# Grey-Line Propagation - A Research Opportunity

0702

www.rsgb.org

# RadCom

OUT NOW!

£3.95 Vol 78 No 7 ♦ July 2002 The Radio Society of Great Britain Members' Magazine

## Islands On The Air Honour Roll Annual Listing


## ICOM IC-T3H Handheld Reviewed


# The CDG2000 Transceiver

## Constructional Details Start in This Issue


RSGB

WATERS & STANTON

FREEPHONE ORDER LINE:

# 08000 73 73 8

HEAD OFFICE 22 MAIN RD, HOCKLEY • ESSEX • SS5 4QS ENQUIRIES: 01702 20

MIDLANDS + NORTH SHOP BENTLEY BRIDGE • CHESTERFIELD RD • MATLOCK •

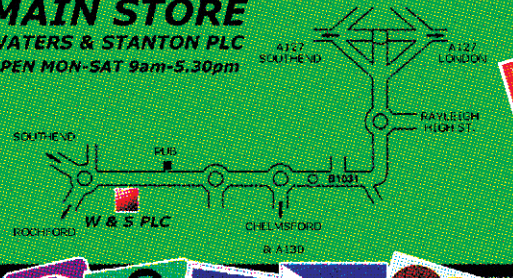
SCOTLAND + BORDERS SHOP 20 • WOODSIDE WAY • GLENROTHES • FIFE KY7

CARRIAGE CHARGE CODES: A=£2.75, B=£6, C=£9 D=£12

## MAIN STORE

WATERS & STANTON PLC

OPEN MON-SAT 9am-5.30pm




SOLO SWITCH VISA DELTA MasterCard

## HEIL CLASSIC MIC


£TBA

- Dual element mic inserts
- "Studio One" insert
  Plus HC-4, HC5 or IC element
- Soft-touch back panel switch
- Removable base
- Complete with your callsign
- Requires CC-14 adaptor
- Includes base stand

Outside the Heil Classic microphone is an exact replica of the 1930's RCA 74B type broadcast microphone. Inside it has the benefit of two of the most modern inserts - the Heil Studio One and a choice of one other Heil communications elements.

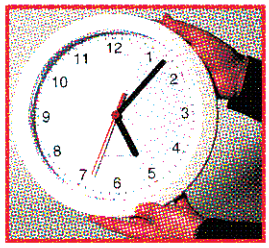
## SPECIAL OFFER

## RADIO LOCKED CLOCK

Model RCWC

£14.95

Carr. £2.75



This fabulous wall clock is offered at a very special price. 25cm diameter and the time is atomic standard! Limited stocks.

## Yupiteru Wideband Scanner

68MHz - 1GHz!

SAVE £20

£129

Carr. £6

### Built-in descrambler

This receiver offers FM and AM reception over the range 68MHz - 1GHz in the bands: 68 - 180MHz, 320 - 470MHz and 808 - 1000MHz. With frequency steps of 5, 6.25, 10, 12.5 & 25kHz it is ideal for all services. The built-in descrambler even allows decoding of some encryped transmissions.

## YAESU NEW FT-1000MP MKV FIELD

NEW

£2199 C

The Yaesu FT-1000MP Mk V has become the benchmark standard for HF transceivers, and has been used by more top DXpeditions than any other model. Now you can share this top performance at a very special price with the new "Field" model. This gives you all the superb features of its bigger brother, but with 3dB reduction in power output, making it the same power output as most other radios. But you will be ahead of the pack with the unequalled receiver performance and the ability to operate under extreme conditions and still pull out the weak signals. We think Yaesu have pulled off a master stroke here, because the price reduction will not affect the value of the 200 Watt version, but does bring the FT-1000MP MKV performance within reach of so many more customers.

## YAESU NEW FT-897

100W HF 50W 2m and 20W 70cm
Plus 20W on (optional) Internal Battery
The FT-897 is modelled around the FT-817, but with 100W capability. It will take either an internal battery or internal AC PSU. Size is 7.87" x 3.15" x 10.3" approx. Available shortly.

NEW

## YAESU

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

3 YEARS FREE WARRANTY

SPECIAL OFFER

FREE HEIL GOLD LINE MICROPHONE

£2899 carr:£9

### FT-847 160m - 70cm ALL MODE

3 YEARS FREE WARRANTY

£1149 carr:£9

### FT-100 D 160m - 70cm ALL MODE

SAVE

£899 carr:£6

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

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

£1099 carr:£9

### FT-817 'SPECIAL OFFER' £595 C

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!

INCLUDES AC CHARGER AND 1 AMP Ni-cad PACK

## NEW HEIL PRO-SET PLUS

£199.95 B

NEW

The PRO-SET PLUS is for contest and DX operators. Dual microphone inserts and acoustically tuned chambers for the speakers. A speaker reversal switch places the signal in the centre of your head or creates a spatial widening sound field. The headset is also the ultimate in comfort with full adjustments possible.

## KENWOOD

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

3 YEARS FREE WARRANTY

+FREE HEIL HM-10 MIC

£1695 carr:£9

### TS-570DG 160m - 10m All Mode

3 YEARS FREE WARRANTY

£849 carr:£9

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

£1349 carr:£9

## SGC

### SGC SG-2020 £599 A

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 £9.00

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

FREE SG-239 ATU (£239) IN MAY, JUNE OR JULY

## ICOM

### IC-756 PRO II £2495 C

NEW

IN STOCK NOW!

This is Icom's new Flagship.

### IC-7400 160m - 2m ALL-MODE

NEW

IN STOCK NOW!

£1499 carr:£9

### IC-706MKIIG 160m - 70cm ALL MODE

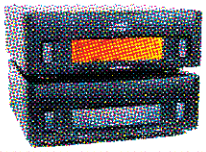
3 YEARS FREE WARRANTY

£849 carr:£9

### IC-718 100W HF £649 C

## YAESU

### VL1000 £3499 C



HF + 6m Linear Amplifier + PSU 1kW

88
6835/204965 FAX: 01702 205843
DERBYSHIRE • DE43 5LE ENQUIRIES: 01629 582380 FAX: 01629 580020
SDF ENQUIRIES: 01592 756962 FAX: 01592 610451-CLOSED MONDAYS
web: www.wsplc.com
email: sales@wsplc.com

DISCOUNT CUSTOMER SERVICE THE ONLY THING WE WON'T

PRICE MATCH

## YAESU

### FT-1500M 2m FM Mobile £159 C

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 C

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 C

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

### TM-V7E 2m + 70cm FM £359 C

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

## ICOM

### IC-207H 2m + 70cm FM £279 C

A great budget class radio for VHF & UHF use.

### IC-2800H 2m + 70cm FM £419 C

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

### IC-2100H 2m FM Mobile £229 C


Rugged design with switched receive filters 12.5/25kHz

### IC-910 2m + 70cm All Mode £1299 C

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

## YAESU

### FT-7100 2m/70cm Mobile £299 C

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).

### AV-40 VSWR METER £39.95 B

- 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 C

**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 £249 C

NEW

WITH EXTRA WIDE RX COVERAGE

- 144-146MHz 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 B

HOCKLEY ONLY

"LAST FEW"

SPECIAL OFFER

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).

- 230mW, CTCSS
- Digital Display

## LINEAR AMPLIFIERS

| | | | |
|---|---|---|---|
| CHALLENGER II | HF LINEAR AMP10-160m | £2095 | D |
| EXPLORER | HF LINEAR AMP10-160m | £1595 | D |
| PIONEAR-572H | HF LINEAR AMP10-160m | £1295 | D |
| RANGER-811H | HF LINEAR AMP10-160m | £895 | D |
| HUNTER | HF LINEAR AMP10-160m | £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 |

## YAESU

### YAESU VX5R BLACK OR SILVER £239 B

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 £149 B

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

### W-25SM 25AMP SWITCH-MODE POWER SUPPLY

THE QUIET ONE

£69.95 Carr. £6.00

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

### HL-50B NEW FT-817 AMPLIFIER 50 WATTS PEP

£299 Carr. £6.00

Made by Tokyo High Power, this amplifier covers 80m to 6m. Purpose designed for the FT-817. RF switched or can be wired to FT-817 acess. socket. Measures 148 x 55 x 190mm.

## HOCKLEY STORE SECOND HAND LIST

| | | | |
|---|---|---|---|
| **HF Transceivers** | | | |
| DR-M03SX | £159.00 | IC-PCR100 | £149.00 |
| IC-575A | £399.00 | **Scanners Hand Held** | |
| IC-746 | £849.00 | DJ-X10 | £199.00 |
| MFJ-9020 | £115.00 | AR-8000 x3 | £199.00 |
| MX-3.5S | £149.00 | IC-R2 | £109.00 |
| MX-21S | £189.00 | SAB-2000 | £35.00 |
| SG-2020 | £485.00 | **Station Accessories** | |
| FT-747GX | £299.00 | PK-900 | £299.00 |
| **VHF/UHF Base/Mobile Transceiver** | | WA-2 | £25.00 |
| 2001x2 | £119.00 | ALS-600XCE | £899.00 |
| 6001 | £145.00 | FL-3 | £99.00 |
| 7003 | £125.00 | Pro-set 5 | £99.00 |
| DR-110E | £125.00 | MK-702 | £49.00 |
| DR-140E | £149.00 | AMT-3 | £50.00 |
| IC-271E | £349.00 | FAX-1 | £125.00 |
| IC-475H | £499.00 | PS-85 | £179.00 |
| IC-821H | £749.00 | SM-20 | £99.00 |
| TM-702E | £199.00 | NIR-10 | £199.00 |
| MFJ-9406X | £149.00 | NTR-1 | £99.00 |
| FT-225RD | £399.00 | KAM Plus x2 | £199.00 |
| FT-290R | £159.00 | MFJ-247 | £129.00 |
| FT-290R IIx4 | £249.00 | MFJ-411 | £45.00 |
| FT-690R II | £299.00 | MFJ-418 | £49.00 |
| FT-790R II | £249.00 | MFJ-452 | £99.00 |
| FT-2500M | £169.00 | MFJ-1020A | £65.00 |
| FT-3000M | £249.00 | MFJ-1026 | £99.00 |
| **VHF/UHF Hand Held Transceiver** | | MFJ-1278BX x2 | £225.00 |
| AT-400 | £115.00 | MFJ-1289M | £49.00 |
| Sender | £95.00 | MFJ-1610 | £4.00 |
| IC-2SET | £99.00 | MFJ-1786 | £289.00 |
| IC-A2E | £199.00 | 3000A + | £289.00 |
| IC-P2ET | £89.00 | Micro-RF | £69.00 |
| IC-T7E | £199.00 | Pico-2 | £149.00 |
| TH-D7E | £249.00 | P-335 | £39.00 |
| FT-41R x2 | £99.00 | DSP-9+ | £129.00 |
| FT-50R | £149.00 | AT-100 | £59.00 |
| FT-51R | £175.00 | VMM-1 | £49.00 |
| VX-5R | £199.00 | FIF-232C | £49.00 |
| **Shortwave Receivers** | | FL-2025 x2 | £99.00 |
| IC-R72 | £399.00 | **Miscellaneous** | |
| NRD-525 | £529.00 | AE-2850 | £50.00 |
| HF-150 | £199.00 | UK-75-ST | £60.00 |
| **Scanners Mobile/Base** | | CD-ROM | £40.00 |
| AR-5000 | £925.00 | GPS-12CX | £179.00 |

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

## 'Amazing' MP-1 Variable Antenna

## 7MHz - 430MHz! 150 Watts

## Use Portable, Mobile, Home or even balcony!

It's sweeping America as the most versatile antenna for any location. Kit includes telescopi whip, variable coil, lower mast, base bracket (SO-239), clamp and optional wire radials (3m approx). Total height approx 2m. Will also screw directly into 3/8" mobile mounts.
The whole antenna packs down to pocket size, yet puts together in a couple of minutes. And with the high Q coil, you get high efficiency. Take it with your FT-817 as hand luggage!!

SLIDE TO CHANGE BANDS!!

£149.95 carr.£9

### PBX-100 Portable HF

£99 C

**80m - 10m 200W**

The PBX 100 offers 80m - 10m operation (max 4-bands at any time) with a height of just 3.6m. Supplied with ground spike, it takes seconds to erect, yet collapses down to little more than 1m. like all ground mounted verticals, it benefits from radials, and the radial wire is provided. Use it in the garden, in the countryside or abroad. SO-239 connection.

### MP-1 Options

**TRIPOD** £19.95 A

Compact tripod for free standing MP1

**MP-80M** £22.95 A

80m Coil for MP-1 3.4MHz - 4MHz

**FT-817 BRACKET**

MP1 bracket mounts on side of FT-817

£19.95 A

# WATERS & STANTON

Freephone Orders 08000 73 73 88

DISCOUNT..... CUSTOMER SERVICE THE ONLY THING WE WON'T

PRICE MATCH

# Get in Front with HUSTLER

CARRIAGE CHARGE CODES: A=£2.75, B=£6, C=£9, D: £12

5BTV

£209.95
Carr. £9.00

4BTV

£169.95
Carr. £9.00

HUSTLER®

## BASE STATION ANTENNAS

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

"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 | £24.95 B |
| RM-20 | 20m | 80-100kHz | £24.95 B |
| RM-30 | 30m | 50-60kHz | £26.95 B |
| RM-40 | 40m | 40-50kHz | £26.95 B |
| RM-80 | 80m | 25-30kHz | £29.95 B |

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

Lower mast sections

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

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 CI-V port for reaction tuning Icom and AOR receivers fitted with this feature. These monitor receivers are designed for nearfiled 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

## LDG USA

### LDG AT-11MP Auto ATU £269.95 A

1.8MHz - 30MHz 150W

Requires no data leads - just 12V at 500mA . Just connect between transceiver and antenna. Handles all coax fed systems but with much wider impedance range than internal models. Should be OK for G5RVs etc.

### CS-600 2-way Coax Switch £12.95 A

2-way coax switch ideal for use in antenna systems and service departments. Provides a very positive method of switching between two coax systems and offers very low loss.

### B1-2K Balun £25.95 A

This balun is designed for dipoles, inverted V antennas, and similar 50 Ohm feed designs.

### B4-2K Balun £34.95 B

The B4-2K 4:1 voltage balun is ideal for folded dipoles, delta loops or other medium impedance balance antennas where ATUs are not required.

### REM-BAL4 Remote Balun £49.95 B

The REM-BAL4 is is a 4:1 current type balun and is ideal for open wire to coax interfacing, especially external to the operating position. Unlike voltage baluns, current type baluns maintain output balance over a wide range of loads. Can be used with a transmatch.

WATSON

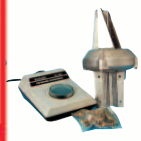
### WEP-300B EARPIECES £2.95 A

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 B

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

### YS-130 ROTATORS £79.95 B



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 I-20 15W DUMMY LOAD £21.95 A

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

### MASPRO VHF/UHF YAGIS

These high quality Yagis are made in Japan and superbly engineered. Features folded dipole, balun transformer, waterproof box and SO-239. You won't find anything better on the market.

Take a look at our prices!

| | | |
|---|---|---|
| 144-WH5 | 2m 5 el. 6.6dBd 0.93m | £26.95 B |
| 144-WH8 | 2m 8 el. 8.6dBd 1.79m | £37.95 B |
| 144-WH10 | 2m 10 el 9.7dBd 2.3m | £41.95 B |
| 435-WH8 | 70cms 8 el. 8.6dBd 0.8m | £29.95 B |
| 435-WH12 | 70cms 12 el. 12.8dBd 1.51m | £35.95 B |
| 435-WH15 | 70cms 15 el. 14.2dBd 2.19m | £41.95 B |

To compare with dBi figures, add 2.4dB

WATSON

### QS-112 SPEAKER MIC £16.95 A

Combined speaker-mic. with PTT switch. Models for Yaesu, Kenwood, Icom, Alinco and Motorola.

### SPM-102 SPEAKER MIC £9.95 A

Incredible value!
Has 4-way 3.5mm plug for VX-1, VX-5, FT-50 and IC-Q7E Handies

*Limited stocks.*

### WM-308 BASE MIC £59.95 B

The perfect answer for a high quality base microphone. Built-in pre-amp powered from rig or 2 x AA, electronic PTT and FM/SSB response switch. Includes lead with 8-pin plug. The plug needs to be wired for your radio. We can do this but phone for quote.

### WCT-321 LAPEL TALKER £19.95 A

The elegant way of personal communications.
Earpiece with combined lapel hanging mic and PTT. Models to suit most radios.
State: Kenwood, Yaesu or Icom when ordering

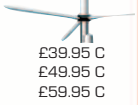
### AVAIR VSWR POWER METERS

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

AV-200 1.8 - 200MHz 5/20/200/400W £49.95 B
AV-400 140 - 525MHz 5/20/200/400W £49.95 B
All fitted with SO-239, PEP/RMS readings, 3W for FSD approx.
Also available AV20 & AV40 compact meters

## BASE VHF/UHF VERTICALS

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.



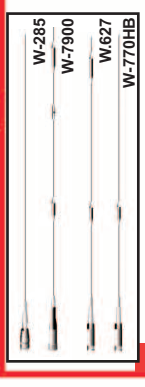
Dual Band 2m/70cms

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

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 1.6m £34.95 B |
| W-770HB | 2m/70cm whip 3dB / 5.5dB length 1.1m £24.95 B |

ALL WITH TILTOVER BASES.

# RSGB Matters


RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

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

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G Hunter, GM3ULP
I Rosevear, G3GKC
R Atterbury, G4NQI
W Jenkins, MM0WKJ

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

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IOTA.HQ@rsgb.org.uk (Islands On The Air)
GM.Dept@rsgb.org.uk (managerial)

**Website: www.rsgb.org**
**WebPlus:** Members-only web site **www.rsgb.org/membersonly** Use your callsign in lower case as the user name, and your membership number (see *RadCom* address label) as the password.


## NEW RSGB REGIONAL MANAGER APPOINTED

BRYN LLEWELLYN, G4DEZ, has been appointed as the RSGB Regional Manager for Region 13, the East Midlands. Region 13 covers Leicestershire & Rutland, Lincolnshire, Nottinghamshire, Derbyshire, Bedfordshire and Northamptonshire. Bryn, of Mavis Enderby near Spilsby in Lincolnshire, is a well-known VHF operator and DXer.

## NEW GB2CW MORSE PRACTICE SESSION

MEMBERS OF THE Staffordshire Morse Test team, Stan, G0BYA; Derek, G0EYX; and Tony, G4RSW, will be sending Morse practice on 145.250MHz each Monday evening at 1930 local time using the callsign GB2CW. It is hoped to cover as wide an area as possible around the County town of Stafford. As this is a new service it would be appreciated if listeners would send in reports after the broadcast when the operator takes calls under his own callsign.

## AROS NEWS

RSGB AMATEUR Radio Observation Service (AROS) Coordinator Barry Scarisbrick, G4ACK, will be giving a talk on the work of AROS at the Waterside ARS (New Forest) on **2 July**. Further details from Tony, G0LKG, tel: 023 80844316.

Barry Scarisbrick asks AROS Observers to keep him updated (by post c/o RSGB HQ or by e-mail: aros@rsgb.org.uk) with changes to their addresses or e-mail addresses. He says that Observers may wish to know that AROS *is* still active even if individual Observers have not been specifically tasked. Positive results have been obtained, thanks to those who have been asked to 'assist with enquiries'. All AROS Observers are thanked for their continuing service.

## BOARD AND NATIONAL COUNCIL ELECTIONS FOR 2003 – FIRST CALL

IN THE ELECTIONS for the Board and Regional Council members later this year there will be the following vacancies:

### The Board

Geoff Dover, G4AFJ, has to stand down after completing his second consecutive term of office, and is ineligible to stand. Mr Dover currently holds the Sports Radio Portfolio.

Gordon Adams, G3LEQ, has to stand for re-election having served his three-year term of office. Mr Adams currently holds the Spectrum Portfolio.

The Board therefore has two vacancies.

### Regional Elections

At the present time there are co-opted Regional Managers serving in the following Regions:

| | |
|---|---|
| Region 1 | Scotland West and the Western Isles |
| Region 2 | Scotland East and the Highlands |
| Region 5 | West Midlands |
| Region 9 | London and the Thames Valley |
| Region 10 | The South and South East |
| Region 11 | South West and the Channel Islands |
| Region 13 | East Midlands |

These appointments cease on 31 December 2002. If the current incumbents wish to continue in post they must stand for election in their respective Regions.

| | |
|---|---|
| Region 8 | Northern Ireland |

Jeff Smith, MI0AEX has to stand for re-election having served his three-year term of office.

The Regional Council therefore has eight vacancies.

Members of the Society who wish to stand for election need to obtain the nominations and supporting signatures from at least 10 Corporate members of the Society. Forms for this purpose are available from the General Manager. For the Regional vacancies, candidates are reminded that they must reside in the relevant Region. The formal notification of the vacancies will be included in the September edition of *RadCom*, and voting papers will be despatched with the November 2002 edition.

**DUE TO RETIREMENT, THE SOCIETY HAS AN IMMEDIATE VACANCY FOR THE POSITION OF VOLUNTEER RSGB MORSE PRACTICE CO-ORDINATOR.**

**INTERESTED? In the first instance please contact Peter Kirby, G0TWW, General Manager, tel: 0870 904 7373 or e-mail: gm.dept@rsgb.org.uk**

**George Allan, GM4HYK, has stood down as Morse Practice Co-ordinator. George has carried out this role for many years and has provided an outstanding service to radio amateurs. The Society would like to thank him for all his hard work and dedication and wish him well on his retirement.**

George Allan, GM4HYK

## G5RP TROPHY: NOMINATIONS WANTED

THE G5RP TROPHY is an annual award to encourage newcomers to HF DXing. It is awarded for making recent rapid progress in DXing, which only newcomers have the scope to do. However, the award is not limited to youngsters or the newly-licensed - the DX bug can bite at any age and after many years of experience.

Seasoned HF DXers are able to reward and encourage newcomers by nominating an up-and-coming DXer for this award. Your nominations for the 2002 - 2003 award are needed now.

The trophy is awarded jointly by the Vale of White Horse Radio Society and the RSGB HF Committee, and will be presented at the RSGB International HF and IOTA Convention.

Nominations should be sent by post to Colin Thomas, G3PSM (QTHR), or c/o RSGB HF Committee at RSGB HQ, or by e-mail to: hf.chairman@rsgb.org.uk, to arrive not later than **31 August**.

● THE WINNER OF the 2001-02 G5RP Trophy was Dominic Smith, M0BLF, a second-year undergraduate languages student at Cambridge University. He was the Cambridge University Wireless Society (CUWS) Chairman for the 2001-02 academic year and is one of the operators on the CUWS GM6UW Treshnish and Shiant Islands DXpedition, which is taking place between 10 and 20 July.

## WRC-03 CONFERENCE IN DOUBT

THE ARRL REPORTED on 10 June that Venezuela had withdrawn its invitation for next year's World Radio Conference (WRC-03). The location of the conference is now uncertain. The conference had been scheduled to be held in Caracas in June and July 2003. Whether it can be held on the scheduled dates in another location is not yet known. The Venezuelan National Commission of Telecommunications, CONATEL, advised the ITU Secretary-General Yoshio Utsumi that it would be unable to host WRC-03 and blamed economic concerns. David Sumner, K1ZZ, who serves as administrative officer for the delegation that will represent the IARU at the conference, said: "Planning for a conference of this size and scope generally takes two or three years. It is a formidable challenge for ITU staff to work with potential host administrations to find a suitable facility for a conference that is supposed to open less than one year from now."

Several issues of importance to radio amateurs are on the conference agenda, including the revision of Article 25 of the international Radio Regulations. This includes the issue of whether to retain the treaty requirement to demonstrate Morse code proficiency for access to amateur bands below 30MHz. Also on the agenda is the question of harmonisation of the 7MHz amateur and broadcasting allocations.


**Rostrum of ITU meeting, with ITU Secretary-General Yoshio Utsumi third from left.**

## RSGB QSL BUREAU NEWS

AN RSGB QSL Bureau sub-manager has been appointed for all UK amateurs who are using the special Golden Jubilee prefixes of GQ, MQ or 2Q. If you have been using one of the special prefixes and wish to receive QSL cards through the RSGB QSL Bureau system, please provide stamped self-addressed envelopes to Michael Evans, MW0CNA, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR. Please ensure that your own callsign appears on the top left-hand corner of the envelopes. The special prefixes may continue to be used until 2400UTC on **30 June**.


## *RSGB YEARBOOK* 2003

IN THE APRIL *RadCom* we asked members for comments and views on what they would like to see (and like not to see) in the next edition of the *RSGB Yearbook*. I would like to thank the many members who made suggestions and am pleased to say that we have taken much on board. Now that the *Yearbook* is in production we would like to bring you up to date with the changes you can expect to see when it is published later this year.

Overall, next year's *Yearbook* will look quite different, because it will be printed on higher quality paper with the same quality paper being used throughout all the sections. The format of pages will also be different, with a bottom margin on each page for readers to add their own amendments, tips and notes. The chapters of the Information Section are being re-organised and consolidated, with a large RSGB-orientated section at the front, followed by Clubs, Licensing, the Review of the Year, and Operating. Every page is being brought as up-to-date as possible. Not included in the 2003 edition will be re-prints of equipment reviews from the previous year's *RadComs*, but in will come an index of *RadCom* reviews. A variety of new features of general interest will complete the Information Section. After much comment and thought the enhanced entries in the Directory Section are being dropped. Although these entries were originally perceived as useful, they have been taken up by only a handful of clubs and individuals and as time has marched on the vast majority of entries have not been updated, leading to them being largely inaccurate. We are also now adding more pages for callsigns catering for the many M3 licences that have been issued since 1 January 2002. Finally, the equipment catalogue at the back will not be included this time.

***Mark Allgar***
***Commercial Manager, RSGB***

## VACANCY ON PLANNING ADVISORY PANEL

THE SOCIETY IS seeking to enlarge the Planning Advisory Panel. Panel members provide one-to-one advice and assistance to RSGB members who are seeking planning permission for towers and aerials. In addition to providing advice, panel members also draft letters and appeal statements. Although people with experience of the planning process would be preferred, others with experience of dealing diplomatically with officialdom would also make effective panel members. Training can be provided, and panel members receive out-of-pocket expenses. There are currently no panel members in Northern Ireland or Scotland, so applications arising from these areas would be especially welcome. To seek further information, please contact the Chairman of the Planning Advisory Committee, Stephen Purser, G4SHF, 80 John Bold Avenue, Stoney Stanton, Leicester LE9 4DN or e-mail: stephen@g4shf.demon.co.uk

# MEMBERS ONLY SPECIAL JUBILEE OFFERS


One of the most important coins of 2002, is the Golden Jubilee commemorative crown. Both the equestrian portrait on the obverse and the fine new portrait of the Queen on the reverse have been created by sculptor Ian Rank-Broadley.

**ONLY £9.45 + p&p**


The Golden Jubilee commemorative medal struck in nickel-brass and measuring over 38mm in diameter is nestled in a luxurious red presentation case.

**ONLY £4.95 + p&p**

**www.rgb.org/shop** **Tel: 0870 904 7373**

---

# QUEEN ELIZABETH GOLDEN JUBILEE QSL CARDS


The RSGB has produced these special commemorative cards to celebrate the Queen's Golden Jubilee. The cards have been luxuriously finished with special colour inks to create an exceptional and memorable card.
The design enables them to be overprinted on your own inkjet printer with your callsign.These cards can also be used in conjunction with the special GQ (MQ, 2Q) callsigns allowed in June to celebrate this Golden Jubilee.

**Special price for members ONLY £9.99 for 400 cards**

(Overprinting with your own callsign can also be arranged for only £25.99 extra)

**www.rsgb.org/shop or Tel: 0870 904 7373**

# Icom Magic

## Icom IC-718

This is Icom's entry level HF transceiver with options for DSP and CW or SSB Filter. Offering 100 Watts on all the HF bands at only £599.00.

ONLY **£599.00**
NO DEPOSIT
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**Options available**
1296MHz, DSP units, TCXO, Voice Synthesizer, Narrow CW filters.

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## Icom IC-756 Pro Mk2

The new Icom flagship has all the features of the IC-756 Pro plus -

- Improved Receiver
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- 24 bit AD-DA converter
- Plus much more!

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£108.32

*'This is set to put Icom back on TOP of the DXers CHOICE'*

## Icom IC-7400

This is the long awaited IC-746Mk2! With 32 bit DSP and 100 Watts on HF/50Mhz and 144MHz plus a built in ATU this radio offers performance at a value for money price.

**Features**

- 100 Watts HF
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- Supplied with Microphone DC lead and 2 Year Icom Warranty

**FINANCE EXAMPLE: ICOM IC-2800 AT £425**
*PAYMENT ILLUSTRATION: ZERO DEPOSIT:* 36 payments of £18.45 *TOTAL AMOUNT PAYABLE:* £664.20 APR: 26.9%. If paid in January 2003 - 0% APR
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## Front Cover:

This month, the construction of the CDG2000 transceiver gets under way. There is also a full listing of the IOTA Honour Roll, together with a comprehensive review of the new Icom IC-T3H hand-held VHF transceiver.


# Radio Communication

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No responsibility can be assumed for the return of unsolicited material (if in doubt, call us first!)





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**RSGB MEMBERSHIP - Annual Rates**

| | |
|---|---|
| Home Corporate | £40.50 |
| Overseas Corporate | £40.50 |
| Corporate (Senior Citizens) | £31.50 |
| (Applications should provide proof of age at last renewal date) | |
| Corporate (50 years membership) | 50% DISCOUNT |
| Corporate (60 years membership) | FREE |
| Family member | £16.50 |
| (Must reside with existing member. Does not include RadCom) | |
| Student Members | £26.50 |
| (Applications should include evidence of full-time student status) | |
| HamClub (under 18) | £16.50 |
| Affiliated Societies (UK or Overseas) | £40.50 |

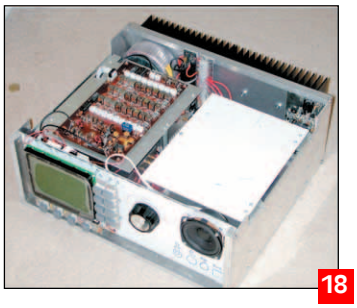
*Subscriptions include VAT where applicable.*
*Special arrangements exist for blind and disabled persons.*
*Details and membership application forms are available from RSGB HQ.*

# RadCom This Month
## July 2002

## News and Reports



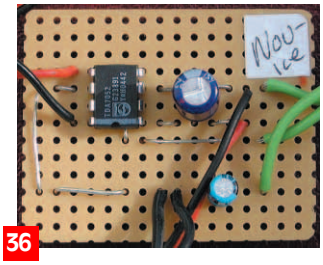
## Technical Features


18



## Down To Earth - Amateur Radio From The Ground Up

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## Reviews



## Regulars

# RadCom NEWS

## SAQ On the Air

THE ANNUAL transmission from Grimeton Radio, SAQ, in Sweden with the Alexanderson alternator on 17.2kHz (see www.alexander.n.se/theassociationalexander/) will take place on Sunday **30 June** at 0830UTC. The transmission will be repeated at 0845, 1230 and 1245UTC. The special event station SA6Q will be active from 0700 - 1400 on 7015, 7050, 14035 and 14215kHz plus 136.8kHz LF. Reception reports can be sent by e-mail to: info@alexander.n.se or by fax to 0046 340 674195.

## Rotarians ROAR

UNTIL RECENTLY, membership of 'ROAR' had been restricted to active members of Rotary International. At the recent AGM it was decided to open the membership to ex-Rotarians and members of Rotaract. ROAR holds nets every Sunday on 80m, and the Intercontinental nets on 20m attract many stations from USA, Australasia and Europe. ROAR also holds get-togethers during the year. If there are any ex-Rotarians or members of Rotaract who are interested in joining, please contact Brian Whittaker, G3LUW, tel: 01566 784222 or e-mail: brian@g3luw.freeserve.co.uk

## GB2RAF On Air

THE RAFARS permanent special event station GB2RAF, located at the RAF Air Defence Radar Museum at RAF Neatishead, is now on the air on the second Saturday of every month, between 9.00am and 4.00pm.

## Correction

THE AUTHOR OF 'A Flexible Voltage Reference' in the June issue apologises for giving the incorrect values for some resistors. In Fig 1 on p38, R4 should be 470Ω, R5 1500Ω, and R6 3300Ω. If your version is not working, this could be why.

## Young DXers Go to Maldives

THE 'CRYSTAL CLEAR DX Group' is now about a month away from conducting one of the first DXpeditions specifically for youngsters, to the Maldives in the Indian Ocean. Three of the four team members, including leader Mark Haynes, M0DXR, are 18 years or younger. The international team leaves London on 28 July and plans to hit the bands as 8Q7ZZ with up to three stations during the evening of the 30th. Two stations will run 24 hours a day for around 11 days, with a third operating mainly in beacon mode on 6m but with the capability of also running on HF. Yagi antennas and an amplifier will be used to help make signals 'loud'. The team will concentrate on working newly-licensed amateurs including Foundation Licensees, and parts of the world where 8Q7 is particularly rare. Extensive propagation forecasting has been carried out by team member Robert, M0TTT, to help ensure they will be on the most productive band, beaming to the best continent, at the right time. More information can be found at the expedition website www.8q7zz.com or from M0DXR, tel: 01279 430609 or e-mail m0dxr@qsl.net

**Lohifushi island, North Male' Atoll, in the Maldives, the site for the 8Q7ZZ DXpedition.**

## WOW: a FUN Sister!

11-YEAR OLD Cherry Constable has just passed the Foundation course and has become M3WOW. Cherry is an active member of the QRZ Amateur Radio Group of Sussex, and is hoping to build a large collection of QSL cards from her contacts, to rival those of her brother, Jonathan, M5FUN. By gaining her licence Cherry makes the family complete: Dad is M0CHW and Mum, M1EXL.

## RAE Report

A REPORT ON the May 2002 Radio Amateurs Examination is now available on the Internet at www.kippax.demon.co.uk/c-and-g Its summary says that candidates were generally well prepared for the examination, their performance being a little above average for the RAE. The total number of candidates was 323, of whom there were 35 from Hong Kong, 20 from Trinidad and Tobago, six from Malta and two from Oman (the RAE is used in some countries overseas as a qualification for amateur radio licences).

## Record Attendance

ON 26 MAY, Waters and Stanton recorded record attendance figures at their 12th Annual Open Day in Hockley, Essex. A marquee enclosing their entire car park at the rear of the building was erected. Yaesu, Icom and Kenwood had stands, as did the Kent TV group, Essex Repeater Group, Intermediate Licence Instruction and Vintage Radio. There was free food and drink throughout the day, free raffles with prizes donated by Kenwood, Yaesu and Icom, plus the largest ever 'junk' clear out and auction. At the front of the building was a display by St John Ambulance Brigade, an organ grinder, and local radio station Essex Radio, who broadcast live reports during the day. Waters & Stanton also have Open Days coming up on Saturday 7 September at Lowe Electronics, Derbyshire, and on Saturday 19 October at Jaycee Electronics in Fife.

**The busy 'Bargain Stand' was several deep throughout the day.**

## The G0CWT Loop Antenna

THE RSGB has received a letter from Ben Edginton, G0CWT, in which he claims that he originated the design of loop antenna shown on page 33 of the May 2002 *RadCom*. Mr Edginton says he holds a patent on the antenna he originated although he has made its design and constructional details openly available on his website at http://members.aol.com/benprom/index.htm Amateurs are invited to visit the website if they wish to experiment with the G0CWT loop antenna for their own use.

## Take Your PIC

THE PICAXE microcontroller used in this project is supplied by Revolution Education Ltd, at a new address. It is 4 Old Dairy Business Centre, Melcombe Road, Bath BA2 3LR, tel: 01225 340 563. The website address given is still correct.

## Foundation Licence for Gib

GIBRALTAR IS introducing a new Foundation Licence similar to that here in the UK. The new licence was scheduled to be introduced by mid-June this year. The prefix to be used will be ZB3.

● GB5NF IS ON the air from Neston Fete, 10 miles NE of Bath, on 13 July. The station is being run by the Wessex Repeater Group. See www.g4sknradio.freeserve.co.uk/gb5nf.htm


**Good luck to Fred Handscombe, G4BWP (left), and Andy Cook, G4PIQ (seen here at XT2DX last November). Fred and Andy are representing the UK at the World Radiosport Team Championships in Helsinki between 10 and 16 July. Look out for Andy and Fred, and the other national teams, on the air using unique OJ1 to OJ8 prefix callsigns during the IARU contest on 13 / 14 July.**

*5000 Visitors to GB50 and 'Amateur Radio Experience' at Windsor*

# Duke of Edinburgh Has an Amateur Radio Experience

THE GB50 Golden Jubilee special event station and Amateur Radio Experience exhibition at Windsor Castle drew to a close on 9 June after being open to the public for 11 days. Around 5000 members of the public visited the exhibition, the great majority learning about amateur radio and the Foundation Licence scheme for the first time. Nearly 500 visitors were able to speak on the radio and send a greetings message from Windsor Castle, giving them a real 'hands-on' experience of amateur radio. It is hoped that many of these people will go on to take out a Foundation Licence of their own and eventually take to the air themselves. GB50 made over 24,500 contacts with some 130 countries, on SSB, CW, RTTY and PSK31. The station was also active on APRS.

## VIP Visit

AT 10.30AM ON Monday 3 June, the Patron of the RSGB, His Royal Highness the Duke of Edinburgh, visited GB50 and the Amateur Radio Experience exhibition. He was introduced to the RSGB President Bob Whelan, G3PJT; the General Manager, Peter Kirby, G0TWW, and other members of RSGB staff; representatives of the Cray Valley Radio Society and the Burnham Beeches Radio Club, and invited guests. Prince Philip spent some time viewing the display of historic radio equipment, including a Marconi transmitter dating from 1901, before being shown the current state-of-the-art equipment being used by GB50. He listened to an SSB contact with Jeff Morris, 9H1EL, in Malta and was shown a Morse contact in progress by John Linford, G3WGV.

A special Golden Jubilee greetings message from the Duke of Edinburgh was transmitted by GB50 and received by Jeff Morris, 9H1EL, on behalf of all radio amateurs in the Commonwealth. The message read: "As Patron of the Radio Society of Great Britain, I am delighted that it has been able to set up the GB50 Special Event Station on the North Terrace of Windsor Castle overlooking the Thames and the town of Windsor. It is in a very appropriate position to receive messages of good wishes from amateur radio enthusiasts to the Queen in her Jubilee year. I know that the Queen very much appreciates this special contact with people throughout the Commonwealth, and the rest of the world, and she has asked me to send you all her warm thanks for your support and affection at this time. I hope that all your contacts with GB50 over the next 10 days will be five and nine. 73, Philip."

**The Duke of Edinburgh is presented with a commemorative GB50 Morse key by RSGB President Bob Whelan, G3PJT, watched by General Manager Peter Kirby, G0TWW (right) and GB50 Station Manager Tim Kirby, G4VXE (no relation, second left).**

On display at the exhibition was a video of the contact between girls from Harrogate Ladies' College and NA1SS on board the International Space Station [see *RadCom* April 2002, page 19]. Some of the Harrogate girls had travelled down that morning to be introduced to Prince Philip and they were able to tell him something of their contact with the Space Station.

Before leaving, His Royal Highness was presented with a commemorative GB50 Morse key in recognition of his 50 years patronage of the RSGB.

## Anyone for an African Adventure?

STUART AND ESTHER GRANT operate Red Zebra Tours and an ornamental fish exporting business on the lakeshore in Central Malawi. In April they had a visit from three Spanish radio amateurs who operated as 7Q7DX (a write-up with photos is on the website www.lakemalawi.com under 'Special DX'). Stuart has recently contacted the RSGB suggesting that UK amateurs might also like to take advantage of the rare prefix and operate from Malawi. They charge $50.00 per day full board for twin share (just $25 per person per night). Further details are on the website, or write to Stuart and Esther Grant, Red Zebra Tours, PO Box 123, Salima, Malawi; tel / fax: 00 265 263 165, or e-mail: stuart@lakemalawi.com

# The RSGB International

## by John Gould, G3WKL*, Organising Committee Chairman

THE RSGB HF Convention [1] has, for many years now, been the key social event in the calendar for HF enthusiasts of all ages and levels of experience. It is very much a social event, with just a few select trade stands, displays by HF and LF related clubs and organisations, and an opportunity to have your QSL cards checked for DXCC or to take a Morse test. The main draw, however, is always the excellent lecture programme and the opportunity to participate in a lively exchange of views and tall stories in the informal bar area, often well into the early hours! For a number of years now the Convention has been held at the Beaumont Conference Centre at Old Windsor but, as many now know, we received the unexpected news in mid-June that the Centre had been sold and our booking for this October's event cancelled.

