be easy".

Dave Hulatt, G4WFQ, constructed a 10m-band Moxon Rectangle from some light multi-stranded insulated house wiring, using the dimensions quoted in [1]. The wire elements are supported using white plastic 12mm tubing, with holes drilled for the elements. The driven element is fed directly with RG239 coax. He erected the antenna in the loft of his house and the results were excellent. The Moxon out-performed the ground plane verticals and a G5RV by an average of three S-points.

G4WFQ's antenna is fixed so that it beams west. During the 2002 ARRL 'RTTY Round-Up' contest, he made 155 QSOs (working 40 states and 9 Canadian provinces) on the 10 metre band. He remarked that had he had additional similar antennas for 15 and 20 metres he could have put in a really big score. G4WFQ also commented that this is the first beam antenna he has had at his present QTH and had forgotten what it was like to have an antenna with gain.

Tony Box, G0HAD, described his experiences with a multiband VK2ABQ beam back in 1993. The overall size of this structure was 20 x 12ft and this was (as Les Moxon, G6XN, suggested in [2]) the optimum size. In view of the difficulties I had described with multibanding [1] I decided to investigate further.

The original VK2ABQ antenna is a square structure, see **Fig 1**. The driven element and the reflector are a quarter wavelength apart although the tips the elements support each other using insulators. These insulators are constructed so that the tips of the elements are 6mm (1/4in) apart and, according to the original description [3], capacitive end (voltage) couples the driven element to the reflector, as opposed to the coupling that occurs on a Yagi. The gap between the tips of the elements is described as 'not critical'. Multiband versions of this antenna were constructed without any known difficulty.

G6XN [2] changed the structure from a square to a rectangle, thereby reducing the centre section spacing of the elements from 0.25 wavelength spacing to 0.17 wavelength spacing. This resulted in improved gain and directivity, see **Fig 2**.

C B Cebik, W4RNL [4], reduced the element spacing further to 0.14 wavelength and obtained yet more gain and improved directivity. This antenna he called the Moxon Rectangle and was the one I described in [1]. The downside of this higher performance is the problem of multibanding.

Going back to G0HAD's description, he says, ". . . as the result of a packet request I was recommended to contact Les Ward, G4XGC, at Blandford, who was a recognised expert on these antennas. I was invited down to view Les's aerial farm and after a short demonstration, I was 'hooked'. By experiment it was found that the gaps between the tips of the elements needed to be a lot larger than published [2] and I followed Les Ward's suggestion of 22in for 20m, 15in for 15m and 10in for 10m, which seemed to work well. It certainly outperformed the previous commercial mini beam . . . I can't remember ever having any problems that could be put down to interaction between the bands, although I remember reading about such a possibility."

It would appear that if you want a multiband beam, the original G6XN antenna gives the best compromise between performance and multibanding.

Lack of space precludes constructional details although I hope to include this in a later column. Details on the construction of this antenna are given in [2] and [4]. Details of the construction of my single-band W4RNL Moxon Rectangle are described in [5].

I have been asked how to work out the length of the support (cane or fibreglass rod) structure required. It is simply the length, squared, plus the width, squared which gives the length of the support (squared). For example, if we wanted a support for a 20m W4RNL antenna:

$$\sqrt{7.62^2 + 2.92^2} = \sqrt{66.59} = 8.16m$$

This is the total length of the diagonal so you would halve that figure for the length of each support:

8.16/2 = 4.08m (approx 13.4ft).

FURTHER READING

[1] 'Antennas', *RadCom*, January 2002.
[2] *HF Antennas for all Locations*, L A Moxon, G6XN.
[3] 'VK2ABQ Antenna', Fred Caton, VK2ABQ, *Electronics Australia*, October 1973.
[4] www.cebik.com/
[5] 'The Moxon Rectangle Revisited', Peter Dodd, G3LDO, *Practical Wireless*, June 2000. ♦

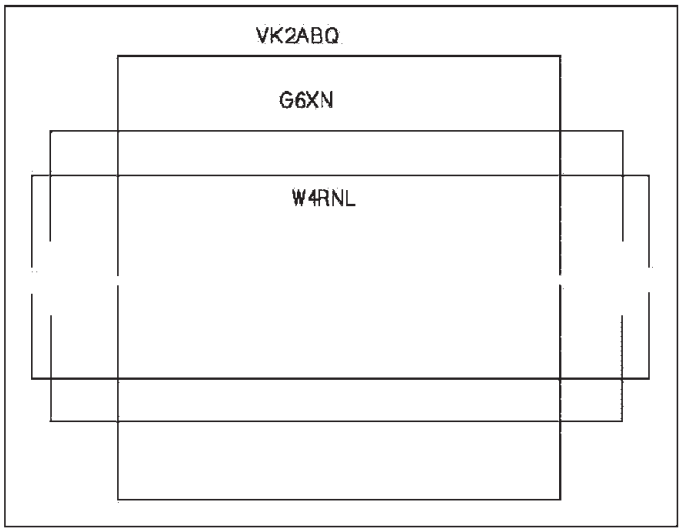

Fig 1: The original VK2ABQ antenna structure compared with the G6XN and the W4RNL. The G6XN has a centre section spacing of the elements of around 0.17 wavelength spacing, while the W4RNL has element spacing reduced further to 0.14 wavelength.

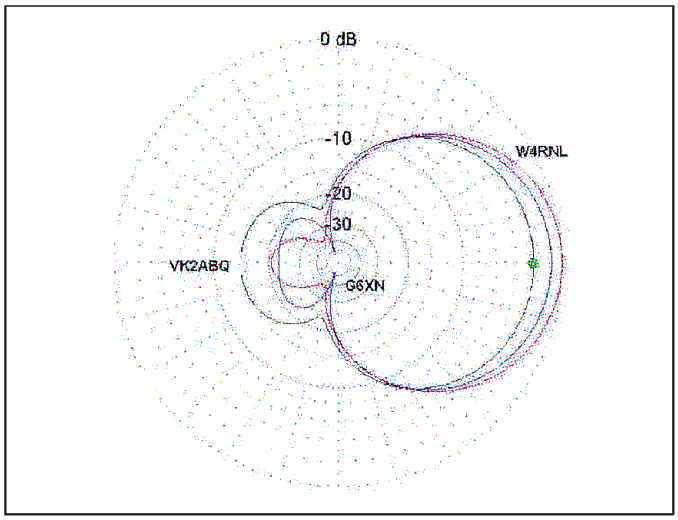

Fig 2: Free-space antenna computer model (using *EZNEC*) showing the relative performances of the VK2ABQ antenna compared with the G6XN and the W4RNL. The calculated gain is 3.77dBi, 5.26dBi and 6.11dBi for the VK2ABQ, G6XN and W4RNL antennas respectively. Although the W4RNL gives the best performance as a single-band antenna, experience shows that problems occur if any attempt is made to construct a multiband model.

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SWL

IT IS NOT too soon to be thinking about the RSGB's 2002 *Yearbook* and ensuring that there is a greater SWL presence. There has been an SWL page in the *Yearbook* for the last few years, but it would be good to have the names, addresses, and e-mail addresses where appropriate, of many more British Isles SWLs.

Having your details in the *Yearbook* would mean that other SWLs could get in touch to exchange ideas. It would provide another means of licensed amateurs having your address details to send you a QSL card; but more importantly, a fuller SWL listing makes a positive statement about SWLing in the British Isles.

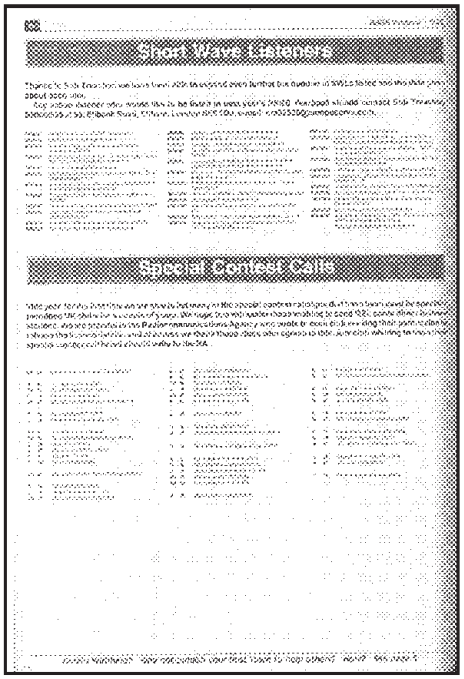
Please send me the details that you would like published – either by e-mail or post – and I will do the rest.

INTERNET SWLING

UNFORTUNATELY, the nasty taste of 'Internet SWLing' has been drawn to my attention again. By 'Internet SWLing' I mean SWLs reporting to stations that they have been heard when clearly they have simply taken a *DXCluster* 'spot' and fired off a QSL card. I really cannot see the point. Short wave listeners are just that: they trawl the amateur bands looking for interesting stations or ones that are new to them and then, if that is their forte, send a QSL card hoping to get a confirmation.