Between writing this article and it arriving in the post we hope that we will have been able to re-locate the event. In looking around we know that we have had a good deal at the Beaumont in the past, so we will have a difficult task of finding an affordable price without compromising the factors that make the event popular.

Moving to a new location will not be an easy change to make since whether you are a day visitor or, like me, normally come for the weekend, we will need to retain the essence of the event, which is the opportunity to learn, mingle and exchange ideas with many of the top DXers, contesters and technical experts. We also need to retain the attraction that it has developed for our overseas friends, since it has become a true international event, drawing HF, IOTA and LF enthusiasts not only from the UK, but also from much of Europe, Scandinavia and often farther afield too. It covers all technical and operating aspects of amateur radio from 50MHz to 136kHz and 73kHz.

This year we are planning for the Convention to be bigger and better than ever, as we welcome the many newcomers to HF and LF through the Foundation Licence. If we are able to stick to our traditional format the event will start on the Friday evening with a welcome from our President, Bob Whelan, G3PJT, before we tuck into the IOTA Buffet to which all are invited. Although I've not (yet) become hooked on island chasing, I've been made to feel very welcome in previous years and enjoy the camaraderie that prevails during the notorious quiz and games.

Standing room only at the excellent lectures.

* Pathways, 116 Wolverton Road, Newport Pagnell, Bucks MK16 8JG; e-mail: HFC2002.Chairman@rsgb.org.uk

G4BWP, G4IDL, G0KRL and G3RTE checking QSLs for DXCC.

### FOR THE DXer

AS THIS ARTICLE is being written, planning for the series of lectures, IOTA, contest items, forums, displays and demonstration stations is already well advanced and stable. Wayne Mills, N7NG, who manages the ARRL DXCC programme, is very keen to come this year and, barring international events that forced his late cancellation last year, will deliver the keynote presentation to the Convention on the 'Logbook of the World'. This project, which Wayne manages for the ARRL, is expected to be the vehicle for a radical change in the way we confirm our contacts and claim operating awards. He is also keen to talk to newcomers to HF on the DXCC programme, which nicely links to his other key task for the weekend, which is to lead the team of UK DXCC checkers, who give their time to check our QSL cards, thus avoiding the risk of consigning those hard-earned cards to the postal service. Last year G4BWP, G3RTE and G0KRL, assisted by G4IDL, checked 6158 QSL cards in 51 applications.

We thought that it would be a hard act to follow last year's line-up of DXpedition stories, which included the excellent presentation by a number of members of the D68C team. We are delighted that the provisional programme already includes Declan Craig's, EI6FR, story of the South Sandwich and South Georgia operation and a talk by some of the members of the Ducie and Henderson Island operations. There will be more to come as we pin down the DXers, so watch out for further announcements!

### IOTA

AS MANY WILL KNOW, this Convention is the premier event in the annual IOTA calendar and, over many years now, has attracted Island enthusiasts from all over the world. The IOTA stream at the Convention will contain the usual mix of DXpedition presentations and updates on developments in the IOTA programme. This is your chance to put questions to the Committee on a wide range of issues.

For those wanting to know more about HF contesting, or are already hooked, the convention hosts a contester's forum, the annual presentation of the HF Contest Trophies and a talk on RTTY / PSK31 contesting. But (unless you are one of the lucky winners) the highlight has to be Roger Western, G3SXW, talking about World Radiosport Team Championship (which takes place from 10 to 16 July). This is sometimes described as 'the Olympics of Amateur Radio' and is a competition among two-person teams of some of the top amateur radio contest operators in the world. Roger has the ideal qualifications to give this talk since, apart from being the manager for the referees for this year's event, along with Dave Lawley, G4BUO, he came second out of a field of 53 teams in the CW listings for the last championship in 2000.

### TECHNICAL AND EXPERIMENTATION

THE PART OF the programme devoted to technical matters and experimentation is an area that we have been building over recent years. It's been broadly split between topics relating to HF (aerials, propagation and operating aids) and experimentation that has been made possible (or essential as some would say) by the allocation of 136kHz and 73kHz for radio amateur use. For those with an experimental or technical bent it's going to be a full weekend and some difficult choices of what to attend will have to be made.

André Kesteloot, N4ICK, adding AMRAD's magic touch to last year's 136kHz demo station put together by G0MRF and G3XTZ.

# HF & IOTA Convention

## Friday 11 to Sunday 13 October 2002

Fun and games at the 'DX Dinner': Martyn, G3RFX, MCs with aplomb.

This year's Convention has got the makings of a first-rate technical programme, which already includes two papers on transceiver design: George Fare, G3OGQ, and Dave Roberts, G8KKB, will discuss the design of their high-performance HF transceiver, the CDG2000, which is currently being serialised in *RadCom*; and Andy Talbot, G4JNT, will give a general overview of Software Defined Radios. For the aerial experimenter we are responding to feedback by including a talk on aerial modeling and 'backyard' aerials by *RadCom* 'Antennas' columnist Peter Dodd, G3LDO, and we have an update from Mike Underhill, G3LHZ, on loop aerials, some of which I understand will be quite controversial! Phil Harman, VK6APH, is planning to visit to talk about his experiments with Critically Coupled Aerials - a story that builds on the definitive work in the early 80s by Les Moxon, G6XN. In addition we have a paper from Steve Nichols, G0KYA, who will be 'lifting the lid' on greyline propagation. Finally, we are working on bringing Murray Greenman, ZL1BPU, and author of the best-selling *Digital Modes* book into the Convention via an Internet link - so watch out for announcements on this once we have sorted the technical issues.

Since 73kHz was allocated temporarily to the Amateur Service the Convention has quickly become an annual focus for LF experimenters and operators. It draws attendance not just from the majority of UK LF operators but also from Europe and the USA, the latter through AMRAD (the Amateur Radio Research & Development Corporation) [2] whose relationship with the RSGB on LF has helped them to gain FCC support for a 136kHz allocation for American amateurs. This year's programme should again ensure a good turn-out since we have an excellent programme that includes Laurie Mayhead, G3AQC, talking about his record-breaking trans-Atlantic transmission at 73kHz; an update on the MB7LF remote LF reception experiment; John Rabson, G3PAI, representing the Cave Radio and Electronics Group (CRAG) [3] to talk about the use of LF to support cavers; a talk on the narrowband data-modes JASON, PSK08 and WOLF; and a novel LF network analyser design by Frank Gentges, K0BRA, a Director and an LF Coordinator for AMRAD. In addition there is a short-paper session within the annual LF Forum, which gives all an opportunity to express their opinion and help direct RSGB policy on the development of bands below 1.8MHz.

Frank Donovan, W3LPL, lucky winner of last year's raffle star prize. It could be you!

### NEWCOMERS WELCOME!

BUT THIS IS not just a convention aimed at the hardened DXer, contester, LFer or indeed the leading-edge designer / constructor. It is a place where newcomers have always been welcome and are able to mingle freely, exchanging views and sharing ideas with the more experienced. Reaching out to the Foundation Licence holders and making them feel welcomed is a primary aim of this year's event. There will be many well-known and respected amateurs to cover the basics, tips and encouragement on how to setup and operate a station in order to get the best out of the 10 watt power limit and modest aerials, etc. I expect the audience for these sessions to include many who have operated on HF for some while, as it never does us any harm to have a refresher, once in while - especially from the experts! What's more, there will be an opportunity on-site to put what you have learned into practice, by operating the Convention's state-of-the-art HF station, kindly provided by one of our two main sponsors, Yaesu (UK) Ltd.

Socialising in the bar: an international group including G4KIU, M0DXR, G3WRO, BRS32525, UT8LL and DL7AKC.

After this brain bashing I for one will need a rest, which is where the social side of the event takes over! Moving to a new location will give some fresh challenges to ensure that the bar, food and coffee facilities are correctly tuned to the appetite and strange hours expected by the radio amateur! If the IOTA Buffet sets the style on the Friday, the 'DX Dinner', held on the Saturday evening, takes this one stage further with its eclectic mix of formality, the bizarre, DXers, contesters, 'rag chewers' and LFers! By popular request our Master of Ceremonies, Martyn Phillips, G3RFX (who has promised not to have any Morse games using party squeakers this year), will do his best to guide us through the evening, yet keep some semblance of order. But, be warned that this is a popular evening and the number of places is strictly limited, so book early to avoid disappointment.

### THANK YOUs

THIS PIECE would be incomplete if I didn't say a "thank you" to our two commercial sponsors of the Convention - Yaesu (UK) Ltd and Martin Lynch & Sons. Not only do they provide cash sponsorship but Yaesu (UK) also donates the star prize for the raffle. Last year this was an FT-817 won by Frank Donovan, W3LPL. But it is also important to thank Kenwood (UK), *The Daily DX* (W3UR), *SHACKLOG*, *TurboLog*, *QRZ Ham Radio*, the RSGB, IOTA, as well as a number of private individuals for their support in donating prizes for the raffle last year. The proceeds of the raffle are the sole source of income for the HF DXpedition Fund that the RSGB HF Committee administers. The excellent range of prizes kindly donated by these various individuals and companies ensures that the raffle is always well supported and a source of great interest to all comers.

So please listen and watch for news and information on how we are re-planning and pricing the event at its new location. This can be done on-line [4], on the GB2RS news or by calling RSGB HQ on 0870 904 7373. Further information will be given in next month's *RadCom*.

### WWW.

[1] RSGB HF Convention http://www.rsgb.org/hfc/
[2] AMRAD http://www.amrad.org
[3] Cave Radio & Electronics Group http://www.caves.org
[4] RSGB Shop http://www.rsgb.org/shop
(type "HFC2002" into search box)

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### Auto Tuner

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

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- Power for tuning = 7-20W
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- Alphanumeric display
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- Comp. programmable 3rd party software
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  Can the DJ-193 actually repel mosquitoes?
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***A feature packed dual bander - yet simple to use, with the capability of Digital Voice operation (where permitted - using optional digital voice board).***

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

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

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

**£199.95**

## DJ 195E

### 2 mtr Handheld with Keypad


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

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

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***A brilliant twin band handheld that does everything including spectrum display of 4 adjacent channels. The receiver has a superb front end that does not suffer with breakthrough like other handhelds and has CTCSS/DTMF built in as standard.***

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(Length 39')
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(2 mts 4.5dBd) (70Cms 7.5dBd)
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(70cms 8.4dBd) (Length 100")
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OPTIONAL 10-15-20 Mtr radial kit ..... **£34.95**

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**EVX4000** 4 BAND VERTICAL FREQ: 10-15-20-40 Mtrs GAIN: 3.5dBd HEIGHT 6.50m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials) .. **£99.95**
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OPTIONAL 10-15-20 Mtr radial kit ..... **£34.95**
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**EVX6000** 6 BAND VERTICAL FREQ: 10-15-10-30-40-80 Mtrs HEIGHT: 5.00m RADIAL LENGTH: 1.70m (included) POWER: 800 Watts ..... **£249.95**

**EVX8000** 8 BAND VERTICAL FREQ: 10-12-15-17-20-30-40 Mtrs (80m optional) HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included) POWER: 2000 Watts ..... **£269.95**
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(picture for reference only)

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**MTD-3** (3BAND) FREQ: 40-80-160 Mtrs LENGTH: 21.5m POWER: 1000 Watts ..... **£79.95**
**MTD-4** (3BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts ..... **£44.95**
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# THE CDG2000 HF TRANSCEIVER

## Part two, by Colin Horrabin, G3SBI, Dave Roberts, G8KBB, and George Fare, G3OGQ *

LAST MONTH, the CDG2000 project was introduced, outlining the design goals and the achieved performance. The series continues with a detailed description of the first board.

## THE FRONT-END BOARD

THE FRONT-END comprises the following main blocks:

- relay switching for transmit / receive and attenuators;
- a 9MHz notch filter;
- a set of band-pass filters;
- an H-mode mixer;
- an SSB-bandwidth roofing filter;
- a computer control interface.

A block diagram is shown in **Fig 4**.

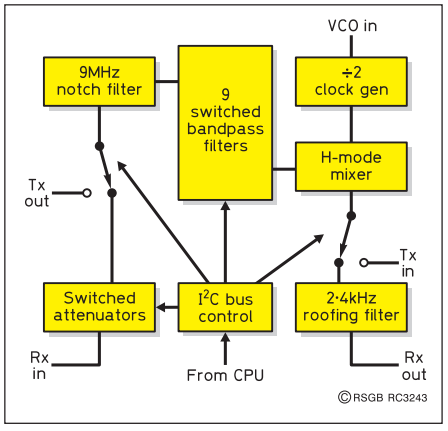


**Fig 4: The front-end block diagram.**

The board is controlled by means of a two-wire I²C bus. The controller may change the transmit/receive switching, attenuator and band pass filters. This interface is optional; it may be replaced by a parallel interface by omitting the I²C bus interface chips and connecting a logic-level signal to the relay drivers or also by omitting the relay drivers and driving the relays directly.

The attenuator provides two switchable attenuators of 6 and 12dB, allowing 0 to 18dB of attenuation in 6dB steps. The nine band-pass filters are one per band. In each case, the band filters cover a complete band, there being no separate 500kHz filters for 10m, where a single filter covers the band. A notch filter reduces IF breakthrough.

The local oscillator frequency from the synthesiser is divided by two in order to provide two signals 180° out of phase for the H-mode mixer.

The mixer is bi-directional, accepting either a 9MHz transmit input and generating a transmit signal, or generating a 9MHz IF from an incoming RF signal.

The receive signal is passed through a 9MHz roofing filter before being output to the IF.

## DETAILED CIRCUIT

THE FULL CIRCUIT diagrams are shown later. Each of the main blocks, as defined in Fig 4, is detailed below.

### ATTENUATOR

The attenuators are simple resistive pads. Each presents 50Ω input and output. The relays are under the command of the controller via the I²C bus. The main point to note, as is the case with all relays on the front-end, is that the contacts carry a DC 'wetting' current. This is to ensure that they do not develop poor (noisy) contacts in use.

### NOTCH FILTER

The performance of the notch filter is shown in **Fig 5**. This is by measurement, not calculation. Its purpose is to prevent large signals at the IF frequency of 9MHz getting through to the IF.

The green line shows the reference signal, and the red line the loss through the notch filter. As can be seen, it presents a loss of over 40dB at the desired frequency, and its loss is negligible on any of the amateur bands with the exception of 10MHz, where it incurs a loss of 1.5dB. This is the band where it is most needed, as the desired signals are but 1MHz away from the IF.

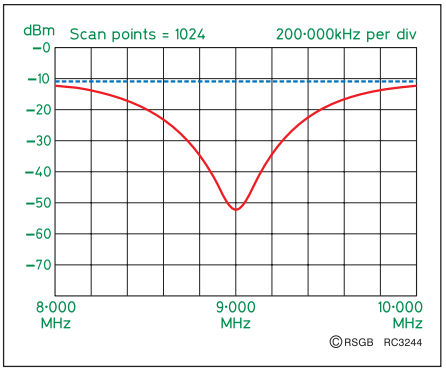


**Fig 5: The notch filter response.**

The overall performance in terms of IF rejection is a combination of the notch, band-pass and RF port isolation loss of the mixer.

### BAND-PASS FILTERS

There is one band-pass filter per amateur band. The filters are 3-section Butterworth designs, with a loaded Q of about eight, varying a little by band. The 50Ω design impedances determine the coefficient capacitors (those to ground), and the series

| Band (m) | dB loss at band centre | dB loss at band edges relative to band centre | | IP3 (dBm) | |
|---|---|---|---|---|---|
| | | Low | High | Output | Input |
| 160 | 2.0 | -0.50 | -0.75 | 33.0 | 35.0 |
| 80 | 1.5 | <-0.25 | <-0.25 | 37.3 | 38.8 |
| 40 | 2.0 | 0.00 | <0.25 | 31.5 | 33.5 |
| 30 | 3.0 | 0.00 | 0.00 | 26.7 | 29.7 |
| 20 | 2.0 | 0.00 | 0.00 | 42.0 | 45.0 |
| 17 | 3.0 | 0.00 | 0.00 | 32.0 | 35.0 |
| 15 | 2.8 | 0.00 | 0.00 | 40.0 | 42.8 |
| 12 | 2.5 | 0.00 | 0.00 | 40.0 | 42.5 |
| 10 | 2.0 | -0.10 | -1.00 | 34.5 | 36.5 |

**Table 1: Band performance.**

* *1 Old Hall Close, Higher Walton, Warrington WA4 6SZ.*

| Band (m) | dB loss at band centre | dB loss at band edges relative to band centre | | IP3 (dBm) | |
|---|---|---|---|---|---|
| | | Low | High | Output | Input |
| 15 | 4.0 | 0.00 | 0.00 | 25.0 | 29.0 |

**Table 2: Performance with Toko coils on 15m - cf Table 1.**

LC circuits define the bandwidth and resonant frequency. The values chosen were based on Toko ready-wound components. The basic design is the same as for the crystal filters shown in the *RSGB Radio Communication Handbook* [5], and the performance of each is tailored to the band in question with losses that vary slightly by band as shown in **Table 1**. You will notice some significant variation in the readings for IP3. This is because two different types of coil were used in its construction. The 21 and 24MHz filters used Lodestone Pacific L45-6 formers, the rest used pre-constructed Toko coils. It was found that the performance of the receiver was different using Lodestone and Toko coils in the band-pass filters. The variation in performance was up to 15dB, as can be seen from **Table 2**. It is presumed that this is due to saturation in the cores, but opinion varies. The Lodestone formers have the same pin connections as the Toko coils and fit the same PCB, but the cases are marginally larger with substantial ferrite content. See WWW. for more details.

Why, then, do we show the Toko data? Not everyone will want to wind coils and not all coils were appreciably different. The board takes both types of coil and the constructor can decide which to use. The components list shows both Toko and hand-wound Lodestone inductors.

Performance plots of all the filters are available from the Warrington Amateur Radio Club (WARC) website. Examples of the 7MHz filter are shown in **Fig 6** and **Fig 7**. Note the effect of the 9MHz trap. The wideband performance plot is limited by the analyser used in the measurement, not by the filter.

The insertion loss, when all relays were off, was measured. It was found that the loss was acceptably small to 20MHz but, from there, rose significantly to be only 30dB at 200MHz. To improve this, the relays were decoupled and inductors fitted in series with each relay control line. This reduced the signals at 200MHz by over 40dB. Specifically, the relay coils on the aerial side were decoupled with 10nF capacitors, the mixer-side relays by 1nF and the series inductors between the relay coils were 0.82µH, self-resonant at 200MHz. Additional connections from the earth tracks between the relays to the ground plane were made in three places on each side. The 12V line was also decoupled and filtered in the same way.

## MIXER

The mixer has already been exhaustively described before in both 'Technical Topics' [6] and in the *RSGB Radiocommunication Handbook* [7]. It is capable of excellent performance both with regard to IP3 and insertion loss. The VCO is applied to IC1, a high-speed JK flip-flop which produces two signals 180° out of phase at the desired local oscillator frequency. These are then fed to the mixer. The mixer is formed by three identical transformers and a high-speed bus switch. Note that the supply to the mixer is not 5V but 7V, derived from a 317-type regulator, while the flip-flop is driven at 5V. Both supplies are well filtered. The input signal from the local oscillator is a CMOS-level signal and may be applied directly to the JK flip-flop, but the board is designed to allow other oscillators to be employed, and a signal between 0 and 10dBm may be used.

The JK flip-flop may be either the 74AC112 or 74AC109 according to availability, but a slight adjustment of the PCB tracking will be needed for the 74AC112.

The insertion loss of the mixer has been measured at between 4dB at 30MHz and 5.5dB at 2MHz. Its input IP3 is 37dB at 14MHz and 40dB at 3.5MHz. This is below the levels first reported for this configuration [6], and is believed to be due to changes in the manufacture of the transformers. It has, however, been measured consistently.

Isolation across the mixer has been measured at between 45dB and 65dB from the RF port to the IF port.

## ROOFING FILTER

The roofing filter's job is to protect the post-mixer amplifier from large signals. It must also possess a large IP3 itself and present an acceptable load to the mixer. The filter actually comprises the following parts:

- a diplexer to present 50Ω at frequencies removed from the 9MHz IF;
- a hybrid coupler to drive two band-pass filters;
- the two band-pass filters;
- a hybrid combiner at the output of the filters.

Why the complexity? The use of this type of structure has been described many times before, for example in *RadCom* [8]. The main reason is that a filter on its own will be nowhere near its design impedance outside its passband. Combining two identical filters, however, allows the errors to be cancelled, leaving a much more stable impedance.

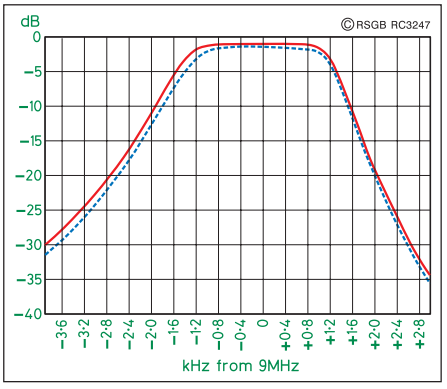


**Fig 8: The individual roofing filters.**

In our design, each of the two band-pass filters is constructed from four ladder networks of identical 9MHz crystals. The performance of these can be seen in **Fig 8**. The two curves show the measured performance of the two filters. The overall performance of the two filters and the diplexer / hybrid is shown in **Fig 9**. The insertion loss is about 2dB for the filters, diplexer and hybrids combined.

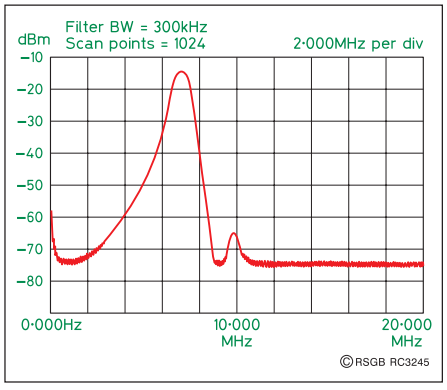


**Fig 6: The 7MHz filter.**

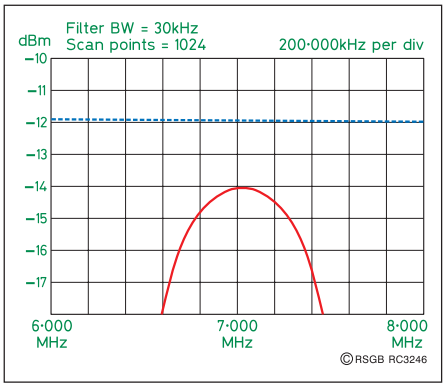


**Fig 7: The 7MHz filter (see text).**

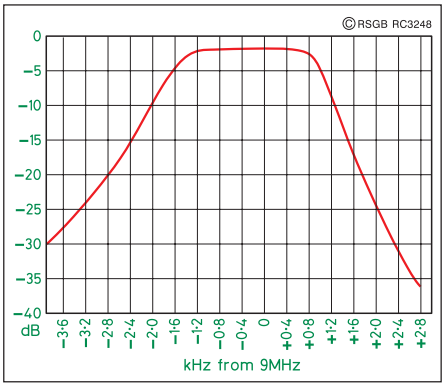


**Fig 9: Overall roofing filter shape (loss of diplexer, hybrids and roofing filters).**

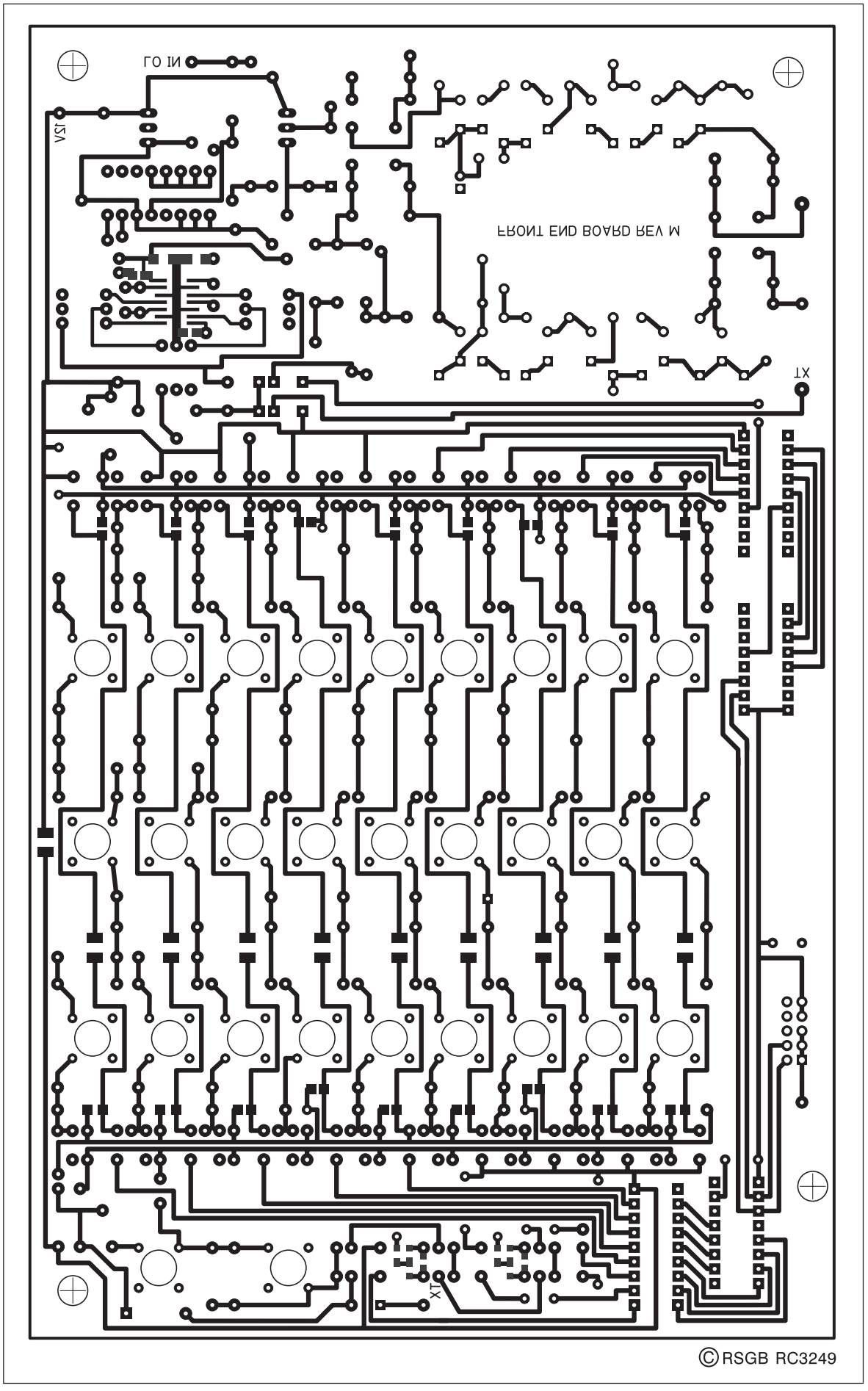


**Fig 10: Front-end PC board tracking, as seen through the board from the component side. Actual size.**

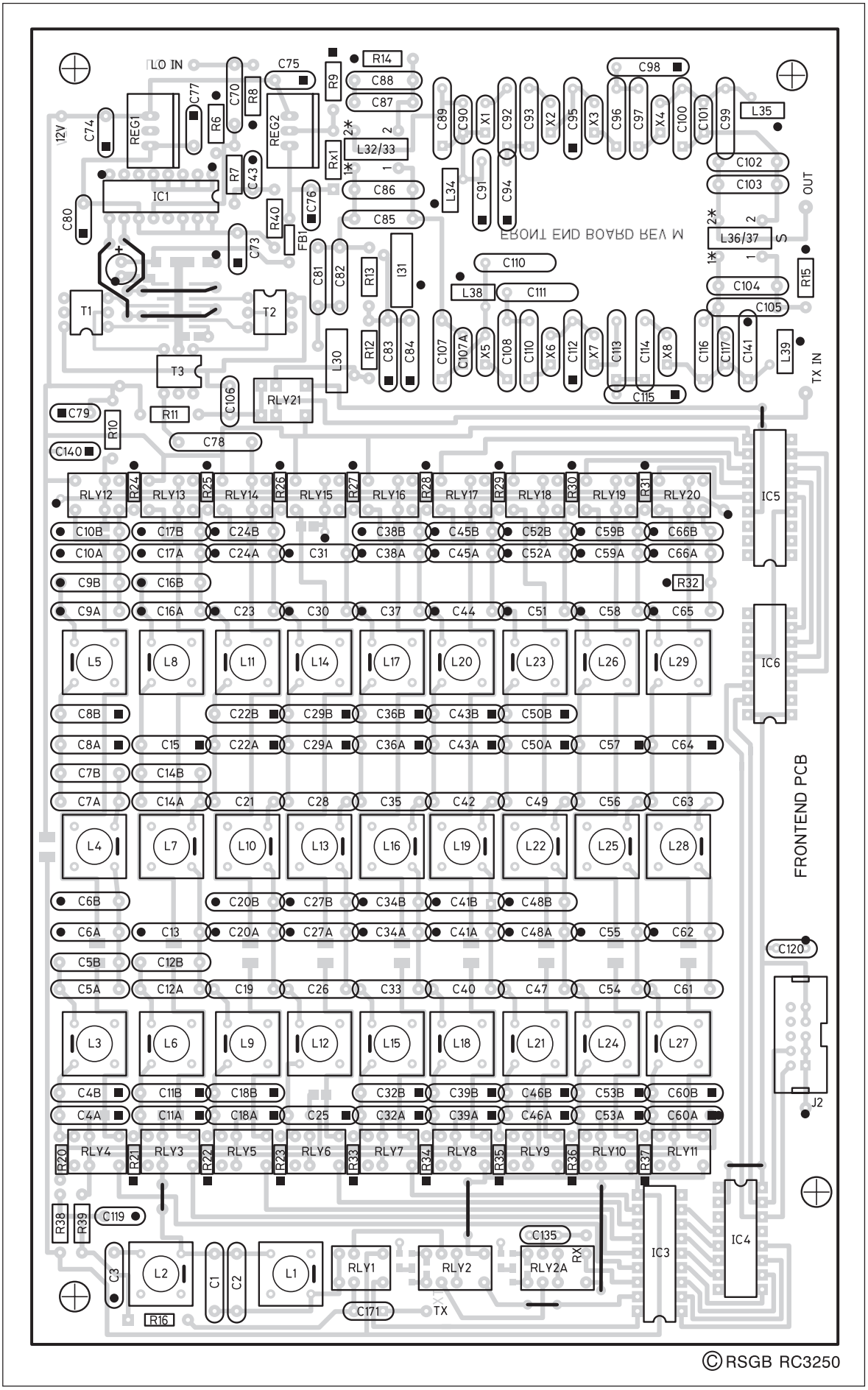


**Fig 11: The component side of the PCB. Actual size.**

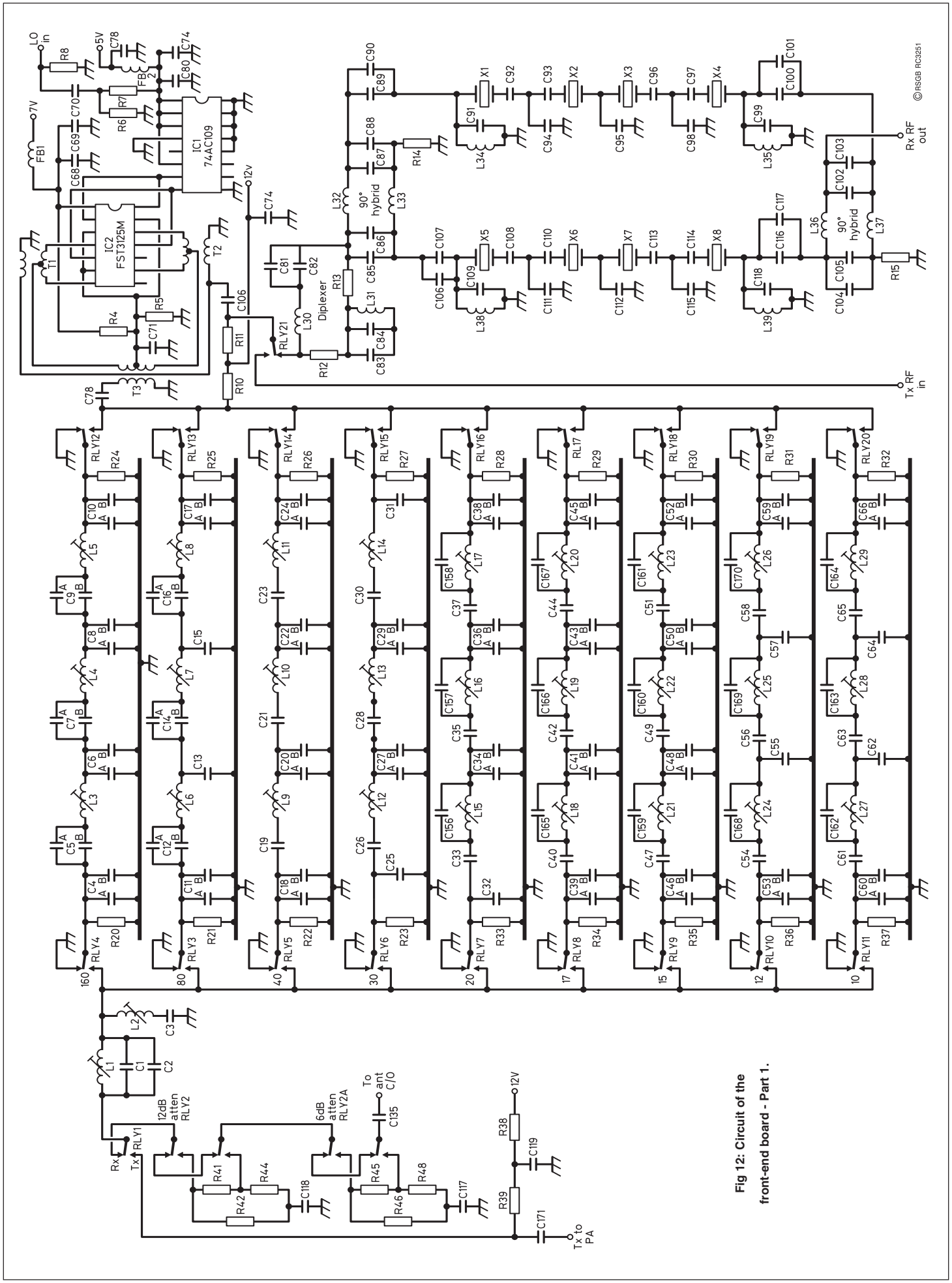


**Fig 12: Circuit of the front-end board - Part 1.**

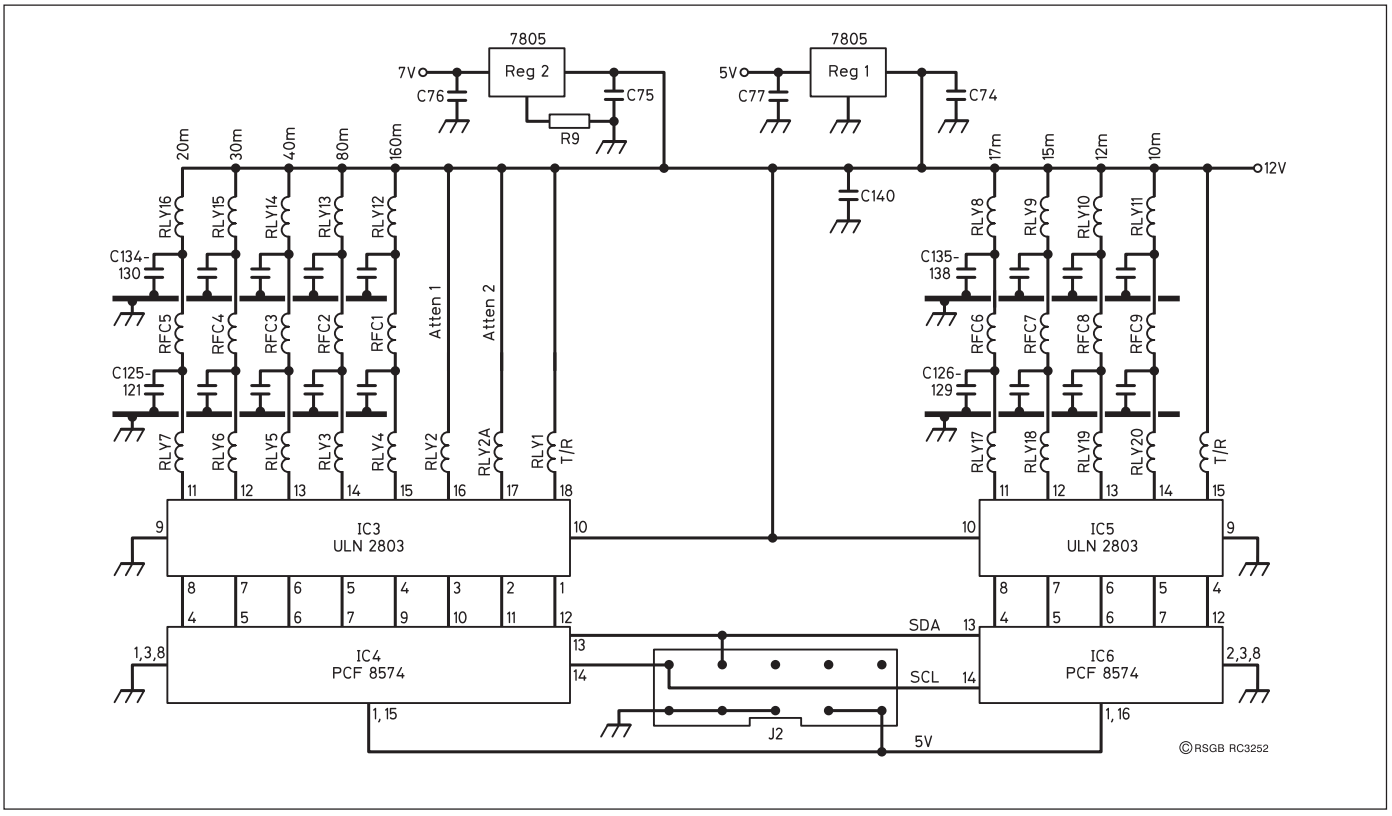


**Fig 13: Circuit of the front-end board - Part 2.**

The performance of each filter is not quite identical, resulting in a slight mismatch. No plot of return loss is available. As an alternative to discrete crystals, a PCB that takes standard commercial filters is also available.

When using discrete components in the roofing filter, care is needed. The filter is narrow and must be on the same frequency as the main crystal filters on the post-mixer amplifier board. If you wish to use commercial filters, we suggest you consider the International Radio Corporation (see WWW.). Further information can also be found on the WARC website.

## CONSTRUCTION

THE FRONT-END BOARD is not a single Eurocard, unlike the other CDG2000 modules. This is because all the filters would not fit on one, and it made no sense to divide the circuit arbitrarily into blocks. The board measures 228 x 140mm. It is single-sided with a ground plane and a small number of wire links. The mixer active device, a CMOS bus switch, is surface-mounted on the rear of the board. Many decoupling capacitors and the inductors isolating the two sets of band-switch relays are also surface-mounted. **Fig 10** shows the tracking of the PCB, and **Fig 11** illustrates the top component placement, the complete circuit being shown in **Fig 12** and **Fig 13**. All artwork is available on-line from the WARC website, as are details of the under-board components not shown in Fig 11.

All grounds are soldered direct to the ground plane. Use turned-pin sockets for all DIP ICs, the ground pins of which can easily be soldered directly to the ground plane.

In construction, start with any part of the circuit you like, but it makes life easier to build the roofing filter before the mixer and don't insert the coupling capacitor from band-pass filter relays to mixer input until all parts are working.

Having built the roofing filters, you need to check that each is working correctly. The filters should be checked individually by removing the input connection to the hybrid for each filter in turn, replacing the filter input by a resistor. Each should be of similar performance – see Fig 8. Now connect both and the performance should be as in Fig 9. If you have access to the necessary test equipment, the return loss of the whole configuration should be low. If not, connect a 50Ω signal source such as a signal generator and monitor the input with a x10 oscilloscope probe. The voltage presented by the signal generator should be constant across a wide frequency range and show no large discontinuities near the 9MHz design frequency. The loss of the whole diplexer / hybrid / filter / hybrid assembly should be about 2dB, and the 3dB bandwidth should be about 2.4kHz as shown in Fig 9.

For the mixer, it is suggested that you check the voltages provided by the regulators before you fit the active devices. The 7V rail may need a 'tweak' to the resistors. Now fit the divide-by-two IC and use an oscilloscope to check its operation. It should work correctly to beyond 80MHz with a signal of between 0 and 10dBm.

The mixer may be tested by applying a signal to the local oscillator input and a second signal to the mixer input, with a 9MHz expected output that should be visible with a scope or spectrum analyser at the roofing filter output.

The notch filter should be tested before connection to the band-pass filters. Tune for maximum attenuation at 9MHz.

The band-pass filters should be tested one by one. The best way to align them is with a spectrum analyser and tracking generator. Failing this, tune all three for best signal at band centre, then tweak the outer two coils slightly for best shape.

## PERFORMANCE

MANY ASPECTS of the performance of the front-end have been presented in the preceding text. What can be expected of the whole unit?

The IP3 of the band-pass filters varies from +30dBm to +45dBm, according to the types of inductor used. At the upper end of band-pass filter performance, it is dominated by the input IP3 of the mixer of +37dBm to +40dBm. Assuming a 2dB to 3dB band-pass filter loss, this gives an equivalent IP3 for the mixer at the input to the filter of +39dBm to +43dBm. If the band-pass IP3 is 43dBm, the overall IP3 is

## COMPONENTS LIST FOR THE FRONT-END BOARD

### Capacitors

| | | |
|---|---|---|
| 100n | multi-layer ceramic | C79,80,119,120,171,173,176 |
| 220n | multi-layer ceramic | C74,75,76 |
| 470n | multi-layer ceramic | C77 |
| 2p7 | ceramic plate | C159,160,161 |
| 3p3 | ceramic plate | C156,157,158,165,166,167 |
| 4p7 | ceramic plate | C162,163,164,168,169,170 |
| 5p6 | polystyrene | C90,101,107A,117 |
| 15p | polystyrene | C86,88,91,99,103,105,109,118 |
| 18p | polystyrene | C82,83 |
| 22p | polystyrene | C46B,47,49,51,52B,53B,59B,61,63 |
| 27p | polystyrene | C54,56,58 |
| 33p | polystyrene | C40,42,44 |
| 39p | polystyrene | C43B,60A,60B,66A,66B |
| 47p | polystyrene | C11B,17B,33,35,37,48B,50B |
| 56p | polystyrene | C32B,38B,39B,45A,45B |
| 68p | polystyrene | C26,28,30,39B,53A,59A,94,98,111,115 |
| 82p | polystyrene | C3,46A,52A |
| 100p | polystyrene | C18A,19,21,23,24A,32A,38A,95,112 |
| 120p | polystyrene | C89,92,93,96,97,100,107, C108,110,113,114, 116 |
| 150p | polystyrene | C12A,12B,14A,14B,16A,16B, C34B,36B,85,87,102,104 |
| 180p | polystyrene | C4B,10B |
| 220p | polystyrene | C18B,24B,31,62,64,65 |
| 270p | polystyrene | C5B,7B,9B,48A,50A,55,57 |
| 330p | polystyrene | C5A,7A,9A,27A,27B,29A,29B, C34A,36A,41,43A,81,84 |
| 390p | polystyrene | C20B,22B,25 |
| 560p | polystyrene | C11A,17A,20A,22A,70 |
| 680p | polystyrene | C1,2 |
| 1000p | polystyrene | C4A,10A |
| 1800p | polystyrene | C6A,6B,8A,8B,13,15 |
| 10000p | polystyrene | C78 |
| 22µF 16V | tantalum | C43,69,73 |

**Surface-mount leadless multi-layer chip ceramic 50V**

| | | |
|---|---|---|
| 1n | multi-layer ceramic | C130,131,132,133,134,135,136,137,138 |
| 10n | multi-layer ceramic | C121,122,123,124,125, C126,127,128,129,139 |
| 100n | | C68,71,117,118 |

### Resistors

**0.125W metal film 1% MF12 series**

| | |
|---|---|
| 10k | R20,21,22,23,24,25,26,27, R28,29,30,31,32,33,34,35,36,37 |

**0.25W metal film 1% MF25 series**

| | |
|---|---|
| 51R | R12,13,14,15 |
| 56R | R8 - fit only if 50Ω source LO is used. Otherwise omit R8. |
| 1k | R38 |
| 10k | R10,11,16,39 |
| 82k | R6,7 |
| 240R | R9 |

**Surface-mount 1206 0.125W 1%**

| | |
|---|---|
| 2k2 | R4,5 |

**Surface-mount 0805 0.1W 1%**

| | |
|---|---|
| 39R | R45 |
| 82R | R42,44 |
| 100R | R41 |
| 150R | R46,48 |

### Integrated Circuits

| | |
|---|---|
| 74AC109E | IC1 |
| FST3125 | IC2 |
| ULN2803 | IC3,5 |
| PCF8574 | IC4,6 |

### Voltage regulators

| | |
|---|---|
| 7805 | REG1 |
| LM317 | REG2 |

### Inductors (except for band-pass filter, see below)

| | |
|---|---|
| 17t 0.315mm enam on T50-10 toroid | L30 |
| 16t 0.315mm enam on T50-10 toroid | L31 |
| 17t bifilar 0.315mm enam on T50-10 toroid | L32/33,36/37 |
| 31t 0.315mm enam on T37-6 toroid | L34,35,38,39 |
| 6t 0.315mm enam on ferrite bead | FB1,2 |
| Mini-Circuits TT4-1A RF transformer | T1,2,3 |
| 0.82µH surface-mount choke | RFC1,2,3,4,5,6,7,8,9 |

### Relays

| | |
|---|---|
| SPCO 12V (RS345-038) *do not substitute* | RLY1,21 |
| DPCO 12V (Farnell 310-3500) | RLY2,2A |
| SPCO 6V (RS 345-022) *do not substitute* | RLY3,4,5,6,7,8,9,10,11,12, RLY13,14,15,16,17,18,19,20 |

### Crystals

| | |
|---|---|
| 9MHz parallel resonant in 30pF by C-MAC ref A164A | X1,2,3,4,5,6,7,8 |

{ (Sterling Components, Slough. Tel: 01753 779 000. Sterling's minimum order is 100 pieces - small quantities *may* be available from the authors.) }

### Connector

| | |
|---|---|
| 10-pin box header | J2 |

**Inductors for band-pass filters**

| | TOKO | Lodestone Pacific* | Ind (µH) |
|---|---|---|---|
| L1 | E526HNA1000076 | 5t 0.4mm on L45-10-PCT-B-4 | 0.22 |
| L2 | KXNSK4173AO | 20t 0.2mm on L45-6-PCT-B-4 | 3.52 |
| L3,4,5 | KANSK4960EG | 39t Litz on L45-2-PCT-B-4 | 15 |
| L6,7,8 | BKANS9440HM | 20t 0.2mm on L45-2-PCT-B-4 | 8.2 |
| L9,10,11 | BTKANS9443HM | 25t 0.2mm on L45-6-PCT-B-4 | 5.6 |
| L12 | BTKANS9443HM | 22t 0.2mm on L45-6-PCT-B-4 | 4.8 |
| L13,14 | 154ANST10052 | 21t 0.2mm on L45-6-PCT-B-4 | 4.3 |
| L15,16,17 | KXNSK4173AO | 18t 0.25mm on L45-6-PCT-B-4 | 2.8 |
| L18,19,20 | KANS12354BM2 | 16t 0.25mm on L45-6-PCY-B-4 | 2.4 |
| L21,22,23 | KANS12354BM2 | 15t 0.25mm on L45-10-PCT-B-4 | 2.1 |
| L24,25,26 | BTKANS9449HM | 14t 0.25mm on L45-10-PCT-B-4 | 1.5 |
| L27,28,29 | KXNSK4172EK | 12t 0.315mm on L45-10-PCT-B-4 | 1.3 |

{ * These coil formers offer a considerable improvement in performance over Toko. There is little difference in cost. See also WWW. }

+37dBm to +40dBm (roughly). For lower values of band-pass filter IP3, the performance of the filters will dominate. For higher performance, the mixer dominates.

Note that mixer IMD was measured in conjunction with the roofing filters, and was not noticeably degraded for close-in signals of a few kilohertz spacing.

The roofing filter works well for SSB signals in protecting the subsequent circuits, but close-in (ie for CW), IP3 will be degraded slightly if the post-mixer amplifier has inadequate performance. However, at these spacings, the chance of the received transmission being clean enough for the receiver's performance to dominate is very small indeed.

Overall noise performance was determined by measuring the 10dB SNR of the receiver using the test setup to be described in the article describing the synthesiser. On SSB it was found to be -120dBm ±1dB across all bands as shown in **Table 3**. The method used was to connect a PC sound card's microphone input to the output of the receive product detector and use DL4YHF's *Spectrum Lab* program (see WWW.) to determine SNR. The program displays the spectral analysis of the audio signal, as shown in the photograph. It is then instructed to calculate the largest signal in the range 1000 to 2000Hz and subtract from it the calculated per-Hertz noise power and a correction of 34dB to account for the bandwidth of the SSB filter, by executing the code:

**print(peak_a(1000,2000)-34-noise_n(1000,2000))**,

and to repeat this calculation every second.

29

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| ZX 6-5 | 5 El. | 50Mhz Beam | 12.1dB | ~~£129.00~~ | £103.20 |
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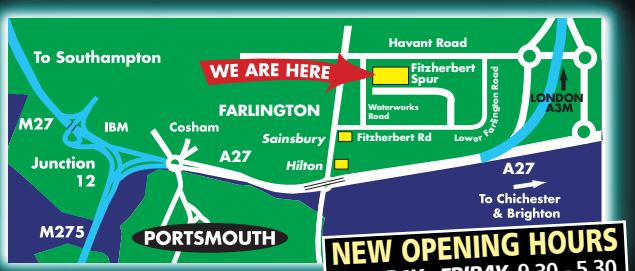


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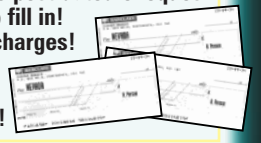

*CHEQUESPREAD prices quoted include postage & packing CHEQUESPREAD minimum order: £99*

*ALL GOODS SHIPPED FOR 24 HR DELIVERY P&P: £10 (UK Mainland) unless otherwise stated E&OE*

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### YAESU FT817
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|---|---|---|
| ALINCO DJ-580E | 2M/70CM HANDHELD | 129.00 |
| ALINCO DJ-SR1 | PMR 446 TRANSCEIVER | 79.00 |
| ALINCO DR-140E | 2M MOBILE TRANSCEIVER | 159.00 |
| ALINCO DR-MO6TH | 20W 6M MOBILE TRANSCEIVER | 119.00 |
| ICOM IC-T7E | 2M/70CM HANDIE TRANSCEIVER | 139.00 |
| KENWOOD TM-231E | 2M FM MOBILE TRANSCEIVER | 119.00 |
| KENWOOD TM-D700E | 2M/70CM MOBILE+APRS | 329.00 |
| KENW"D TS-790E+PS31 | 2M/70/23CM BASE STATION | 1195.00 |
| STANDARD C558+ACC | 2M/70CM HANDHELD | 165.00 |
| TRIO TR-7500 | 2M FM 10W TRANSCEIVER | 105.00 |
| TRIO TR-7800 | 2M FM 25W TRANSCEIVER | 149.95 |
| YAESU FT225RD | 2M MULTIMODE BASE + MUTEK | 399.00 |
| YAESU FT290R | 2M MULTIMODE PORTABLE | 159.00 |
| YAESU FT290R2+CASE | 2M MULTIMODE PORTABLE | 229.00 |
| YAESU FT290RII | 2M MULTIMODE PORTABLE | 225.00 |
| YAESU FT290RII+FL2025 | 2M MULTIMODE PORTABLE | 239.00 |
| YAESU FT40R | 70CM HANDHELD | 119.00 |
| YAESU FT470 + ACC | 2M/70CM HANDI+MOB ADPT CASE | 139.00 |
| YAESU FT4700RH | 2M/70CM MOBILE TRANSCEIVER | 259.00 |
| YAESU FT-90R | 2M/70CM MOBILE TRANSCEIVER | 285.00 |
| YAESU FTL2014 | VHF PMR TRANSCEIVER | 75.00 |

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| | | |
|---|---|---|
| ICOM IC751A | 100 W HF TRANSCEIVER | 399.00 |
| ICOM IC-775DSP | 150W HF BASE TRANSCEIVER | 1895.00 |
| KENWOOD TS-950S | 150W HF BASE TRANSCEIVER | 999.00 |
| YAESU FT847 | HF-70CM BASE TRANSCEIVER | 899.00 |
| YAESU FT890 | 100W HF TRANSCEIVER | 375.00 |
| YAESU FT-900 | 100W HF TRANSCEIVER | 499.00 |

**Receivers**

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|---|---|---|
| BEARCAT UBC 220XLT | HANDHELD SCANNER | 99.00 |
| ICOM IC-R3 | HANDHELD SCANNER WITH TV | 359.00 |
| YUPITERU MVT9000II | HANDHELD SCANNER | 275.00 |
| AOR AR8600+PSU | WIDEBAND RECEIVER | 549.00 |
| ICOM IC-R7000 | WIDEBAND RECEIVER | 399.00 |
| LOWE HF225 EUROPA | HF RECEIVER | 375.00 |
| LOWE HF225+CASE, FM & K PADHF RECEIVER + ACC | | 329.00 |
| REALISTIC DX-349 | SHORTWAVE RECEIVER | 99.00 |
| YAESU VR-5000+DSP | WIDEBAND RECEIVER | 529.00 |
| YAESU FRG 7700 | HF RECEIVER | 99.00 |

**Accessories**

| | | |
|---|---|---|
| ALINCO EDC-91 | FAST CHARGER DJ-V5 | 32.00 |
| BENCHER PADDLE KEY | DUAL PADDLE KEY | 64.75 |
| DAIWA LA-2080H | 2M 80W AMPLIFIER+PREAMP | 85.00 |
| ICOM IC-AT500 | AUTO ANTENNA TUNER | 299.00 |
| KENWOOD VS-2 | VOICE BOARD | 40.00 |
| KENWOOD YK88-S1 | 2.4KHZ SSB FILTER TS450/850 | 49.00 |
| M W MODS MM4001KB | MW-MODS RTTY RX/TX INC KB | 49.00 |
| MFJ-447 | ELECTRONIC MEMORY KEYER UNIT | 19.00 |
| NISSEI SJCD-308 | BASE MICROPHONE (8 PIN YAESU) | 39.95 |
| OPTO SCOUT 40 | FREQUENCY COUNTER | 249.00 |
| PALSTAR AT1500 | ANTENNA TUNER 1500W PEP | 249.00 |
| SGC SG230 | AUTO ANTENNA TUNER | 275.00 |
| TIMEWAVE DSP599ZX | ALL MODE DSP UNIT | 259.00 |
| TOKYO HL100B/21-28 | LINEAR AMP 10-100W 21-28MHZ | 129.00 |
| WATSON WPR2 | PRECLECTOR | 29.95 |
| WATSON WR5001+DC ADAPT | VHF/UHF RX TESTER | 59.00 |
| WELTZ SP-400 | VHF/UHF POWER METER | 65.00 |
| YAESU FIF232C VAN | COMPUTER INTERFACE (FT736) | 59.00 |
| YAESU FL2050 | 2M 50W LINEAR AMP | 50.00 |
| YAESU FRT7700 | RX ANTENNA TUNER FRG7700 | 29.00 |

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**G1000C HEAVY DUTY**
C/W Control Box & 25m Cable
~~£559.00~~ **£499.00** | P&P £10

**G650C MEDIUM DUTY**
C/W Control Box & 25m Cable
~~£459.00~~ **£399.00** | P&P £10

**G450C LIGHT DUTY** C/W Control Box & 25m Cable
~~£349.00~~ **£325.00** | P&P £10

**GC038 LOWER MAST CLAMP** **£25.00**

## HEIL PRO-SET

**PRO SET 4**
For contesters & DX'ers who want to cut through the pile ups. Using Hc4 insert.
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A fuller range insert for rag chewers who want quality with clarity. Hc5 insert.
**£129.95** | P&P £7.50

## DAIWA
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**SWR/POWER METERS**

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**CN801V** .....140 - 525MHZ 200W ....**£119.95**
**CN101L**.....1.8 - 150MHZ 1.5KW.....**£59.95**
**CN103LN** ....140 - 525MHZ 200W.....**£65.95**

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**LOW PROFILE 3 BAND MINI BEAM**
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**LOW COST MULTIBAND VERTICALS**

Two lightweight multiband verticals that really work. Each is supplied with a set of 3 wire radials. These may be laid out or bent to suit your location. Power handling approx 500W.

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*postage & packing £4.75 (UK mainland)*

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|---|---|
| SM-A3 | SMA connector 144/432/900MHz ....£19.95 |
| SH-95 | BNC connector 144/432/1200MHz ....£26.95 |
| RX-5 | SMA conn 144/430MHz wide RX....£26.95 |

p & p £3.75 all items above (UK MAINLAND)

**COMET MOBILE ANTENNA CABLES/MOUNTS**

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|---|---|
| 3D-4MB | SO239 Base/4mtrs coax c/w PL259 plug .£15.50 |
| CK-3M4B | SO239 Base w/4mtrs coax c/w PL259 .£24.50 |
| MG-4M | Heavy duty mag mount/4m /PL259....£29.95 |
| RS-700 | Gutter Mount fully adjustable....£17.95 |
| RS-730 | Hatch/Trunk Mount fully adjust. ....£19.95 |
| TBR | Hatch/Trunk Mount std model....£14.95 |

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| | |
|---|---|
| CF-30S | 32MHz low pass filter, 150W CW ....£19.95 |
| CF-30MR | 32MHz Low pass, 1kw PEP....£37.50 |
| CF-50S | 50MHz low pass filter, 150W CW ....£21.50 |
| CF-50MR | 50MHz low pass, 1kw PEP ....£37.50 |

**COMET BAND PASS FILTERS**

| | |
|---|---|
| CF-BPF6 | 50MHz band pass filter 150W CW....£42.50 |
| CF-BPF2 | 144MHz band pass filt 150W CW....£42.50 |

**COMET BASE ANTENNAS**

| | |
|---|---|
| GP-15N | 50, 144, 430MHz, L: 2.4m 300W PEP .£89.95 |
| GP-1 | 144/430MHz 3/6dB 1.25mtrs 200W ....£49.00 |
| GP-3 | 144/430MHz 4.5/7.2 1.78mtrs 200W ..£59.95 |
| GP-6 | 144/430MHz 6.5/9.0 3.07mtrs 200W ..£89.95 |
| GP-98 | 144/430/1.2GHz 2.94mtrs ....£129.95 |

**COMET HF MOBILE ANTENNA**

| | |
|---|---|
| CA-UHV | 7,(14)21,28,50,144,430MHz 1.9 mtrs.£89.00 |
| L14 | Optional 14MHz coil for CA-UHV ....£19.95 |
| UHV-6 | 7, 21, 28, 50, 144, 430 1.9 mtrs ....£89.00 |

p & p £10.00 all items above (UK MAINLAND)

**COMET VHF MOBILE ANTENNAS**

| | |
|---|---|
| CHL-285 | 50/144MHz Mobile 300W, lgth 1.32mtrs £24.95 |
| CHL-350 | 28/50MHz Mobile 200W, lgth 2.16 mtrs.£39.95 |
| HR-50 | 50MHz centre loaded, length 2.13 mtrs £39.95 |
| SB-15 | 50/144/432MHz with w/fold-over ....£46.95 |
| SBB-2 | Dual band mob 144/432 lgth 0.46mtrs .£19.95 |
| SBB-4 | Dual band mob 144/432 lgth 0.92mtrs .£29.95 |
| SBB-14 | Triband mob 50/144/432 lth 1.08mtrs .£39.95 |

p & p £10.00 all items above (UK MAINLAND)

**COMET BALUNS**

| | |
|---|---|
| CBL-20000 | 5 - 60MHz 2kW 1:1 ....£27.50 |
| CBL-30 | 1.7 - 30MHz 1kW 1:1 ....£21.95 |

**COMET DUPLEXERS**

| | |
|---|---|
| CF-416A | 144/430MHz SO239/PL/PL....£27.50 |
| CF-416B | 144/430MHz SO239/PL'N' ....£28.50 |
| CF-360A | 1.3-30MHz/49-470MHz SO239/PL/PL £37.95 |
| CF-530 | 1.3-90MHz/125-470MHz SO239/PL/PL .£39.95 |

**COMET TRIPLEXERS**

| | |
|---|---|
| Comet CFX-431A | 144/430/1200MHz....£46.00 |
| Comet CFX-514N | 50/144/430MHz ....£47.95 |

## PRESIDENT LINCOLN

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- 25/30A max
- Voltage + current meters
- 10mW RMS noise and ripple

**£99** | 3 CHEQUES OF **£36.33** | P&P £10
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**NEW**
**High Power Tuner**
**1.5kW (2kW Peak) HF Antenna Tuner**

*Now* with:
- NEW Heavy Duty Edge-Wound **silver plated roller inductor** for ***ultra high efficiency*** and ***reliability***
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- Bypass position for quick straight-through antenna connection with SWR/POWER monitoring.
- 6 position antenna selector switching
- Average power meter reading to 3000 Watts
- Vernier dial plates for more accurate settings.

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**AUTO ATU**

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- 200W PEP

**£359.95** | 3 CHEQUES OF **£123.31** | P&P £10
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## MFJ
**Antenna Tuners & Accessories**

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|---|---|
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| MFJ-269 | Antenna Analyser HF/VHF/UHF....£369.95 |
| MFJ-914 | Auto Tuner extender 300W .....£64.95 |
| MFJ-914E | 1.8-30MHz 300W Tuner.....£129.95 |
| MFJ-945E | 1.8-60MHz 300W Tuner.....£119.95 |
| MFJ-948 | 1.8-30MHz 300W Tuner w/Balun .£139.95 |
| MFJ-949E | 1.8-30MHz 300W Tuner+D/load .£159.95 |
| MFJ-962D | 1.8-30MHz 800W Compact Tuner £259.95 |
| MFJ-969 | 1.8-60MHz 300W Tuner.....£199.95 |
| MFJ-971 | 1.8-30MHz 200W Portable Tuner ...£99.95 |
| MFJ-986 | 1.8-30MHz 1500W Tuner.....£349.95 |
| MFJ-989C | 1.8-30MHz 1500W Tuner+D/load £379.95 |

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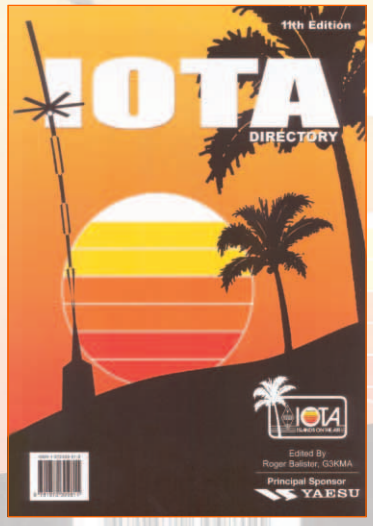
# RSGB PUBLICATIONS



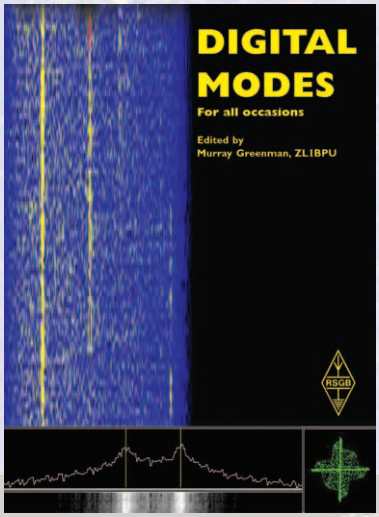

## IOTA DIRECTORY - 11th Edition

This book is an essential guide to participating in the IOTA (Islands on the Air) programme. It contains everything a newcomer needs to know to enjoy collecting or operating from islands for this popular world-wide programme.

**New For This Edition**

* A listing of accepted operations from the 500+ rarest IOTAs
* 1018 of the 1200 IOTAs now numbered
* Hundreds more islands added
* Illustrated in colour
* Articles on major DXpedition activity in Russia, China and Indonesia.
* A report on one of the most ambitious IOTA operations ever mounted.
* A fully updated list of Most Wanted IOTA groups (with notes of operations in the last 2 years).

**ONLY £8.49 + p&p (£9.99 non-members)**




## DIGITAL MODES FOR ALL OCCASIONS

This is the book for every person who is interested in digital modes, as it is simply the most complete book yet written on this subject. The book describes serial transmission and various data and error correction techniques. It explains the differences between a bit, a byte and a symbol, the baud and BPS, Baudot and ITA2 and much more.

With this book you will be able to:

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- Learn how to connect the computer and radio together safely and simply
- Learn where to find all the software you need, at no cost
- Operate exciting real-time QSOs, working across town or around the world
- Learn which modes to use, which are best for certain conditions
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Written for the average radio amateur through to the seasoned digital mode expert, this book is a must for everyone!

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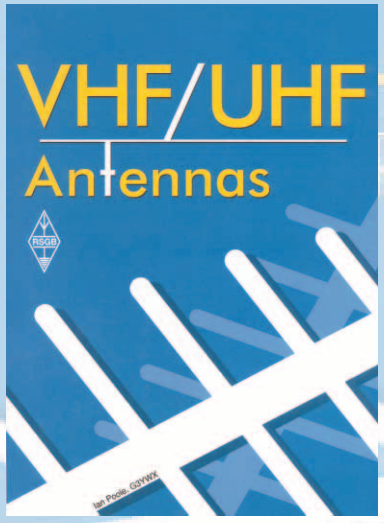



## VHF/UHF ANTENNAS

This great new book from the popular author Ian Poole investigates the exciting area of VHF and UHF antennas. The VHF and UHF bands provide an exciting opportunity for those wishing to experiment, whilst the antenna sizes at these frequencies mean that they do not occupy great amounts of space.

VHF / UHF Antennas contains both the basic theory and constructional details for many antenna designs, taking the reader through the essentials in an easy to understand fashion. Chapters are devoted to different types of antenna from dipoles to Yagis, and verticals to log periodic antennas, giving details of the way in which they work and constructional information for a variety of designs. Simple antennas for broadcast reception supplement the amateur radio projects. The final chapters in the book cover measurements and installation techniques.

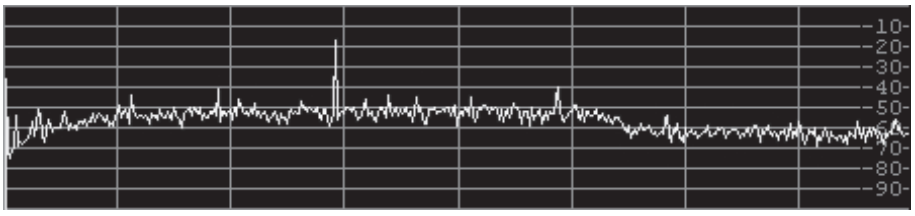
The book is a mine of information for anyone wanting to understand more about antennas for the VHF and UHF bands, or wants to construct them.

**ONLY £11.89 + p&p (£13.99 non-members)**

**www.rsgb.org/shop - Tel: 0870 904 7373**

| Band (m) | Level (dBm) for 10dB signal-to-noise ratio |
|---|---|
| 160 | -121 |
| 80 | -121 |
| 40 | -121 |
| 30 | -120 |
| 20 | -120 |
| 17 | -120 |
| 15 | -119 |
| 12 | -120 |
| 10 | -119 |

**Table 3: 10dB SNR measurements.**




***Spectrum Lab* display.**

WWW.

**Warrington ARC** — **www.warc.org.uk**
**International Radio Corporation** — **www.qth.com/inrad**
**DL4YHF *Spectrum Lab* program** — **www.qsl.net/dl4yhf/spectra1.html**
**Coil formers** — **www.lodestonepacific.com**



This causes it to display directly signal-to-noise ratio once a second. Note that this is S / N *not* (S+N) / N.

Interestingly, a small improvement is possible by removing the 50Ω resistor in the roofing filter output hybrid. Could this be due to resistor-generated noise reflected back from the band-pass filters?

## NEXT MONTH

LEAVING YOU TO COGITATE on this rhetorical question (the nearest we can get to a cliff-hanger), next month's instalment descibes the post-mixer amplifier. This unit is designed to overcome the losses in the front-end and to provide the main SSB and CW filtering.

## REFERENCES

[5] *RSGB Radio Communication Handbook*, 6th Edition, Fig 6.46, p6.26.
[6] 'Technical Topics' *RadCom* Sep 1998 p58.
[7] *RSGB Radio Communication Handbook*, 6th Edition, pp6.48 to 6.53.
[8] 'RX84 Advanced Receiver', by T E Bay, OZ5KG, *RadCom* May - Sep 1994. ♦

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# Helplines

RadCom FOR MEMBERS

● Colin, G7HPI, is looking for a complete workshop service manual for the **Lafayette HA-230 general coverage communications receiver**, made in Japan between 1964 and 1966. All expenses will be reimbursed. G7HPI, tel: 01793 534 198 or e-mail: g7hpi@yahoo.co.uk

● Jon, G1OSP, is looking for information on the **JRC NRD-515 comms receiver**. Handbook and diagram required; he is also trying to source **NDH-515 24** or **NDH-518 96** external memory units. G1OSP, QTHR. E-mail: castlecolumbus@tinyworld.co.uk

● David, G3PTU, requires circuit details and information on the **Belcom Liner2** 144MHz transceiver. G3PTU, tel: 01274 877 211.

● Boris, UA1CCE, needs a service manual for the **Icom IC-211E**. If you can help, please e-mail ua1cce@qsl.net

● Roger, G0CYC, needs to replace the right-channel record level control in his **Akai 4000D** tape recorder. The control is a 10kΩ pot incorporating a push-switch operated by pushing the shaft in and out independent of the rotation. Can anyone advise where he might get such a control? G0CYC, tel: 01707 324 958.

● H G Woodhouse, G3MFW, needs a manual and battery source for a **Panasonic VHS video recorder** type **NV-100-B**. G3MFW, QTHR. Tel: 01726 73608.

● Wilf, GD0IFU, needs a circuit diagram for a **PEK1 electronic keyer** from ProElectron Communications Products of Cheltenham. He will meet all expenses. GD0IFU, QTHR. Tel: 01624 629 455.

● Joe, G0SQF, needs photocopies of the circuit diagram for a **Marconi TF995A FM / AM signal generator** and assembly instructions for the **Cirkit GDO (Stock No 40-16217)**. All expenses reimbursed. G0SQF, QTHR. Tel: 01444 232 974 or e-mail andrzejb@btinternet.com

● Snowy, G0HZE, requires any information (circuit diagrams, manuals, etc) for the **Sayrosa frequency counter, model 261**, and will pay all reasonable costs. G0HZE, QTHR, Tel: 01733 816 253 daytime, and he will call you back, or e-mail snowy.howell@btinternet.com

● Douglas, G3KPO, is searching for a **G2YL QSL card**, to exhibit with her home-built transmitter in the National Wireless Museum at Seaview on the Isle of Wight. G3KPO, QTHR. Tel: 01983 567 665.

● Eric, G1WCQ, is seeking mechanical and circuit details for the **Marconi radio model T29A** which, he says, is not covered in Newnes' *Radio & Television Servicing*. He is refurbishing the radio for the benefit of the residents of a retirement home and would appreciate any help. G1WCQ, QTHR.

● Clive, G4FZH, would like the loan (or copy) of the maintenance manual for the **Marconi Spectrum Analyser TF2370** and **extender TK2372**. All costs re-imbursed. G4FZH, QTHR. Tel: 01298 74097.

● Ed, G3WDN, would like information on putting the **SMC-2520** on 2m (retuning, modifications, programming the EPROM). He also needs a handbook and operating manual for the **Compaq 'Armada' 7730MT laptop**, or a source thereof. Any expenses will be met. G3WDN, QTHR. Tel: 01502 715 537.

● Steve, G8EBM, is planning to set up a website devoted to the **Marconi R1475 receiver** (also known as the type 88 receiving set), which is intended as a central information resource for the receiver. He would be pleased to hear from anyone who designed, maintained or used the R1475 in the Services. Comments and anecdotes are also welcome, as would any photographs, which would be copied for the web and returned. G8EBM, QTHR. E-mail: g8ebm@compuserve.com

● Ray, G3HRH, would like to hear from anyone, probably past or present BT, who can tell him the voltage of **Battery, Dry, No 26**, which is used in the **PO Meter Multirange No 14C**. He would also like to find a source of them. G3HRH, QTHR. E-mail: g3hrh@btinternet.com

# WHATEVER NEXT

**STEVE WHITE, G3ZVW**
*31 Amberley Road, London N13 4BH.*
*e-mail: steve.white@rsgb.org.uk*

TO COMPLETE last month's look at Digital Radio Mondiale (DRM), the world-wide standard that has been adopted for digital broadcasting from long-wave to short-wave, we need to look at the receiver. The layout of most of it will be familiar, but the prospect of receiving a complex waveform that contains both amplitude and phase differences, indeed transmissions that vary in bandwidth and in their very nature, present some interesting 'challenges' for a demodulator.

DRM requires a receiver with a wider than normal IF bandwidth and an analog-to-digital (A/D) converter instead of a conventional demodulator. A block diagram is shown in **Fig 1**. After conversion into a digital stream, the complex baseband signal is dealt with by two digital demodulators, one for the AM content and one for the digital.

In the case of a hybrid or 'Simulcast' transmission of AM and DRM, it is intended that the receiver be capable of switching back seamlessly to AM if the digital signal is lost or corrupted ('graceful degradation' as they call it), and also during the period of acquisition. The demodulator can also be used to listen to conventional AM-only broadcasts.

Acquisition time is a serious issue with digital transmissions because, unlike their analogue cousins, a digital receiver has to receive at least one complete packet of data before it can start to decode the signal. In the case of DRM, transmissions that are intended for reception via groundwave are interleaved at 800ms intervals, which results in an average delay of 1.6 seconds before audio is delivered. Transmissions that are intended for reception via skywave are interleaved differently, and in this case the average time before audio is delivered increases to 3.6 seconds.

Finally, noise blanking is 'part of the deal' with a DRM receiver.

## ORGANIC DISPLAYS

FURTHER TO the item in April entitled 'Plastic Everything', Paul Shayler, G6TSF / M3TSF wrote to point me in the direction of DuPont, a company that delivers science-based solutions in markets such as food and nutrition, health care, apparel, home and construction, electronics and transportation (although they actually started out by making explosives).

A company that DuPont have acquired is Uniax, who produce OLEDs – Organic Light Emitting Diodes. OLEDs are a new way to generate light, using organic materials rather than the complex crystalline structures found in traditional LEDs. When a thin layer of one of these organic materials is sandwiched between appropriate Anode and Cathode materials, and a relatively modest voltage is applied, electrophosphorescence results in the section of the material between the two electrodes glowing. With careful selection of the organic material and the anode and cathode material, the entire structure can be made incredibly thin, with organic layers less than 0.1mm thick.

Initially OLED displays are to be produced on wafer-thin glass substrates, but DuPont are at work improving plastic/polymer materials to form the substrate of future displays. In Polymer OLEDs (see **Fig 2**), the organic material is a special polymer that can be quickly and easily applied to an appropriate substrate. It simplifies the manufacturing process, which leads to lower costs, which leads to higher sales, which leads to still lower costs – the economy of scale, as they call it.

It is expected that OLED displays will be available in two basic types, Passive Matrix and Active Matrix. **Fig 3** shows how, in Passive Matrix displays, the light emitting material will be scanned sequentially. Pixels on one line will be activated, followed by pixels on the next line, and so on. This can be likened to multiplexed LED displays, rather like those used in first generation pocket calculators. In Active Matrix displays each pixel has a couple of transistors associated with it. The transistors are used to hold an activated pixel 'on', until the next time it is scanned. Obviously this makes Active Matrix displays more complex

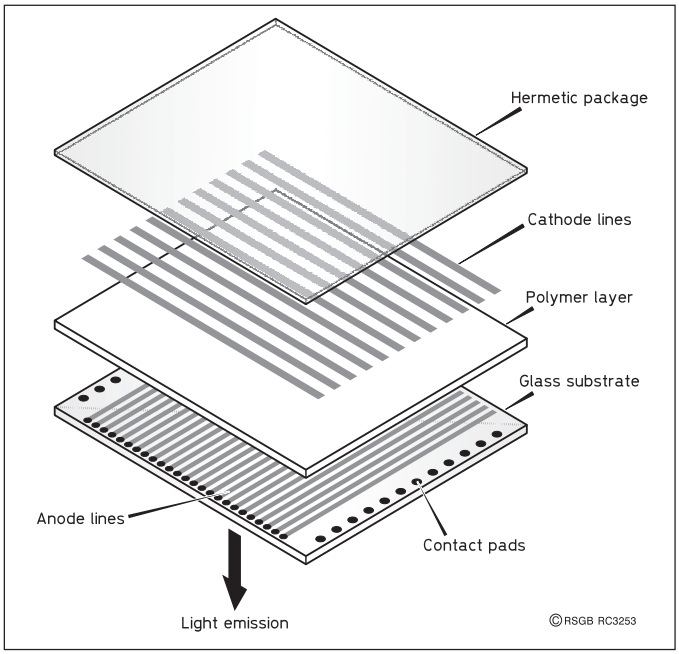



**Fig 2: The Organic LED display consists of a matrix of anode and cathode lines with a layer of light-emitting organic polymer sandwiched between.**

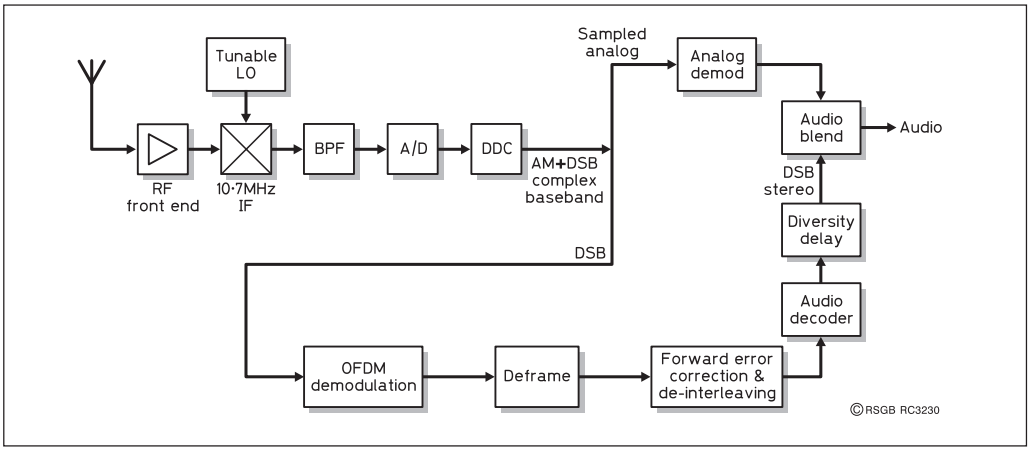



**Fig 1: Block diagram of a typical DRM receiver.**

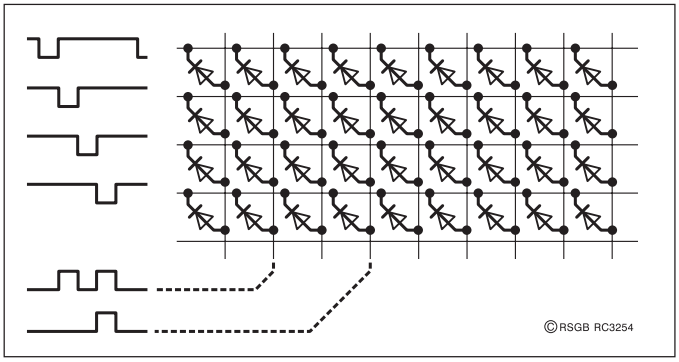



**Fig 3: How the OLED display is addressed. The first horizontal line is activated by a low-going pulse. During the time that it is active, each vertical line is activated in turn by a high-going pulse. Where a 'low' horizontal and a 'high' vertical meet, the material between the lines glows. When the scan of all vertical lines is complete, a low-going pulse is applied to the next horizontal line and the process is repeated. The scanning process is continuously repeated and takes place sufficiently fast that the human eye doesn't see a flickering image.**

and expensive, but they display brighter images.

The promise of Poly-OLED-based displays is significant, because they are more electrically efficient than backlit displays. They will also be far more robust than glass, yet extremely light and thin. They are much better than liquid crystal displays at handling motion, and offer a much wider viewing angle. Single colour, area colour and full colour will all be possible in a thin, lightweight display ideally suited to many mobile, avionic and pervasive applications – so expect next generation GPS units, portable PCs, PDAs and phones to incorporate this kind of technology.

Finally, Ken Wood, ZS2KW, wrote regarding the 'Chemistry Lesson' that I included in the April column. The object of the exercise was to give those who know nothing about chemistry a basic understanding of the way in which chain molecules are 'constructed', but to be absolutely correct I should have said that "polyethylene consists of a long chain of molecules that contain carbon atoms", as opposed to "polyethylene consists of a long chain of carbon atoms".

## RADIOS FRANÇAISES

DURING A RECENT trip to France I found myself in a newsagents. Amongst all the magazines on display there were copies of *CQ Radioamateur* and *Megahertz*, the two French bookstand magazines devoted to amateur radio. It immediately struck me that amateur radio magazines must be somewhat easier to get hold of in France than Britain, but that's another subject – and definitely not what I want to discuss here.