Short wave listening is *not* sitting in front of a computer screen watching for the details of a 'rare one' to appear and then preparing a QSL card which says that the station has been heard. This game is tarnishing the image of the SWL movement. Amateurs are getting wise to this new 'hobby', especially if the 'report' is for a QSO which relates to a QSO for a time / band which is completely impossible for the SWL to have heard. I know that some well-known amateurs already refuse to reply to SWL cards because of the dubious methods of a growing number. This will impact on all SWLs eventually. Think about it. I have already mentioned the steps taken to eradicate this practice by one DX organisation. I am sure that others will follow suit.

If anyone wants to collect QSL cards from different countries, then fine, but do not call yourself a short wave listener, do not claim SWL awards, and do not boast hefty 'heard scores' in any of the SWL tables that appear in various publications from time to time.



The SWL page in the 2001 RSGB *Yearbook*. Send your details in to Bob Treacher to ensure that *you* are listed in the 2002 *Yearbook*!

CQ TUNISIA

I HEARD 3V8SM on 50MHz last summer and have been trying to track down the correct QSL Manager. I have since been informed that there is doubt about the legality of the operation, so it is unlikely to count for awards, etc. However, in my search for the right manager, I e-mailed Mustapha, DL1BDF, who is the official QSL Manager for 3V8ST, 3V8CB, 3V8SQ, 3V8SF, 3V8SM, 3V8SJ and 3V8MED. He is the initiator of amateur radio in Tunisia, installs all the stations, and confirmed that the only 6m permissions were granted to TS7N in November 2000 and 3V8CB in July 2001. He is "collecting information about those black operators to take a decision".

In the meantime, any SWL hearing any of the 3V8 stations listed here on HF can request a QSL card from Mustapha.

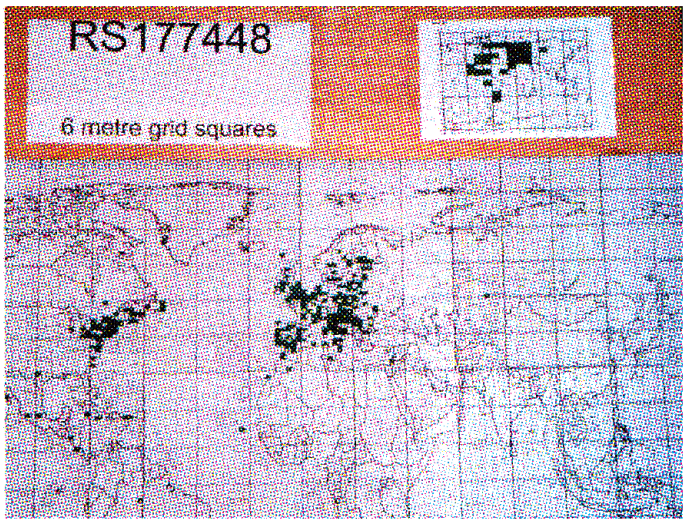
DX NEWS

ROBERT SMALL, BRS8841, actually reported a fairly ineffectual month this time – there is always a first time for everything! However, he did report XU7ACB on 7MHz, and FO0DEH, CE7AOY/8 (IOTA SA-091), FJ0DX and 3XY8A on 14MHz, but that's it!

50MHz continued to provide some startling DX. David Whitaker, BRS25429, fared the best, logging stations in Asia, Africa and North and South America in December.

Simon, RS177448, also had a good haul of DX, logging FG5BG, HP2CWB, JY9NX, KP2BH, OD5/OK1MU, P49MR, PY8MD, PZ5RA, VP5VAC and YY5OIG. In his first six months on 50MHz, Simon heard 62 DXCC entities. A map showing the areas heard is reproduced in this month's column. I hope it will act as a spur to other listeners to get equipped for the band. If you already listen on 50MHz, let me know what you have been hearing.

Looking forward, listening on the bands in the next few weeks could prove quite advantageous as there are planned DXpeditions to South Georgia and the South Sandwich Islands, VP8; Cocos Island, TI9; and San Felix Island, CE0X. If all these trips materialise, listeners can expect some giant pile-ups, and some missing 'slots' filled in in their all-time lists. Good Luck! ♦



Simon, RS177448, made up this chart to keep track of the areas he has heard on 50MHz - all in the first six months of listening on the band!

ATV

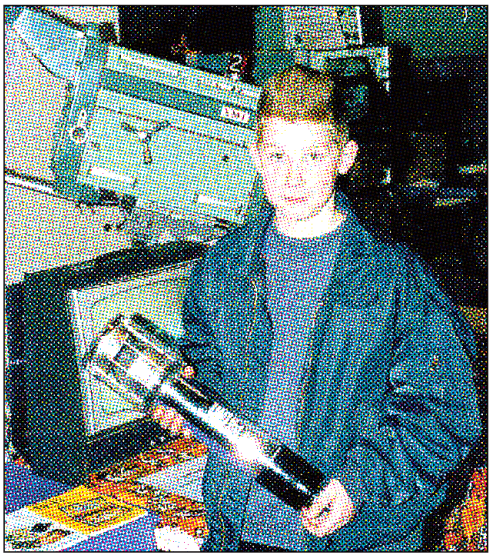
TREVOR BROWN, G8CJS
E-mail: chairman@batc.org.uk

SO FAR we have looked at examples of what you can do with off-the-shelf TV equipment from ATV repeaters to ATV in models and weather balloons. Most of this has revolved around the modern 'smaller' equipment.

There are many ATV enthusiasts who spend their time at what can only be described as the 'larger' end. These are the collectors and restorers of ex-broadcast television equipment. This part of the hobby is not for everyone, as broadcast equipment uses very complex circuitry. Having said that it is much easier to expose all the various bits and pieces than anything designed for the home video market. The end result of working with a broadcast piece of equipment that was designed to yield the highest possible quality from the electronics available at that time can only be described as rewarding.

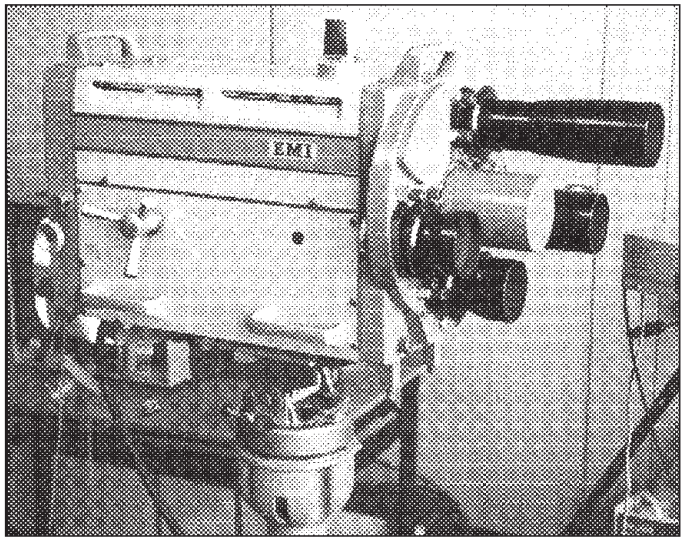
To this end I would like to introduce you to some of the camera technology, starting with the early black-and-white TV cameras based on image orthicon camera tubes. These were not the first camera tubes, but rather the end of a long R&D chain that produced better and better TV pictures. The camera tubes were either 3in or 4½in diameter, and cost thousands of pounds to manufacture. Zoom lenses were around, but were rare and fixed-focus lenses were used in a turret arrangement so that the cameraman could change to a lens with a different focal length. This system relied on a multi-camera studio setup, because the lenses could not be changed on air.

The equipment was produced by several manufacturers from Pye through to Marconi and EMI. The Marconi MkII is famous as the BBC presents a model of it every year to the 'BBC Sports Personality of the Year'. The Marconi MkIII and MkIV cameras are still to be found in some of the amateur shacks along with my favourite, the EMI 203 or 'green machine' as it became later known (green was the EMI colour). This popular 60s camera used valve technology and a 4½in image orthicon tube which, for the first time in a TV camera, could be changed via a removable plate on the lens turret.



Matthew Brown with some TV history - a 4½in image orthicon tube, used in the EMI 203 camera, seen in the background.

The first pre-production camera went to the BBC Lime Grove studio in 1959. By the early 1960s this camera was in production and being used by the BBC for 'Hancock' and 'Till Death Us Do Part' (405-line). By 1967 the BBC was recording the 'Forsyte Saga' in 625-lines. Shot on the EMI 203, the image orthicon tube produced the best-quality black and white pictures ever, as many of these enthusiast-owned cameras can still demonstrate today.

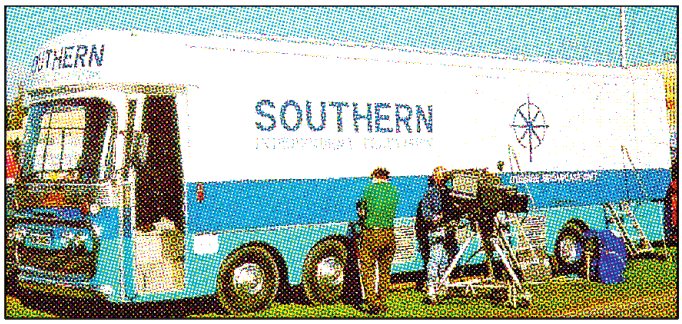


The EMI 203 camera, utilising the image orthicon tube, pictured below, left. You can see why, if a colour camera needs at least three tubes, the Camcorder would not be with us yet!

Colour TV was now coming and, to produce a colour TV picture, a minimum of three camera tubes (preferably four) was needed. The image orthicon tubes were too large, so a different technology emerged in the form of the smaller plumbicon tube. Marconi produced the MkVII camera based on this technology. Four tubes were used, one for luminance and one each for the three primary colours (red, green and blue). EMI produced the 2001, again with four tubes. Both cameras were equipped with zoom lenses.

The BBC seemed to favour the EMI camera, and ITV was split between the two. These two cameras kept both ITV and BBC television going through most of the 1960s. Again, examples of both cameras can be found in the hands of TV amateurs. The last time I saw a Marconi MkVII was at the last BATC meeting at Shuttleworth in 1999. They were part of a completely restored mobile control room that started life at Southern Television and which is now privately owned by Paul Marshall. The cameras were used to feed a satellite uplink which connected the OB vehicle to the Dutch ATV repeater PI6ALK. The uplink was kindly provided by ITN and the engineers in the control room monitoring the transmission, back at base thought they were in a time warp, seeing a fully restored vehicle in Southern colours and then a camera which has been extinct in broadcast television for some 25 years.

The BATC Convention for 2002 will again be at Shuttleworth on 16 June. All are welcome, I can't promise you an extinct TV camera, as the event is still being planned. Watch this space for a list of attractions, and remember next time someone sends you a picture over the air ask them what camera is being used; you might be in for a surprise. ♦



The restored Southern mobile control room, now the property of Paul Marshall.

RSGB

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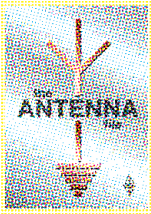

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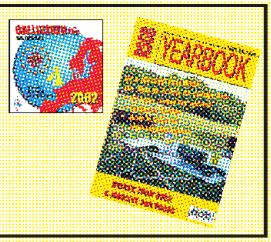

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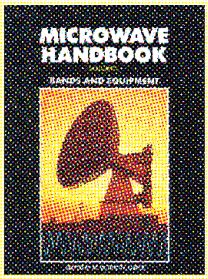

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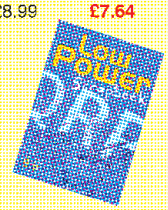

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ARRL

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Rochdale OL11 3HE.
E-mail: g3rjv@gqrp.com

IN RECENT times, much of this column has been devoted to the home-construction side of QRP. To ring the changes, this one is more inclined towards QRP operating with a new award and a couple of QRP operating events.

THE NEW ARRL QRP DXCC

IN RECOGNITION of the popularity of QRP operation, the ARRL Board of Directors approved the QRP DXCC Award at its July 2001 meeting. The QRP DXCC Award is given for working 100 different entities (formerly countries) on the DXCC list while operating with a transmitter power output of 5W or less. Standard DXCC rules also apply to this new award. Contacts made since 15 November 1945 are acceptable. The QRP DXCC is a one-time award and is non-endorsable. You do not have to be an ARRL member to qualify.

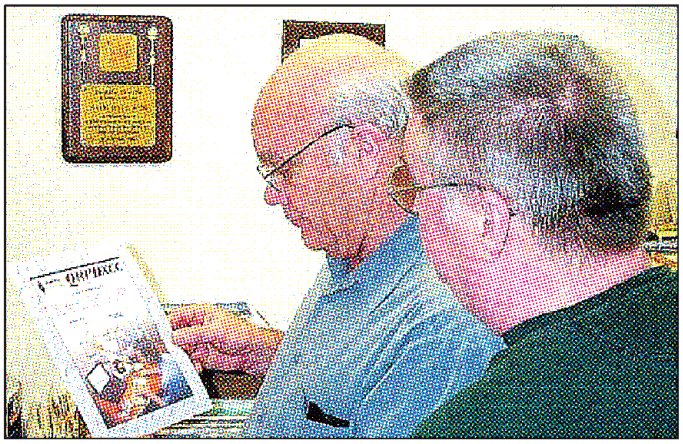
YEOVIL QRP CONVENTION

A POPULAR FIXTURE in the QRP calendar, the 18th Yeovil QRP Convention will be held on Sunday 21 April 2002 preceded by the dinner on the evening before. The annual Constructional Challenge this year is to construct a VXO to operate from 9V, using no more than 15 components. The winning entry will be the one exhibiting the greatest stable frequency swing. In the event of a tie, the number of components will be taken into consideration. Entrants will be expected to demonstrate that the frequency is stable from switch-on – ie in the opinion of the adjudicator, it is capable of being keyed. YARC will provide a HC25/U, 30pF parallel resonance, 7030kHz crystal, a 9V power supply, and a frequency counter with 50mV sensitivity. Enquiries about the challenge can be addressed to G3ICO (QTHR, or e-mail to george@mudford.fsnet.co.uk).

YEOVIL 'FUNRUN'

This takes place from Monday 1 April to Thursday 4 April inclusive, 1900 to 2100UTC on 3560kHz and 7030kHz, both ±10kHz. Contacts should be between QRP stations with a maximum of 5W output CW. However, contacts with QRO stations are permitted, but with a reduced points value (see below). All stations may be worked *once each evening*, on *each band*. FunRun Bonus Stations will be operating each evening randomly for one hour on each band.

FunRun Bonus Stations: GB2LOW from G3ICO nr Yeovil (3558 and 7028 ±2kHz); G4PRL nr Okehampton (3563 and 7023 ±2kHz); PA3CLQ in Geertruidenburg (3553 and 7033 ±2kHz). Call "CQ FR". Each QSO with another QRP station scores 10 points. Each QSO with any FunRun Bonus Station scores 25 points. Each QSO with a QRO station scores 3 points. All duplicates *must* be marked and no points claimed. Points will be deducted for unmarked duplicates at twice that particular QSO score! Exchange RST / serial number / output power / name. The three-figure serial number must start with any random number of your choice not less than 100, and increment by one for each QSO throughout the contest. However, the three Bonus Stations listed above will all commence with 001. Entries should be separate log sheets for each band, with sub-totals for each evening, preferably in the RSGB format. A separate RSGB-style cover sheet stating the rig, output power and aerial is required. Entries (to arrive no later than Thursday 18 April) to G W Davies, G3ICO, Broadview, East Lanes, Mudford, Yeovil, Somerset BA21 5SP, or to george@mudford.fsnet.co.uk Certificates will be awarded (after lunch during the Convention) for the highest score for any three evenings out of the four, on each band, and also for the highest overall total score for any three evenings on both bands. A certificate will also be awarded to the station consistently using the lowest power. Listener reports will be welcome, with a certificate for the listener submitting the most comprehensive report. ♦



ARRL Membership Services Dpeartmental Manager Wayne Mills, N7NG (left), and Century Club's Manager Bill Moore, NC1L, check the new QRP DXCC Award certificate. ARRL staff member Joe Bottiglieri, AA1GW, is featured on the certificate.

QRP DXCC RULES

1. The QRP DXCC Award certificate is given for working 100 different DXCC entities on the DXCC list while operating with a transmitter power of 5W or less.
2. Applications will be accepted beginning 2 January 2002. Contacts may have been made at any time since 15 November 1945.
3. This Award is not endorsable. Certificates will be dated, not numbered.
4. The applicant must certify the authenticity of log information for contacts with 100 entities using 5W or less. No QSL cards are required for this award.
5. This Award is separate and distinct from the traditional DXCC award program. Credits are not assigned to other DXCC awards.
6. This Award is available to all amateur radio operators anywhere in the world.
7. The standard DXCC rules apply to this Award.
8. The Award application and an alpha-numeric list of 100 contacts is required in order to facilitate processing.
9. The fee for this Award is $10. This includes all postage and handling fees.

To apply for the QRP DXCC, just send a list of your contacts including callsigns, countries / entities and contact dates. Do not send QSLs. The list must also carry a signed statement from you that all of the contacts were made with 5W RF output or less (as measured at the antenna system input). Along with your contact list, include a $10 application fee in the form of a cheque or money order in US funds. Make sure to indicate your mailing address and your name as you want it to appear on the certificate. Mail everything to: QRP DXCC, ARRL, 225 Main St, Newington CT 06111, USA. Faxed and web applications must be accompanied by a credit card number for payment.