My knowledge of French is rudimentary, at best, but I understand circuit diagrams and pictures all right, so it was with great interest that I scanned through these magazines for any interesting items of technology that we don't see in Britain. It didn't take long for me to find some.


**The VX-110 from Vertex (Yaesu), a commercial-grade VHF transceiver that is programmed for the 144MHz band and sold in France into the amateur market. A sister model, the VX-150, is also available.**

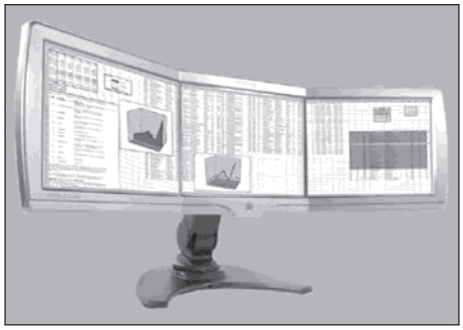
Almost immediately I opened the cover of the first magazine my eye was drawn to the word 'Vertex', which is the brand name of the commercial equipment arm of Yaesu. In France (and several other countries, as I subsequently discovered), Vertex transceivers are being sold into the amateur market. A prime example of this is the VX-110 pictured below. It is a well-specified 5-watt 144MHz transceiver, built around a die-cast aluminium chassis. It is rugged, weatherproof and is said to have extremely good audio. When I came to write this piece, I undertook some more research and the more I looked, the more Vertex transceivers I found – from handies to mobiles, from Poland to Brazil.

Of course there may be transceivers that we see in Britain which are not seen (or do not have equivalents) in other countries, but wouldn't it make good commercial sense to sell the same (or slightly tailored) products at least across the EU?

## OVER-THE-TOP MONITOR

IF YOU HAVE a computer and want to display a lot of information on the screen, you have a choice; buy a bigger screen and set your video card to maximum resolution, or buy a second screen and a dual-headed video adapter. Now there is a way of displaying even more information on your desktop.

The new PV230 from Panoram Technologies is described as the "ultimate" monitor by its manufacturers. It is a 36in-wide triple flat-screen display, specifically designed for graphics designers and financial analysts. The total resolution of the monitors is 3072x768 (2.4 megapixels) but, unlike placing multiple monitors next to each other, the gap between the sections of the PV230 is only 11mm. With its wrap-around design and small gap between the sections, you really could become immersed in your application.



**The PV230 triple-XGA monitor from Panoram Technologies.**

As with most dual-headed video adapters, you can open an application in a single screen or across multiple screens. With digital video, VGA, S-video and composite inputs (one of each for each of the three sections), a great deal of flexibility is available to the user. The screens are mounted on a fully articulated swing arm in which the connecting cables can be concealed, and it is available in versions for IBM-type PCs and the Macintosh.

Not surprisingly, the price tag of the PV230 is truly frightening, but if you're a financial analyst, a top paid designer, or setting up a flight simulator for professional pilots, you probably won't care about the cost.

Thinks… wouldn't it be great if DuPont's Poly-OLED technology became incorporated in a display of this kind? By employing a flexible substrate I can imagine being able to carry a panoramic video display around in a tube, and just unroll it wherever it is required. I've seen a keyboard that can be rolled up, so it's not unrealistic to think of a display along the same lines. ♦

**WWW.**

**Poly-OLEDs** www.uniax.com
**Vertex VX-110** www.yaesu.com/amateur/vx110.html
**Triple monitor** www.potce.com/Cat1/01/Computers/Peripherals/monitors/panorampv230.htm

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

Down To Earth

# Newcomers' News

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

LOTS OF Foundation News came in this month, with a fair number of pictures. I haven't been able to fit them all in this month but I will share them with you as soon as possible. It is great to see so much activity with newcomers, keep it up!

## ANOTHER FIRST

THE MID-GLAMORGAN Amateur Radio Group is celebrating the success of their first Foundation Licence (FL) course under the guidance of senior tutor Tom Beedle, GW0TOM.

The students included a rather experienced 'newcomer' in the shape of Makato Okasaki, JK1GMB, who has held a Japanese licence for some 25 years but has been unable to operate in the UK as the two countries do not have a reciprocal licensing agreement. However, as Makato is a keen low power (QRP) operator, the FL is ideal for him to get on the air with the minimum of red tape.

Congratulations go to the Group for running the first course and to the students for doing the hard work to pass the assessments.

## CHELMSFORD NUMBERS GROW

TREVOR Hawkins, M5AKA, reports that membership of the Chelmsford Amateur Radio Society has grown rapidly since the introduction of the FL. Membership now stands at 109 with many of the newcomers attending regularly.

There are more courses planned and each will run over six evening sessions. At the time of writing the next two courses were already fully booked but if anyone in the Chelmsford area is interested in joining in the fun they should contact the club secretary David Bradley, M0BQC, tel: 01245 602838 or via e-mail cars@g0mwt.org.uk

## NEWS FROM A NEW M3

WHEN I SAY a 'new' M3 what I mean is a complete beginner as opposed to an existing Class B licence holder that has completed the FL Morse assessment. Matthew Saunders, M3OHM, attended a FL course at the Colchester Amateur Radio Club in February with Frank Howe, G3FIJ, and others all providing 'excellent' tutoring and support.

Now that he has got over his initial nervousness on the microphone, Matthew reports good local contacts using a Yeasu VX-5R with external antennas on 70cm and 6m. He explains that his uncle, David Piper, G4JXY, introduced him to the hobby some time ago but the thought of doing the Radio Amateurs Examination (RAE) had put him off the hobby. However, now that the FL has given him some confidence he is keen to learn more and does intend sitting the RAE in time.

The Mid Glamorgan Foundation Class with Howard, GW0BOJ (Senior Morse Tutor) on the right and Tom, GW0TOM, seated (see 'Another First').

I think Matthew's experience shows that the FL scheme really is opening doors that were previously seen to be closed and providing that initial stepping stone for the newcomer to progress through the licences. Good luck with the future studies Matthew!

## PRACTICAL BARRIERS?

QUENTIN Cruse, MW1SZC, contacted me to express his fears about the changes in the way that amateur radio qualifications are to be assessed. In particular he was concerned about the future requirement to progress through the licence qualifications meaning that everyone will need to complete practical assessments. He pointed out, quite rightly, that there are many disabled amateurs who gain enormous benefit from the hobby and Quentin was worried that a mandatory practical could exclude some disabled people in the future.

I have reassured Quentin that the Radiocommunications Agency is mindful of the need to make amateur radio accessible to all. The current FL tutors' guide, and the draft Intermediate syllabus, both make it clear that assessors must take disabilities into account for practical exercises. The idea is that where it is physically impossible for a candidate to carry out an assessment then, providing that the candidate can demonstrate sufficient knowledge to describe the process, they should be assessed positively. For example, someone with severe arthritis in their hands may not be able to wire a 13 amp mains plug but if they can describe the process they would be able to supervise someone doing the job on their behalf.

Being somewhat disabled himself, Quentin reports that he has been bowled over by the help he has received from amateurs. He responded to an advertisement for a 144MHz antenna in *RadCom* and the seller not only delivered the antenna but he refused to accept any money for it. A local amateur then supplied all the brackets, plugs and cable and put up the antenna, again, at no cost to Quentin. An excellent example of the true spirit of amateur radio! Well done to those concerned, you know who you are.

Two very happy M3's from the Chelmsford ARC (see 'Chelmsford Numbers Grow' above).

## MICHAEL'S PROGRESS

SOME TIME AGO we heard from Michael Clarke when he had just sat the RAE in Enniskillen. Michael almost missed the exam because he had been following the instructions in the *RSGB RAE Manual* and took pencils with him for the marking. Unfortunately the City and Guilds had changed their policy and Michael had to quickly find a shop that sold ballpoint pens.

Thankfully the excitement didn't put him off and he passed the exam. Michael wrote to bring us up to date with his amateur radio exploits. He went on to pass the Morse test and is now licensed as MI5MTC. He is having great fun with QRP Morse on the high frequency (HF) bands. He has a couple of old Heathkit transceivers and is 'homebrewing' more equipment. His 2 watts of CW on 3.5MHz has brought him lots of contacts including one into the Czech Republic. Great news! ♦

**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.*

Down To Earth

# The Twilight Zone:

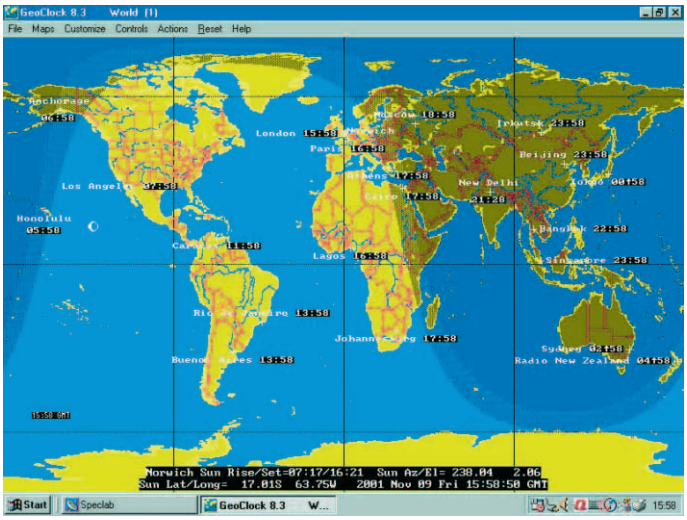
## just what is 'grey-line' propagation?

By Steve Nichols, G0KYA*

*Steve Nichols, G0KYA, of the RSGB's Propagation Studies Committee, believes that MF and HF propagation around sunrise and sunset is not fully understood. Here he outlines the mechanisms behind grey line and other twilight propagation modes and launches a research project to help us understand them better.*

WORLD-WIDE communications using the MF and HF bands are dependent on radiation coming from the sun. But twice a day, at sunrise and sunset, the ionosphere undergoes dramatic changes, giving enhanced propagation in some directions.

In terms of radio propagation, the D and E layers are responsible for most of the absorption of radio waves that pass through them, but the absorption is frequency dependent. The D layer can completely absorb signals on 160, 80 and 40 metres during the day, and can attenuate signals on 20m too. Hence the reason you don't hear much, if any, DX on the low bands during the day as sky-wave signals are absorbed before they can reach the reflective (more correctly, refractive) E and F layers.




**Darkness, daylight and the terminator for any time of day and any day of the year can be displayed using the *GeoClock* program.**

The ionosphere undergoes a dramatic change in ionisation at the transition from day to night. The electron (and ion) density in the E-layer decreases by a factor of 200 to 1 and the F1 by nearly 100 to 1 (see **Fig 1**). At sunset, the D layer disappears rapidly.

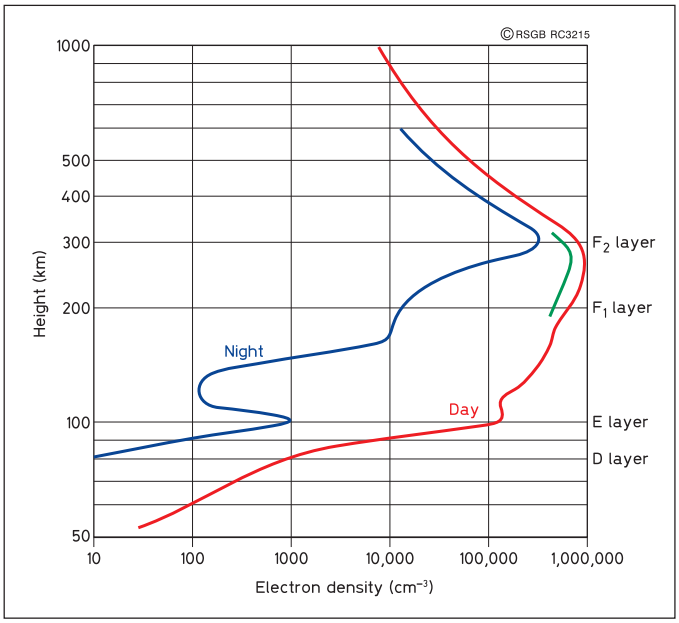



**Fig 1: Electron density during day and night as a function of height above the earth's surface, showing how the ionosphere undergoes dramatic changes in ionisation at the transition from day to night.**

## ENTER THE TERMINATOR

AROUND THE OTHER side of the world other regions that are entering into daylight have yet to form any significant D layer and the E layer has not built up from its night-time low. Therefore, for a short period, propagation between two regions simultaneously experiencing sunrise and sunset can be highly efficient. Signals on the lower bands can theoretically travel over great distances with little attenuation.

This is well documented, with many examples of such propagation being logged on 160 and 80m over the years. Many amateurs will be familiar with this so-called *grey-line* propagation (the term was coined in 1975 - see [1]) - propagation that occurs along a line separating night from day. The line is called the *terminator* but it is diffuse, due largely to the earth's atmosphere that scatters the light over a large area. In radio terms, the radio terminator is not the same as the visual one. The latter refers to the point when we see the sunrise or sunset at ground level on the earth and

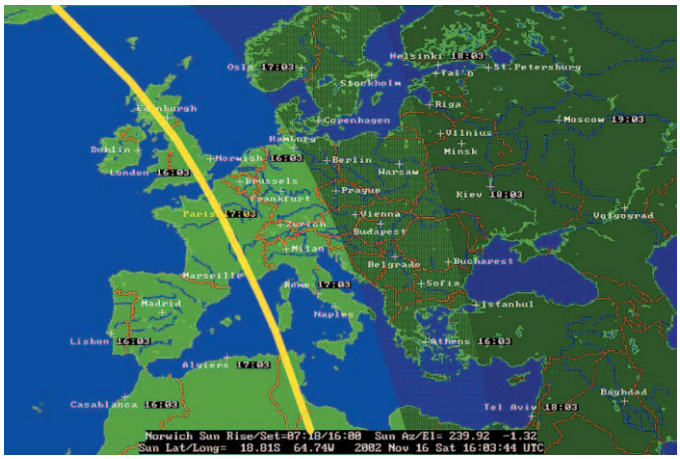
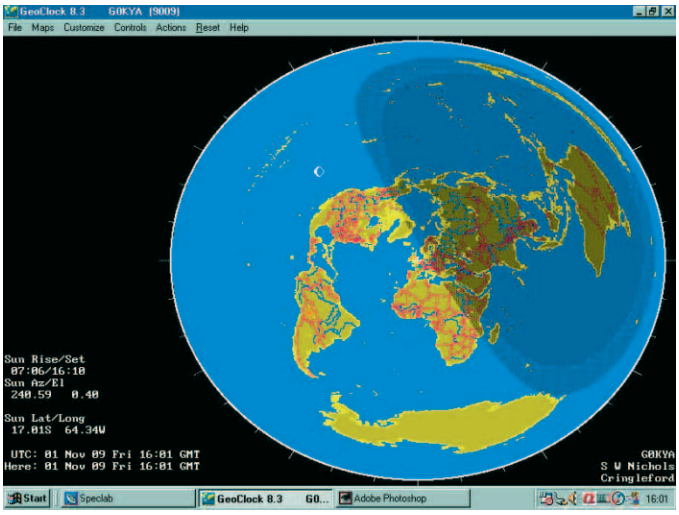



**Fig 2: The twilight zone - the yellow line shows the areas experiencing physical sunset and the two shaded areas show the loss of first the D layer and then the F layer illumination.**

*7 Quebec Close, Cringleford, Norwich NR4 6XU; e-mail: steve@infotechcomms.co.uk




**Another *GeoClock* display map, showing the illumination of the sun over the Americas, Antarctica and most of Africa, while most of Europe, Asia and Australia is in darkness.**

the period of visual twilight that either precedes or follows. The former is related to the way the sun illuminates the ionospheric D, E and F layers.

For example, the PC program *GeoClock* defines the point at which the sun starts / stops illuminating the D-layer as being offset from the visual sunrise / sunset by 6.596 degrees longitude. As the earth rotates 15 degrees per hour this could be as much as 24 minutes before or after sunrise or sunset, although the actual figure will depend upon the time of year and latitude.

The radio 'twilight zone' - the region on earth between the creation / loss of the D layer and where the sun starts / stops illuminating the F layer (roughly defined as being offset from sunset by 14.165 degrees longitude) can be almost one hour before and after sunrise and sunset. See **Fig 2**: the yellow line shows the areas experiencing physical sunset and the two subsequent shaded areas show the loss of D and then F layer illumination at that time. E layer illumination starts / finishes somewhere in between these two, but the average height is much closer to that of the D layer.

To confuse matters, these values are based on average D- and F- layer heights, but the apparent heights of these can change too. The conclusion is it is no good looking for grey-line DX just at your visual sunrise / sunset - you could be out by up to an hour depending on the band, your respective locations, and the time of year.

And - even worse - for signals at an angle to the terminator, we are interested in where the first ionospheric refraction (or hop) actually occurs once you radiate a signal, which is likely to be many hundreds of miles to the east or west of you - where the sun may still be illuminating the E and F layers (see **Fig 3**).

Most books relating to HF propagation give a brief description of grey-line propagation, and how and why it works. What they don't tell you is the actual frequencies affected, other than a vague idea that 80 / 160m are definite bands for grey line, and 'some' HF bands also exhibit grey-line enhancements. Either way, all these books tell you that grey-line enhancements occur along the terminator, ie when both stations are at the sunrise / sunset condition.

John Devoldere's, ON4UN, book *Low-Band DXing* [2] shows that paths perpendicular to the terminator may enjoy the greatest signal enhancement. That is, on the low bands, as sunset occurs at the receiving station, you may get enhancements at right angles to the terminator in the direction towards the dark side of the earth - and not along the terminator itself. He also points out that the width of the terminator will vary according to the season and your position on the earth, and cannot be thought of as a fixed entity - the grey line will be narrower at the equator and wider at the poles. So the time-span available for grey-line conditions will also vary depending upon the time of year, and the locations of the two stations.

Likewise, the width of the grey line will depend upon frequency as D layer absorption is frequency dependent - you may be able to work DX on 40m 24 hours a day in mid-winter, while DX on 160m will fade out quite quickly after sunrise due to the greater D layer absorption.

## WHAT ABOUT HF?

THERE APPEARS to be little hard research of grey-line propagation at higher frequencies. The vague suggestion in most books appears to be that grey-line enhancements can and do occur on 20m. 10m is theoretically too high for the effect to appear, as D layer absorption is virtually non-existent normally at these high frequencies, although I have read more than one article about how to work grey-line on 10m! See the graph of frequency-dependent D-layer absorption predictions on the Internet (see WWW. below).

My own studies show that twilight enhancements on 10m *do* occur, but not necessarily along grey-line paths. On many occasions I have heard signals from Indian, Indonesian and other stations on 10m just after their local sunset - these stations were not audible before. I have also worked a Brazilian station (PT2GTI) on 10m just after his local sunrise, receiving a 59+ report using just 10 watts into an indoor dipole. He was still audible later that morning but at reduced signal strengths - down 10 - 15dB. The same has occurred with KP4NU in Puerto Rico. These were definitely not grey-line paths, but still showed definite enhancements.

Reports of sunset / sunrise enhancements at 50MHz over long distances have also been logged, notably between the UK and USA. One suggestion (see [3]) is that this is due to E or Es enhancements as the E layer increases in altitude at sunset.

The increase in altitude of the

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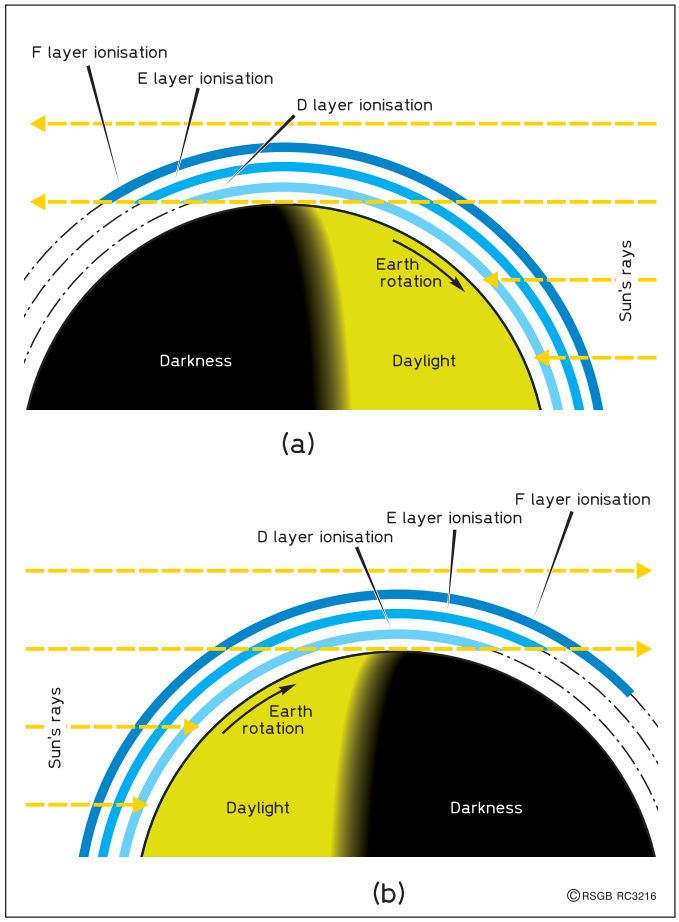



**Fig 3: The effect of ionisation of the D, E and F layers, (a) at dawn, and (b) at dusk (scale exaggerated for clarity).**

Down To Earth

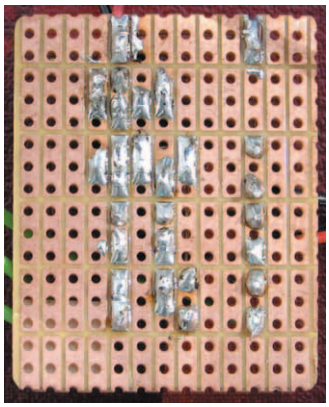
# Micro Radio Products' Novice Medium-Wave Radio & Novice AF Amplifier Kits

Reviewed by Robert Snary, G4OBE *

MICRO RADIO Products is a new UK-based kit manufacturer set up by David Rowlands, G6UEB, and Tony Bowmaker, G0EBP, who have started producing kits for the home electronics constructor. These kits are designed for use by typical Intermediate RAE students.

## THE BOARDS

THE TWO KITS supplied for review are both constructed on 'tripad stripboard', where the tracks are limited to being three holes long (hence 'tripad').



The 'tripad' board.

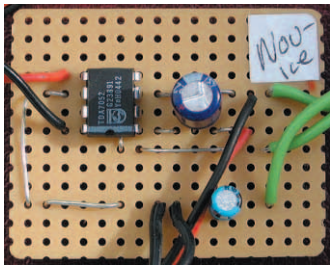
Rather than asking the constructor to use offcuts of component leads, sufficient pre-tinned wire was supplied with the kits for the links. One of the things that I was pleased to note was that the edges had been smoothed and the corners rounded off.

## DOCUMENTATION

THIS WAS VERY easy to read and well laid out, with sections covering how the kit worked, step-by-step construction and checking guides. The instructions were printed on single-sided A4 sheets, with a diagram showing the board layout (with all the links) and also a circuit diagram. The only major criticism that I would make of the documentation is that the instructions mention twisting the excess length of wire off with pliers rather than cutting them with proper side-cutters.

## THE AUDIO AMPLIFIER

THE AMPLIFIER is designed around the TDA7052 integrated circuit (IC) and is built on a small piece of board measuring 42mm x 33mm. The kit was very easy to make, the only concerns being that the constructor should be very neat, as there are two wire links which need to be placed on the board *before* the IC is soldered into place. The construction should be no problem for anyone new to soldering, provided that he / she can solder neatly, with construction taking about 45 minutes.



The completed AF Amplifier board.

The circuit is very simple and comprises just two capacitors, the single IC and the supplied volume control. No 8Ω loudspeaker was supplied with the kit, but a quick raid of the spares box should overcome this difficulty. The kit worked first time and, running off a 9V battery, provided more than enough volume.

The kit costs £5.75, although a loudspeaker would be required on top of this cost. It should be noted that the IC is capable of producing over 1 watt of audio output and, for this reason, I would recommend that it should not be used with headphones without extreme care.

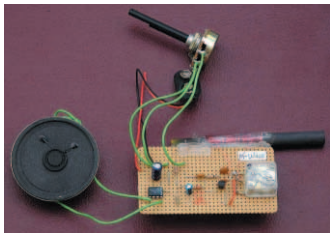
## THE MW RECEIVER

THIS KIT incorporates a tuned-radio-frequency (TRF) receiver using the MK484 IC (the replacement for the ZN414) with the TDA7052 amplifier already mentioned. The board is somewhat larger, being 87mm x 44mm. All the components are supplied, with the exception of the loudspeaker. The comments previously made about the documentation apply, the manual being laid out on four A4 pages. The only thing to note of importance is that two power buses needed to be soldered and these are on the track side of the board rather than on the component side.

The mounting screws for the polyvaricon variable capacitor were supplied, which is something that I have seen forgotten in some kits, so there were no problems with the wrong screw length being used and damaging the vanes of the capacitor. A spacer was also provided as a shaft extension for the capacitor; however, this would normally need some modification to ensure a good mechanical lock onto the shaft. I cheated and used some hot melt glue.

As the capacitor is mounted on the board, I would have liked a small template to be provided so that a constructor could either drill the board or mark a case to the right size for mounting the capacitor. The details of how to wind the ferrite rod antenna were very clear and provided some useful hints for the new constructor.

The kit took about 90 minutes to build and worked first time, with a number of local and not-so-local medium wave stations being heard. The idea of first-time working is, of course, very important for new entrants to the hobby.



The completed MW Radio.

The cost of the kit is £10.50 and again, this does not include the loudspeaker. The previous recommendation about using headphones with extreme care should be considered.

## CONCLUSIONS

THE TWO KITS are ideal for their intended purposes and should be excellent to introduce newcomers into construction. The MW radio is ideal as a replacement for the original MW Receiver in the Intermediate Licence course, while the audio amplifier, although simpler its equivalent in the Intermediate Licence course, would be very useful as a shack or bench amplifier.

As 'tripad' is used for the construction, care must be taken by newcomers, but this would form the basis of an ideal project for clubs to use to help recruit people into the hobby.


## ACKNOWLEDGEMENTS

I WOULD LIKE to extend my thanks to David Rowlands, G6UEB, of Micro Radio Products, 7 Broomfield Road, Swanscombe, Kent DA10 0LU, for supplying the two kits for review. I have been informed that there are other kits under development, including a regenerative receiver for the short-wave bands, which may be of interest to potential licence holders. ♦



* *12 Borden Avenue, Enfield EN1 2BZ.*

Cont from p35

E layer needs further explanation. As the sun sets, the lower regions of the E layer are not illuminated, so the effective height of the reflecting layer appears to increase. Likewise, at this time we can imagine the radio ionosphere as being tilted as it is being illuminated at an angle. This is probably the vehicle for the enhanced propagation at 28MHz and 50MHz - the loss of the D layer probably has nothing to do with it.

If my theory holds, look for enhanced signals on 28MHz and 50MHz during local daytime in G from stations experiencing their local sunrise / sunset - from the west at their local sunset and from the east at their local sunrise. The signals should be strongest at roughly right angles to the terminator - the same as ON4UN's prediction of propagation on the low bands, but from the illuminated parts of the globe, not dark.

## AN ALTERNATIVE VIEW

THERE IS AN alternative way of looking at grey-line conditions on 7MHz and 10MHz connected with the critical frequency (fof2). At frequencies above fof2 a radio wave travelling vertically upwards would pass through the f2 layer into outer space. Below fof2 it would be reflected back to earth. Now imagine a radio wave hitting the ionosphere at an angle of about 75 - 85 degrees to the earth - a near vertical incidence skywave (NVIS). Below the critical frequency it would be returned. If it is some way above fof2 it will pass into space. At some frequency close to fof2 it could be refracted through a large angle and end up travelling almost parallel to the earth, giving a very long first skip distance. This is the condition for the Pedersen (see [4]) or critical ray, discovered in 1927 and characterised as being high angle, long distance and close to and probably above the fof2 frequency. As there would be no intermediate ground hops the signal strength could be very high indeed.

It is likely that these conditions exist around local sunset / sunrise as fof2 passes through the two bands and could account for long distance communications under grey line conditions on 7MHz and 10MHz. A near-real-time fof2 map can be found on the Internet.

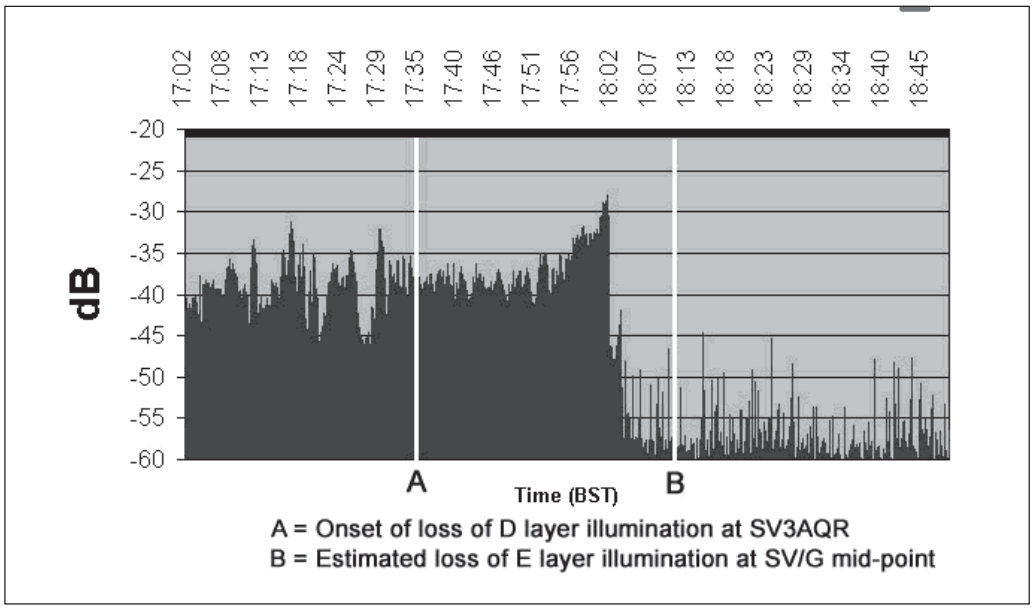



**Fig 4: The SV3AQR beacon on 28182kHz, as received at G0KYA, on 8 October 2001.**

Either way, there is more to grey line and twilight propagation than meets the eye. The effects and the mechanisms behind the propagation are probably different on each band too. What we *can* say is that twilight propagation is not always best along the terminator, hence I try to avoid the term 'grey line' where it is not applicable. There may not be any enhancement at all on some bands. Some books would have you believe that you can just tune up on 20m at sunset and work ZL at 59+20dB every day - if you can I would like to hear about it!

## A RESEARCH OPPORTUNITY

I AM CURRENTLY doing some research into twilight propagation on many of the amateur bands, starting with 10m. The early results confirm that we can and do see twilight enhancements from signals originating from areas experiencing sunrise / sunset.

The graph of the beacon SV3AQR on 28182kHz shown in **Fig 4** is typical. This was produced using *SpectrumLab* software connected to the audio output from a Yaesu FT-920. With the AGC turned off, the vertical scale indicates signal strength while the horizontal scale shows time. You can quite clearly see a 10dB increase in signal strength near the beacon's radio 'dusk'. The effect has been seen on other beacons, but like all ionospheric effects, it doesn't occur every day and is virtually impossible to forecast.

More monitoring work needs to be done before we can write the definitive guide to grey line and twilight propagation and this is where I need readers' help. If you have a PC with a soundcard, can run the *SpectrumLab* software, have a very stable receiver (the software needs stability in the order of a few Hz), and can leave your system monitoring for an hour or more at a time, then I would like to hear from you. As part of the Propagation Studies Committee's work I plan to look at twilight and grey-line propagation on all the HF and LF bands systematically, using known, quantifiable signal sources such as beacons and broadcast stations. This is a long-term project though, but is essential if we are finally to clear up what has been a grey area of propagation research for a long time - every pun intended!

## REFERENCES

[1] 'The Grayline Method of DXing', Dale Hoppe, K6UA, et al, *CQ* Sept 1975.
[2] *Low-Band DXing*, John Devoldere, ON4UN, ARRL, 1999.
[3] 'E layer and Sporadic E - Two Modes of Propagation at 50MHz', Ken Osborne, G4IGO, UK Six Metre Group website.
[4] *An Introduction to Radio Wave Propagation*, J G Lee, Babani BP293, 1991.
[5] *Your Guide to Propagation*, Ian Poole, G3YWX, RSGB, 1998.
[6] *The New Shortwave Propagation Handbook*, Jacobs, Cohen and Rose, *CQ* Communications, 1995. ♦

**WWW.**

| | |
|---|---|
| ***Geoclock* software** | **www.geoclock.com** |
| **D-layer absorption predictions** | **www.sec.noaa.gov/rt_plots/dregion.html** |
| **Critical frequency (fof2) predictions** | **www.spacew.com/www/fof2.html** |
| ***SpectrumLab* software** | **www.qsl.net/dl4yhf/** |
| **UK Six Metre Group (UKSMG)** | **www.uksmg.org** |
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# in practice

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## SMD ELECTROLYTICS - WARNING!

*THE INFORMATION on the polarity marking of SMD electrolytic capacitors that I gave in the May column has proved unreliable, and may have safety implications.*

THE CORRECT ANSWER is that there is *no* universal convention! The ones that I had tested (and asked someone else to double-check) were as described in May; but fellow columnist Andy Talbot, G4JNT, was the first to point out that tantalum SMD capacitors tend to have the polarity band on the opposite - positive - end. David Mackenzie, GM4HJQ, pointed out the same, with references to the web sites of manufacturers Vishay (Sprague), Cornell-Dubilier and Kemet, as listed in '*WWW*' below. It appears that for *tantalum* electrolytics, and for at least some rectangular plastic-cased aluminium types, the stripe denotes the *positive* end. For SMD electrolytics with a miniature aluminium can, we haven't yet found any exception to the stripe being on the negative end. Likewise if the package has one tapered end, that still *seems* always to be positive.

But you obviously cannot trust those generalisations very far, unless you check the actual component data sheet - and even then the manufacturers don't always make this key information very prominent. Neither do some of the component catalogues - I was particularly unimpressed by the Farnell catalogue, which warns that polarity is important but gives no further information. This is particularly annoying because such suppliers sell the components in small 'off the reel' quantities that would be used for prototyping and repairs, where the risk of human error is much greater than in machine assembly.

This lack of information also has safety implications. To settle the question in his own mind, G4JNT tried to find the correct polarity by the time-honoured method of measuring the leakage current in both directions. Usually, the leakage current is much less when voltage is applied in the correct polarity. The dielectric film is a very thin insulating layer that is deposited electrolytically when the capacitor is manufactured, by applying a DC voltage of the correct polarity. Incorrect polarity reverses that electrolytic reaction, so there is an increase in leakage current as the film breaks down. Andy confirmed that SMD tantalum capacitors behave very much like the older wire-ended bead types: they will often tolerate a small reverse voltage, but if subjected to a higher reverse voltage (eg the normal maximum working voltage) they get hot and fail short-circuit.

Andy then tried to test some aluminium electrolytics for reverse leakage, but found inconclusive results at low voltages. "By raising the test voltage up to the working rating," he said, "I finally managed to come up with a spectacular answer. On the ones I tested, the black mark is the negative terminal and, when reverse-connected, these devices go off with a bang, with bits of red-hot material shooting out." This illustrates an important safety point: if a component is connected to a substantial power supply (a common situation for electrolytic capacitors) and it fails short-circuit, then it's liable to explode or ignite unless you provide protection in the power supply.

David, GM4HJQ, confirms these points: "I've seen consultant engineers argue over polarity markers, it's such a pain. It's one reason I like those SMT tantalums with the built-in fuses, such as some that Kemet makes. I've seen SMT tantalums fitted to PCBs the wrong way round and survive for months before the mistake is found - it definitely needs caution. The company I mainly work with makes folk wear safety glasses at all times."

So if even professionals are in doubt, where does that leave the amateur constructor? The most important thing to know is that *you can't be sure*. Based on this recent experience, I would now be careful about accepting *anyone's* advice on SMD electrolytic polarity without checking for myself. If you know what the components are, you can generally check on the manufacturer's website, but take special care when using unidentified components. Check for yourself by measuring leakage current at the full operating voltage, in both polarities.

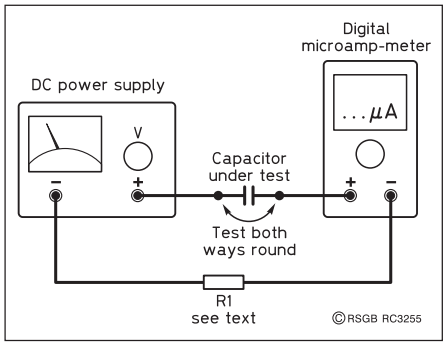


**Fig 1: A safe way to check the leakage current of a capacitor. R1 limits the maximum possible current to a few milliamps.**

**Fig 1** shows how to do this safely, using a series resistor to limit the potential short-circuit current to about one milliamp. R1 should be about 1kΩ per volt applied, eg 10kΩ or 15kΩ when testing at 12V or 16V, or 33kΩ when testing at 35V. There will be an initial current surge as the capacitor charges up, but then the current will settle to a lower value which changes only quite slowly - the value and the rate of change are what you're looking for. The 'forward' leakage current will probably stay constant, or may even decrease over several minutes if the applied voltage is re-forming the dielectric film. The 'reverse' leakage current may be higher at the outset, and it will tend to rise as the dielectric film is being electrolysed away. Stop the test as early as possible to avoid doing any permanent damage, and finish off with a few minutes connected the right way round to re-form the dielectric. To be able to tell the difference as early as possible, you will probably need to use a digital multimeter on its lowest current range. With the maximum possible current limited to about 1mA by the series resistor, the meter is well protected even if the capacitor goes completely short-circuit.

## BYPASS CAPACITORS

*WHAT TYPES of capacitor, and what values, should I use for bypass capacitors at HF, VHF or above?*

THERE ISN'T a universal answer to this question - but there are some universal principles. Lots of people use bypass capacitors without asking themselves what they're actually *for*. A bypass capacitor is used to provide a direct low-impedance RF path to ground, from some point in a circuit where there is also a DC voltage present. The aim is to nail that point securely to RF ground, so that no unwanted RF currents flow through the parts of the circuit that are intended to be DC-only.

**Fig 2** shows the circuit of a dual-gate

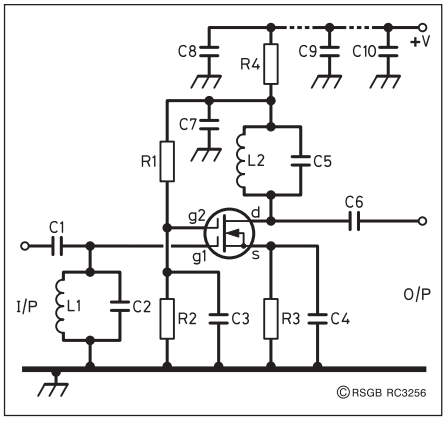


**Fig 2: RF bypass capacitors in this dual-gate MOSFET amplifier are C3, C4 and C7, and also C8-C10 along the DC supply rail.**

MOSFET RF / IF amplifier containing a number of bypass capacitors. For example, the potential divider R1 - R2 establishes the correct DC potential for gate 2, but this point needs to be at zero RF potential so it is bypassed by C3. Likewise at the transistor source, current flowing through R3 creates the DC bias, but C4 bypasses the source to RF ground. C7 establishes zero RF potential at the top end of the output tuned circuit, often known as the 'cold' end; the other end connected to the collector of the transistor is the 'hot' end.

For completeness, we should also identify the capacitors in Fig 2 that are *not* RF bypass capacitors. C1 and C6 are the RF input and output coupling capacitors. C2 and C5 respectively resonate the input and output tuned circuits, with L1 and L2. Finally C8 - C10 *are* RF bypass capacitors, but we'll talk about those later.

What value should the bypass capacitors be? For effective RF grounding, the reactance of the capacitor should be small, but it can never be zero because that requires an infinite capacitance. **Table 1** shows the reactances of a range of capacitor values, across a range of frequencies. These are calculated from the well-known formula:

$$X_C \quad \frac{1}{2\ fC}$$

When you connect a bypass capacitor to ground from a certain point in the circuit, what you're trying to do is to make that capacitor the strongly-preferred path for RF currents to take. In other words, we want to make the reactance of the bypass capacitor *small compared with all other impedances connected to same point*. You obviously want to stay away from the top-left area of Table 1 where capacitor values are small and reactances are high. In the opposite, bottom-left, corner of Table 1 the reactance values are very low - so it comes as a surprise to beginners that we don't want to go down there either.