THE ORIGINAL QRP CONTEST RULES

THIS IS A POPULAR twice-annual event sponsored by Hartmut Weber, DJ7ST. The details are:

Participants: Operators of original QRP equipment, commercial or home-made, including commercial QRP equipment exceeding 5W, like the QRP-Plus, FT-7 and QRP versions of QRO transceivers. QRO transceivers (over 20W output) temporarily turned down to QRP are not allowed.

Date: 6 / 7 July 2002. Saturday 1500 until Sunday 1500UTC, with a rest period of nine hours minimum in one or two parts.

Frequencies: CW segments of the 80, 40 and 20 metre bands.

Call: "CQ QRP"

Categories: VLP : 1W out or 2W input, QRP : 5W out or 10W input, MP : 20W out or 40W input.

Operation: Single-operator CW. Various transceivers and transmitters may be used, but only one at a time.

Exchange : RST, serial number / category / eg 559001/VLP. No series reports, please.

QSO Points: the log checker will count 4 points for a QSO with another contest station whose log has been received. All other QSOs count 1 point. The exchange of RST is sufficient with stations not in the contest.

Multipliers: The log checker will count 2 multiplier points for each DXCC country from a QSO with a station whose log has been received. Otherwise, each DXCC country counts as 1 multiplier 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 as points depend upon other logs received. Therefore every log is welcome, even if just 3 QSOs on a postcard.

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 the manufacturer or measured under contest conditions. Home-made transmitters should name the PA device and a possible circuit reference.

Logs: List QSO, sorted by band. Add the DXCC prefix if you claim a multiplier for a QSO.

Deadline: 31 July 2002.

Send to: Dr Hartmut Weber, DJ7ST, Schlesierweg 13, D-38228 Salzgitter, Germany.

ANDY GAYNE, G7KPF
119 Lower Lickhill Road,
Stourport-on-Severn DY13 8UQ.
E-mail: www.radcom@rsgb.org.uk

IT IS NOT very often that a website grabs your attention and refuses to let go, but one that certainly falls into this category is the wonderful How Stuff Works (1). Founded by Marshall Brain, How Stuff Works is a commercial media company that has specialised in providing plain language explanations of how things work, from doorbells to nuclear bombs!

The HSW web site is easy to navigate, with selections being made from 'super categories' such as Automotive, Electronics, Transportation, and so on. Within the Electronics section can be found a 'How Ham Radio Works' page which, apart from betraying the site's American origins, does give a straightforward introduction to the hobby, although the prominence given to VHF repeater operation may irritate some people. All of the explanations avoid detailed technical discussions, indicating the text has been aimed primarily at those still of school age, but nevertheless the topics available are fascinating and will keep you browsing for many hours.

RAF MUSEUM

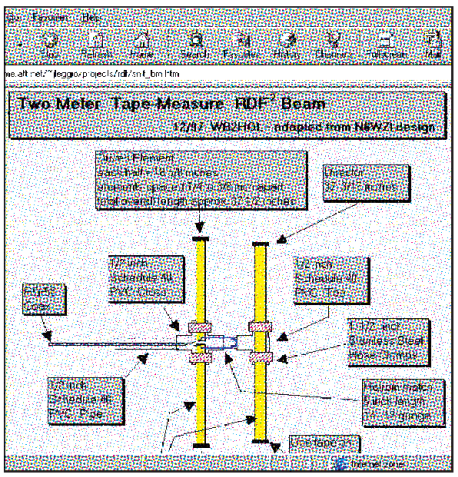
THE ARMED FORCES have always been significant users of many different types of communications equipment. Several branches of the Services have recognised the heritage of the equipment they have used, and have set up museums to preserve and display their own vintage equipment, which includes many radio systems that have become familiar to amateur radio enthusiasts over the years. The latest museum to find its way on-line is the RAF Signals Museum (2), and is maintained by the museum curator Dave Thompson, G3XOG.

Based at RAF Henlow in Bedfordshire, the actual museum is open to visitors by appointment only, so the website may grow to be one of the main display mechanisms for the museum exhibits. At the moment, the site is in an embryonic state, but does contain some interesting pictures of items on display. Alongside the array of well-known radio units, there are several examples of ground- and aircraft-based radar systems, plus specimens of test equipment and other communications systems used by the RAF.

At the moment, I imagine that the web site does not do the museum justice, but putting a collection like this on-line is a major task so we should all offer Dave our encouragement. Museums of this nature tend to survive on the goodwill of the general public donating exhibits, photographs, etc, so I am sure Dave would be very pleased to hear from anyone who can help enhance the museum with additional material.

DF CONSTRUCTION

THE ARRIVAL of spring usually means the start of the fox-hunt season so, for those looking for some new techniques, a visit to the web site of Joe Leggio, WB2HOL (3), may prove interesting. Joe's 'Radio Direction-Finding Projects' page presents a number of construction projects that may help improve your success rate, with designs for flexible-element Yagi aerials, attenuators and variations on the well known 'time-difference' aerial array. The fox is not forgotten either, with circuits for some simple low-power transmitters and associated controllers being described.



Find the fox with a WB2HOL Yagi.

It seems that most of Joe's projects are improvements of previously-published designs, each being well-documented with plenty of detailed photographs and well-drawn circuit diagrams. PCB layouts are also shown where relevant which, together with descriptive text that is full of constructional and operating tips, means that anyone should be able to reproduce the projects successfully.

QSL CARD DESIGN

ANYONE WITH a home computer will, at some time, have considered producing his/her own QSL cards, as acceptable results can be obtained using even a basic word processor and a low-cost colour printer. For those who need a bit more of a guiding hand, the *QSL Maker* software package (4) from John J McDonough, WB8RCR, may be the solution.

This software is free to use, and allows a colourful and professional-looking QSL card to be designed in a very short time. The background of the card can be any Windows bitmap file, so importing a photograph of your shack or location, for instance, is very easy. Name, address and callsign information can be entered and manipulated by changing the font and text colour, and the contact information block can be removed if you prefer to write this information on the rear of the QSL card.

John admits on the site that the program is not perfect, and lists some features he would like to add in time, but for most people the current program will be perfectly adequate and is certainly worth downloading. Also present on the QSL Maker site are two bonus programs for producing dial scales and front panels. First inspection leads me to believe these will not be as easy to use as *QSL Maker*, but they may still be of interest to the keen home constructor.

FLEA MARKET

FOLLOWING MY discussion of on-line 'for sale' websites in January's *RadCom*, Richard Newstead, G3CWI, has written to remind me of his 'Amazing Online Flea Market' (5), which has been running successfully for some time now. Richard's flea market is a free-to-use notice board for wanted, exchange and for sale advertisements, exclusively for amateur-radio-related equipment.

Each advert page lists a small number of items with full details, as entered by the vendor, and the adverts are listed chronologically rather than by type, so it's not a site that can be quickly scanned through. Adverts can be set (by the vendor) to expire automatically after a fixed period, which is a useful feature, and the most recent adverts are always presented on the opening page. When viewed in January there were 184 adverts present, so this is a reasonably popular advert site that just might contain that bargain you were searching for. ♦

WWW.

(1)	How Stuff Works	www.howstuffworks.com
(2)	RAF Signals Museum	www.geocities.com/raf_signals_museum
(3)	Direction-Finding Projects	http://home.att.net/~jleggio/projects/rdf/rdf.htm
(4)	QSL Maker software	http://hfradio.org/wb8rcr/QSLMaker.html
(5)	Online Flea Market	www.qsl.net/g3cwi

LF

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I THOUGHT it would be interesting to have a look at the stations of a few well-known LF operators over the next few months. First to step into the spotlight is Ron, G6RO, often to be heard on 136kHz CW with a consistently good signal from West Yorkshire.

G6RO PROFILE

RON WAS LICENSED in 1932 and so will be celebrating the 70th anniversary of G6RO this year. His first 136kHz transmission was with his Advance signal generator fed into his topband wire loop. The signal reached the end of the garden. He then added an amplifier and reached the end of his road. Ron improved the setup by degrees until he arrived at his present system, which has given him contacts with 15 countries and a best DX of OH1TN.

He compares this experimentation with his early attempts to radiate a signal as a young boy using a spark transmitter; little by little the discoveries and improvements are made as experience increases.

The spirit of amateur radio certainly seems to live on for Ron; Steve, GW4ALG, has been particularly supportive and gave him his prototype 5W transmitter with which Ron has worked quite a few stations. He now uses it to drive his valve amplifier, the VFO is more stable than the Advance signal generator!

Ron's equipment is mostly home-built; he has always been a keen constructor - his home-brew 1920s two-valve receiver still works today, and he has even heard 136kHz amateur signals on it!

Location: Baildon near Shipley; high ground with good soil conductivity and a clear take-off.

Antenna: 35ft wooden mast supporting three inverted Ls with two horizontal top wires of about 80ft and the third wire sloping down to the hedge. (Ron hopes to raise this wire soon to make it a third horizontal span).

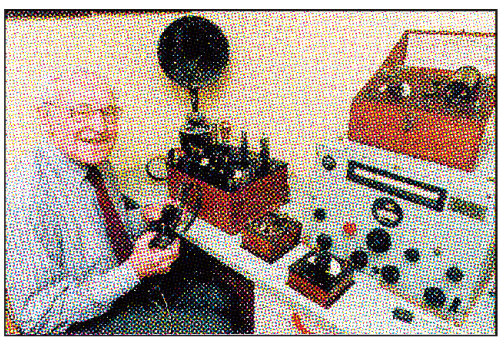
Earth: Several long earth stakes and buried wires around the garden.

ATU: Home-made series-tuned coil incorporating a variometer in a plastic dustbin at the base of the mast. Coax feeder back to the shack.

Tx: GW4ALG QRP transmitter as exciter, feeding into a PA with 2 x QQVO6-40 valves producing around 100W of RF. Powered from the transverter socket of his FT-101.

Rx: B28 receiver (or 1920s two-valver!). Recently, he has been experimenting with a 'Q5er' receiver as a second IF from the B28 to improve selectivity.

First LF QSO: G4GVC in 1998.



Ron with his home-brew 1920s receiver and the B28 he uses on LF.

DX NEWS

AFTER A SLOW START, the DX experiments really got going in December. VE1ZJ, W4DEX, W1TAG and W3EEE kept a close watch on the bottom of the 136kHz band and it was amazing how often signals were received. With 60-second dot lengths, it seems that even average winter conditions will allow trans-Atlantic reception, which continues through the hours of darkness until about an hour after our sunrise.

Some experiments were done with other modes such as '7FSK', devised by ON7YD, in which each letter is sent as a two-tone sequence. With a total of seven discrete frequencies one can identify 49 characters, enough for all the letters of the alphabet, the numbers 0 to 9 and some special characters. Using 60-second bursts of carrier, it is many times faster than Morse and the tones can be spaced so closely that the signal has a bandwidth of 0.5Hz.

ZL6QH, the Quartz Hill club station near Wellington, made some 136kHz transmissions in December and was copied by W4DEX on the first attempt.

The out-and-out record for 136kHz signal reception is now held by ZL6QH and VE1ZJ in Nova Scotia. John received the signals on 15 December over a distance of 15,600km. The mode used was DFCW with 120-second dots.

Almost as remarkable has been G3AQC's success on 73kHz. His DFCW signals were received beautifully by W1TAG at a distance of 5291km. It was no mean feat to keep up regular 73kHz transmissions through the night, waiting for the conditions to be right.

At the turn of the year, Mal, G3KEV, used QRSS to have a cross-band contact with W1TAG, who transmitted CW on 40m. It's the first G-to-W cross-band contact on 136kHz. All in all, a good way to end Marconi centenary year.

BUSY WEEKEND

THE WEEKEND of 15 / 16 December, when ZL6QH was transmitting, saw plenty of activity from Europe, too. The big signals came from OM2TW at his portable site near Sintava, where he can erect a big antenna, and from DF2BC/P at the Campen lighthouse off the North German coast. Great to hear the band so busy!

On the subject of activity, some operators have been lamenting the low level of CW activity on the LF bands. This may be because there is more interest in burning the midnight kilowatt-hours than working CW during the day, but it gives the impression to the newcomer, that the band is unused. I think it's a good idea to try to maintain a high level of CW activity at least on Sunday mornings - not everyone is a DX enthusiast!

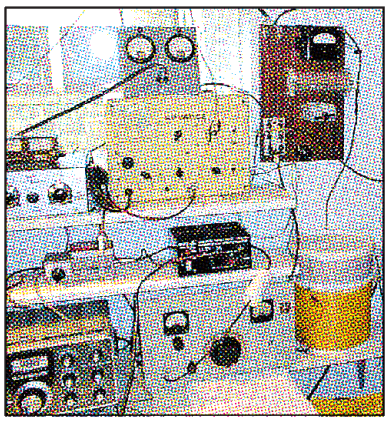
NEW CALLS

LOW DAYTIME activity or not, there are some converts to the band. EI3CZ is active from Dublin, improving things as he goes. A new one to me is G3LCB, who has worked a few from his Kent location, but is not very strong yet. On the other hand, G4FTC has hit the band running! David has already been copied across the pond on QRSS and (obviously) has a strong signal in the UK.

MORE EXPERIMENTAL PERMITS IN THE US

MIKE, W2AG, REPORTS that the FCC's Office of Science & Technology has approved a request for an experimental licence on 166.5, 440, 470, 480 and 495kHz, with 200W ERP! Station WC2XSR is authorised at 36 locations across the US, as requested by the hams of the 600-Metre Research Group.

400-odd kHz is MF not LF, but it interests me and I hope that the moves to get us an allocation around there bear fruit. These permits do not allow contacts with other amateurs but I imagine they will put out some beacon transmissions that we can listen for. ♦



The LF PA stands next to the FT-101 PSU with the exciter above.

ROGER BALISTER, G3KMA
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E-mail: g3kma@dial.pipex.com

The antennas at CS5C during the RSGB IOTA Contest 2001 (see also pages 18 - 24). CS5C was active from Culatra Island, EU-145.

THE IOTA COMMITTEE is often asked the easiest way for an IOTA newcomer to prepare a first submission. As with everything else, having the right tools is essential. To start with, under the rules you need to have a copy of the *IOTA Directory* before you can participate. Although, technically, possession of an old *Directory* meets this requirement, a major revision of the island list in 2000 makes it sensible to use *IOTA Directory 2000* or (here's a plug!) the new *RSGB IOTA Directory - 11th Edition* to be published in a couple of months. Only these list comprehensively the 15,000 islands qualifying for IOTA groups and, in the case of the new *Directory*, the 70 or so new IOTA reference numbers issued in the last two years. If you are short on time - or 'really, really hate' to have a lot of mistakes pointed out - get the latest *Directory*!

Secondly, use the *IOTAMEM* software program to prepare your application. Available from your checkpoint, it simplifies the preparation of your claim and also entitles you to a discount on administration fees for both the initial application and all subsequent updates.

We have always advised the newcomer to start with his / her DXCC QSL collection and work through that before turning to the bulk of archived QSLs. This is still good practice. *Directory 2000* (as well as the new *Directory*) lists the 100+ DXCC entities from which *any* card will be valid for only one IOTA reference number. For example, if you have any DXCC QSL valid for the Spratly Islands, it will also be valid for IOTA AS-051 and only AS-051. You could collect just sufficient cards for the basic 100 Islands award from this list alone but you would need to be a 'big gun' operator to do so! For most applicants, a secondary 'culling' list is needed and the *Directory* provides this in the form of a list of DXCC entities where cards can count for one of only two IOTA reference numbers. For example a ZD9 card will count for either Tristan da Cunha, AF-029, or Gough Island, AF-030.

RSGB IOTA Programme, PO Box 9, Potters Bar, Herts EN6 3RH; e-mail: iota.hq@rsgb.org.uk

A MAJOR NEW AID

AT LAST we can make the task of preparing an application much easier, particularly for those who have really deep QSL boxes. *RSGB IOTA Directory - 11th Edition* lists all or almost all the operations over the years from more than 500 of the rarest IOTA groups. It details for each such group, by continent, the callsigns recorded as accepted on the central IOTA database of members' records. In most cases there have not been more than a handful of operations, so with this list it should be a straightforward task to check if you have these cards in your QSL files. If you run a computerised log, it is easier still - just check it to see if you worked the station and have the QSL-received flag shown. The saving in time should be significant because, for your starter application at least, you can assume that it is not worth checking other cards for additional 'counters' for these groups - recent operations excepted, the chances are quite slim that an operation will be found that is not already listed. Sharing of database information with the IOTA community has been an objective of the IOTA Committee for a long time and we are delighted that we have finally been able to achieve it in the new *Directory*.

OTHER AIDS

YOUR COLUMNIST was recently alerted by Ray Small, G3ALI, one of our two UK checkpoints, to a valuable additional source of information. The *DX Summit* website on the Internet will be known to many IOTA chasers, but perhaps not all know that it has a powerful search facility that allows a listing of *Cluster* spots for each year back to 1997. Enter either a known callsign or an IOTA number in the format of, eg AS051, and it will list all spots that match. If, therefore, you need to top up the list in the new *Directory* with data on latest operations, you can obtain it there. As a source of information it is equally useful for intending DXpeditioners who can interrogate it to see whether a known previous operation or any operation took place in the last five years from a particular IOTA reference.