Why not? Because real-life capacitors don't only have capacitance - they also have inductance and resistance, and this spoils the performance of high-value capacitors at high frequencies. The inductance is partly in the internal construction of the capacitor, and partly in the connecting leads. The resistance is due to various losses at high frequencies, and is not to be confused with the DC leakage resistance. The inductance, RF loss resistance and the capacitance are all in series (**Fig 3**) and the DC leakage resistance is a high resistance in parallel with the whole thing. We can forget about DC leakage resistance for the rest of this discussion, because it is extremely high for the kinds of capacitors we'd consider for RF bypassing.

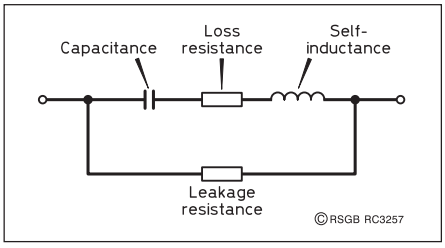


**Fig 3: Equivalent circuit of a capacitor, showing self-inductance, loss resistance and leakage resistance in addition to the true capacitance.**

What we're looking for an in RF bypass capacitor is therefore low inductance and low losses. These features come together nicely in modern multi-layer ceramic capacitors, which are probably the best choice for general-purpose RF bypassing. They are available both in wire-ended form, usually with a resin dip for outer protection, and as surface-mount packages (SMD) which greatly reduce the self-inductance and enhance the performance at higher frequencies.

Returning to Table 1, what values *should* we choose, then? For most practical purposes, the diagonal '1.6Ω' line in Table 1 represents the lowest reactance we can realistically hope to achieve. That is why you commonly see 100nF capacitors in 455kHz IF stages, and in the RF stages of LW / MW broadcast receivers. For HF a typical value is 10nF, while 1nF is much more common at VHF. However, these nice round numbers conceal some further layers of design complexity. We've already seen that the aim of bypassing is to make the reactance of the capacitor much lower than other impedances connected to that point, so that the capacitor to ground is the preferred path for RF currents. That means that a suitable value of bypass capacitor will depend to some extent on the surrounding impedances. For example, in Fig 2 the impedance at the source of the MOSFET is low, so C5 needs to have a low reactance (higher value) for effective bypassing. In contrast, gate 2 of the MOSFET has a high impedance, and R1 and R2 connected to it will normally have high values; this means that a smaller capacitance at C3 can still be a very effective RF bypass.

Now is the time to look again at C8, C9 and C10 in Fig 2, and also to ask why R4 is there. In some poor designs you don't see an R4 at all; instead the cold ends of all tuned circuits are bypassed by a C7, and then connected directly to the DC supply rail. This is a recipe for disaster! Remember that a bypass capacitor can only provide a *preferred* route for RF currents to ground. There will always be some residual RF currents in all the other connections to the 'bypasssed' point. If you leave out R4, you are providing a maze of other routes for the RF currents. Instead of going almost exclusively through C7, the currents will run along the supply rail and divide themselves through C8, C9, etc. So instead of being RF-free, the supply rail is acting as an RF *interconnection* between the stages! That's why you should always use R4 and C8 as well as C7 at the top of a tuned circuit. In low-level transistor stages, R4 is typically 10-100Ω, depending on the voltage drop you can tolerate, and its impedance says to the RF: "You really don't want to come this way - go down through C7 instead". Some very small residual RF current will leak out through R4, and C8 is there to give a further preferred path to ground. If you build in those extra components as precautions at the design stage, you can save yourself a lot of trouble when you try to make the circuit work. ♦

**WWW.**

**SMD electrolytics:**
**www.vishay.com/document/40002/40002.pdf**
**www.cornell-dubilier.com/catalogs/1.045-1.046.pdf**
**(FAQs) www.kemet.com/keask**

| | Reactance (Ω) | | | | | |
|---|---|---|---|---|---|---|
| **Capacitance** | **10kHz** | **100kHz** | **1MHz** | **10MHz** | **100MHz** | **1GHz** |
| 100pF | 160,000 | 16,000 | 1,600 | 160 | 16 | 1.6 |
| 1nF (1000pF) | 16,000 | 1,600 | 160 | 16 | 1.6 | 0.16 |
| 10nF (10,000pF, 0.01µF) | 1,600 | 160 | 16 | 1.6 | 0.16 | 0.016 |
| 100nF (100,000pF, 0.1µF) | 160 | 16 | 1.6 | 0.16 | 0.016 | 0.0016 |
| 1.0µF | 16 | 1.6 | 0.16 | 0.016 | 0.0016 | 0.00016 |
| 10µF | 1.6 | 0.16 | 0.016 | 0.0016 | 0.00016 | 0.000016 |

**Table 1: Theoretical reactance of capacitors across a range of frequencies. Self-inductance and loss resistance mean that the shaded areas are not practically achievable.**

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 post 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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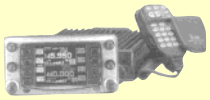

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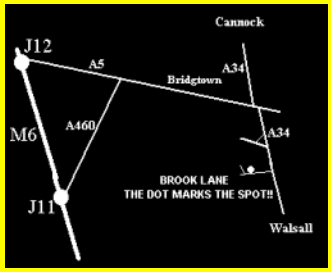


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| AZDEN | PCS-4000 | 2M TRANSCEIVER | £99.00 |
| BNOS | AMPLIFIER | 432-10-50 70CM 50Watt | £99.00 |
| CAPLO | SPL-3000 | ANTENNA TUNING UNIT | £199.00 |
| DAIWA | CNW-419 | ATU | £190.00 |
| DAIWA | CNW-518 | 1KW AUTO ATU | £199.00 |
| DAIWA | NS-660P | SWR &PWR MTR | £40.00 |
| DAIWA | CN-540 | SWR &PWR MTR | £30.00 |
| DAIWA | CN-630 | SWR &PWR MTR | £40.00 |
| DATONG | FL3 | FILTER | £75.00 |
| DATONG | FL-2 | FILTER | £60.00 |
| DRAKE | MN7 | ATU 300 WATT INPUT | £140.00 |
| DRAKE | R7 | HF RECEIVER | £550.00 |
| DRAKE | R-8E | HF RECEIVER | £499.00 |
| DRAKE | SW-2 | HF RECEIVER | £299.00 |
| DRAKE | SW-8 | WORLD BAND RECEIVER | £375.00 |
| DRESSLER | D200 | 2M MAINS AMPLIFIER 400Watt | £399.00 |
| FAIRHAVEN | RD-500 | WIDE BAND RECEIVER | £575.00 |
| ICOM | AT-150 | AUTO ATU | £175.00 |
| ICOM | AT-500 | AUTO ATU | £275.00 |
| ICOM | IC-2000H | 2/70 MOBILE TRANSCEIVER | £170.00 |
| ICOM | IC-2100H | 2M MOBILE TRANSCEIVER | £150.00 |
| ICOM | IC-251 | 2m MULTIMODE TRANSCEIVER | £295.00 |
| ICOM | IC-275E | 25W TRANSCEIVER | £525.00 |
| ICOM | IC-275H | 2M MULTIMODE 100W TRANSCEIVER | £575.00 |
| ICOM | IC-290H | 2M MULTIMODE MOBILE TRANSCEIVER | £250.00 |
| ICOM | IC-2KL | AUTOMATIC LINEAR AMPLIFIER + PSU | £999.00 |
| ICOM | IC-3230H | 2-70CM MOBILE TRANSCEIVER | £160.00 |
| ICOM | IC-471E | 70CM BASE MULITMODE TRANSCEIVER | £299.00 |
| ICOM | IC-490E | 70cms MULTIMODE MOBILE TRANSCEIVER | £265.00 |
| ICOM | IC-728 | HF TRANSCEIVER | £399.00 |
| ICOM | IC-730 | HF TRANSCEIVER MINT! | £400.00 |
| ICOM | IC-735 | HF TRANSCEIVER | £400.00 |
| ICOM | IC-737 | HF BASE BUILT IN ATU 100W | £595.00 |
| ICOM | IC-737 | HF inc ATU BASE STATION TRANSCEIVER | £575.00 |
| ICOM | IC-746 | TRANSCEIVER | £899.00 |
| ICOM | IC-756 | HF / 6m All Band Transceiver | £999.00 |
| ICOM | IC-756PRO | ICOM TRANSCEIVER | £1,699.00 |
| ICOM | IC-765 | HF BASE TRANSCEIVER | £800.00 |
| ICOM | IC-775DSP | HF 200W BASE STATION TRANSCEIVER | £1,499.00 |
| ICOM | IC-820 | 2-70CM BASE STATION 50Watt | £599.00 |
| ICOM | IC-821H | VHF / UHF MULTIMODE TRANSCEIVER | £699.00 |
| ICOM | IC-910 | 2/70 CM BASE TRANSCEIVER + 23CM UNIT | £1,100.00 |
| ICOM | IC-R2 | HANDY SCANNER | £99.00 |
| ICOM | IC-R3 | SCANNER + TV | £299.00 |
| ICOM | IC-R7000 | RECEIVER MINT! CONDITION | £550.00 |
| ICOM | IC-R72 | RECEIVER | £399.00 |
| ICOM | IC-R75 | HF / 6m RECEIVER | £475.00 |
| ICOM | IC-T81E | QUAD BAND HANDY 2m/6m/23cm/70cm | £250.00 |
| ICOM | IC-T8E | HANDY TRANSCEIVER | £175.00 |
| ICOM | IC-W21E | HANDY TRANSCEIVER | £199.00 |
| ICOM | PCR-1000 | COMPUTER SCANNER | £200.00 |
| ICOM | PS-1520A | POWER SUPPLY FITS ALL ICOM | £110.00 |
| ICOM | PS-85 | POWER SUPPLY | £175.00 |
| ICOM | R-75 | HF RECEIVER | £400.00 |
| ICOM | SP-20 | SPEAKER | £120.00 |
| ICOM | SP-21 | LOUDSPEAKER, BOXED | £55.00 |
| ICOM | T-7E | 2/70CM HANDY TRANSCEIVER | £170.00 |
| ICOM | T-8E | 2/70CM 6M HANDY TRANSCEIVER | £185.00 |
| ICOM | UT-84 | TONE SQUELCH UNIT | £25.00 |
| ICOM | IC-2SET | 2M HANDY | £89.00 |
| ICOM | IC-R71E | RECEIVER | £399.00 |
| JRC | JST-245DSP | HF 50MHz 1500w AC BASE TRANSCEIVER | £1,295.00 |
| JRC | NRD-535 | HF RECEIVER | £600.00 |
| KANTRONICS | KAM PLUS | TNC | £220.00 |
| KENWOOD | DFC-230 | FREQUENCY CONTROLLER | £70.00 |
| KENWOOD | PS-20 | 10A POWER SUPPLY FITS TR-9130 ETC | £55.00 |
| KENWOOD | PS-430 | POWER SUPPLY | £100.00 |
| KENWOOD | PS-50 | POWER SUPPLY | £145.00 |
| KENWOOD | R-5000 | RECEIVER | £499.00 |
| KENWOOD | SP-950 | LOUDSPEAKER | £90.00 |
| KENWOOD | SW-2000 | SWR METER | £60.00 |
| KENWOOD | TH-22E | 2M HANDY TRANSCEIVER | £89.00 |
| KENWOOD | TH-25E | HANDY TRANSCEIVER | £49.00 |
| KENWOOD | TH-47E | HANDY TRANSCEIVER | £100.00 |
| KENWOOD | TH-75E | 2/70 HANDY TRANSCEIVER | £125.00 |
| KENWOOD | TH-78E | 2/70CM HANDY TRANSCEIVER | £175.00 |
| KENWOOD | TH-79E | HANDY TRANSCEIVER | £189.00 |
| KENWOOD | TL-922 | HF LINEAR AMP 1Kw (AS NEW!) | £899.00 |
| KENWOOD | TM-231E | 2M MOBILE TRANSCEIVER | £120.00 |
| KENWOOD | TM-241E | 2M MOBILE TRANSCEIVER | £120.00 |
| KENWOOD | TM-251E | MOBILE TRANSCEIVER | £140.00 |
| KENWOOD | TM-255E | 2m MULTI-MODE MOBILE TRANSCEIVER | £400.00 |
| KENWOOD | TM-455E | 70CM MULTIMODE MOBILE TRANSCEIVER | £495.00 |
| KENWOOD | TM-733 | 2/70 MOBILE TRANSCEIVER | £225.00 |
| KENWOOD | TR-751E | 2M MULTIMODE TRANSCEIVER | £350.00 |
| KENWOOD | TR-851E | 70CM MULTIMODE MOBILE TRANSCEIVER | £395.00 |
| KENWOOD | TS-120 | HF SOLID STATE MOBILE | £225.00 |
| KENWOOD | TS-450S | HF TRANSCEIVER | £499.00 |
| KENWOOD | TS-450SAT | HF BUILT IN ATU EXCELLENT TRANSCEIVER | £575.00 |
| KENWOOD | TS-530SP | HF MAINS 100Watt TRANSCEIVER | £275.00 |
| KENWOOD | TS-680 | HF 6M MOBILE/BASE TRANSCEIVER | £400.00 |
| KENWOOD | TS-690SAT | HF 6M Inc ATU | £650.00 |
| KENWOOD | TS-711E | SM BASE STATION TRANSCEIVER | £399.00 |
| KENWOOD | TS-790E | 2/70CM BASE STATION TRANSCEIVER | £699.00 |
| KENWOOD | TS-790E | 2m / 70cm MULTIMODE BASE TRANSCEIVER | £799.00 |
| KENWOOD | TS-811E | 70cms MULTIMODE BASE TRANSCEIVER | £399.00 |
| KENWOOD | TS-830S | HF TRANSCEIVER | £325.00 |
| KENWOOD | TS-850SAT | HF TRANSCEIVER MINT! | £800.00 |
| KENWOOD | TS-870SAT | HF/DSP-IF-100W BUILT IN ATU TRANSCEIVER | £999.00 |
| KENWOOD | TS-950SD | HF/ 150W DSP BASE TRANSCEIVER | £1,100.00 |
| KENWOOD | TSB-2000 | LATEST KENWOOD - COMPUTER CONTROLED | £1,299.00 |
| KENWOOD | VFO-120 | | £50.00 |
| KENWOOD | VFO-180 | EXTERNAL VFO | £75.00 |
| KENWOOD | VS-1 | VOICE SYTHESISER | £30.00 |
| KENWOOD | VS-2 | VOICE SYTHESISER | £30.00 |
| KENWOOD | YG-455 CN-1 | 270Hz CW CRYSTAL FILTER | £100.00 |
| KENWOOD | YK-88A-1 | AM FILTER | £40.00 |
| KENWOOD | YK-88C-1 | 500Hz CW NARROW FILTER | £40.00 |
| KENWOOD | YK-88CN1 | 270Hz CW FILTER 8.83MHz IF | £40.00 |
| KENWOOD | YK-88S-1 | 2.4KHz SSB NARROW FILTER 8.83MHz IF | £40.00 |
| KENWOOD | YK-88SN | 1.8K SSB FILTER (TS-440 /R5000) | £40.00 |
| KENWOOD | YK-88SN-1 | 1.8KHz SSB NARROW FILTER 8.83MHz IF | £40.00 |
| KENWOOD | PS-430 | POWER SUPPLY | £120.00 |
| LINEAR AMP | CHALLENGER II | CHALLENGER AMPLIFIER 11 2kW | £1,400.00 |
| LOWE | HF-150 | SW RECEIVER | £150.00 |
| LOWE | HF-250 | INCLUDES REMOTE CONTROL | £300.00 |
| MCL | MCL1100 | EASY READER | £75.00 |
| MFJ | MFJ-414 | MORSE CODE TRAINER | £120.00 |
| MFJ | SET-UP | 971-9015-4114 PORTABLE 21MHz | £299.00 |
| MICROSET MICROWAVE | PT-135 | POWER SUPPLY | £80.00 |
| MODULES | 28/144 | TRANSVERTER 28/144 | £125.00 |
| PACCOM | TINY 11 | TNC | £99.00 |
| PACCOM | TNC-320 | TNC | £90.00 |
| PLESSEY | PR-2250 | HF RECEIVER BEST QUALITY CLASSIC! | £1,200.00 |
| QM 70 | 28/144 | TRANSVERTER | £100.00 |
| RACAL | RACAL 1792 | HF RECEIVER | £499.00 |
| REALISTIC | PRO-2037 | SCANNER BASE | £99.00 |
| REALISTIC | PRO-394 | HF RECIEVER | £99.00 |
| SGC | SGC-2020 | HF TRANSCEIVER | £450.00 |
| SOMMERKAMP | FT290R | 2m MULTI-MODE TRANSCEIVER | £180.00 |
| SONY | ICF-SW77 | FM/SW/MW/LW PORTABLE AS NEW! | £250.00 |
| SONY | SW-100E | FM/SW/MW/LW PORTABLE | £90.00 |
| ST3 HEADPHONES | | DELUXE HEADPHONES | £45.00 |
| SYNCRON | PS-1220VU | 20 AMP POWER SUPPLY | £60.00 |
| TAGRA | | 22AMP POWER SUPPLY | £70.00 |
| TENTEC | | SCOUT + MODULES | £350.00 |
| TIMEWAVE | DSP-9+ | | £125.00 |
| TOKYO HY-POWER | HL-30V | 2M and 25W AMPLIFIER | £75.00 |
| TOKYO HY-POWER | HL-37V | LINEAR AMPLIFIER | £60.00 |
| TONNA | 7000E | TERMINAL | £130.00 |
| TRIO | R-2000 | RECEIVER + CONVERTER | £300.00 |
| TRIO | TR-9130 | 2M ALL MODE TRANSCEIVER | £250.00 |
| TRIO | TRIO 9130 | 2M MOBILE MULITMODE TRANSCEIVER | £250.00 |
| TRIO | TS-780 | DUAL BAND BASE TRANSCEIVER | £275.00 |
| WELZ | AC-38M | 200W MOBILE MATCHING NETWORK | £50.00 |
| WELZ | SP-15M | SWR & POWER METER | £20.00 |
| YAESU | FC-102 | 1 .2KW ATU WITH 4 WAY SWITCHING UNIT | £200.00 |
| YAESU | FC-20 | AUTO ANTENNA TUNER FOR 847/FT100 | £175.00 |
| YAESU | FC-902 | ATU 500W | £140.00 |
| YAESU | FL-2100Z | HF AMPLIFIER | £450.00 |
| YAESU | FP700 | POWER SUPPLY | £100.00 |
| YAESU | FP-757HD | HEAVY DUTY POWER SUPPLY | £120.00 |
| YAESU | FRG-100 | HF RECEIVER | £300.00 |
| YAESU | FRG-7700 | HF RECEIVER | £220.00 |
| YAESU | FRG-8800 | RECEIVER INCLUDES CONVERTER | £399.00 |
| YAESU | FRT-7700 | ATU MINT! | £75.00 |
| YAESU | FRV-7700 | UHF CONVERTER MINT! | £80.00 |
| YAESU | FT-1000MK5 | 200W DSP HF TRANSCEIVER | £2,600.00 |
| YAESU | FT-1000MP | AC HF BASE DSPTRANS-CEIVER (Late serial no) | £1,550.00 |
| YAESU | FT-1000MP | DC BASE TRANSCEIVER | £1,200.00 |
| YAESU | FT-101ZDmk111 | HF TRANSCEIVER inc FM | £375.00 |
| YAESU | FT-225RD | 2M BASE MULTIMODE CLASSIC! | £399.00 |
| YAESU | FT-23R | HANDY TRANSCEIVER | £180.00 |
| YAESU | FT-2500M | MOBILE TRANSCEIVER | £190.00 |
| YAESU | FT-290RMK1 | 2M ALL MODE TRANSCEIVER | £180.00 |
| YAESU | FT-290RMK11 | MOBILE 2M MULTIMODE TRANSCEIVER | £275.00 |
| YAESU | FT-411E | 2M HANDY TRANSCEIVER | £99.00 |
| YAESU | FT-41R | HANDY TRANSCEIVER | £120.00 |
| YAESU | FT-470 | 2/70CM HANDY TRANSCEIVER | £140.00 |
| YAESU | FT-650AC | 26-50MHz 100w BASE STATION TRANSCEIVER | £599.00 |
| YAESU | FT-690MK11 | 6M MULTIMODE MOBILE TRANSCEIVER | £295.00 |
| YAESU | FT-690RMK | 1 6M MULTIMODE MOBILE TRANSCEIVER | £250.00 |
| YAESU | FT-690RMK11 | 6M PORTABLE | £375.00 |
| YAESU | FT-726R | 2 / 70 / HF TRANSCEIVER | £400.00 |
| YAESU | FT-726R | 2 / 70 / 6m TRANSCEIVER | £575.00 |
| YAESU | FT-730R | 70CM MOBILE TRANSCEIVER | £120.00 |
| YAESU | FT-736R | 2/70/6/23CM TRANSCEIVER | £1,050.00 |
| YAESU | FT-736R | 2m / 70cm TRANSCEIVER | £650.00 |
| YAESU | FT-736R | 2m/70cm/6m TRANSCEIVER | £750.00 |
| YAESU | FT-7400 | 70cm MOBILE TRANSCEIVER | £160.00 |
| YAESU | FT-747GX | HF TRANSCEIVER | £399.00 |
| YAESU | FT-747GX | TRANSCEIVER | £299.00 |
| YAESU | FT-757GXMK11 | TRANSCEIVER MINT! | £400.00 |
| YAESU | FT-757MK1GX | HF TRANSCEIVER | £375.00 |
| YAESU | FT-767GX | HF BASE 100watt built-in ATU | £599.00 |
| YAESU | FT-77 | INCLUDES FM MINT! | £275.00 |
| YAESU | FT-790R | 70CM MULTIMODE MOBILE TRANSCEIVER | £225.00 |
| YAESU | FT-7B | HF 50W MOBILE TRANSCEIVER | £199.00 |
| YAESU | FT-80C | 0-30MHz COMMERCIAL TRANSCEIVER | £375.00 |
| YAESU | FT-8100 | 2/70cm MOBILE TRANSCEIVER | £249.00 |
| YAESU | FT-811E | 70CM HANDY TRANSCEIVER | £99.00 |
| YAESU | FT-847 | HF / 2 / 6 / 70cm BASE TRANSCEIVER | £999.00 |
| YAESU | FT-900 | HF TRANSCEIVER | £550.00 |
| YAESU | FT-902DM | HF BASE TRANSCEIVER | £400.00 |
| YAESU | FT-920AF | HF/6M BASE WITH DSP | £899.00 |
| YAESU | FT-980 | HF TRANSCEIVER | £495.00 |
| YAESU | FT-990AC | HF BASE STATION TRANSCEIVER | £750.00 |
| YAESU | FT-ONE | HF BASE TRANSCEIVER | £450.00 |
| YAESU | FTV-901 | TRANSVERTER Inc 2m Mod | £165.00 |
| YAESU | FV-707 | VFO UNIT | £99.00 |
| YAESU | SP-8 | LOUDSPEAKER Including Audio Filters | £100.00 |
| YAESU | VFO-102 | MINT CONDITION! | £199.00 |
| YAESU | VR-5000TOP | RANGE SCANNER RECEIVER | £500.00 |
| YAESU | VX-5R | 2 / 70 / 6 HANDIE 5W | £220.00 |
| YAESU | XF-114SN | 2KHz SSB FILTER | £60.00 |
| YAESU | YO-100 | SCOPE VERY RARE! | £150.00 |
| YAESU | YS-60 | SWR METER 1.6 - 60MHz | £30.00 |
| YUPITERU | MVT-7000 | HANDY SCANNER | £99.00 |
| ZETAGI | B-132 | 10 / 11m LINEAR AMPLIFIER, MAINS | £60.00 |

# RSGB IOTA ANNUAL LISTINGS 2002

## by Roger Balister, G3KMA, RSGB IOTA Manager*

ONE NEW IOTA A WEEK was last year's proud boast. This was never going to continue. Boosted then by the addition of 58 new IOTAs to the list, activity hit a record peak, creating in the process nervous tension among some of the programme's keenest participants. The 12 months that followed, up to January this year, saw a return to a more tempered rate of one new IOTA every two and a half weeks. And since then it has moved to an even more sustainable rate of one a month. Thank goodness, time to fit in a family holiday between operations!

Most top players saw an increase in their scores of around 30. This is higher than the number of new ones which can only reflect reactivation of some very rare IOTAs as well as receipt of late QSLs from operations in the previous year. The gap between the first and the 20th stations has narrowed sharply from 43 to 36. Increased bunching will become a feature of the listing as, one by one, the remaining very rare numbered groups that last saw activity 15 or more years ago are reactivated. The number of members who have achieved the Plaque of Excellence level (750 groups) has jumped from 150 to 180 with another 50 or so within striking distance.

The number of new award applicants increased by 6% in the period under review. While this may be lower than in previous years, the level of interest in IOTA contacts has never been greater. IOTA is firmly established as an activity programme rather than primarily an award programme. Each year hundreds of amateurs experience for the first time the delight (did someone say "discomfort"?) of an IOTA DXpedition. The

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**One of many new Indonesian IOTAs activated in 2000/2001. Left to right: YD8SKP, YC8RSW, YC8TXW and YC8UFF.**



**QSLs from two 'new ones' for IOTA during the year: YV5JBI/P from Piritu Afuera (SA-090) (top left) and RI0B from Ushakova Island (AS-156).**

# IOTA HONOUR ROLL - MAY 2002

**(minimum qualification = confirmed QSOs with half of activated IOTA island groups)**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F9RM | 998 | 81 | SM0AJU | 870 | 163 | CT1UD | 769 | 244 | DL7CW | 692 | 325 | DL5AWI | 613 | 405 | GM3BCL | 549 |
| 2 | I1ZL | 989 | 83 | W2FXA | 869 | 163 | K5MK | 769 | 245 | G3SJX | 691 | 325 | SM7WDS | 613 | 405 | VE2FVD | 549 |
| 3 | 9A2AA | 986 | 84 | F5XL | 866 | 165 | K1HTV | 768 | 246 | DK6AO | 690 | 325 | WF5E | 613 | 408 | DL3ECK | 547 |
| 3 | I1SNW | 986 | 84 | G4SOZ | 866 | 166 | VE3MDQ | 767 | 247 | DL1BKK | 687 | 328 | DL6ATM | 612 | 408 | JM1XCW | 547 |
| 5 | W9DC | 981 | 86 | I8YRK | 863 | 167 | I1CAW | 763 | 248 | JA9IFF | 686 | 328 | JR6SVM | 612 | 410 | KH7RS | 546 |
| 6 | ON6HE | 980 | 87 | ZL2VS | 861 | 168 | W9HAO | 761 | 249 | DL2NES | 685 | 328 | WC6DX | 612 | 410 | W5ZE | 546 |
| 7 | EA4MY | 979 | 88 | VE7YL | 860 | 169 | W0BBT | 759 | 250 | G3YAA | 683 | 331 | EA5OL | 611 | 412 | G3AEZ | 545 |
| 8 | GM3ITN | 978 | 89 | 4X4JU | 859 | 170 | N4QQ | 758 | 251 | KA5TQF | 680 | 331 | GW0VMZ | 611 | 412 | ON4BB | 545 |
| 8 | I2YDX | 978 | 90 | G4BWP | 858 | 170 | UA9YE | 758 | 252 | WB2YQH | 679 | 331 | IK1QFM | 611 | 414 | OE2KGM | 544 |
| 8 | I8XTX | 978 | 91 | F6CKH | 856 | 172 | DJ4XA | 757 | 253 | N4AH | 678 | 331 | N3ERM | 611 | 414 | WD9FEN | 544 |
| 11 | IK1JJB | 975 | 92 | F9GL | 855 | 173 | G4RFV | 756 | 254 | VE3LYC | 677 | 331 | VO1XC | 611 | 416 | G3PFS | 543 |
| 12 | I8KNT | 971 | 93 | K8NA | 853 | 173 | PY5PS | 756 | 255 | DL8DXL | 675 | 336 | G3XON | 610 | 417 | DL8MER | 541 |
| 12 | VE6VK | 971 | 93 | SM5DJZ | 853 | 175 | N6BOI | 754 | 256 | G4DUW | 673 | 336 | VE6PW | 610 | 417 | IT9AZS | 541 |
| 14 | I8ACB | 968 | 93 | SM6CVX | 853 | 176 | IK4HLU | 753 | 256 | I2JSB | 673 | 338 | IT9FXY | 609 | 417 | LA2PHA | 541 |
| 15 | F2BS | 967 | 96 | G3OCA | 852 | 177 | WT2O | 752 | 258 | HB9BMY | 672 | 338 | OE6GRG | 609 | 420 | DK1FW | 540 |
| 16 | K9PPY | 966 | 97 | F6DZU | 851 | 178 | G3TOK | 751 | 258 | I2LXA | 672 | 340 | F2YT | 608 | 420 | DL4FDM | 540 |
| 17 | ON7EM | 965 | 98 | G3TJW | 850 | 179 | AA5AT | 750 | 260 | LA2PA | 671 | 340 | SM6TEU | 608 | 420 | N3CWP | 540 |
| 18 | DL8NU | 963 | 98 | IK1ADH | 850 | 179 | DL5MU | 750 | 261 | G3LAS | 670 | 340 | WD0FTD | 608 | 423 | K0DEQ | 539 |
| 18 | IT9GAI | 963 | 100 | W9HA | 848 | 181 | RW4HW | 749 | 262 | AA9DX | 669 | 343 | F6IMB | 607 | 424 | JN3SAC | 538 |
| 20 | G3GIQ | 962 | 101 | K8SIX | 845 | 182 | F6FHO | 748 | 263 | I0ZYA | 668 | 343 | F8PX | 607 | 425 | HB9BIN | 537 |
| 21 | WD8MGQ | 960 | 102 | DL8USA | 844 | 183 | UR5LCV | 747 | 264 | DL6DK | 666 | 343 | HK3JJH | 607 | 426 | EA3BT | 535 |
| 22 | F6AJA | 957 | 102 | EA7DUD | 844 | 184 | GI0TJJ | 743 | 264 | VK3UY | 666 | 343 | W3SI | 607 | 426 | G0VBD | 535 |
| 22 | ON4AAC | 957 | 104 | DL6MI | 843 | 185 | W4ABW | 742 | 266 | DL5ME | 665 | 347 | S51RU | 606 | 428 | EA7TV | 534 |
| 24 | K8DYZ | 954 | 105 | CT1EEB | 840 | 186 | VK7BC | 740 | 267 | HB9CEX | 664 | 347 | W3KO | 606 | 428 | G0WRE | 534 |
| 25 | N7TZ | 953 | 106 | EA3KB | 839 | 187 | N5XG | 739 | 267 | IT9HLR | 664 | 349 | JA4UQY | 605 | 428 | OZ7DN | 534 |
| 26 | OM3JW | 951 | 106 | N6PYN | 839 | 188 | W1CU | 737 | 269 | DF9ZN | 663 | 349 | OE3JHC | 605 | 431 | OH2BF | 533 |
| 27 | G4WFZ | 949 | 108 | IK4CWP | 838 | 189 | G0ANH | 736 | 269 | JA5IU | 663 | 351 | EI2HY | 604 | 431 | ON4AWZ | 533 |
| 27 | VE3XN | 949 | 109 | GJ3LFJ | 835 | 189 | PA3EXX | 736 | 271 | JA7JI | 662 | 351 | JA8RJE | 604 | 433 | DL5MX | 532 |
| 29 | ON5KL | 947 | 110 | G0APV | 833 | 191 | I4UDV | 735 | 271 | SM5JE | 662 | 353 | 7K3EOP | 603 | 434 | DJ5AI | 530 |
| 30 | G3ZAY | 946 | 110 | OZ5MJ | 833 | 191 | JH2AYB | 735 | 273 | CT1AHU | 661 | 353 | IK8CVZ | 603 | 435 | JL7BRH | 528 |
| 31 | DK6NP | 943 | 112 | GM0AGN | 832 | 193 | I4GAS | 734 | 274 | IK4HPU | 660 | 353 | W7MO | 603 | 436 | G3SWH | 526 |
| 32 | W5BOS | 942 | 113 | N6AWD | 831 | 194 | F9MD | 732 | 275 | G0RCI | 657 | 356 | HB9BHY | 601 | 436 | IK8JWA | 526 |
| 33 | OH2QQ | 941 | 114 | HB9RG | 830 | 195 | G3HSR | 731 | 275 | N5FW | 657 | 356 | JA1GRM | 601 | 436 | IT9RZR | 526 |
| 34 | IK2MLY | 939 | 115 | EI7CC | 829 | 196 | F5IL | 730 | 277 | F5TJC | 656 | 356 | KQ4YI | 601 | 439 | IK1AOD | 525 |
| 35 | I4LCK | 938 | 115 | ON4QP | 829 | 196 | G3PMR | 730 | 278 | F5HNQ | 655 | 359 | SM7CNA | 600 | 439 | IK2WXZ | 525 |
| 36 | DK1RV | 937 | 117 | G3VJP | 828 | 196 | IK2WAL | 730 | 278 | G3SMP | 655 | 359 | W7OF | 600 | 439 | IK4DCS | 525 |
| 36 | F6BFH | 937 | 118 | AA7AV | 824 | 196 | OZ1ACB | 730 | 278 | W0GAX | 655 | 361 | KM4RX | 598 | 439 | IK4SDY | 525 |
| 38 | EA8AKN | 936 | 118 | W3KH | 824 | 196 | VE3PRU | 730 | 278 | W1ENE | 655 | 362 | IK8JVG | 596 | 443 | VE2NW | 524 |
| 39 | I0OLK | 933 | 120 | I2YWR | 823 | 201 | I1EEW | 729 | 282 | HB9CMZ | 653 | 363 | G4XOP | 595 | 444 | F5RBB | 523 |
| 39 | K6DT | 933 | 121 | G3XTT | 821 | 202 | HA1AG | 728 | 283 | IK7MXB | 651 | 363 | I4CSP | 595 | 445 | G3EZZ | 522 |
| 39 | OE3WWB | 933 | 122 | GW3ARS | 820 | 203 | CT1EEN | 727 | 283 | JF4VZT | 651 | 363 | KI6T | 595 | 446 | DL1BKI | 521 |
| 42 | EA5AT | 932 | 122 | OE3SGA | 820 | 203 | EA5KB | 727 | 285 | IK0AZG | 650 | 366 | PY2DBU | 593 | 446 | EA3JL | 521 |
| 43 | G3ALI | 929 | 124 | ON4IZ | 819 | 203 | VE3JV | 727 | 286 | OE1MEW | 649 | 367 | DL4MCF | 592 | 446 | IT9ZGY | 521 |
| 44 | F6AXP | 928 | 124 | ON5NT | 819 | 206 | OH5PA | 725 | 287 | DL6KVA | 647 | 367 | KC5E | 592 | 446 | WB3DNA | 521 |
| 44 | F6DLM | 928 | 126 | KD1CT | 818 | 207 | IK8TWV | 723 | 287 | N6JV | 647 | 369 | G3RTE | 591 | 450 | DL6ZXG | 520 |
| 46 | K7SO | 926 | 127 | OH2BLD | 817 | 208 | WW1V | 722 | 289 | IK2ILH | 646 | 369 | JA2CEJ | 591 | 451 | G4NXG/M | 519 |
| 47 | I2FUG | 924 | 128 | DK2PR | 816 | 209 | EA7ABW | 721 | 289 | JH1QVW | 646 | 369 | W6YOO | 591 | 452 | DF5WA | 518 |
| 47 | IK8DDN | 924 | 129 | F6CUK | 814 | 210 | SM5CZY | 719 | 291 | 5B4AFB | 645 | 372 | JA1KQX | 590 | 452 | F6HQP | 518 |
| 49 | 4Z4DX | 922 | 129 | HB9BVV | 814 | 211 | DL6MST | 718 | 292 | DJ9HX | 643 | 373 | I2PQW | 589 | 452 | K2SHZ | 518 |
| 50 | F6ELE | 921 | 131 | DL8DSL | 813 | 212 | N7RO | 716 | 292 | NN2C | 643 | 374 | I1GEA | 588 | 452 | VE7TLL | 518 |
| 51 | ON4FU | 920 | 131 | G3RUV | 813 | 213 | DL5ZG | 714 | 292 | VE7QCR | 643 | 374 | JA1SKE | 588 | 456 | JA6LCJ | 517 |
| 52 | I2VDX | 918 | 131 | N8JV | 813 | 213 | I8YZP | 714 | 295 | DJ8QP | 642 | 376 | DJ4GJ | 586 | 457 | I4JBJ | 516 |
| 53 | OZ4RT | 915 | 134 | AD5A | 810 | 215 | W1OX | 713 | 295 | I1ZXT | 642 | 376 | DK6IP | 586 | 457 | K5FNR | 516 |
| 53 | W1NG | 915 | 134 | JE1DXC | 810 | 216 | HB9BZA | 712 | 295 | JA1EY | 642 | 378 | G4XRX | 585 | 457 | ON4BAV | 516 |
| 55 | WB9EEE | 914 | 136 | CT4NH | 806 | 217 | G3HTA | 711 | 295 | PA2JHO | 642 | 379 | JH2KXN | 584 | 460 | F5JQI | 515 |
| 56 | ON4XL | 913 | 137 | DL2SCQ | 805 | 218 | G3MLX | 710 | 295 | SP5TZC | 642 | 380 | CT1BY | 583 | 460 | K8LJG | 515 |
| 57 | VE7IG | 912 | 138 | DK2UA | 804 | 218 | IK4WMA | 710 | 300 | K8AJK | 641 | 381 | W8WFN | 578 | 462 | DL9GOA | 514 |
| 58 | VE7IU | 909 | 139 | F6CYV | 802 | 220 | F5NPS | 708 | 301 | G0MSM | 640 | 382 | HA0HW | 573 | 462 | G3XPO | 514 |
| 59 | W4BAA | 905 | 139 | SM6CAS | 802 | 220 | ON5TW | 708 | 301 | S52KM | 640 | 382 | JA1BNW | 573 | 464 | HB9BCK | 513 |
| 60 | N5JR | 904 | 141 | W5KN | 801 | 222 | G3OAG | 707 | 303 | KB5GL | 638 | 382 | KD3CQ | 573 | 464 | N6KZ | 513 |
| 61 | HB9AFI | 902 | 142 | K3FN | 797 | 222 | SM7TE | 707 | 304 | IK4IDF | 636 | 382 | S51TE | 573 | 464 | N8MZ | 513 |
| 62 | I1HYW | 901 | 143 | I5ZJK | 796 | 224 | G3UAS | 706 | 305 | UA4SKW | 635 | 386 | HA7UW | 570 | 464 | RZ1OA | 513 |
| 63 | 9A2TW | 900 | 144 | W6ED | 793 | 225 | N6JM | 705 | 306 | S51ZY | 634 | 386 | JH1IED | 570 | 464 | US7MM | 513 |
| 63 | VE3LDT | 900 | 145 | I4EAT | 792 | 226 | DL1BDD | 704 | 306 | W5RQ | 634 | 388 | SM3TLG | 567 | 469 | HA9PP | 511 |
| 65 | IK1AIG | 899 | 146 | N6VR | 791 | 226 | DL8MLD | 704 | 308 | DL5SBA | 632 | 389 | G3KYF | 566 | 470 | I5CRL | 510 |
| 65 | W4DKS | 899 | 147 | G0LRJ | 789 | 228 | DK8UH | 703 | 309 | HA5DA | 631 | 389 | IK2PZG | 566 | 471 | SM5BMB | 509 |
| 67 | ZL1ARY | 897 | 148 | N5ET | 786 | 228 | EA1KK | 703 | 309 | RA6AR | 631 | 389 | IK4PMA | 566 | 471 | VE3ZZ | 509 |
| 68 | HA0DU | 893 | 148 | W2JZK | 786 | 230 | ON4ADN | 702 | 311 | DL8YR | 629 | 392 | DL1XE | 564 | 473 | LU5DV | 508 |
| 69 | DF2NS | 889 | 150 | I1TBE | 784 | 230 | W9NZM | 702 | 311 | HA6NF | 629 | 393 | G4VXT | 563 | 473 | SV1JA | 508 |
| 69 | I2MWZ | 889 | 151 | G0MYC | 783 | 232 | JR7TEQ | 701 | 313 | DL9JH | 627 | 394 | AB5C | 562 | 475 | IN3QCI | 507 |
| 69 | VK9NS | 889 | 152 | KH6WU | 782 | 233 | IK2IGX | 700 | 313 | SM4SET | 627 | 395 | I2MQP | 559 | 475 | ON5SY | 507 |
| 72 | N5UR | 887 | 153 | G4LVQ | 781 | 234 | F5PAC | 699 | 315 | UA6AF | 626 | 395 | N5OUE | 559 | 477 | DF7HX | 506 |
| 73 | DL1SDN | 885 | 154 | G3ZBA | 779 | 234 | JA1QXY | 699 | 316 | KD6WW | 625 | 397 | DJ3XG | 558 | 477 | G3ZQQ | 506 |
| 74 | G3NUG | 882 | 154 | GM0KCY | 779 | 234 | K2VV | 699 | 316 | OZ1HPS | 625 | 398 | AB6QM | 556 | 477 | OH3MIG | 506 |
| 75 | I1WFF | 881 | 154 | UY5XE | 779 | 237 | EA9PB | 697 | 318 | IT9YRE | 624 | 399 | DF7GK | 555 | 477 | OZ5JQ | 506 |
| 75 | OK1JKM | 881 | 157 | JF1SEK | 778 | 238 | DL8FL | 696 | 319 | DL2MEV | 622 | 400 | IK4MSV | 552 | 481 | PY4OY | 505 |
| 77 | DK6NJ | 877 | 158 | I8LEL | 775 | 238 | JO1WKO | 696 | 320 | DL2DXA | 621 | 401 | ON4CAS | 551 | 482 | DL1DWT | 504 |
| 78 | IK1GPG | 873 | 159 | IK2EUY | 774 | 240 | I1FY | 695 | 321 | JA8IYI | 619 | 402 | IK1NEG | 550 | 482 | HA0UZ | 504 |
| 79 | CT1ZW | 872 | 160 | WF1N | 773 | 241 | AB5EB | 694 | 322 | IK2UEC | 618 | 402 | OE6DK | 550 | 482 | IK0OEM | 504 |
| 79 | W1DIG | 872 | 161 | ON4ON | 772 | 241 | VE3NSZ | 694 | 323 | HA0IH | 616 | 402 | UA0FZ | 550 | 482 | N1KC | 504 |
| 81 | IK8PGC | 870 | 162 | G8JM | 770 | 243 | K1OA | 693 | 324 | W1KSZ | 615 | 405 | G0KIK | 549 | 486 | WA7OBH | 503 |
| | | | | | | | | | | | | | | | 486 | WW8W | 503 |