Finally, a large percentage of island QSLs now mention the IOTA reference number. Be on the lookout for these, but take care. Some reference numbers have changed. Check the *Directory* to ensure that the island name on the card - it is essential that there is one - is shown as qualifying for that group.

ACTIVITY ON THE BANDS

DECEMBER'S operation by Ismael, CE7AOY/8, from remote Riesco Island in southern Magallanes and Antartica Chilena Province resulted in the issue of new reference SA-091. Then in mid-January, true to their promise, VU2HFR, VU2KFR and other members of the Calcutta VHF Amateur Radio Society, mounted a second, larger, IOTA activity from Sagar Island in West Bengal (AS-153) during the Ganga Sagar Mela festival. Readers may recall the first short operation during last year's event while group members carried out back-up emergency communication duties on the island (see March / May 2001 'IOTA' columns).

IOTA ON 6 METRES

FEW ISLAND stations were heard in December and January, and fewer still made it into the log. However, HC8N (SA-004), P43JB and P49MR (SA-036), PJ2MI (SA-006), CO8DM (NA-015), D44TD (AF-086), FM5WD (NA-107) and 9Y4TL (SA-011) were snagged during short F2 openings, taking the 6m band score to 50 IOTAs since mid-July. ♦

NEW REFERENCES

NA-221	XE1	Veracruz State North group
SA-091/Pr	CE8	Magallanes & Antartica Chilena Province South group

Pr=provisional

WWW.

RSGB IOTA Programme:	http://www.rsgbiota.org
IOTA Manager's website:	http://www.eo19.dial.pipex.com/index.shtml
IOTA Contest rules:	http://www.rsgbhfcc.org/
DX Summit	http://oh2aq.kolumbus.com/dxs/

MICROWAVE

SIMON LEWIS, GM4PLM
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E-mail: uwave.radcom@rsgb.org.uk

I HOPE the festive season was good to you all and that you managed some radio over the holidays. I have been a little preoccupied, but my 10GHz transverter rebuild is still ongoing – the 10W solid-state PA is now ready to install, having built the DC PSU, so maybe before the spring…!

SCOTTISH EME ACTIVITY

A LONG-FORGOTTEN backwater for Earth-Moon-Earth (EME) activity, Scotland appears to be staging a revival, with a number of stations either operational with new setups, or in construction.

I was pleased to hear from Iain, GM0ONN, who writes "Just a quick note to let you know I had my first contact on 23cm EME on 1 January 2002 with Howard, G4CCH. We exchanged M/M reports. Had a sked with OE9ERC, who heard me at 449 but, on two occasions, his feeder cable caused him problems. While tuning up, he was easily S1! I am now running 230W to a 1.8m Andrew dish with VE4MA circular feed, MGF 4919 preamplifier with a second stage MGF1302 preamplifier at this end, with a DD9DU transverter and TS-2000 as the 2m IF. I have been in touch with Neal, GM0PWS, and will endeavour to work him with my 43-element in the not-too-distant future. Incidentally, my 230W from a single-valve is an N6CA 2C39A water-cooled design. Working on an amplifier using a pair now. Keep up the good work."

GM4ISM's compact 23cm EME system.

Mark, GM4ISM, is also busy with his new station in many ways. He writes "I am going temporarily QRT on 1296MHz EME, I am about to dismantle the entire shack over the Christmas holiday. I don't know when it will be re-assembled. I have to re-floor the room completely, and am taking the opportunity to build in some office space. I am now up to 13 initials. Stations contacted were OX2K, OE9ERC, OE9XXI, HB9Q, HB9BBD, OZ4MM, G4CCH, G3LTF, K5JL, K0YW, DJ9YW, W5LUA and DJ5MN. All were pretty easy from this end, except DJ5MN. I am amazed that he could hear my 125W to a 2.4m dish! My PA has not blown up recently, the system is working moderately well, and I am running the supply up from 1kV to 1.5kV. I will be back on 23cm EME in 2002. I may be back on by late Jan, but most of the 23cm gear is outside. Also, folks should be aware that I have a minimum elevation of about 25°. Improvements are under way, so I should be able to make quite a few more contacts. Activity in Scotland is also likely to increase. GM0ONN is nearly there with a 1.8m dish (yes he is - see above). GM4LBV has taken delivery of the mast section and bearings for his 12ft Paraclipse and is a good possibility for later on. Maybe 2002 will see three or four stations active from Scotland."

I hope so, Mark! I will also be busy and am currently underway with a 500W+ amplifier and will hopefully have the 20ft dish up sometime later this year.

10GHz CUMULATIVES 2001 RESULTS

A TOTAL of 13 entries was received for the 2001 10GHz cumulatives - eight in the Open section and five in the Restricted section. This compares to a total of eight entries in 2000, despite the foot and mouth restrictions on using some portable sites in the earlier part of the year. In the Open section, congratulations to Peter Day, G3PHO, who leads with a convincing score, due in part to very good scores for the July and August events. In July, 33 stations were worked, best DX being 572km, and in August, 29 stations were worked, with a best DX of 585km. Peter was using a 5W PA and a receiver with a noise figure of 1.3dB, mounted behind a 1.2m dish at 3m AGL, with 50W talkback on 2m with an 8-element Yagi. The runner-up in the Open section was G4ZXO/P.

In the Restricted section (maximum of 1W at 10 GHz), congratulations go to Allan, G8LSD/P, who narrowly beat GW3ATM/P, due to tallying one extra locator for the multiplier. Allan was using just under 1W to an 80cm dish, also mounted 3m above ground.

There were no entries for the Wideband-Only section in 2001. A check log is acknowledged from G3XDY, who was not able to be active in all the sessions.

Finally, the dates for 2002 are now published (see the *Microwave Newsletter* and G3PHO website) and the rules are unchanged. Let's hope we see some good activity on 10GHz, and please *do* send in your entry, even if you can only make one or two of the sessions.

Steve Davies, G4KNZ

Well done to everyone who took part and a special thanks to the adjudicators and organisers.

That's it for this time round. Articles and news to the normal address please – see the note in last column. ♦

RSGB 10GHz CUMULATIVES, 2001

Open section

Pos	Callsign	May	Jun	Jul	Aug	Sep	Oct	Points	Mult	Total
1	G3PHO/P	4463	4811	7229	6412	3247	1911	22915	18	412470
2	G4ZXO/P	4269	4380	5538	3887	3772	1741	18074	18	325332
3	G4LDR	2754	3308	3115	2971	304	444	12148	17	206516
4	G4NNS	2454	1631	3493	2081	437	926	9659	15	144885
5	G0API	54	3402	2518	2972	1586	247	10478	13	136214
6	G3JMY	1509	1488	1862	2550	0	0	7409	11	81499
7	G3LRP	1292	1357	1853	2544	893	1382	7136	10	71360
8	G3JMB/P	0	423	712	0	0	25	1160	6	6960

Restricted section

1	G8LSD/P	973	3150	3788	0	0	0	7911	13	102843
2	GW3ATM/P	0	2638	1975	2572	747	0	7932	12	95184
3	G4BRK	1069	1003	1424	884	365	0	4380	9	39420
4	G7JTT/P	0	0	0	2094	0	0	2094	7	14658
5	G0RRJ	0	978	0	1007	0	0	1985	7	13895

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SPACE

AS PROMISED in the January column, a look-up table is shown below in **Table 1**. You can easily produce one for yourself for any of the analogue satellites using the frequency lists I gave last time. Choose frequency steps that suit your needs. FO-29 has an inverting transponder so, as the uplink frequency increases, the corresponding downlink frequency increases. Make a table for each satellite that you intend to use and keep it handy when operating. You will find it especially useful if you are using separate radios on the uplink and downlink. Keep in mind that it is a 'theoretical table' and does not take into account the high speed of the satellite and the resultant Doppler shifts.

Inverting Transponder - CW Beacon 435.795MHz	
TX LSB (MHz)	RX USB (MHz)
145.900	435.900
145.905	435.895
145.910	435.890
145.915	435.885
145.920	435.880
145.925	435.875
145.930	435.870
145.935	435.865
145.940	435.860
145.945	435.855
145.950	435.850
145.955	435.845
145.960	435.840
145.965	435.835
145.970	435.830
145.975	435.825
145.980	435.820
145.985	435.815
145.990	435.810
145.995	435.805
146.000	435.800
at zero Doppler	

Table 1: A typical look-up table for FO-29.

TAKING THE TEMPERATURE OF A SATELLITE

HERE IS A LITTLE practical experiment in space radio that you may care to try. Several of the satellites in the Amateur Service have beacon transmitters sending Morse code. As well as their functions as beacons, they are used to send vital spacecraft operating data to the ground control stations, such as battery and solar panel voltages, transmitter output power, and temperatures at strategic places within the spacecraft. You can collect and decode these data in your shack in real time. All you will need for this experiment is:

- A receive capability for CW / USB on 437.134 to 437.114MHz . Any reasonable UHF station with a small beam can do this. Elevation control is not needed. You can even do it with a collinear used for local FM work. When the satellite first comes into range you will find it approximately on 437.135 falling towards 437.114MHz.
- The ability to take down eight three-character Morse code groups at 12 words per minute. The code groups are repeated every minute, and use only 10 characters of Morse code to represent the numbers 0 to 9. The characters used are, T, A, U, V, 4, E, 6, B, D and N. If your Morse is rusty, you could record it and play it back. If your Morse is almost non-existent, like mine, try *Hamscope* by KD5HIO, which works with your PC sound card. Designed principally for PSK31, it includes a very good Morse decoder.
- A calculator. The satellite to be used for our experiment is LUSAT OSCAR 19, one of a group of University of Surrey Microsats launched on an Ariane 4 rocket from Kourou, French Guiana, in February 1990. A typical Microsat, it is essentially a 23cm cube with a mass of approximately 9kg. The orbit is near-polar with a period of around 100 minutes. With nearly 1W from the beacon, Oscar 19 is easily copied. You will notice some fading at low elevations; this may defeat your computer Morse reader, but not a trained Morse ear.

LO-19 TELEMETRY CALIBRATION EQUATIONS

Channel 1 +5 Regulated volts	636 / CH1	V
Channel 2 +10 Volts Battery	0.064 x CH2	V
Channel 3 CW tx temperature	0.354 x (134.7 - CH3)	°C
Channel 4 CW tx power output	((10.9 + CH4)^2) / 40.1	mW
Channel 5 Tray 4 temp	0.356 x (136 - CH5)	°C
Channel 6 +10V Current	0.7 * CH6	mA
Channel 7 Solar Panel +Z face	0.15 x CH7	V
Channel 8 Regulated +8.5 V	0.056 x CH8	V

Tray 4 Temperature is Channel 5 = AUA = 121,
thus the temperature is 0.356 x (136 - 121) = 5.34 °C.

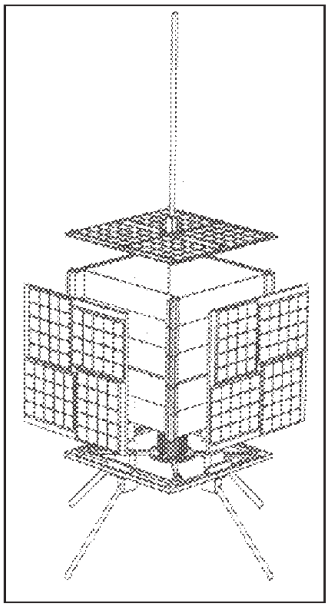
A typical transmission looks like this:

E LUSAT 60 HI HI AUN ABN AUN ADE AUA A6D AEV AE6

Transmission starts with an E, followed by the name of the spacecraft, the EPROM version number, currently 6, and the letter O or E confirming the state of the RAM (O = OK, E = error), then HI HI followed by eight groups of three characters. The first group is channel one, followed by two, three, and so on for the eight channels. Substituting the numbers:

AUN	ABN	AUN	ADE
129	179	129	185
AUA	A6D	AEV	AE6
121	168	153	156

Use of the figures is shown in the panel. At this time of year the satellite is in darkness for all the passes in range of the United Kingdom after about 2200UTC. Check out the value for the solar panel voltage to prove it. Also compare the tray 4 temperature in sunlight and in darkness.



Microsats are composed of five aluminium trays in a stack held together with tie bolts. Tray slots are numbered 1 to 5 starting at the –Z face which is the bottom of the spacecraft. The +Z face is the top. Side panels carry the solar panels and antennas. (Drawing courtesy of WD4FAB)

NOW TRY IT...

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the last WORD

Carrot And Stick?

Regarding the letter 'Illegal Pirates' (*The Last Word*, February), one of the bands mentioned has been active for at least 40 years, having started as a popular spot with owners of No 18 and 19 sets who found they could work all over Britain with a few watts of AM or CW. Once the band was established, it became self-perpetuating as it was 'discovered' by subsequent generations of SWLs. In those days of course, CB was banned on clearly unreasonable grounds, 40 metres was largely unusable due to broadcast intrusion, and the RSGB presented the appearance of a pompous old boys' club which encouraged the erroneous belief that the RAE was enormously difficult and licensed amateur radio was highly esoteric. Whilst these are not excuses, they certainly helped to shape the attitude of potential illegal operators.

Fortunately, none of that is true today, and most operators on that band have subsequently moved on to become reputable licensed amateurs - including a number of extremely well-known and highly respected names.

With the introduction of the Foundation Licence, I suggest that instead of 'shopping and bopping', we now have the perfect opportunity to encourage these people to become legitimate. The present operators on that band all seem to be using black boxes and powers of under 50 watts, and obviously have the motivation and interest to pursue the hobby. Surely they have little to lose and plenty to gain by joining us? Perhaps a well-timed announcement of an impending clampdown by the RIS would help to concentrate a few minds. . .

Name and callsign supplied

. . . Why is G4ABS so uptight about 'illegal' operators, especially those outside our bands on the two frequencies he mentions? I'll agree that I get niggled by those who populate the 10m band when there is an opening such as the one I am enjoying at the moment, but even there we have nearly 2MHz, of which 99% is usually free of intruders. Is he seriously suggesting that someone should be shopped on the dubious evidence of voice recognition via a SSB transmission? There are professional monitors of frequency abuse. Relax, and leave it to them. Let us get on with enjoying our hobby on our privileged frequencies. Life's too short to sit around listening to pirate net frequencies in the hope of snitching on someone who is doing me no harm.

Al Smith, SV5/G4FMK

HF in a Week

Just a few words. Read *RadCom*, found my nearest club (Mid Lanark), booked a Morse Assessment, passed! All within a week - excellent! Looking forward to my MM3 callsign.

Jim Brown, GM7SPA

. . . I was very pleased to be at the RSGB AGM in Hamilton in December and especially enjoyed the open forum in the afternoon. During the lunch break there was a Morse Assessment test and five B licence holders attended. I would like to thank Bob Whelan, G3PJT, for his patience and kindness towards us in our faltering steps on the key. May I wish him every success in his years as President and hopefully speak to him soon on HF as MM3OKX.

Geoff Chesworth, MM3OKX

. . . Just a big thank you to all the people involved in getting the M3 off the ground. I have been on air from 1 January 2002 as M3BFP and having a great time. The reception from all the other hams has been fantastic. Well done.

Lee Humphrey, G6BFP / M3BFP

Good News from Bulgaria

In the May 1997 *RadCom* a news item was published concerning the plight of a young Bulgarian amateur, Ivo, LZ4RV, who had become disabled after a 20m fall while installing an antenna. An appeal was made in the article through G0KDZ, asking for donations for continued medical treatment. Now, some five years later, Ivo has regained some of his mobility. This morning I received a letter from Ivo, which he has asked me to pass on to *RadCom*:

"Dear RSGB, In 1997 you published my story in the respected and beloved magazine *RadCom*, with the help of Mike, G0KDZ. My photograph was printed too. Thanks to your publicity, many amateurs from around the world responded to my call for help by sending financial aid to me. Through these donations my health has been restored, and also my faith in humanity.

"My father and I would like to express our gratitude to the radio amateurs from England, and also to SU1ER, DL9EA, SP6GVU, SP6DNS and others who replied to my appeal.

"Special thanks go out to Mike, G0KDZ, who despite poor health did his best to help me. I have had several operations on my legs, but will retain some degree of disability. This experience has taught me to trust people, and to devote myself to our wonderful hobby. I wish you all good health and prosperity. Thank you once again.

Ivo, LZ4RV."

Andy Gilfillan, G0FVI

Piece of Wet String...

There are often comments in *RadCom* and elsewhere about using the proverbial piece of wet string as an antenna. As it was cold but nice and sunny on 30 December I thought I'd get outside and give it a try for an hour or so. Using a 30ft portable mast with a remote auto ATU and fairly comprehensive ground system I slung some 43ft of string soaked in strong brine as an end-fed sloper antenna. The length was totally random, to match ATU output insulator and mast positions.

Results. 10m: Reykjavik, Iceland, 59+; Maine, USA, 57. 15m: Klagenfurd, Austria, 59+20; Berlin, Germany, 59. 40m: Lannion, France, 57; UK, 33.

Power 20 to 30 watts SSB. I tried 80m, but to no avail. Ordinary tap water didn't work either. So there is some truth in the saying after all!

Alan Messenger, G0TLK

An SWL Ham

I have just read the 'SWL' column in *RadCom* December 2001, and just wanted to say how nice it is to put a face to a name, ie the photo of Bob Treacher, BRS32525, and family.