## IOTA ANNUAL LISTING - MAY 2002 (RSGB MEMBERS)

**(minimum qualification = confirmed QSOs with 100 IOTA island groups)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 493 | G3DZS | 501 | 897 | G0PCF | 282 | 1119 | G4SSH | 209 | 1399 | G2FQR | 137 |
| 504 | G3KWK | 496 | 906 | GM0OYU | 278 | 1152 | G5MY | 204 | 1407 | G4ZME | 136 |
| 508 | I1BUP | 488 | 908 | G3VDL | 277 | 1152 | MM0BQI | 204 | 1413 | G0DHZ | 135 |
| 544 | AB5EU | 449 | 913 | G0UKX | 274 | 1169 | G0AHC | 202 | 1419 | G3KNU | 134 |
| 551 | G3LUW | 440 | 918 | G0ARF | 272 | 1169 | G0MTN | 202 | 1426 | SM6CZU | 133 |
| 555 | GW3NXR | 436 | 919 | G4MVA | 271 | 1169 | G0THF | 202 | 1436 | G4TGK | 132 |
| 575 | G4JFS | 426 | 927 | G4FAM | 268 | 1188 | G0SWG | 201 | 1439 | G3JQJ | 131 |
| 591 | 9V1RH | 415 | 928 | MM0ABJ | 267 | 1195 | G0UWW | 200 | 1439 | GM4ELV | 131 |
| 594 | GM0PKX | 412 | 939 | G8DR | 261 | 1195 | G3DCC | 200 | 1444 | G0ZMC | 130 |
| 605 | G3NDC | 410 | 945 | G0FUV | 259 | 1195 | G3IZM | 200 | 1463 | G0SJC | 126 |
| 605 | G4DQW | 410 | 945 | G3GHY | 259 | 1195 | GM4CHX | 200 | 1463 | G0XBI | 126 |
| 619 | G3LHJ | 404 | 949 | G3VOF | 258 | 1205 | GM4SID | 199 | 1463 | G3WRD | 126 |
| 619 | G4GIR | 404 | 952 | G0PHN | 257 | 1222 | G4YYR | 193 | 1490 | G0OOF | 123 |
| 623 | G0GKY | 403 | 952 | GW4TSG | 257 | 1231 | GW0SLM | 187 | 1490 | G3ASG | 123 |
| 623 | G4BGW | 403 | 957 | G3SBP | 254 | 1233 | G3JYP | 186 | 1500 | G0KEY | 122 |
| 641 | G4KGT | 398 | 962 | G0WAX | 250 | 1239 | G0EAA | 183 | 1511 | G2HLU | 121 |
| 644 | GW0IWD | 397 | 965 | G3JUL | 249 | 1239 | G3ZKW | 183 | 1518 | G3PJT | 120 |
| 651 | G0PAJ | 393 | 969 | G4RTO | 248 | 1248 | G3JTO | 179 | 1518 | G3WPT | 120 |
| 655 | G0FYX | 392 | 971 | G3NKC | 247 | 1251 | GI0KVQ | 177 | 1518 | G4AKR | 120 |
| 690 | G0VLK | 362 | 983 | GW0ANA | 244 | 1254 | MW0CBC | 176 | 1518 | GD0ADV | 120 |
| 690 | G4KBX | 362 | 985 | G2FFO | 242 | 1265 | G0VYR | 172 | 1546 | G3FNM | 119 |
| 704 | G0TYV | 355 | 985 | G3GZJ | 242 | 1271 | G4NAQ | 171 | 1546 | MM0BPP | 119 |
| 707 | G3MDH | 353 | 991 | G3DPX | 241 | 1273 | G0BFJ | 170 | 1626 | G0HBB | 116 |
| 720 | G4OBK | 342 | 997 | G4VMX | 238 | 1273 | G3PSY | 170 | 1626 | G0PPK | 116 |
| 723 | G3EKJ | 340 | 1014 | G0PSE | 234 | 1276 | EI2CH | 169 | 1626 | GW0PUP | 116 |
| 725 | G3GMY | 338 | 1014 | G3HQH | 234 | 1285 | G3ZJF | 166 | 1650 | G3IZD | 115 |
| 726 | G0CGL | 337 | 1017 | G4VBI | 233 | 1290 | G8GG | 165 | 1664 | G4ZOY | 114 |
| 732 | G3LPS | 335 | 1020 | G2BFO | 232 | 1297 | G3KDE | 163 | 1688 | GI0VJV | 112 |
| 733 | G3TLG | 334 | 1026 | G3NOH | 231 | 1305 | GM3EDZ | 160 | 1701 | GW0HUT | 111 |
| 747 | G3OLY | 326 | 1031 | G4POF | 229 | 1316 | G0HXN | 157 | 1728 | DL4NBE | 109 |
| 753 | G4UZN | 324 | 1043 | G3ECS | 227 | 1316 | G3DNF | 157 | 1728 | GM0VRP | 109 |
| 766 | G3YEC | 320 | 1053 | OZ4ZT | 225 | 1316 | G3LIV | 157 | 1754 | G0KRL | 108 |
| 786 | M0ADG | 316 | 1068 | G3CWW | 222 | 1334 | G3LCG | 152 | 1754 | G4VPF | 108 |
| 830 | G0MUR | 305 | 1068 | G3XLF | 222 | 1339 | G0YYY | 151 | 1784 | G0TDV | 106 |
| 830 | G0REP | 305 | 1081 | G4PZQ | 218 | 1348 | G3HQX | 149 | 1784 | G4ASL | 106 |
| 839 | G2ART | 304 | 1099 | G4DJC | 213 | 1356 | G3IMK | 147 | 1803 | G3FIC | 105 |
| 862 | G3DEF | 300 | 1109 | G4ZKJ | 211 | 1359 | G0DNV | 146 | 1803 | G3GHS | 105 |
| 869 | G4YRR | 298 | 1109 | GM4KHE | 211 | 1371 | G2HDR | 144 | 1803 | G6QQ | 105 |
| 873 | G2ATM | 297 | 1109 | M0BRK | 211 | 1375 | MM0BCR | 143 | 1818 | G0AEV | 104 |
| 887 | GW4BYA | 288 | 1119 | G2HW | 209 | 1381 | G0DEZ | 141 | 1818 | G3TTC | 104 |
| 890 | G3VQO | 287 | 1119 | G3LSW | 209 | 1381 | GM0LVI | 141 | 1835 | G4EHT | 103 |
| 895 | G0SBQ | 283 | 1119 | G4FVK | 209 | 1385 | G8FF | 140 | 1851 | G3RGD | 102 |
| | | | | | | | | | 1866 | ZC4IW | 101 |

fact that so many now make it an annual or biennial 'event' must indicate how enjoyable it can be.

## IOTA CONTESTERS

THE IOTA CONTEST is an event which regularly attracts 1000 or more entries. Most years many of the leading stations work more than the minimum 100 groups required to enter the listing. Yet, so far, very few have submitted an entry. Contest groups who operate from islands within the same DXCC entity year after year have a great opportunity to build a big score. Any serious IOTA contester will find that effort spent in getting into IOTA can be amply rewarded with additional points in the contest. Regular programme participants have considerable knowledge of island station activity through familiarity with the callsigns of resident islanders and current operations as well as a better knowledge than most of island geography! Tap into that expertise and it could lead to swifter identification of those valuable multipliers and IOTA numbers in QRM conditions and, importantly, improve the chances of spotting mistakes in the log entry before submission! If your group has little IOTA expertise, why not grow it by starting a club entry or by encouraging your operators individually to get into IOTA? After all, if enough clubs submitted entries, it could develop into a contest 'off piste'!

This is an appropriate point to mention that the *IOTA Directory - 11th Edition* has just been published [purchase details available on page 28 - *Ed*]. It has all the latest information, particularly on new numbers, that contesters require. Maximise the use of your time and minimise the scope for errors by being up to date.

## CHANGES TO THE TABLES

NOTE THAT WE PLAN to apply next year the new rule in the latest *IOTA Directory* that limits inclusion in the listing to those members who update their scores at least once every five years. The purpose is to stimulate regular updating and, by removing the scores of 'lapsed' members, increase participant interest.

It is important therefore that members who have not updated since the 1998 annual listings and wish to remain listed should make a submission before end-January 2003. This change should not have a major effect on the Honour Roll where four out of five members have updated in the last year alone, but it could lead to some reduction in the size of the other annual listings. Update now and keep your score live!

The records of 'lapsed' members will be retained on the IOTA HQ database.

## UNCHECKED CREDITS DELETED

LATER THIS YEAR members who have not converted their records to the revised island listing in *Directory 2000* will have this done

### PARTICIPATION BY CONTINENT

| | |
|---|---|
| Europe | 1162 |
| North America | 426 |
| Asia | 220 |
| South America | 43 |
| Oceania | 30 |
| Africa | 9 |
| **Total** | **1890** |


**A joint Italian / British team activated T88SI from Sonsorol Island in the South Palau group in February 2002. Congratulations on 3500 QSOs made by Maurizio, IZ1CRR; Derek, G3KHZ; and Ferdinando, IT9YRE.**

for them by IOTA HQ. This is no cause for hurrahs! The maximum 19 credits concerned will either be confirmed or repositioned where HQ knows the correct group or, more likely, deleted. Where this happens, Checkpoints should, in early December, be able to provide information on revised scores in time for replacement card action to be taken before the end-January 2003 annual listings deadline.

## CREDITS PREFACED WITH '/'

THE PREFACING of a credit with '/' on a member's record signifies that the relevant card needs to be resubmitted before 1 February 2005 to the Checkpoint for confirmation that it counts for the group or, alternatively, replaced with a card from a valid island. The *Directory 2000* revision exercise identified some 25 islands in the list that, on a close examination of detailed marine maps, failed the qualification criteria. The Committee decided that all credits would remain valid until 1 February 2005 but that after that date these islands would cease to count for the groups in question and the credits would be withdrawn. It follows that credits prefaced with '/' that are not rechecked will similarly be deleted.

## THANKS

MOST IOTA DXpeditioners see their operations through without thought or expectation of financial assistance and they deserve our thanks, every one of them.

Some operations, however, particularly ones targeted on unnumbered or very rare IOTAs, are dependent on outside funding. Without it they could not take place. We are fortunate that, where a need can clearly be demonstrated, there are organisations and individuals ready to help.

A number of the operations that contributed to the increased scores mentioned above received funding from the Island Radio Expedition Foundation, Inc (IREF), and it's about this organisation that I would like to say a few words.

IREF was specifically created to provide support to qualifying expeditions to unnumbered or rare IOTA groups. Since its inception in 1999, it has granted more than $10,000 to more than 30 expeditions of which 16 were new IOTAs. Governed by an international Board of Directors it operates independently of the RSGB and its IOTA Committee. It is a subscription-based organisation, that means its funds come from members, most of whom are US amateurs. IREF is keen to expand and spread its membership base beyond the US. Maybe you would like to show your thanks by becoming a member. If so, please contact Island Radio Expedition Foundation, Inc., 118 Oak Ridge Drive, New Braunfels, Texas 78132, USA; e-mail: ad5a@sat.net (website below).

Finally, a big vote of thanks to our Checkpoints for the sterling work they do to provide a local service to you on our behalf. We could not do without them. ♦

## IOTA SWL LISTING - MAY 2002

| | | | | | |
|---|---|---|---|---|---|
| 1 | DE0MST | 983 | 31 | JH8GAU | 264 |
| 2 | BRS-8841 | 925 | 32 | F-10046 | 258 |
| 3 | DL-SWL P Sinke | 906 | 33 | ONL-4234 | 229 |
| 4 | UA3-147-412 | 794 | 34 | F-10437 | 220 |
| 5 | I1-21171 | 771 | 35 | UA1-136-644/MM | 216 |
| 6 | I1-12387 | 750 | 36 | ONL-5923 | 212 |
| 7 | ONL-7681 | 749 | 37 | DE0OLL | 210 |
| 8 | DL-9286 | 680 | 38 | DE0THM | 206 |
| 9 | NL-4276 | 660 | 39 | DE1ABM | 205 |
| 10 | BRS-47426 | 645 | 40 | EI-982/G | 197 |
| 11 | F-16332 | 591 | 41 | DE0RFE | 172 |
| 12 | DL-312WW | 579 | 42 | OM3-28013 | 170 |
| 13 | JA1-20784 | 562 | 43 | I2-66508 | 169 |
| 14 | DL-20064 | 516 | 44 | UA0-124-451 | 166 |
| 15 | W0-20276 | 515 | 45 | F-10371 | 162 |
| 16 | BRS-94761 | 496 | 46 | PS7-54418 | 157 |
| 17 | WDX3JFH | 474 | 47 | I3-2834/VE | 122 |
| 18 | DE0RFR | 443 | 48 | EA-1033 | 121 |
| 19 | W1-7897 | 432 | 49 | VU-0020 | 119 |
| 20 | EI-1260 | 419 | 49 | I1-4851/TO | 119 |
| 21 | WDX2TAU | 403 | 49 | DG3YGT | 119 |
| 22 | DE7KKB | 354 | 52 | BRS-30493 | 118 |
| 23 | OE3-3008372 | 346 | 53 | I3-2514/VE | 116 |
| 24 | F-10255 | 345 | 53 | OH3-911 | 116 |
| 25 | RS-96462 | 342 | 53 | DE1ABL | 116 |
| 25 | BRS-94436 | 342 | 53 | DE0KAY | 116 |
| 27 | UA6-150-1367 | 322 | 53 | DE3HLA | 116 |
| 28 | F-14368 | 320 | 58 | DE9DIG | 109 |
| 29 | DE1JSH | 276 | 59 | HE9RFF | 101 |
| 30 | DE1LSL | 269 | 60 | PY1-13332 | 100 |

## PARTICIPATION BY DXCC ENTITY

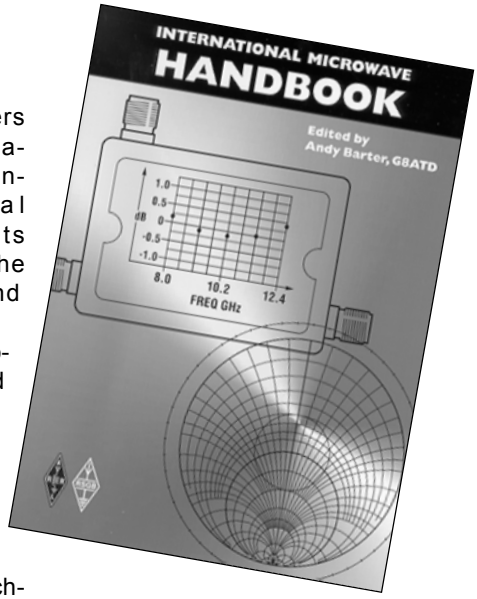
| | Hon Roll | Ann List | Total | | Hon Roll | Ann List | Total |
|---|---|---|---|---|---|---|---|
| W | 97 | 272 | 369 | GI | 1 | 2 | 3 |
| DL | 56 | 193 | 249 | IS | - | 3 | 3 |
| I | 76 | 148 | 224 | SV | 1 | 2 | 3 |
| G | 50 | 142 | 192 | YU | - | 3 | 3 |
| JA | 28 | 158 | 186 | BY | - | 2 | 2 |
| F | 26 | 54 | 80 | CU | - | 2 | 2 |
| EA | 11 | 60 | 71 | EA9 | 1 | 1 | 2 |
| VE | 18 | 27 | 45 | EU | - | 2 | 2 |
| SM | 13 | 25 | 38 | HC | - | 2 | 2 |
| HA | 9 | 26 | 35 | YO | - | 2 | 2 |
| ON | 17 | 15 | 32 | ZC4 | - | 2 | 2 |
| PY | 3 | 28 | 31 | ZP | - | 2 | 2 |
| UA | 5 | 26 | 31 | 5B | 1 | - | 1 |
| HB | 10 | 18 | 28 | 9V | - | 1 | 1 |
| CT | 7 | 12 | 19 | A9 | - | 1 | 1 |
| UR | 3 | 16 | 19 | C2 | - | 1 | 1 |
| GM | 4 | 14 | 18 | CT3 | - | 1 | 1 |
| OE | 7 | 10 | 17 | EA6 | - | 1 | 1 |
| GW | 2 | 10 | 12 | ES | - | 1 | 1 |
| OK | 1 | 11 | 12 | FR | - | 1 | 1 |
| RA9/0 | 2 | 8 | 10 | GD | - | 1 | 1 |
| VK | 2 | 8 | 10 | GJ | 1 | - | 1 |
| OZ | 6 | 3 | 9 | H4 | - | 1 | 1 |
| OH | 5 | 3 | 8 | HK | 1 | - | 1 |
| 4X | 2 | 5 | 7 | HS | - | 1 | 1 |
| PA | 2 | 5 | 7 | KH2 | - | 1 | 1 |
| SP | 1 | 6 | 7 | KH8 | - | 1 | 1 |
| ZL | 2 | 5 | 7 | KP4 | - | 1 | 1 |
| 9A | 2 | 4 | 6 | LY | - | 1 | 1 |
| HL | - | 6 | 6 | P2 | - | 1 | 1 |
| KH6/7 | 2 | 4 | 6 | T7 | - | 1 | 1 |
| KL | - | 6 | 6 | TI | - | 1 | 1 |
| LA | 2 | 4 | 6 | UN | - | 1 | 1 |
| EI | 2 | 3 | 5 | VK9N | 1 | - | 1 |
| S5 | 4 | 1 | 5 | VR2 | - | 1 | 1 |
| EA8 | 1 | 3 | 4 | VU | - | 1 | 1 |
| LU | 1 | 3 | 4 | XE | - | 1 | 1 |
| LX | - | 4 | 4 | YB | - | 1 | 1 |
| OM | 1 | 3 | 4 | ZS | - | 1 | 1 |
| CE | - | 3 | 3 | | | | |
| CO | - | 3 | 3 | **Total** | **487** | **1403** | **1890** |


**Another 'new one' for IOTA during the last year: UE1RCV/1 from Sengeyskiy Island, EU-188.**

**WWW.**

**RSGB IOTA Programme:** **www.rsgbiota.org**
**IOTA Manager's website:** **www.eo19.dial.pipex.com/index.shtml**
**IOTA Contest rules:** **www.rsgbhfcc.org/**
**IREF, Inc:** **www.sat.net/~iref**

# Book Review




***INTERNATIONAL MICROWAVE HANDBOOK***
**Edited by Andy Barter, G8ATD**

THE RSGB, in partnership with the ARRL, has produced this invaluable source of reference information, comprising excellent designs from around the world. Many sources of material have been used, including the RSGB journal *RadCom* and the ARRL publications *QST* and *QEX*.

Chapter one opens the book with an account of operating techniques. How do microwaves compare with HF and VHF? How can conditions be forecast? What are the main requirements of fixed and portable operation? What sort of antennas and masts are suitable?

Chapter two is unashamedly theoretical, covering the analysis of system performance and microwave propagation.

Chapter three describes the different types of microwave antenna. Erudite this book may be, but you will still find that the dustbin-lid reflector is by no means *infra dig*, and its properties are given, albeit concisely. Dish feeds such as the direct, indirect and Cassegrain, together with pyramidal, sectoral and circular horn feeds are not omitted.

Chapter four is also large. Starting with a thorough description of transmission-line theory, it then goes on to give details of coaxial lines, stripline, microstrip and waveguide.

It then moves on to simple passive components, splitters and combiners, directional couplers, tuners and resonators. Non-reciprocal components such as the isolator and circulator complete the list.

Chapter five covers microwave semiconductors and valves, from the humble diode via the Gunn diode to magnetrons, travelling-wave tubes and backward-wave oscillators.

The bulk of the information on constructional techniques is reserved for chapter six, with advice on how *not* to do things, as well as how to do things properly.

Chapters six and seven cover the types of equipment common to most stations, such as frequency sources and test equipment.

The following chapters cover each band up to 24GHz in detail, those above 24GHz being grouped in the final chapter. Each begins with the UK and US band plans, before going into the minutiæ.

The point size of the text is less than is normal for technical books and the occasional diagram is an nth generation copy, but these by no means detract from the book's appeal.

*International Microwave Handbook, RSGB / ARRL*
*ISBN 1-872309-83-6*
*175 x 240mm*
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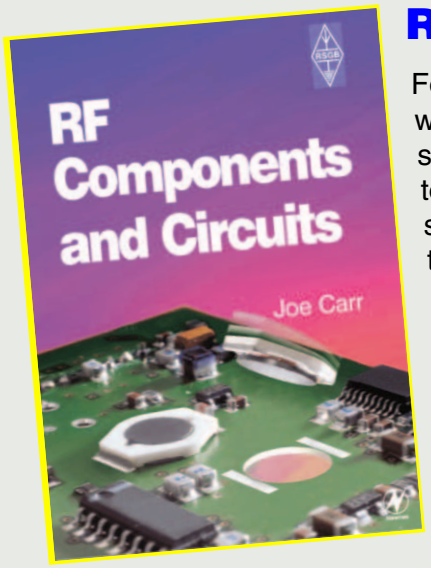
*Non-members' price £24.99*

# COMPONENTS & COOKBOOKS

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For those who are interested in RF design, this is the first RSGB book on the subject written by the legendary author Joe Carr. This book is written in an easy to understand style with the minimum of theory whilst offering a comprehensive introduction to the design and understanding of RF circuits. Developed from a highly popular series in *Electronics World* magazine, *RF Components and Circuits* covers the practicalities of designing and building circuits, including fault-finding and use of test equipment.

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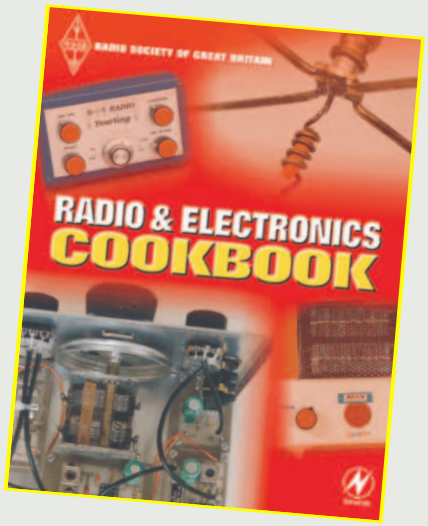


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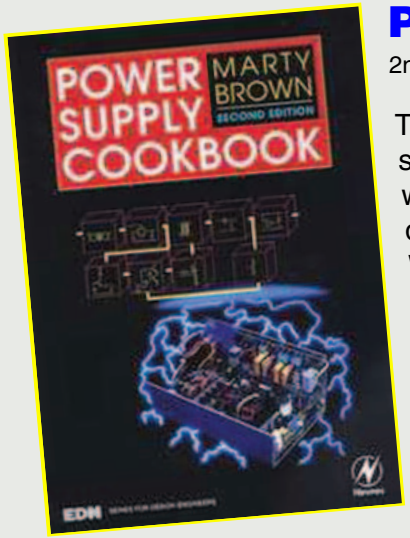


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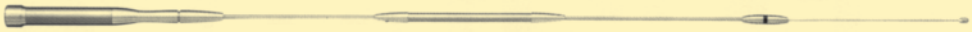

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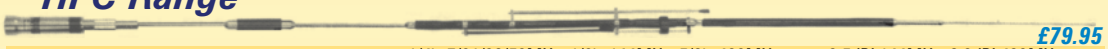

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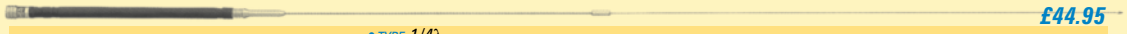

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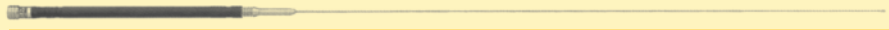

**HFC-80** 3.5MHz — £38.95
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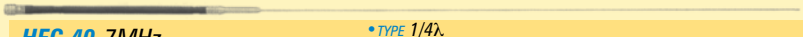

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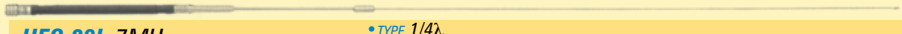

**HFC-20L** 7MHz — £34.95
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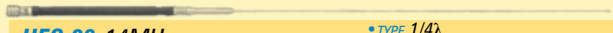

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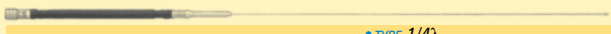
• TYPE 1/4λ. • MAX POWER INPUT 250W SSB • CONN. M-P • LENGTH 1515mm • WEIGHT 245g



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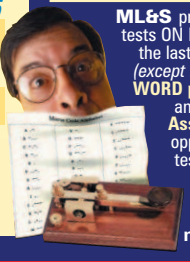

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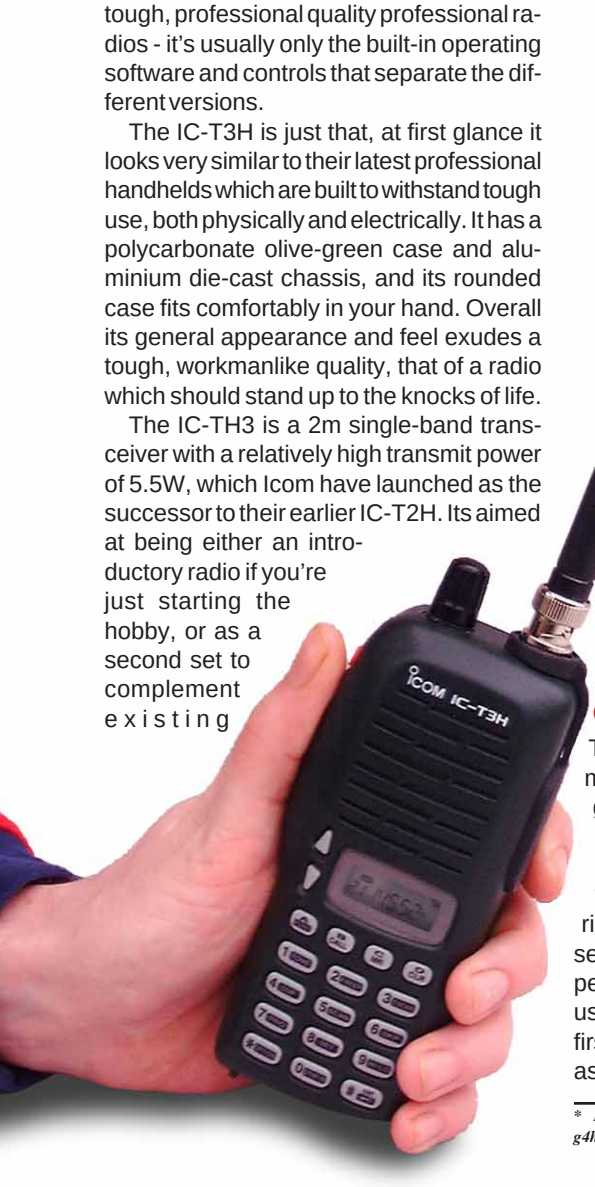
# ICOM IC-T3H VHF Transceiver

## Reviewed by Chris Lorek, G4HCL *


EVER SINCE THE enormously popular IC-2E was launched many years ago (who remembers this pioneering thumbwheel-controlled handheld, then?), Icom have had a solid reputation in producing handhelds for amateur use. In common with many Japanese manufacturing companies, it also didn't take them long to expand into the professional two-way radio market. Icom's amateur handhelds have recently been closely associated with their tough, professional quality professional radios - it's usually only the built-in operating software and controls that separate the different versions.

The IC-T3H is just that, at first glance it looks very similar to their latest professional handhelds which are built to withstand tough use, both physically and electrically. It has a polycarbonate olive-green case and aluminium die-cast chassis, and its rounded case fits comfortably in your hand. Overall its general appearance and feel exudes a tough, workmanlike quality, that of a radio which should stand up to the knocks of life.

The IC-TH3 is a 2m single-band transceiver with a relatively high transmit power of 5.5W, which Icom have launched as the successor to their earlier IC-T2H. Its aimed at being either an introductory radio if you're just starting the hobby, or as a second set to complement existing equipment in your station. The transceiver measures 54W x 132H x 35Dmm and weighs 350g with the supplied BP-222 nicad pack attached.




### CONTROLS

IN COMMON WITH many of the latest amateur handhelds, there are no 'analogue' rotary knobs to control things like on / off / volume and squelch. Instead there's a click-step rotary knob on the top panel, which can be used either for volume or channel setting, ie one or the other, whichever you choose. Further up / down buttons just to the left of the set's Liquid Crystal Display (LCD) provide the alternative volume / squelch or channel function not used by the upper knob. The LCD gives an uncluttered five-character readout, with small icons for transmit output power, key lock, tone mode, offset and a tiny S-meter bar-graph section. An LCD backlight lets you see what's happening at night. The front panel keypad is used for the remainder of the set's functions, including direct frequency entry.

### CHANNELS

THE TRANSCEIVER IS equipped with 100 memory channels, which can be programmed with the operation frequency, repeater offset, sub-tone encode / decode and tone frequency, and memory 'skip' for scanning. I found that the memories would also store the transmit deviation setting, ie 2.5kHz or 5kHz maximum, depending upon which channel spacing I'd used when programming the memory in the first place. Each of the channels can also be assigned a short name, of up to five characters, for display as an alternative to the actual operating frequency. The memory channels can be scanned for activity, the scan halting when the receiver squelch raises and continuing either a couple of seconds after the signal disappears, or pausing on the signal for either 5, 10 or 15 seconds before resuming, whichever you prefer. As usual, if you've programmed a 'skip' into individual memory channels, the scan will automatically skip these whilst still allowing you to select them manually.

To find new active frequencies, three programmed scans are available. Here you set

Close-up of the clear front panel and LCD panel.

* PO Box 400, Eastleigh, Hants SO53 4ZF. E-mail: g4hcl@rsgb.org.uk



the upper and lower scan edge frequencies into dedicated extra memory channels, and the radio will automatically sweep between these in your programmed tuning steps looking for activity. Finally, a useful mode for when you'd like to keep an ear open on, say, your local club's frequency while you're listening elsewhere, is a 'priority watch'. Here the receiver will check very briefly (for 50ms to be precise) your pre-programmed 'priority' memory channel frequency every five seconds while you're listening otherwise in 'VFO' mode, halting when the receiver squelch raises on the priority channel. You can also use this in reverse, ie to check a given VFO frequency while you're in memory scan mode.

## TONES

WITH MANY REPEATERS around the UK and mainland Europe now having facilities for CTCSS (sub-tone) access, the IC-T3H usefully has this encode facility built in as standard, as well as a 'traditional' 1750Hz toneburst. Also fitted is a 'tone squelch', where the receiver's squelch will only raise when the correct CTCSS tone accompanies the incoming signal. As well as this, DCS (Digital Coded Squelch) is fitted, which is commonly used by professionals but rarely by amateurs. But the receiver can be set to sound an alert tone, using Icom's 'pocket bleep' facility, when the correct CTCSS tone or DCS code is received, making this DCS facility useful for 'private channel' monitoring between a group of users.

To find which CTCSS tone or DCS code, if any, is being used on the channel you're monitoring, a 'tone scan' displays the decoded CTCSS frequency or three-digit DCS code on the LCD.

## POWER

THERE'S A RANGE OF power sources for the radio. Rechargeable battery packs include the BP-222 600mAh nicad pack as supplied with the set, for use when size and weight is important. Other optional packs include the BP209 1100mAh nicad pack, and the BP210 1650mAh NiMH version for longer-duty use. The BP-209 battery case is also available, which is capable of housing six alkaline AA cells. A BC-146 desktop 'pod' (above left) plus a plug-in AC wall adapter (above) are supplied for battery recharging, with a charge time of around 18.5 hours. For faster changing, optional BC-144 and BC-119 desktop chargers are available which give a recharge time of around one and a half to two hours.

To keep your batteries lasting that bit longer in use, a 'power save' mode can be switched in on receive, with on / off ratios of 1:32, 1:16, 1:8, 1:2 or off. There's also a useful automatic mode, where the duty cycle changes according to the radio's use - a clever touch. An auto-power-off facility also helps prevent you flattening the batteries by leaving the set switched on while you're not using it.

## ACCESSORIES

BESIDES A USER instruction manual and the battery charger, the transceiver comes supplied with a belt clip and rubber set-top antenna, this having a BNC connector which also lets you plug in an external antenna for home or mobile use. There are, of course, several further optional accessories available.

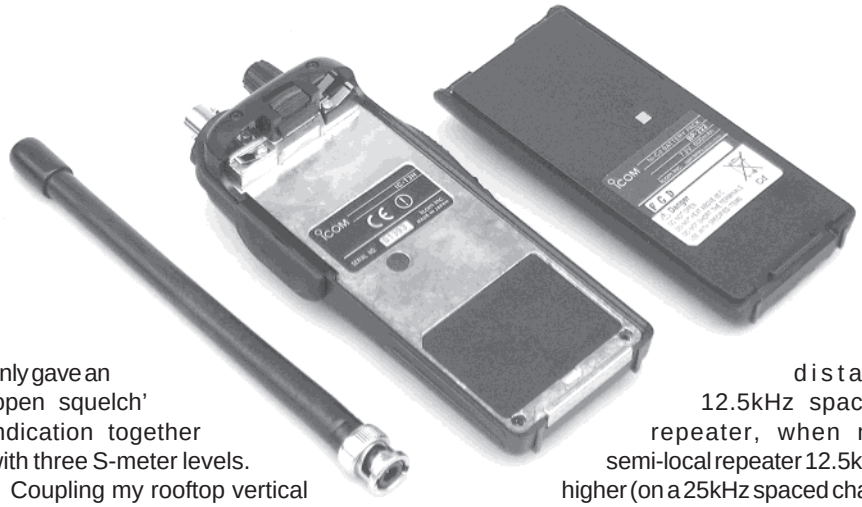

For remote control operation with the transceiver clipped to your belt, an optional combination speaker-mic is available, the HM-75A, which gives you four function switches on the fascia for commonly-used controls, eg memory VFO switching etc. For hands-free operation, the optional HS-51 headset can be plugged in, which gives you VOX operation, PTT, and 'one-touch' PTT with a time-out timer. There's an 'alligator' belt clip available, a standard earphone for private listening, and a clone cable which lets you transfer the memory contents of one transceiver to another.

## ON THE AIR

TWO METRE REPEATERS in the UK are now usually equipped for 12.5kHz channel spacing, and often won't accept 5kHz deviation signals which earlier 25kHz-spaced radios usually put out. Here was my first problem - the IC-3TH was overdeviating on my first attempted contacts, and nowhere in the accompanying 58-page operating manual (unless I missed something!) was there any information on reducing the deviation. But, quite by accident, I found that if I set the tuning steps to 12.5kHz and stored the frequency into memory, the set would give me a perfect narrow deviation signal on that frequency. Having done that, I had plenty of successful contacts, both simplex and through my local and semi-local repeaters.

I found the receiver to be nicely sensitive, the set-top whip bringing in signals very well when compared with many other 'compact' helical whips I've used with other handhelds. The relatively high transmitter power output and good antenna efficiency also helped to get my signal to distant stations: a transceiver is only as good as the antenna! I also managed around 1000 miles of travelling around the UK as a passenger, by car and railway, with the handheld with equally good results.

Overall I found the transceiver very easy to use, with plenty of audio available on receive, and - from the reports I received - with a crisp, clear transmitted signal. The large LCD was easy to read, the only negative point here being the minuscule S-meter section to the far right of the display, which



only gave an 'open squelch' indication together with three S-meter levels.

Coupling my rooftop vertical collinear to the IC-T3H showed the receiver to be quite immune from strong out-of-band signals, with no trace of the dreaded 'pager breakthrough' I often experience with some handhelds. But I did find that relatively strong 12.5kHz spaced signals could sometimes affect my tuned-in signal. For example, when I was trying to use a distant 12.5kHz spaced repeater, when my semi-local repeater 12.5kHz higher (on a 25kHz spaced channel but with 2.5kHz deviation) came on, it made the other difficult to copy. Apparently the 12.5kHz internal transmitter switching didn't affect the receive filtering, although on a good note 25kHz-spaced signals were very nicely rejected.

The lab test figures below show that the receiver is reasonably sensitive, with a good tolerance to unwanted signals both 25kHz away and out-of-band, although as I found on air the rejection of 12.5kHz signals wasn't too good. On transmit the deviation was well controlled, the frequency accuracy excellent, and harmonics well suppressed.

## CONCLUSIONS

A SOLID, RUGGED 2m handheld that's easy to use, with its 5.5W transmit power and efficient antenna it'll get your signals where they're needed. Performance was equally good when coupled to a rooftop antenna, the only limitation being that of very strong received signals just 12.5kHz away. I'm sure with its economic price the IC-T3H be very popular with amateurs both new and experienced.

The Icom IC-T3H, complete with charger, rechargeable battery, belt clip and handbook is currently priced at around £160 and is available from all approved Icom dealers. Our thanks go to Icom (UK) for the loan of the review transceiver. ♦

# ICOM IC-T3H LABORATORY RESULTS

*All measurements taken on 145.000MHz, TX high power, unless otherwise stated, using the set powered from a fully-charged BP-222 7.2V 600mAh nicad as supplied.*

## RECEIVER

**Adjacent Channel Selectivity**
Measured as increase in level of interfering signal, modulated with 400Hz at 1.5kHz deviation, above 12dB SINAD ref level to cause 6dB degradation in 12dB on-channel signal:

| | |
|---|---|
| +12.5kHz | 22.8dB |
| -12.5kHz | 44.7dB |
| +25kHz | 65.6dB |
| -25kHz | 69.7dB |

**Blocking**
Increase over 12dB SINAD level of interfering signal modulated with 400Hz at 1.5kHz deviation to cause 6dB degradation in 12dB SINAD on-channel signal;

| | |
|---|---|
| +100kHz | 80.8dB |
| +1MHz | 88.9dB |
| +10MHz | 95.5dB |

**Sensitivity**
Input signal level required to give 12dB SINAD:

| | |
|---|---|
| 144MHz | 0.13µV |
| 145MHz | 0.13µV |
| 146MHz | 0.13µV |

**Intermodulation Rejection**
Increase over 12dB SINAD level of two interfering signals, spaced at 25 and 50kHz off-channel, and 50 and 100kHz off-channel, giving identical 12dB SINAD on-channel 3rd order intermodulation product:

| | |
|---|---|
| 25kHz spaced signals | 69.2dB |
| 50kHz spaced signals | 68.7dB |

**Squelch Sensitivity**

| | |
|---|---|
| Min (1) | 0.08µV (4dB SINAD) |
| Max (10) | 0.23µV (22dB SINAD) |

**Image Rejection**
Increase in level of signal at 1st (41.7MHz) and 2nd IF (450kHz) image frequencies, and half 1st IF, over level of on-channel signal, giving identical 12dB SINAD signal:

| | |
|---|---|
| 1st Image | 79.8dB |
| Half 1st IF | 86.8dB |
| 2nd Image | Blocking limited |

**Maximum Audio Output**
Measured from external audio output socket, using 1kHz audio, at the onset of 10% distortion:
396mW RMS

**S-Meter Indication**

| | |
|---|---|
| 1 | Squelch open |
| 2 | 0.34µV (0dB ref) |
| 3 | 0.69µV (+6.2dB) |
| 4 | 1.77µV (+14.4dB) |

## TRANSMITTER

**HARMONICS**

| | |
|---|---|
| 2nd Harmonic | -75dBc |
| 3rd Harmonic | -77dBc |
| 4th Harmonic | -78dBc |
| 5th Harmonic | <-90dBc |
| 6th Harmonic | <-90dBc |
| 7th Harmonic | <-90dBc |

**PEAK DEVIATION**
5.25kHz (25kHz spacing)
2.96kHz (12.5kHz spacing)

**TONEBURST DEVIATION**
3.35kHz (25kHz spacing)
1.89kHz (12.5kHz spacing)

**POWER OUTPUT**

| | |
|---|---|
| 144MHz | 5.50W (high), 520mW (low) |
| 145MHz | 5.55W (high), 520mW (low) |
| 146MHz | 5.55W (high), 520mW (low) |

**FREQUENCY ACCURACY**
+24Hz

**On the instructions of John Townend, proprietor of Johns Radio, due to his retirement.**

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# Technical Topics

PAT HAWKER, G3VA
37 Dovercourt Road, London SE22 8SS

## USING CERAMIC IF FILTERS IN VFOS

JAN-MARTIN NOEDING, LA8AK, has sent along information on using ceramic IF filters in variable-frequency oscillators, based on experiments he and Egil, LA8OJ, have carried out. He writes: "I recently visited LA8OJ who had prepared some information for using ceramic filters as variable frequency oscillators. My previous efforts at using these devices had been unsuccessful, so it was interesting to try out his approach. **Fig 1** shows his oscillator circuit, and I subsequently found that this worked immediately. I have tabulated data on a number of the ceramic filters that I had available: see **Table 1.**

"LA8OJ says that these devices oscillate only on the edge frequencies of the filter where there is a phase shift. Usually, oscillation occurs on the higher edge of the passband but, with some filters, on the lower edge. LA8OJ has also managed to change from higher to lower band-edge with some manipulation of component values.