Although I have a Class A licence, like a lot of people I am busy trying to earn a living and that leaves little time for radio at the moment, but I always read *RadCom* and the 'SWL' column in particular. As an SWL once myself (as a youngster I accidentally heard my first ham after shifting the local oscillator of a valve medium-wave receiver up on to topband), I know the value of 'listening'. Hence my full support for this valuable aspect of our hobby. Indeed, SWLs along with QRPers show the acceptable face of amateur radio in this world of power amplifiers and giant antennas. Long may your excellent work continue.

Peter Lewis, G3WBI

A *New* Hobby?

It would seem some people consider Amateur Radio to be a *new* hobby! I came across this comment posted on the Internet by a pupil after a school trip last year: "On the trip I learnt about a new hobby called amateur radio. It was really interesting because you talk to people from other countries and other parts of England. That was the best about the trip."

Could this indicate that there is a low level of public awareness of amateur radio?

Trevor, M5AKA

A Political Stunt?

I thought we should *not* comment on political matters. I see you advertising the Euro award ['HF', *RadCom* January 2002 - *Ed*] which publicises this *political* stunt, the introduction of the common currency. Romano Prodi, the past president of the EU, has said it is purely political and not related to economic considerations.

Dick Biddulph, M0CGN

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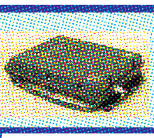

Covers 1.6 - 30MHz and handles 3 - 200W. Designed for end fed wires, just connect to 12V and feed with RF via coax. Can be mounted outside or at top of mast.

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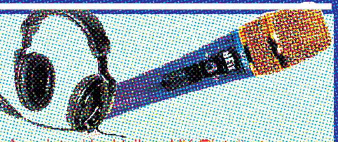

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HM-10-5	Stick mic	£69.95	B
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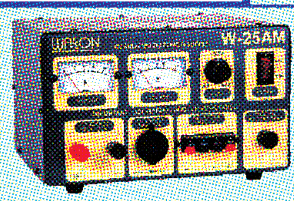

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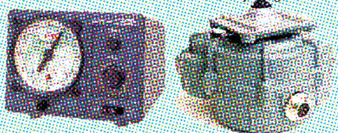

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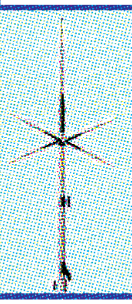

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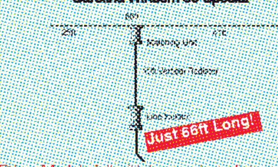
Carolina Windom 80 Special



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Other Models (all with low angle radiator stub)

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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.

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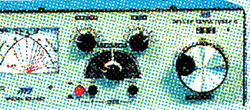

It has a very accurate PEP meter built-in. (PP3 battery needed) Includes VSWR cross needle meter, dummy load and lovely roller coaster for critical adjustment. Handles coax, balanced an wire. Size 268 x 242 x 95mm.

MFJ-949E ATU £149.95

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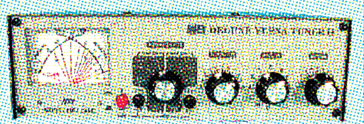

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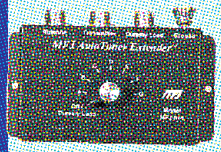

If your internal auto atu is having trouble matching your G5RV or similar antenna, this should solve the problem. Just place it in series with the coax feed to the rear of your transceiver. Magic!

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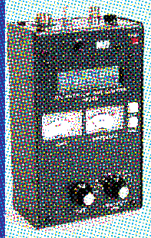
The easy way to learn CW

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.

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 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-962D ATU — £259.95 Plus £8.00 Carr.

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-989C ATU — £349.95 Plus £8.00 Carr.

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

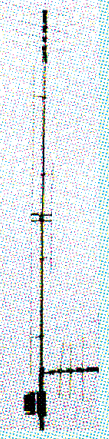
MFJ-1025 • Local Noise Canceller — £119.95 Plus £8.00 Carr.

MFJ-1025 As MFJ-1025, but has active whip antenna for picking up noise signals (as illustrated above). £159.95 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 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 £9.00

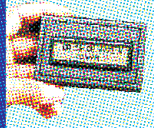
MFJ-1798 (80, 40, 30, 20, 17, 15, 12, 10, 6 & 2m!)
Only 6.7m long, it covers every popular band. No radials and no ground needed. £279.95 Carr £8.00

MFJ-616 SPEECH INTELLIGIBILITY ENHANCER — £169.95 Plus £8.00 Carr.

HEAR SIGNALS BETTER

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!

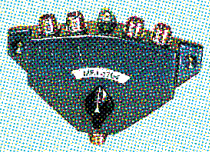
MFJ-461 • MORSE CODE READER — £84.95 Plus £6.00 Carr.



The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking, a serial port - if you wish to connect to a computer to display the text on a bigger screen. It can also be connected to your receivers audio if required. Truly pocket sized at 57 x 82.5 x 25.5mm and 158g.

MFJ-1704 • 4-way switch — £59.95 Plus £6.00 Carr.

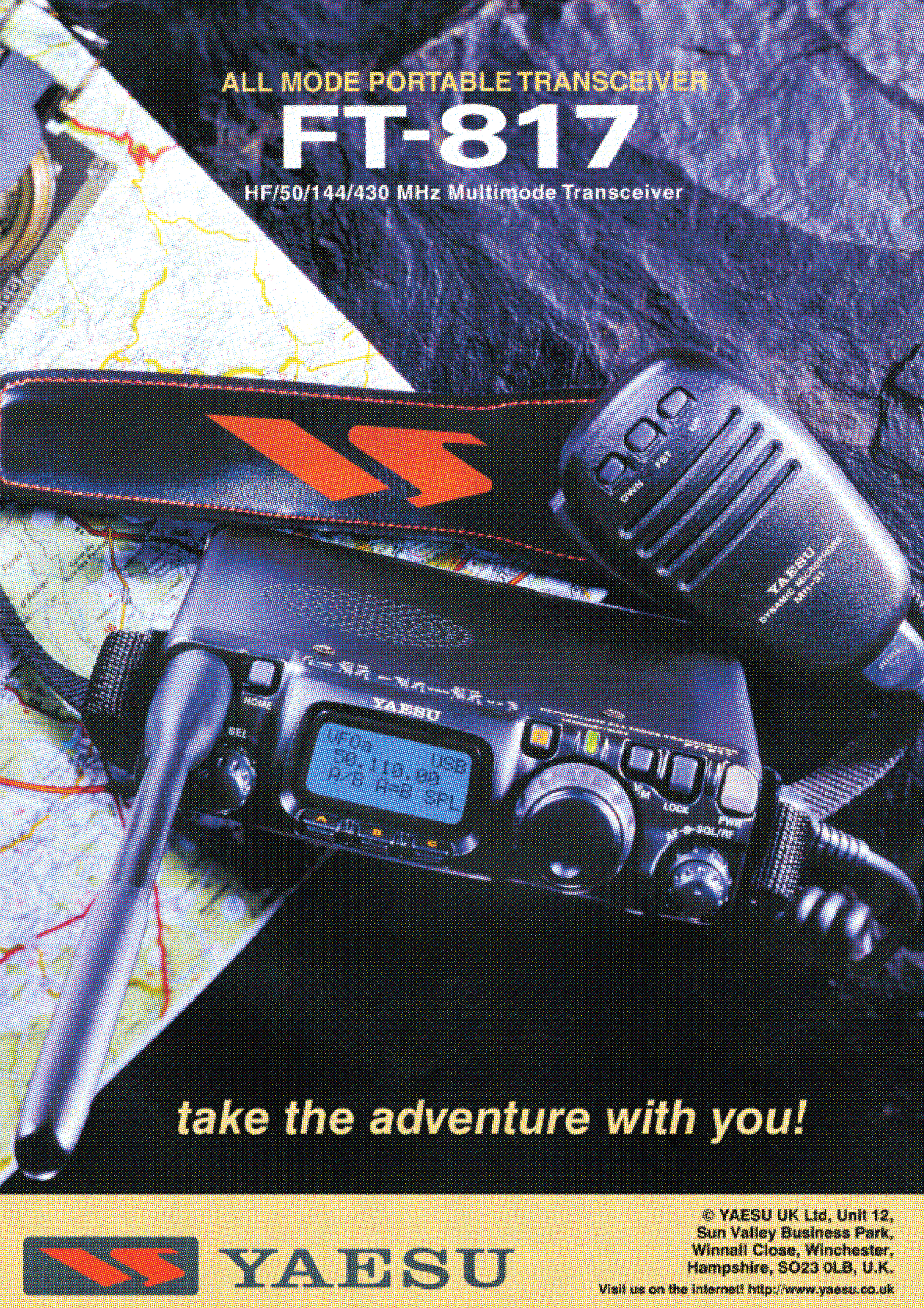
DC - 500MHz 2.5kW



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-392 Mono Padded Communications Earphones — £22.95 Plus £3.00 Carr.

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.



YAESU