"Ceramic IF filters are available on the market with many different bandwidths and centre frequencies in the 10.6 to 10.8MHz range, and for some other frequencies. As a guideline, the reactance of C1 should be 300Ω, but this is not critical. I chose a 56pF capacitor as one was close to hand of reasonably good RF characteristics. This worked for 6MHz filters, but for 5.5MHz filters it must be increased; I connect another 56pF capacitor in parallel.

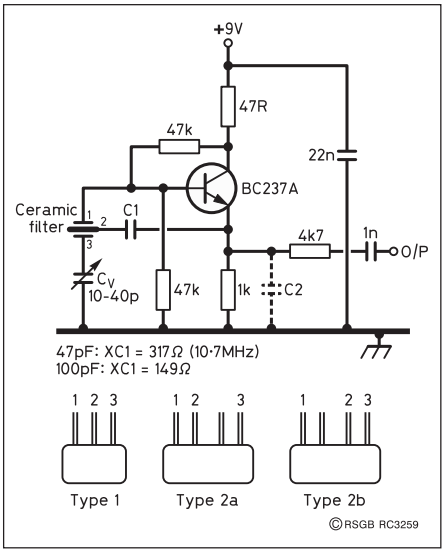



**Fig 1: LA8AK's test oscillator for tests using ceramic IF filters as variable frequency elements in variable ceramic oscillators.**

"C2 is not necessarily needed for oscillation, but can be chosen to change the frequency; I used a 90.9pF silver-mica capacitor as it was at hand, but the value is not critical. I used a 10 - 40pF trimmer as $C_V$, but have not checked whether a larger value could have been used to increase the pulling range.

"As shown in the table, the four-pin filters will also work. As an experiment, I connected only three legs, and then noted which plate, when connected, would effectively change the frequency. I also noted that there was some shift of frequency when Vcc was lowered from 9 to 6V. The BC237A transistor was available, but an RF-type transistor (eg BF199, BF224) may be an improvement.

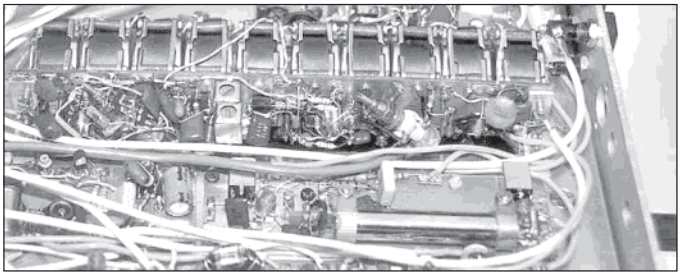
"In view of some reported problems in using crystals in 10.7MHz FM oscillators, it is possible that an IF ceramic filter would be a solution."

## PA0SE'S 'SLIDING DOORS' IF FILTER

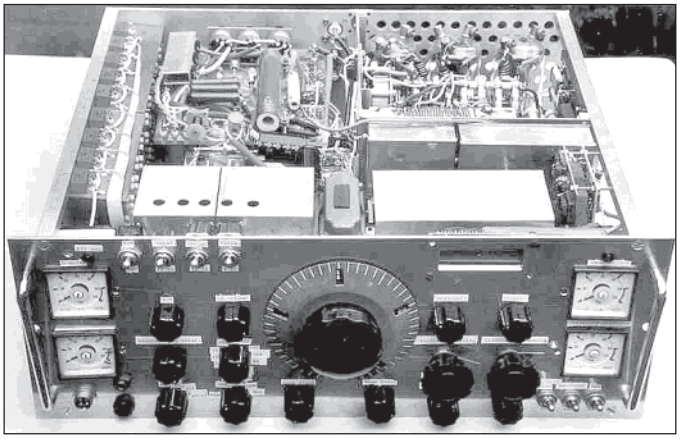
THE JUNE 'TT' included a brief outline of PA0SE's 'sliding doors' filter, providing continuously-variable selectivity with an excellent shape factor for both narrow and wider bandwidths, and showed how this was a modified form of the system used originally in the 1960s in the Rohde & Schwarz EK-07 general purpose receiver. The R/S EK-07-80 filter was based on two 30kHz low-pass

| Filter type | Pulling range (kHz) | C1 (pF) | C2 (pF) | Note 1 | Note 2 |
|---|---|---|---|---|---|
| SFE5.5MB (Type 1) | 5428-5436<br>5465-5481 | 112<br>112 | 91<br>- | | |
| T6.0A (Type 2) | 6132-6149<br>6160-6179<br>6156-6170<br>6128-6159 | 56<br>56<br>56<br>56 | 91<br>-<br>-<br>91 | *<br>*<br>*<br>* | conn 2a<br>conn 2a<br>conn 2b<br>conn 2b |
| SFE 10.7MS black dot (Type 1) | 10802-10818<br>10792-10810<br>10759-10789<br>10759-10786 | 56<br>112<br>56<br>112 | -<br>-<br>91<br>91 | | |
| 107C9 blue (Type 1) | 10821-10845<br>10867-10886 | 56<br>56 | 91<br>- | * | |
| NTKK8002 black (Type 1) | 10866-10887<br>10818-10836 | 56<br>56 | -<br>91 | *<br>* | |
| SFJ 10.7MA blue/yellow (Type 2) | 10903-10935<br>10837-10897 | 56<br>56 | -<br>91 | | conn 2a<br>conn 2a |
| SFE 10.7MA orange (Type 1) | 10936-10965<br>10990-11018<br>10986-11012 | 56<br>56<br>56 | 91<br>-<br>- | * | <br><br>(Vcc 6V) |
| SFE 10.7 white (Type 1) | 10943-10952<br>11002-11025 | 56<br>56 | 91<br>- | * | |

**Table 1: LA8AK's ceramic filter oscillator experiments (Vcc = 9V).**
***Notes:*** **(1) *Will not oscillate with minimum variable capacitance ($C_V$).**
**(2) Connection for 4-pin filters (see Fig 1).**



**Under view showing (in front) the 455kHz mechanical filter and behind it the 'sliding doors' system. The inductors of the two low-pass filters are on one side of a PCB, the remaining circuitry on the other side.**



**The PA0SE HF transceiver under construction, shown out of its cabinet. Later, the front panel will be covered by one with neat lettering and the four meters will have properly-calibrated dials.**
***(Photos: PA0SE)***

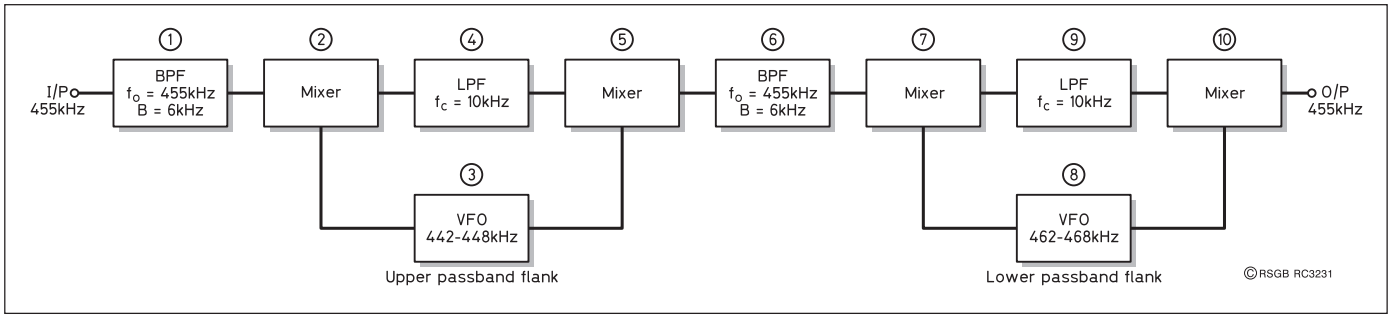



**Fig 2: Block diagram of PA0SE's 'sliding doors' system providing continuously-variable IF selectivity down to -80dB. As noted in the June 'TT', it is a modified form of the Rohde & Schwarz EK-07-80 filter of the 1960s.**

filters with a multi-mixing technique as shown in Fig 2 in June.

It should be explained that PA0SE has been building an HF transceiver (receiver section already completed and providing excellent performance) using components drawn from those he had available, resulting in a mixture of techniques and parts from the past and the present, a 'one-off' design rather than one intended for reproduction. For example, his PA uses three WWII German RL12P35 valves (roughly similar to the 807), working happily in conjunction with American fixed and variable capacitors from the same period. The main tuning mechanism is the National PW (HRO) worm drive gearing tuning system, but used to drive two sets of five-gang variable capacitors, each of 70pF maximum. The PW-type mechanism was recovered from a WWII receiver made by Korting (illustrated with the original four capacitors in 'TT', January 2002, p69), a German copy of the HRO.

On the modern side, there is a PIC in the frequency display circuit, a module bought as a kit. The receiver front-end input includes 6dB and 12dB switched attenuators (found unnecessary even for the 'European 7MHz-band evening test'). These are followed by nine minimum-loss Cohn RF band-pass filters, one for each HF band, each filter having four tuned circuits as described by PA0SE in 'TT' January and April 1997 (see also *TTS 1995-1999*). The filters are followed by a Mini-Circuits MAV11 12dB amplifier that can be manually switched on to improve the noise figure on the 24 and 28MHz bands. The first (high-level) mixer is a Plessey SL6440 IC mixer (unfortunately no longer manufactured). The HF injection signal comes from one of 12 separate crystal oscillators (one each for the 1.8MHz to 24MHz bands, four for 28MHz) with only the oscillator in use powered from 12VDC. The mixer converts the input signal to the tunable first IF of 2500 - 3000kHz. The injection signal is poorly suppressed by the SL6440, and this signal plus harmonics appear strongly at the output. These gave rise to 'birdies', but these were overcome by inserting a low-pass filter with cut-off at 3.5MHz (5th order Chebyshev design with 0.5dB passband ripple) following the mixer. Selectivity at the first IF is provided by a tunable band-pass filter with five resonant circuits. By a combination of capacitive top and bottom coupling, the insertion loss in the passband does not vary more than 1dB. The five inductors are wound on Amidon T68-2 toroids. The five-gang variable capacitors are driven from the main tuning dial via the PW worm gear drive.

The tunable IF filter is followed by an amplifier using two J310 FETs in parallel in a common-gate configuration. This drives the second mixer, also a SL6440, with injection from the VFO which tunes 2545 - 2045kHz with the aid of a second set of five ganged capacitors all connected in parallel to tune a stable high-C oscillator due to the late Klaas Speargaren, PA0KSB. The oscillator gang is also driven from the PW gear, with the VFO tracking the tunable first IF filter. Frequency stability is further enhanced by a huff-and-puff stabiliser. Both tunable filter and VFO are in screening boxes, located left and right of the PW drive Output of the second mixer is at 455kHz and this is fed to the 'sliding doors' system.

PA0SE has eschewed contemporary 'high-tech' approaches: no PLL, no DSP, but has instead broken new ground for amateur construction by modifying the R/S EK-07-80 filter design to form what he has called 'sliding doors' selectivity. A brief outline of this filter (**Fig 2)** and the R/S EK-07-80 filter on which it was based were given in the June 'TT'. Unlike the EK-07-80 filter (June Fig 2). the PA0SE version does not gang the two filter injection oscillators and so provides both sideband, bandwidth and passband shift control.

PA0SE has provided a detailed explanation of his filter and of how he has overcome various problems encountered during the construction of the receiver. Unfortunately, it is possible in 'TT' to provide only a brief summary of the essentials, though I am willing to provide photocopies of his six-page un-edited A4 single-spaced report to seriously-interested readers on receipt of 60p (in stamps) to cover cost of postage and photocopying.

Briefly, all mixers in the filter are type SA612A doubly-balanced devices. The signal out of the second mixer enters a mechanical filter with a 6kHz passband of 452 - 458kHz. This is followed by an AGC-controlled amplifier (not shown in Fig 2). BPF 6 is a doubly-tuned 455kHz IF filter. The two low-pass filters are 10th order elliptical (Cauer) filters with a pass-band ripple of

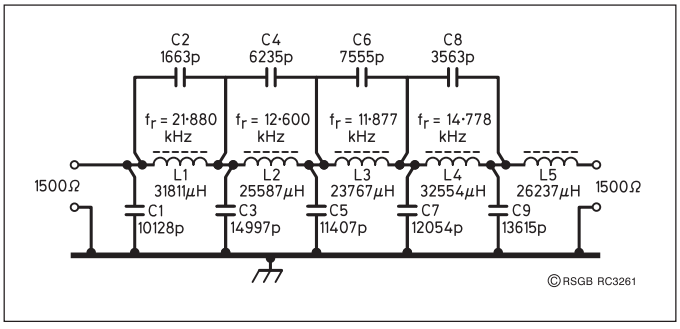



**Fig 3: Circuit diagram of the two low-pass filters with cut-off frequencies of 10kHz.**

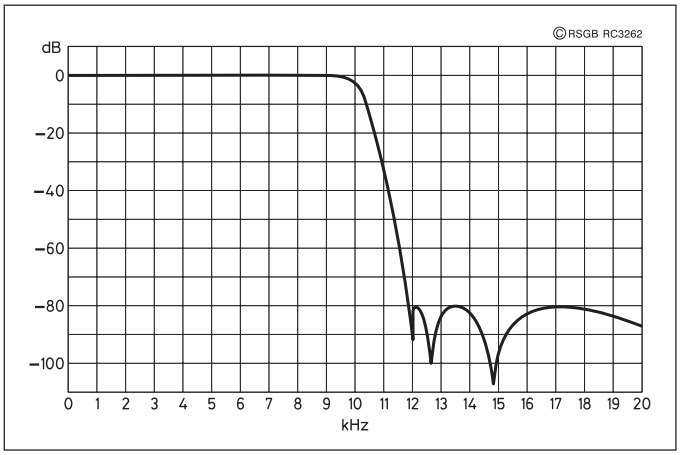



**Fig 4: Response curve of the 10kHz low-pass filters.**

0.1dB and minimum stop-band attenuation of 80dB: **Fig 3** and **Fig 4.**

It will be noted from Fig 3 that all capacitors and inductors have non-standard values. Paralleled low-tolerance capacitors were measured using a pre-war 'Philoscope'. It was reasoned by PA0SE that the values of C2, C4, C6 and C8 and inductors L1, L2, L3 and L4 might not have to be very precise, as long as the frequencies of maximum attenuation in the stop-band had the correct values indicated in the diagram.

The inductors are wound in pot cores of 2.5cm diameter, probably made by Mullard and marked 'LA 2'. These have no adjustable cores and the inductances can be varied only by changing the number of turns. PA0SE writes: "I first made a test winding, putting 100 turns of 10 x 0.5mm Litz wire on the bobbin, this came out as 2197µH. This enabled me to calculate the number of turns needed to provide the wanted inductances. For example, with C2 theoretically 1663pF, I connected two 820pF capacitors in parallel, making C2 1640pF; L1 then needed to be 32,257µH to produce resonance at 21.88kHz. The calculated number of turns came out as 383. I put on an extra 20, then clamped together the two halves of the pot core with a large clothes-peg. The inductor was connected to C1 and the resonance frequency measured using an audio generator and valve voltmeter plus a frequency counter for greater precision. The frequency, as expected, was too low. I then gradually took off turns until the frequency was about 100Hz higher than the required 21.88kHz. The pot core was then completed using its mounting hardware. The two halves were now pressed together with greater force than provided by the clothes-peg, and this brought the inductance to the required 32,257µH. This process was repeated for all ten inductors in the two low-pass filters. In spite of the components not having the exact values calculated, the measured frequency response follows closely the calculated theoretical response."

**Fig 5** shows an example of the excellent overall response curve that can be achieved: a stop-band greater than -80dB, and filter slope virtually constant at all bandwidths.

Incidentally, PA0SE initially used a multi-section 12-position rotary switch for selection of the front-end RF filters (as recommended in the January 'TT' by G3LLL), but found that the attenuation of the Cohn input filters did not increase beyond about 60dB. It turned out this was caused by magnetic coupling between the switch decks at the input and output of the filters, in spite of a separation of some 3.5cm. He solved the problem by using relays of which there are 36 already in use, with more to be added to complete the transmitter section.

## RESISTANCE LOADING OF HF ANTENNAS

THE USE OF non-inductive resistors to provide uni-directional long-wire, rhombic antennas etc, or for multi-band or broadband resistor-loaded dipole elements, has been discussed on a number of occasions in 'TT'. The technique has a long history, unfortunately sometimes brought into disrepute by, for example, exaggerated claims for the performance and operational bandwidth of the 'T2FD' (tilted, terminated folded dipole) antenna. There have also been several 'con' designs marketed, including a length of co-axial cable terminated directly with a resistor, ensuring a near unity SWR on all frequencies and a modicum of radiation / pick-up from the co-axial cable 'feeder'! As was shown in the recent 'TT' discussion on the so-called use of trees, it is often the 'feeder' rather than the 'element' that accounts for much of the limited radiation from controversial designs.

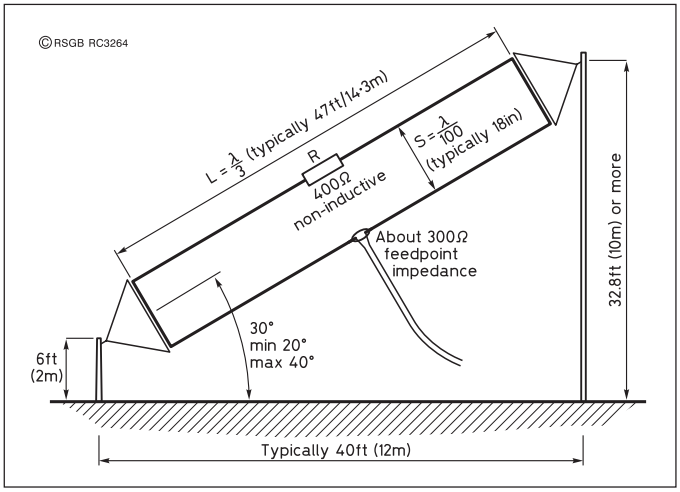



**Fig 6: T2FD (tilted, terminated folded dipole) antenna. Although controversial, it has, for many years, found supporters. In this implementation it was claimed that, with a span of only about one-third of the wavelength of the lowest band of interest, it covers a frequency range of some 4:1 and often more (3.5MHz design suitable for use up to 14MHz or higher). RF power lost in the resistor may be up to about 3dB at some frequencies.**

But, used correctly, resistance-loading of wire elements can play a valuable role in amateur radio. The tilted T2FD (**Fig 6**) is based on an established WWII design often claimed to cover several octaves. In 1971 Bill Conkin, K6KA, reported in 'TT' that the T2FD measured some 6dB down on a dipole and was intended by the US Navy to increase bandwidth by only a few hundred kilohertz. It is perhaps more accurately termed an aperiodic multi-band antenna than a broadband design. But it remains a popular design found satisfactory by users. **Fig 7(a)** is the 'Australian Dipole' due to Guertler and Collyer, an effective multi-band design (see 'TT' June 1974, September 1984). **Fig 7(b)** is a modified form developed for military communications in South Africa by Dr Brian Austin (ZS6BKW / G0GSF) and André Fourie, covering the entire band 3 to 30MHz with good efficiency. It forms a convenient, if undeservedly seldom-used, single-pole, inverted-V antenna fed from 500Ω line ('TT' June, 1987 and in more detail September 1987, see also *TTS, 1985-89*).

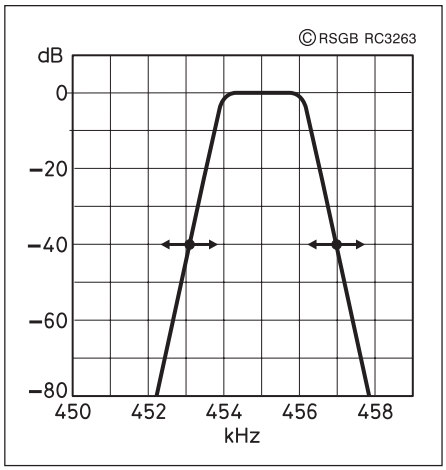



**Fig 5: Example of the overall response of PA0SE's 'sliding doors' system.**

D A Bundey, FIEE, G3JQO, writes: "An antenna I came across professionally many years ago was the 'Terminated Delta Loop'. It was used for ionospheric sounding work and radiated towards the zenith. Since near-vertical-incidence-radiation (NVIS) has become fashionable recently in professional circles, as though it were a new discovery, I decided to put up a near copy (**Fig 8**) of this ionosonde antenna and compare it with my multiband dipole, which is about 120ft long.

"As expected, it performed in a comparable manner, provided the delta leg length was at least λ/2, but not so well if only λ/4 or λ/8 long - not surprising, since the laws of physics apply particularly to untuned systems! However, there were two possible advantages. Firstly, the VSWR excursion was less than three within three octaves, and hence capable of being matched by the in-built tuners found in modern transceivers. Secondly, noise pickup, particularly on 7MHz, was at least 6dB down, making many signals clearer on the delta.

"It is, of course, a matter of horses for courses, but the terminated delta loop may be worth a thought for those who work predominately at short to medium ranges. Finally, it is a balanced configuration which in my view is always an advantage in the urban environment."

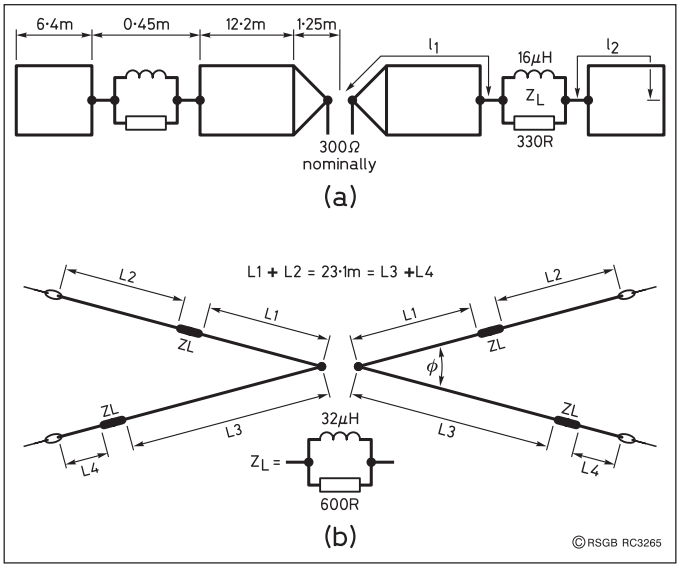



**Fig 7: (a) The 'Australian Dipole' developed in the 1970s and suitable for erection as a horizontal or inverted-V broadband travelling-wave dipole antenna. With the dimensions shown, it was claimed to provide a VSWR of less than 3 over the range 2 to 30MHz and less than 2.5 above 3.5MHz. The 1.8m spacers are 25mm diameter aluminium tubes (ie non-insulated spacers).**
**(b) Broadband inverted-V form of HF antenna developed in South Africa covering 3 to 30MHz with good radiation efficiency when fed from 500Ω line. Unlike the Australian dipole no aluminium spacers are required. Key dimensions:**
**L1 + L2 = L3 + L4 = 23.1m**
**L1 = 13.5m (hence L2 = 9.6m)**
**L3 = 17m (hence L4 = 6.1m)**
**The included angle, $\phi$, does not markedly affect the VSWR, but the feedpoint impedance is dependent to some extent, 5° optimum yields 500Ω, reducing to about 400Ω at near-zero spacing. A range of 3 to 30MHz with a VSWR of less than 2.5 can be achieved.**

As the above notes were being compiled, there arrived from John Pegler, G3ENI, a copy of an article he has written for the *Thames Valley ARTS Newsletter* entitled 'The Resistor-Loaded Folded Dipole', providing an informative and interesting review of the early development of this form of antenna. He notes that in the mid-1930s, a French company, Société Anonyme des Industries Radio Electroniques of Paris, designed a resistor-loaded folded dipole and submitted a patent specification in France on 10 June, 1937, granted on 8 June, 1938, and in the UK on 10 June, 1938 (granted as Patent No 500,162 on 3 February, 1939). G3ENI writes: "The seven-page French specification covered the subject in great detail, including a vertical, earthed-monopole version, a two-element bi-directional version and a direction-finding version."

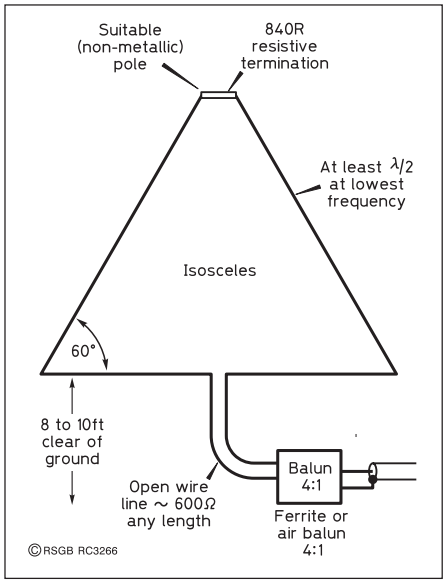



**Fig 8: The broadband Terminated Delta Loop HF antenna with maximum radiation towards the zenith. The 840Ω resistive termination can comprise 24 2W resistors in four strings of six (each 560Ω) inside a 2in plastic pipe open at the ends (100W RF limit). Higher-rated termination needed for use with QRO linears. Termination value and balun match may be varied to optimise VSWR excursion over range of frequencies used.**

It was claimed that "the antenna can be used in a variety of shapes, including horizontal, vertical, inverted-V, and flat-top beams in addition to the tilted version." The useful bandwidth claimed was from 0.8 to 3 times the frequency given by the length of the half-wave dipole, with the lower frequency limited by the drop in radiated power and the upper frequency limited by loss in the resistor.

"During and after WWII, this type of antenna was used by the Royal Navy at shore stations and there are several both horizontal and vertical terminated folded dipoles listed in the Naval Handbook on antennas for powers up to 10kW, and receiving masts as high as 55m (180ft) were used with 600, 70 or 50Ω feeders as required.

"The patent specification claimed that, when two similar conductors are arranged in parallel with their ends joined and with small spacing are terminated by an impedance substantially equal to the characteristic impedance of the two conductors, they are traversed by travelling waves only, permitting the element to be used within a wide range of wavelengths with substantially constant radiation characteristics. An example showing curves with a 20m span folded dipole fed and loaded by 600Ω, from experiments by W L McPherson is shown in **Fig 9**."

G3ENI traces in some detail the evolution of the US Navy antenna into the amateur radio 'T2FD', principally by W3HH between 1949 and 1951. He notes wryly that, on August 31 1981, Elmer R Bush of the American firm Barker and Williamson Inc filed a specification for a Broad Bandwidth Folded Dipole (US Patent No 4,423,423 granted 27 December 1983) with an 'abstract' and 'background to the invention' substantially identical to the French UK patent of 1939! The preferred terminating resistor was given as 600Ω with the antenna fed by 50Ω cable with a 1:12 balun at the antenna feed point.

G3ENI also notes that Serge Montagnon, F5HUP, has recently described in *REF Technique* a folded dipole based on W3HH's design (390Ω resistor) in which he referred to W3HH as the inventor. "Perhaps he was not aware of the original French work!"

## HERE & THERE

GODFREY MANNING, G4GLM, provides the following tip on encapsulating EHT connections: "Even double-insulated multimeter wire is not able to withstand a few thousand volts, but the polythene inner of large-gauge coaxial cable (eg UR67, RG8) is. After connecting, the joint may be insulated by casting it in epoxy resin, but this is brittle. How about more polythene? Hot-melt general-purpose glue (*not* the woodworking variety) is the same material."

JAMES MILLER, G3RUH, noted my reference in the April 'TT' to the OptiVisor Model DA5 hands-free binocular magnifier made by the Donegan Optical Company of Kansas, USA. He writes: The Donegan Optical Company Inc was founded in 1952, is still going strong and the DA5 visors remain in full production. They can be obtained in the UK from RS Components as part 290-1539 priced at £37 + VAT (or for about $37 in the USA). I've had mine for a couple of years, but they have proved so utterly indispensable that I wish I'd had them in the days when my eyesight was perfect! As essential as a good soldering iron." ♦

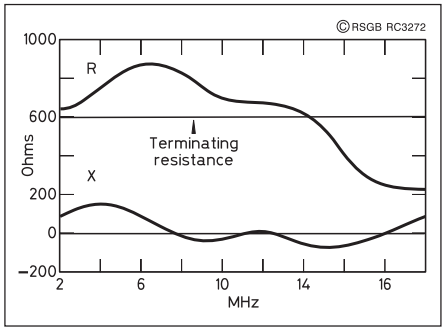



**Fig 9: Resistance (R) and reactance (X) curves over the frequency range 2 to 17MHz of an experimental 20m-long terminated folded dipole fed and loaded by 600Ω, as reported by W L McPherson.**

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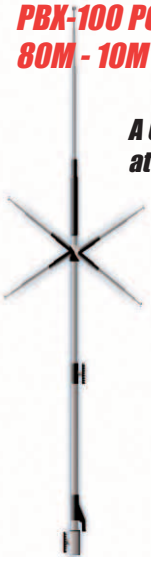

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*Covers 1.8 - 170MHz. Just plug your antenna into the socket and measure the VSWR. Internal battery facility lets you adjust on site. No more treks between rig and antenna!*

## CONNECTOR KIT

### NEVER BE STUCK FOR A PLUG!

£49.95
Carriage £6.00

*No less than 12 pairs of popular RF plugs and sockets together with 6 joiners. No more worries about connector combinations. Ideal for field day and contests.*

## DCI-145 2M BANDPASS FILTER

### Cure Breakthrough Problems

£89.95
Carriage £6.00

*If you suffer with breakthrough from signals on adjacent channels to 2m, then this will kill your problem for good. Just plug it in-line and all out-of-band problems will disappear. 200W handling and up to 60dB rejection. SO239 sockets ("N" available).*

## ONE TOUCH TUNE FOR FT-817 £59.95

Carriage £6.00

*One button press is all you need to get instant RF for adjusting ATU etc. No matter what mode, you will instantly get a steady carrier. And you don't lose your accessory socket!*

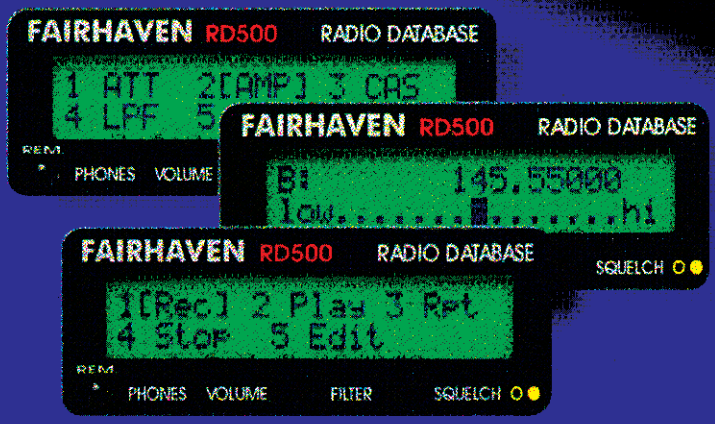
**Main Store: 22 Main Rd, Hockley, Essex, SS5 4QS. Tel: 01702 206835**
**Midlands Store: Bentley Bridge, Chesterfield Rd, Matlock, Derbyshire, DE43 5LE. Tel: 01629 582380**
**Scottish Store: 20 Woodside Way, Glenrothes, Fife, KY7 5DF. Tel: 01592 756962**

# ...bring your scanning directories to life!

## With 2 Megabytes of Memory

FAIRHAVEN RD500VX
RADIO DATABASE

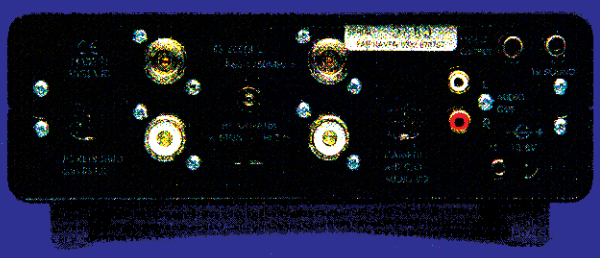

**The RD500VX** is a new kind of wideband receiver with sleek, robust styling, ...only 8 inches wide!




Its massive memory can store information equivalent to several scanning directory books. Any word such as "Fire', "Air", "Voice Of America", or even your local town can be searched for. It can hold 54,682 entries, each with 20 characters of text, mode, and frequency.

A 45 key TV style remote is provided for text entry and control, and a PC keyboard can be plugged into the receiver.

...No more thumbing through scanning directories, and no PC needed!



**The RD500VX** gives wideband coverage with auto memory, skip list, priority channel, pause/hold, AFC, world time clock, and S.meter, and its HF performance is complemented with pass band shift, notch and peak filter, noise blanker, and smooth 5Hz tuning steps.

Modes include USB/LSB, AM, sync AM, stereo CW, NBFM/WBFM and stereo FM, with TV sound and video output as standard.

We include Windows software to make it easy to gather information from document scanners, the Internet and other sources. **The RD500VX** can be linked to your PC to backup or download information, and a database is loaded into the receiver before shipping.

It also has a built in digital sound recorder and editor so a news flash or rare DX can be recorded. Up to 4 minutes of sound can be permanently stored!

*Price:* £899

FAIRHAVEN radio

Includes software, PSU, remote and 2 year guarantee.

Specifications:
Sensitivity (10dB S/N) HF SSB 0.2uV. IP3 +10dBm.
VHF/UHF NBFM 0.3uV. Scan speed 50/second.
Frequency range 0 - 1750MHz
Collins filters available.


Phone +44(0)1332 670707 Fax +44(0)87 00 55 88 99
http://www.fair-radio.demon.co.uk
PO Box 6102, Hatton, Derby DE65 5WG

# Members' Advertisements

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

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

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

## EXCHANGE

**COMPAQ** Armada laptop P133, 6.5GB, 48MB. 56K modem, CD, Win98, mans, immaculate. Trade for Trio Kenwood SM220 - VFO 230. 0151 339 6794 (Ellesmere Port).
E-mail: paul-m3zxz@thersgb.net

## FOR SALE

**RA187N** man, £140. FT-101ZD MkIII, man, mic, £300. FT-101, £125. FT-200 and PSU, mic, £150. TS-930, MC-80, man, filters, inc 500kHz, £350. Yaesu ext-ls, £35. FT-221R, £300. FC-102, £60. FC-902, £100. TS-430, ext-ls, mic, mint, £275. SB200, £200. FL-2100, £200. FL-21DOZ, inc WARC, £250. Carriage at cost. Ben, 01398 361 215 after 6pm (Taunton).

**12m** tilt-over mast with tackle, needs renovation. CDR rotor. TA33 triband beam, £110. 01923 896 318 (Croxley Green).
E-mail: info.harknett@btinternet.com

**AERIAL** rotator KR-400, £100. Yaesu FT-708R 70cm h/held, £120. FT-208R 2m h/held, £120. Multi-U11 70cm tcvr, £80. 023 9258 0114 (Gosport).
E-mail: rakf@rforster.freeserve.co.uk

**ALINCO** DR-610 dual 2/70/airband. Remote front panel cable plus mobile PTT, up/down control with boom mic headset, £225. ADI AR147 2m 50W extended receive, fitted cool fans plus mobile PTT up/down control with boom mic headset, £150. Daiwa CN101 SWR/PWR meter 1.8 to 150MHz, £20. 6m 3-ele beam, Moonraker, tested and adjusted, but never used, £40. AV600 SWR/PWR meter, dual sensors, 1.8 to 200MHz and 140 to 525MHz up to 400W, £30. DX-394 rcvr, £50. All no offers. The boom mic/headsets listed above are £75 each trade. 07976 747 432 (Watford).

**ALINCO** DX-70 as new, with box, instruction man etc, £350. Also Kenwood antenna tuner AT-230, box and instruction man, £50. 0117 956 8380 (Bristol).

**AMERITRON** 811 amplifier, 600W, in daily use, spare tubes, man, £350. G3JLB, QTHR, 01474 534 694 (Gravesend).
E-mail: lbelger@aol.com

**ARTIFICIAL** aerial type 21 (dummy load) for T1154, T1083, T1115, TR1091, TR1196, TR9 and TCS, like new, £40. 01634 253 056 (Medway).

**CLANDESTINE** radio collection type 3 MkII (B2) in globetrotter suitcase, £1800. MK128 set, £300. MK119 set (wooden cased), £500. MK123 + ant reel and tester, in webbing satchel, £300. 1940s/50s Embassy stn MK33 tx with HRO, £500. MK328 rcvr, £150. MK301 rcvr, £200. MCR1 rcvr, £200. All above are open to offers. 0191 386 1116 (Durham).

**CLEARANCE** surplus shack test equipment. Racal 9082 sig gen, £400. Racal 9082a sig gen, £500. Ando tone generator, £150. Cushman CE4B test set with HF rcvr, £750. AEA PK-88 packet controllers x 2, £150 each, as new. AEA PK-90 packet controllers x 2, £175 each, as new. Braun Se400 2m all mode tcvr, not working but known fault, £100. Farnell professional oscillator, £100. Yaesu YC1000L data recorder/frequency counter, £150. Racal frequency counter pro 9917A, £500. Racal mod meter pro 91008, £250. Racal MVM pro 9301A, £250. Helper Sinadder 3 pro x 2, £150 ea. Helper MVM pro, £150. M Higgins, G4CIV, 0035 391 846 224 Home or 0035 391 790 222 Work (Co Galway, Ireland).
E-mail: mhiggins@telecomes.com

**COMPLETE** APT/Meteosat system by Timestep, 90cm dish, preamp, Meteosat + Proscan rcvrs ext interface & software man, cost £850. Bargain, £250. Could deliver up to 200 miles. M5ABC. QTHR, 01872 501 566 (Truro).
E-mail: rfmanuk@aol.com

## CONGRATULATIONS

**to the following whom our records show as having reached 50 or 60 years' continuous RSGB membership this month:**

| *50 years* | | *60 years* | |
|---|---|---|---|
| G3HRD | Mr J Ellis | RS5272 | Mr C L Chappell |
| G3HUL | Mr D M Mallett | | |
| G3HZI | Mr C L Hatfull | | |
| G3IOI | Mr N R Pascoe | | |
| G3JLN | Mr F G Blain | | |
| G3KSP | Mr P O Hooper | | |
| G3LQW | Mr K Wallace | | |
| G3PXJ | Mr S A Gaunt | | |

Our apologies to Mr T D Jardine, GM2BMJ, who was omitted from a previous list. He has been a member for 61 years.

**DRAKE** C-line, mint cond, all filters R4C, noise blanker, new bands T4XC + PSU, all late serial numbers, the Rolls Royce of separates, £750. No offers as this is possibly the best C-line. AOR 3000A scanning rcvr, £425. Dave, G3RCQ/M3DLC, 01708 374 043 (Romford).
E-mail: g3rcq@supanet.com

**EXTENSIVE** junk box free to someone prepared to take it away. All or nothing, no pick and mix, please. 01784 440 569 (Staines).
E-mail: adrian@g3zlr.fsnet.co.uk

**FT-8000** 2m 50W, 70cm 35W mobile L-M-H pwr, bracket box, h/book, £165 ono. Lowe FX1 wavemeter, £15 ono. Oskerblock 200 SWR meter, £20 ono. MH12 A2B speakermic, £12 ono. All exc cond. 024 7646 2035 (Coventy).

**FT-817** all-mode tcvr Nicads, charger, spare NiMH rechargeable battery pack, mic. PSU PS-817, protective case, Miracle Whip, boxed as new, £725 ono. Carriage/insurance included. G0GPO, QTHR, 01227 711 261 (Canterbury).

**GARMIN** GPS-12 personal navigator, £40. MFJ 1270B TNC2 packet modem, £20. MFJ-931 artificial RF ground, £30. 01443 683 912 (Rhondda).

**HF** mobile antenna by ZS Electroniques to go on truck, large vehicle or camper. 3-hole fixing HD coil mount. Coils and whip for 10 - 80m. Huge great thing for brave person. Worked the world with it, £80. ATAS 100 for FT-100 and separation kit as new cost £300, accept £200 ono. Trio SP-5D spkr, £20. G4PFR anytime. 01296 623 802 (Wendover)

**HUSTLER** mobile antenna system, mostly unused, all in mint cond. Resonators RM80, RM40, RM20, RM17, RM15, RM12, and RM10 plus ball mount, fast-release coupling, resonator impact spring, fold-over mast and instruction man. UK retail over £200, but offered at £150 ono. Purchaser please inspect and collect. GW3BAZ, QTHR, 029 2075 7556 (Cardiff).

**HY-GAIN** antenna 204BA 4-ele monobander, good cond, £240. Carriage extra or collect. G3SPU, QTHR, 01225 703 696 (Melksham).
E-mail: rmoore@g3spu.freeserve.co.uk

**HY-GAIN** AV-640 8-band vertical, brand new and boxed at £295, reason, planning problems, first offer secures. GM3CFS, QTHR (New), 01593 721 578 (Caithness).

**KENWOOD** 440S, Adonis AM-503G desk mic and Manson EP-925 PSU, £400. Compaq 486, Epson Stylus 800 printer, PK-88 TNC, Alinco DR-605 twin band radio 45 + 35W and all lead's, £325. Tilt-over tower, three 20ft sections, solid construction plus 10m monoband Quagi antenna and Yaesu G-600 RC rotator, £250. Buyer inspects and collects. 0151 608 9993 (Wirral).
E-mail: terry@g0wab.fsnet.co.uk

**KENWOOD** TL-120 linear amp, 13.8VDC with instructions, £90. No offers please. 01634 253 056 (Medway).

**KENWOOD** TM-255E AM m/mode mobile tcvr, shack used only. Mic, bracket, man, etc, boxed. Buyer inspects/collects, £300. M0BKX, QTHR, 01273 844 398 (W Sussex).

**KENWOOD** TS-50, AT-50, SEC-1223 complete HF station & PSU, £650. Yaesu FT-530 144/430MHz h/held wideband receive, as new, £125. All boxed. 01451 821 955 (Bourton-on-the-Water).
E-mail: g3tso@qsl.net

**KENWOOD** TS-50S tcvr 80m-10m AM/SSB/CW, lead, mic, h/book. H/B mast free to purchaser, £350, carriage extra. 01299 828 487 (Stourport).
E-mail: ggrieves@fish.co.uk

**KENWOOD** TS-570S, USA version, 100W 160-60m auto ATU, boxed, man, mic, mint condition, £700. TS-850S, mint, mic, auto ATU, man, 270Hz filter fitted, £650. Ten-Tec Corsair exc cond, mic & man, £250. Nissei 30A PSU, new, boxed, £85. 01257 421 442 (Standish).

**KW107** Supermatch ATU 1kW, late model, vgc £85. Icom R-71E, Airlite headphones with user and service mans, £275. Icom IC-SM6 mic (base) new, boxed, £38 ono. Prefer collect or pay carriage. Ken, G3ACB, 01279 731 070 (Nr Harlow).

**KW2000E** HF tcvr, PSU and original Shure 201 mic, exc cond, spare set of valves, £200. Shure 444 mic, £45. 01428 658 497 (Haslemere).
E-mail: g0xtl@tesco.net

**LINEAR** Amp UK Explorer 1200, 160-10m, WARC, soft start, vcg, £750. Icom GC-5 world clock, £25. Nissei SJCD-308 desk mic, leads for IC-706 or Kenwood rigs, £35. Wilson PM-2001 peak reading wattmeter 50-150 MHz, £25. Alan, G4YYD, 0161 797 7893 (Bury).

**LOW**E HF-150 rcvr c/w keypad and man, pristine, £180 or offers. 01773 856 518 (Derbyshire).
E-mail: bakercrich@aol.com

**NATIONAL** HRO-M, gwo, in wood case with original front panel, 4 coils, UK power unit, £50. 01928 723 118 (Helsby).

**QRP** freq crystals 1.8432, 3.560, 3.570, 7.075, 7.030MHz, £5 for all five. Valves QVO6-40 (2) £5 each. QQVO3-10 (4) £3 each. 813 (2) used, OK, £7 each. G2FQP, QTHR, 01179 570 929.

**QRP** Outfit, Lake DTR3-5 and matching SWR, fitted additional CW filter, £100 and £70 respectively, both vgc. Keith, G4ZTZ, QTHR. 07855 647 150 (Cambridge).
E-mail: taylor_k_m@hotmail.com

**RACAL** h/books inc postage. RA-63, £25. RA-218, £25. MA-1072, £35. MA-1072 OP, £15. MA-1090, £40. MA-1107/1105, £15. MA-1110 Pt1 and 2, £60. MA-1723, £50. RA-1771/2 (3 books), £65. RA1792 ST-80730 photocopy, £40. RA-1792, £65. RA-2291, £30. RA-2294, £25. RA-2296, £25. MA-2305, £35. RA-6790 photocopy, £25. RM-1290A Radar, £25. RA-1217 photocopy, £12. Racal MA-1723 drive unit complete, not working, can't be bothered to fix! Offers? 01743 884 858 (Shrewsbury).

**RACAL** MA-295 antenna changeover unit, new and unused with matching coaxial plugs, £150. Buyer to collect, G3PHA, 01204 840 629 (Bolton).

**RACAL** RA-1217 transistorised HF comms rcvr, 1-30MHz ex-Portishead Radio with operator's man and maintenance man, £230. GM3EOB, QTHR, 01738 551 042 (Perth).

***RADCOM*** bound volumes 69, 70, 71, 72, 81, 82, 88, 89. *VHF Communications* complete 1970-1993, duplicates 76-80, offers? 01773 856 518 (Derbyshire).
E-mail: bakercrich@aol.com

**RIGBLASTER** Plus, see page 65 May *RadCom*, bought from Waters & Stanton on 30/04/02. I have tried and tried, with some assistance from W&S to make it function with my old Yaesu FT-One, without success, and have finally given up. The unit is as brand new, cost £139.95, sell for £100 plus postage (£5). Ken, G3RDG, 020 8455 8831 (London).
E-mail: kennethb@btinternet.com

**SERVICE** mans, Pye PMRs, £5 each. Icom V200, H2, H10, V200T, Bird 6154, Zycom UT500, £10 each. Icom 706II, Alinco DX-70TH, £15 each. Icom IC-251E 2m multimode, £150. IC451E 70cm multimode, £150. Heatherlite Explorer 2m linear, £200. All vgc, ring for list of PYE mans. 01354 741 168 (March).

**SILENT** key sale (G2BUJ). Fixed length sectional tower, with 3-ele tri-band beam and rotator type Emotator 502cxx, buyer inspects and dismantles, £300. Trio/Kenwood TS-530SP, buyer inspects, £250. Trio/Kenwood AT-230 ATU, £70. Trio/Kenwood TS-520SE, £150. Trio/Kenwood TR-2500 2m tcvr with charger unit, £70. Bird 150W dummy load, £50. Hansen FS50 power meter, £25. SMC relative power meter, £10. Simpson 710 frequency meter, £10. Test Labs digital multimeter, £25. Trio/Kenwood LF-30 LF low-pass filter, £30. Marconi Instruments valve voltmeter, £10. Telequipment S54m oscilloscope, £20. Eddystone 750 rcvr (broken dial cord), £50. Advance Q meter type T1, £25. Model 50b regulated power supply, £10. Avo mutual conductivity meter, £5. AVO valve tester on stand (with valve data book), offers? Himound Morse key, £20. Bug key with plastic top, circa 1960, £20. Equipment listed above are complete with mics and h/books, buyer to inspect and collect, prices are all ono, all has to go. The following items are home made, G2DAF transmitter MkI, single 6146 with Eddystone dial, £70. Home made 2 x 4/65A linear amp, £75. Home made transistor rcvr 80 & 10, £30. Rack of power supplies for linear and G2DAF rcvr. Miss Susan Greenwood, 07816 917 666 or Rev Adrian Heath, G4GDR, QTHR, 01793 762 970 (evenings).

**SILENT** key sale. Icom IC-756 fitted 250Hz CW Filter, £650 ono. PK232 packet controller, £45. 01737 553 043 (Croydon).

**SILENT** key sale. Kenwood TS-570D used 4 times only, £675. TS-50, £70. FT-290R, £160. FT-101E, £140. FT-2 ATU, £40. YD-846, £10. Swan 350, £100. HRO R106, £40. Mizuho FX1 unused, £40. Dummy load DL100D, £45. IC-726, £380. AT-150, £150. PS-55, £75. FT-790 with 30W linear, £200. TR-751R, £380. IC-T7E, £170. ERA Microreader, £70. Kenpro KR-500, £150. FT-901, offers? FT-902DM offers? MM10-100 linear, £900. 01244 342 987 (Chester).
E-mail: mike.abram@btopenworld.com

**SPECTRUM** Analyser Anritsu MS-610B 10kHz to 2GHz, £1650. Philips 6.5 digit DMM, LCD display PM-2534, £145. Both in working order. 020 8668 7119 (London).
E-mail: jmort@global.freeserve.co.uk

**STRUMECH** telescopic mast, 4-section, max height 60ft, £300. John, G0GBN, 0151 327 2425.

**TELEPRINTER** Creed 7E, silence cover, part-built terminal unit, service and setup information included, £20. Buyer collects. Peter, GM6SHB, 01360 310 062 (Glasgow).
E-mail: p.miller@elec.gla.ac.uk

**TEN-TEC** Century 22, CW-only tcvr. 10W RF out. Analogue dial, needs re-stringing. Base model, with man, 160 - 10m plus 10MHz,

£125. Kenwood TM-G707E mobile FM tcvr, 144 and 432MHz. Boxed, vgc, mans and long remote kit. Never used mobile, £220. Both plus postage costs. Richard, G8ITB, QTHR, 01689 602 948 (Bromley).

**TONNA** 23cm 35-ele Yagis, £20 each. £35 for 2 or £60 for 4. Wimo 70cm 23-ele Yagi, £25. Buyer collects. 01442 826 651 (Tring). E-mail: g3meh@supanet.com

**UV** exposure unit (RS), no timer, £50. Coaxial antenna switch, £25. AEI transistor test set, £15. Farnell SM power supply board 5/12/24V, £8. 50 feeder spreaders, £10. 20V transformers, £2. Taylor signal generator, £15. Pascal, GI0SFT, 028 7135 2804 after 5.30pm (Londonderry). E-mail: pascalmcd@aol.com

**WESTOWER** 3-section tiltover tower, 58ft, c/w head unit and electric winch. Needs new ground post or welding. Buyer inspects and collects. G0LAN, QTHR, 01845 501 327 or 07941 252 969.

**YAESU** 101ZD MkIII with FM and CW filter, plus Explorer 1.2kW linear amplifier (160-10m) with slow start, almost new 3-500Zs (plus a spare), £650 (no split). Tom, GW3LJS, 01792 363 442 (Swansea).

**YAESU** FT-1000MP, mint cond, exc performer. Narrow filter, int power supply. Demonstration welcome, £1350. Jim, MM0BQI 0131 661 4686 (Edinburgh). E-mail: mm0bqi@thersgb.net

**YAESU** FT-1000D vgc, 3 years old, complete with all filters, man, sell for £1500. Mr Bradbury, M0WDB, 07815 453 313.

**YAESU** FT-1000MP AC/DC with InRad noise mod, £1250. Linear Amp UK Ranger 811H with new valves, £550. 01929 463 171 (Wool). E-mail: eric_g0cgl@lineone.net

**YAESU** FT-290R MkI, Mutek pre-amp, all accessories, mobile mount, £150. TS-403S, FM board, SSB filters, £200. Yaesu FRG-9600 rcvr, £100, all gwo. 01237 424 011 (Bideford). E-mail: jbg4sof@aol.com

**YAESU** FT-690R, 6m, man and 15W Nevada linear, £140. Prefer buyer inspects and collects. M1RPW/M3TMO, 07950 595 893 (Halifax).

**YAESU** FT-736R 6m, 2m, 70cm, 23cms, CW filter, CTCSS, mic and will include 60W 6m linear and 100W 2m linear, £850 ovno. Az/El rotator, Kenpro 5400, bearings and pots replaced last year, complete with 18m control cable and glass fibre horizontal boom, £295. <50m hardline LDF2-50 with one connector, £45 ono. Tennamast Adapt-a-Mast, £150. Satellite antennas, 70cm helix and 20-ele crossed Yagi, £35 the two. 01527 541 502 (Redditch). E-mail: g3kwkroger@aol.com

**YAESU** FT-757GX plus matching FP-757 PSU. All boxed, mans, ideal for your M3 callsign, little used since service. Buyer collects. Peter, M0CGA, QTHR, 01257 263 407 (Chorley). E-mail: peter.desoer@tiscali.co.uk

**YAESU** FT-847, new February, c/w mic and PSU, plus SWR meter. W&S 3-year warranty, £800. Discone ant, UHF/VHF, unused, £20. 01603 812 129 (Norwich).

**YAESU** FT-990 HF tcvr, AC model, includes mic, power lead, man, exc cond, £525. 01925 815 705 (Warrington). E-mail: g0pzp2@aol.com

# WANTED

**BC610** AM tx. BC-610 ATU. KW107. KW109. Heathkit SB220. 3-500Z. Heathkit B-IU Balun. TL-922. KW 75-ohm dummy load. Ben, 01398 361 215 after 6pm (Taunton).

**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 SX-42 or similar top-end valve comms, rcvr. G4ERU, QTHR, 01202 510 400 (Bournemouth).

**76** sender, part or complete please. 01634 253 056 (Medway).

**BC610**, BC375, BC312, BC342, command sets, must be complete, not modified, and working order. Cash waiting. 01202 480 088 or 01202 488 819 (eve) (Christchurch).

**EDDYSTONE** 888A rcvr or EA12, any condition. Paul, G3SDH, 01761 221 206 (Bristol). E-mail: g3sdh@btinternet.com

**G2DAF** rcvr, components needed to complete project. Coils, switches, IFTs, xtals, or non-working but complete rcvr. Wanted by G8HLJ, Ted, 0151 632 0614 (Hoylake).

**KW-109** ATU, also MFJ-209. 01539 726 909 (Kendal). E-mail: tapline@aol.com

**LABGEAR** LG-300 PSU/Modulator or complete transmitter. Paul, G3SDH, 01761 221 206 (Bristol). E-mail: g3sdh@btinternet.com

**MARCONI** CW key 365a and/or 365b. Dave, 07767 305 866 (Upminster). E-mail: gm362@btinternet.com

**MURPHY** B4OD rcvr. Murphy 62B rcvr. Any homebrew AM/CW transmitter etc, good price paid. WHY? G0JNT, QTHR, 01472 509 753 (Grimsby). E-mail: les-g0jnt@ntlworld.com

**PILOT's** control box type CRV-23254 for CRV-46151 rcvr, also 16-way plugs for above. GM8MMA, QTHR, 01957 702 384 (Shetland). E-mail: william.williamson1@btinternet.com

**POWER** supply for Swan 350. Would be interested in Swan 350 plus power supply if not prepared to split. GM2FVV, QTHR, 01786 811 237 (Stirling).

**ROHDE** & Schwarz test equipment made in the sixties, including original mans, particularly looking for models SMLR and USVH. Creed 75 teleprinters, un-used spares and tools. Tool kit for Siemens T100 teleprinter. Racal Speedrace MA275 oscillator coupling unit. Racal valve radio equipment, mans and sales literature bought for cash. Nigel, G0UGD, 01323 486 822 (Eastbourne). E-mail: nigel@irisys.co.uk

**SERVICE** man for TS-940S. Scrap Tektronix 453 scope for spares. G3SES, QTHR, 01244 383 954 (Chester). E-mail: philg3ses@aol.com

**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

**SONY** communications rcvr CRFV21 or CRF320, any cond. John, 07976 384 020 or 0121 704 2393 (Solihull).

**STRUMECH** standard duty P60 or BP60 in vgc, un-corroded. Specifically this model required, for more details see www.daveevans.org.uk Dave, GW4GTE, QTHR, 01244 544 794 (Chester). E-mail: dave@daveevans.org.uk

**WANTED** for restoration project 1960s-style moving coil meter. Scale marked Japan S-meter TS2 size 60mm square, barrel diameter 52mm, as used with Electroniques and other kits. Dennis, G4IAD, QTHR, 01942 817 556 (Bolton).

**WANTED** R1475, gwo. Marconi AD-108 rcvr, cylindrical scale for R1475 ranges 6.38MHz to 20.14MHz + two scale pointers. Cliff Collins, G3THX, 01754 761 306 (Skegness).

The Members' Ads order form is now published here. If members do not wish to cut the form out of the magazine, photocopies will be accepted, as will recent copies of the form from previous months, or recent copies of the 'carrier' sheet. *As a last resort*, members may also send in their advertisements on separate sheets of paper, but if you choose to do this, you *must* supply an accurate word count - and, of course, the correct fee in the normal manner.

## RSGB MEMBERS' ADS ORDER FORM

***Application form for one For Sale, Exchange or Wanted advertisement. Do not mix classifications on this form; separate applications must be made.***

Please ensure you read and understand the conditions of acceptance of these subsidised Members' Advertisements, printed at the top of the Members' Ads page of the current *RadCom*.

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EXCHANGE ☐
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Tick one box

I enclose a cheque/PO for £ ..... or please charge to my credit account below

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*Signed:* . . . . . *Date:* . . . . . .

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# Rallies & Events

**29 JUNE 2002**

**REDDISH RALLY** - St Mary's Parish Hall, St Mary's Drive, South Reddish, Stockport (jn of Broadstone Road South and Reddish Road). OT 11am, £1. TI on S22, C. John, G4ILA, 0161 477 6702.

**29 / 30 JUNE 2002**

**RAF WADDINGTON ARC** Air Show special event station. Bob, G3VCA, 01522 528 708

**30 JUNE 2002**

**ALEXANDERSON DAY** - SAQ on 17.2kHz and SA6Q on 136kHz. [www.telemuseum.se/grimeton/defaulte.html]

**CITY OF BRISTOL RSGB GROUP Longleat Amateur Radio & Computer Rally** - Longleat House, Warminster, Wiltshire. OT 10am, £3. TS, SIG, CS, RSGB, RA, CBS, CP, C, LB. Ron, G4GTD, 0117 985 6253 or ronford@g4gtd.freeserve.co.uk [www.longleatrally.co.uk]

**7 JULY 2002**

**YORK RC Rally** - held in the new stand at York racecourse. OT 10.30am. CP free. TI on 2m & 70cm. yorkradiorally@btopenworld.com [www.john.g4fuo@btinternet.co.uk/rally.htm]

**13 JULY 2002**

**CORNISH RAC Radio & Computer Rally** - Penair School, Truro. OT 10.30. TS, B&B, MT, CP free, C, TI. Ken, G0FIC, ken@jtarry.freeserve.co.uk or John, G4LJY, g4ljy@hotmail.com

**WESSEX RG special event station GB5NF** - Neston Fete, 10 miles NE of Bath. OT 12 noon. HF, VHF, UHF, various modes, inc PSK31. [www.g4sknradio.freeserve.co.uk/gb5nf.htm]

**20 / 21 JULY 2002**

**USS SALEM RC, K1USN, Annual Worldwide Museum Ships Weekend** runs from 0000UTC Saturday until 2400UTC on Sunday. Bob, W1QWT, w1qwt@arrl.net

**21 JULY 2002**

**HULL & DARS 9th Humber Bridge Radio Rally** - Cottingham High School. OT 10.30am. C, TI on S22. Leigh, G0UBY, leigh@sydney.karoo.co.uk or Jon, G7DBL, 01482 493 425.

**McMICHAEL RALLY & BOOT SALE** - Reading Rugby Football Club, Sonning Lane (B4446, just off A4) near Reading, Berkshire. OT 9am. CP, CBS, C, LB, TI on S22. First Aid post. Dave, G4XDU, 01628 625 720 or g4xdu@amsat.org [http://go.to/mcmichaelrally]

**TIVERTON SOUTH WEST RC (Mid Devon) Rally** - Pannier Market, Tiverton. OT 09.45/10am, £1. TS, B&B, C, CP. club@g4tsw.freeserve.co.uk [www.g4tsw.freeserve.co.uk]

**26 - 28 JULY 2002**

**AMSAT-UK COLLOQUIUM** - University of Surrey, Guildford. [www.uk.amsat.org]

**RADIO AMATEURS OF CANADA National Convention** - Vernon, British Columbia, Canada. The largest amateur radio event for the last five years in Canada. [www.rac2002.org/]

**28 JULY 2002**

**COLCHESTER RA Amateur Radio Rally & Computer Fair** - St Helena School, Sheepen Road, Colchester. CBS, B&B, C, TS, TI via GB3CO on S22, CP free. Ron, G4JIE, 01206 826 387 or ron@g4jie.freeserve.co.uk [www.g3co.ccom.co.uk]

**LEEDS & DARS Biannual Outdoor Rally & Car Boot Sale** - Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. CBS, CP free. J A Mortimer, M0JAM, 01943 874 650.

**RUGBY ATS Radio Rally** - BP Truck Stop on A5, 2 miles north of M1 jn 18. 01455 552 449 or rally@rugby-ats.co.uk

**4 AUGUST 2002**

**FENLAND RG Horncastle Summer Amateur Radio Rally** - Horncastle Youth Centre,

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; **MA** - Foundation Morse Assessments; **LB** - Licensed Bar; **C** - Catering; **DF** - Disabled Facilities; **WIN** - prize draw, raffle; **LEC** - LECtures / seminars; **FAM** - FAMily attractions; **CS** - Camp Site.

Cagthorpe, Horncastle, Lincs. OT 10.30am. C, MT (pre-book), TI on S22. Chris, G0PXB, 01526 860 320. [www.fenlandrepeater.org.uk]
**LORN ARS Radio Rally** - Benderloch Victory Halls, 8 miles north of Oban on A828. OT 10.30 for 11am. TI on HF and VHF. Shirley, GM0ERV, QTHR, 01631 566 518 or s.mclennan@freeuk.com or John, MM3MLH, QTHR, 01838 200 304.

**9 AUGUST 2002**

**COCKENZIE & PORT SETON ARC 9th Annual Junk Night** - Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, E Lothian. OT 6.30pm, £1. C, DF, WIN. All proceeds to British Heart Foundation. Bob, GM4UYZ, 01875 811 723 or bob.gm4uyz@btinternet.com

**11 AUGUST 2002**

**FLIGHT REFUELLING ARS Hamfest** - Cobham Sports and Social Sportsground, Merley, Wimborne, off the A31 (signposted). OT 10am, £2 - please have correct money ready. TS, CBS, MT (5WPM), LB, C, FAM, TI on S22 from 8am. Overnight camping on Saturday. Keith, G1VHG, 01202 577 937 or hamfest@frars.org.uk [www.frars.org.uk/hamfest]

**17 / 18 AUGUST 2002**

**INTERNATIONAL LIGHTHOUSE / LIGHTSHIP WEEKEND** - entry forms not necessary, but ensures that your entry is listed officially. Entry form from www.vk2ce.com/illw/index.html Runs from 0001 on Saturday until 2359UTC on Sunday. Exchange RS(T), QTH and ARLHS number of the light, obtainable from www.arlhs.com/awards/arlhs-numbers.html
**SCARBOROUGH SPECIAL EVENTS GROUP** - International Lighthouse / Lightship Weekend. Operation of GB2SCA from the lamp room at the top of Scarborough lighthouse. QSL card shows full colour photograph of the lighthouse. 40m SSB/CW, 2m & 70cm SSB/FM. Roy, G4SSH, g4ssh@netscapeonline.co.uk

**18 AUGUST 2002**

**KING'S LYNN ARC 13th Great Eastern Radio Rally & Car Boot Sale** - New venue: Fosters Sports & Social Club, Ferry Road, Clenchwarton. OT 10am. TI on S22, C, LB. No dogs. George, G6AKC, 07719 874 128 (eve) or george@g6akc.freeserve.co.uk

**24 - 31 AUGUST 2002**

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

**25 AUGUST 2002**

**COLERAINE & DARS Radio & Computer Rally** - Bohill Hotel, Cloyfin Road, Coleraine. OT 11.30am/12 noon. Peter, MI0CIB, 028 7035 1335 or Jim, GI4ORI, 028 7035 2393.
**MILTON KEYNES ARS Rally** - St Paul's School, Leaden Hall, Milton Keynes. OT 8am traders, 9am buyers, £1, TI on S22. Dave, M0BZK, 01908 501 310 or rally@bletchley.net [www.qsl.net/g3hiu/rally.html]
**TORBAY ARS Communications Fair** - Churston Ferrers Grammar School, Churston, Brixham. OT 10am, £2. TI, CP free, TS, B&B, MT, WIN. rally@tars.org.uk

**26 AUGUST 2002**

**HUNTINGDONSHIRE ARS Amateur Radio Rally** - Ernulf Community School, St Neots, near superstore on A428. OT 10am, £1.50. C, CBS, TI on S22. Peter, M5ABN, 01480 457 347 (6pm - 10pm) or peterherbert@aol.com

**29 AUGUST - 5 SEPTEMBER 2002**

**HORNSEA ARC 4th Antenna Workshop** - Manor Farm, Bewholme, Driffield, E Yorkshire. Free entry, but prior booking essential. G4YTV, QTHR, 01964 562 498 or g4ytv@aol.com

**1 SEPTEMBER 2002**

**MID-SUSSEX ARS Amateur Radio & Computer Car Boot Sale** - Marle Place, Burgess Hill. OT 10am. [www.msars.co.uk]
**TELFORD & DARS Rally** - Aerospace Museum, RAF Cosford, nr Wolverhampton, on A41 1 mile south of jn3 of M54. Admission free. TS, CBS, FM, DF, C, MT, FAM, CP free. TI on 2m and 70cm. 01952 299 677 or e-mail mstreet@g3jkx.freeserve.co.uk [www.telfordrally.org.uk]

**8 SEPTEMBER 2002**

**LINCOLN SWC Hamfest** - Lincolnshire Showground on A15, 5 miles north of Lincoln. OT 10.30am, £2, under-14s free. CP free, TI on 2m, CS by arrangement, C, TS, B&B, FM. Dave, 01522 878 481 or 07961 961 494.
**SUFFOLK DATA GROUP Rally & Surplus Sale** (Five Ss Rally) - Raceway Centre Green, Foxhall Stadium, nr Ipswich. OT 9.30am, £1. CBS, CP free, C, TI on S22. Peter, G8HUE, 01473 631 313. [www.antrina.net/hamradio/sdg-rally-2002-info,htm]

**14 / 15 SEPTEMBER 2002**

**TRANSMISSION 2002** - 10th annual event to raise money for British Wireless for the Blind Fund. John 01634 832 501.

**15 SEPTEMBER 2002**

**BARRY ARS Welsh Amateur Radio Show** - Memorial Hall, Barry. George, GW0PUP, 029 2083 2253.

**20 / 21 SEPTEMBER 2002**

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

**4 - 6 OCTOBER 2002**

**WACRAL CONFERENCE and AGM 2002** - Geoff, G4YJW, 01323 721 352 or geoff@g4yjw.freeserve.co.uk

**6 OCTOBER 2002**

**GREAT LUMLEY AR & ES Rally** - [www.glares.fsnet.co.uk]
**HORNSEA ARC Annual Rally** - G4YTV, QTHR, 01964 562 498 or g4ytv@aol.com

**11 - 13 OCTOBER 2002**

**RSGB International HF & IOTA Convention HFC 2002** - RSGB 0870 904 7373. [www.rsgb.org/hfc/]

**13 OCTOBER 2002**

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

**20 OCTOBER 2002**

**BLACKWOOD & DARS Radio, Computer & Electronics Rally** - George, 01495 724 942 or Dave, GW4HBK, 01495 228 516.

**26 OCTOBER 2002**

**CARRICKFERGUS ARG Rally** - Billy, MI0CZF.

**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

**17 NOVEMBER 2002**

**COULSDON ATS CATS Bazaar** - Andy, G0KZT, 01737 552 139 or andyg0kzt@hotmail.com
**MIDLAND AMATEUR RADIO SOCIETY Radio & Computer Rally** - Peter, G6DRN, 0121 443 1189.

**23 / 24 NOVEMBER 2002**

**LONDON COMMUNICATION & COMPUTER SHOW - New venue** - Wodson Park, Ware, Herts. RadioSport 01923 893 929. [www.radiosport.co.uk]

**30 NOVEMBER 2002**

**ROCHDALE & DARS Traditional Radio Rally** - John, G7OAI, 01706 376 204 (eve) or radars@mbc.co.uk

**1 DECEMBER 2002**

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

**8 DECEMBER 2002**

**WEST MANCHESTER RADIO CLUB Red Rose Radio Rally** - Stephen, G6BVN, 01942 888 900.

# 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 Jul** GB4MGR: Manx Guide Radio. Sulby, Isle of Man. (GD4OEL)
**3 Jul** GB0RAF: Royal Air Force. Deerbolt, Co. Durham. L (G0NRK)
**5 Jul** GB2HOG: Harley Owners Group. Wallheath, West Midlands. TLH (M0SJV)
GB4YOU: Youlbury Scout & Guide Radio. Oxford. TLH27P (G0RJX)
GB4YOU: Youlbury Scout & Guide Radio. Oxford. TLH27P (G0REL)
**6 Jul** GB0WCS: Wolverhampton City Show. Wolverhampton. LHV27P (M0SRB)
GB1JLC: John Lowther Centre. Kettering, Northants. V27 (G4MRA)
GB2EK: East Kirkby. East Kirkby, Lincolnshire. LH2 (G4BZA)
GB2LC: Linnet Clough. Stockport. LH2 (G3WFW)
GB4BOB: Borough of Broxbourne. Cheshunt, Herts. LHV27 (M5AJK)
GB4FT: Foredown Tower. Portslade. LH (G4XKF)
GB4JLC: John Lowther Centre. Kettering, Northants. LH (G4MRA)
**7 Jul** GB2FX: Felixstowe. Felixstowe, Suffolk. LH2 (G4YQC)
**12 Jul** GB2CP: Carisbrooke Priory. Newport, Isle of Wight. TLHV27 (M5PDL)
GB4WS: Wyre Scouts. Goosnargh. TLH2 (G0LRK)
GB5RL: Ribble Link. Preston, Lancs. TLH27 (G3UCA)
**13 Jul** GB2BC: Blackwell Court. Bromsgrove. LH2 (G0TIB)
GB2BJG: Belchford Jubilee Gala. Belchford, Lincs. LH2 (G4BZA)
GB2RVS: Rettendon Village Show. Rettendon, Essex. TLHV27 (G4ZPE)
GB5NF: Neston Fete. Corsham, Wilts. LHV27 (G4SKN)
GB5OM: Our Majesty. Nr Petersfield, Hants. TLHV2 (G0DHZ)
**14 Jul** GB0ERG: Eagle Radio Group. Mablethorpe, Lincs. H2 (G0CBM)
GB4CH: Childrens Hospital. Walkden, Manchester. LH2 (G0KEV)
**15 Jul** GB1CG: Commonwealth Games. Manchester, M60 1QD. V27P (G7JKK)
GB5MG: Manchester Games. Manchester, M60 1QD. TLH (G3RTU)
**20 Jul** GB5SI: Summer Isles. Tanera Mor, Summer Isles. LH (MM0BQI)
**21 Jul** GB2SOB: Sirloin of Beef. Hoghton, Preston. LH27 (G3UCA)
GB6MMR: McMichael Rally. Reading, Berks. 27P (G4KWT)
**25 Jul** GB0MCG: Manchester Commonwealth Games. Rochdale. (G0HXQ)
GB4CG: Manchester Commonwealth Games. Manchester. (G0TOG)
GB4MCG: Manchester Commonwealth Games. Manchester. (G0BUS)
GB8CG: Manchester Commonwealth Games. Ashton under Lyne. (G0RGU)
**26 Jul** GB0SAS: Sunderland Air Show. Seafront, Sunderland. LHV27 (G0YCA)
**27 Jul** GB1BGC: Bounce Guide Camp. Nr Kettering, Northants. V27 (G4MRA)
GB2BGC: Bounce Guide Camp. Nr Kettering, Northants. LH (G4MRA)
GB2CUM: Cumbaree. Milnthorpe, Cumbria. LH27 (G3HMR)
GB2HWG: Hampshire West Guides. Lyndhurst, Hampshire. LH27 (M0ACL)

## SILENT KEYS

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

| | | |
|---|---|---|
| G0IZT | Mr C C Shedden | |
| G0JFJ | Mr G Berry | 05/02/02 |
| G0KTB | Mr G C Spencer | 05/05/02 |
| G1AVJ | Mr G M A Flower | 10/04/02 |
| G1UJR | Mr E G Bradbury | 16/05/02 |
| G2BAH | Mr L S Gumbrill | 18/02/02 |
| G2BUJ | Mr P Greenwood | |
| G3BEG | Mr P Bond | 10/05/02 |
| G3CPS | Mr E C Gray | 17/04/02 |
| G3CXI | Mr P J Cooper | |
| G3KEU | Mr T Leighfield | 14/05/02 |
| G3KFT | Mr J Reddings | 29/04/02 |
| G3LCG | Mr P Bateman | 09/05/02 |
| G3MII | Mr P Roper | |
| G3MYV | Mr E Yates | 21/05/02 |
| G3UAC | Mr J D W Aitken | 22/03/02 |
| G4AML | Mr L M G Dumont | 29/03/02 |
| G4GWW | Mr R W Broom | 21/03/02 |
| G4KDZ | Mr A W Clements | 04/02 |
| G4MBV | Mr W Blofield | 22/03/02 |
| G6PHV | Mr D R G Ford | 07/11/01 |
| G8BFW | Mr T A Wildman | 31/07/01 |
| GI0ACE | Mr P Smith | 04/05/02 |
| GI4OYE | Mr W G Heyburn | 04/12/01 |
| GM3YCG | Mr S Spence | 02/03/02 |
| GM4AGX | Mr J Yates | |
| GM6YRZ | Mr N R Blake | 09/04/02 |
| GM7DSC | Mr J D Simpson | 24/03/02 |
| M5ALF | Mr A E Chapman | 06/04/02 |
| RS23133 | Mr R C Mense | 11/02/02 |
| ZL2PB | Mr H B McLaren | |

# Club & Regional NEWS

## Region 1: Scotland West & Western Isles

No club details received.

## Region 2: Scotland East & the Highlands

**COCKENZIE & PORT SETON ARC**

6/7, VHF Field Day. 27/28, RSGB IOTA Contest from Tiree. Bob, GM4UYZ, 01875 811723.

## Region 3: North West

**MID CHESHIRE ARS**

3, VHF NFD preparation. 10, Club maintenance & stock taking. 17, On air. 24 BBQ. Niall, G0VOK, 01606 871413.

**PRESTON ARS**

4, TBA. 11, Foundation Licence course starts. 21, BBQ. Sean, M3HDD, 07951 169 330.

**STOCKPORT RS**

2, VHF portable activity, 2m UK Activity Contest. 18, 'Ladies Night' New Zealand, Gordon Mills. David, M1ANT, 0161 4567832.

**THORNTON CLEVELEYS ARS**

1, Special events discussion. 8, Licensing and the future. 15, 'Setting up a station', Ian, G3ZRZ. 22, HF Awards, Ken, G3RFH. 29, Test equipment. Jack, G4BFH, jack@jduddington.fsnet.co.uk

## Region 4: North East

**GOOLE R & ES**

12, Contest debrief at Black Swan, Asselby. 19, BBQ at Barmby Tidal Barrage. 26, Fundraising at Black Swan. Richard, G0GLZ, 07867 862169.

**GRIMSBY ARS**

4, Old reaction radio, G4DXB. Brian, G4DXB, 01472 231383.

**HALIFAX & DARS**

16, 'D-Day Deception', Bill, G4KQJ. R E Nolson, G0PMU, 01274 600297.

**HORNSEA ARS**

3, 'Foxhunt'. Andy, G0VRM, 07050 287279.

**HULL & DARS**

21, 9th Humber Bridge Radio Rally. Leigh, G0UBY, leigh@sydney.karoo.co.uk

**KEIGHLEY ARS**

11, On air. 18, Film show (TBA). Ian, M1BGY, 01274 723951.

## Region 5: West Midlands

**BUSHBURY E & ARS**

6/7, GB0WCS at Wolverhampton City Show, West Park. Steve, M0SRB, 01902 865746.

**COVENTRY ARS**

5, VHF NFD preparation. 12, On air, CW practice. 19, DF hunt. 26, On air, CW practice. John, G8SEQ / M3AGM, johng8seq@ntlworld.com

**CHELTENHAM ARS**

5, Connecting to the Internet, Mark David, G4MEM. Derek, G3NKS, 01242 241099.

**GLOUCESTER AR & ES**

1, Workshop, on air. 8, Club '80 plus' birthday. 15, Workshop, on air. 20/21, Picnic, QRP weekend operating. 22, 29, Workshop, on air. Tony, 01452 618930.

**KIDDERMINSTER & DARS**

2, On air, HF, VHF and PSK31 demonstration. Tony, G1OZB, 01299 400172.

**MAXPAK**

1, AGW / WINPAK software demonstration, G0CNG and G4GSB. G4GSB, 01952 585447, milesclifford@aol.com

**MID-WARWICKSHIRE ARS**

9, 'Broadcast Antennas', Nigel, G7TMA. 23, Field day planning. Bernard, M1AUK, 01926 420913.

**SALOP ARS**

4, VHF NFD preparation. 6/7, VHF NFDl. 18, 'foxhunt'. 25, Summer social, Corbett Arms, Uffington. Wayne, M5WJF, m5wjf@qthr.freeserve.co.uk

**STRATFORD UPON AVON & DRS**

8, Surplus sale, John, G8HJS. 22, Construction competition, Terry, G3MXH. David, 01926 642858 or 07816 550075.

**TELFORD & DARS**

3, Open evening, on air. 6/7, VHF NFD, site TBD. 10, 3rd 2m / 70cm DF hunt ('fox' 2E1DJM). Mike, G3JKX, 01952 299677.

## Region 6: North Wales

No club details received.

## Region 7: South Wales

**BARRY ARS**

2, Open forum. 9, 'Operating Techniques on the HF Bands', Glyn, GW0ANA. 16, Logging


**Merv Williams, GW3VXC, sent in this photo of members of the Pontpool Radio Club, *circa* 1958, while on a visit to the HTV studios at Pontcanna, Cardiff.**

software. 23, 'Another Construction Project', John Barber, GW4SKA. 30, Planning for Flatholm Island expedition. Richard, GW4BVJ, 01656 658830.

## Region 8: Northern Ireland

No club details received.

## Region 9: London & Thames Valley

**CHESHAM & DARS**

3, General Meeting. 10, On air. 17, McMichael Rally planning. 24, Mystery treasure hunt, Jeremy, G3XZG. 31, Foundation Licence CW training, G3MEH, G4HES. Terry, terence.thirlwell@eds.com

**CHESHUNT & DARC**

3, Members' Forum. Jim, G0JXN, 01992 468204.

**COULSDON ATS**

8, Quiz, Andy & Jan Jackson. Steve, G7SYO, 01737 354271.

**EDGWARE & DARS**

11, 'Non-radio DIY', Terry, G3WUX. 25, 'Electromagnetic Waves', Ian, G4IUZ. David, G5HY, 01923 655284 (days) / 020 89549180 (eve).

**MAIDENHEAD & DARC**

4, Quiz (TBC). 16, Home Counties ATV Group, Mike, G8LES. John, G3TWG, 01628 525275.

**NEWBURY & DARS**

17, BBQ. 27, 28 RSGB IOTA Contest IoW. Mark, M0CUK, 01635 36444.

**RS OF HARROW**

5, Informal. 7, GB2DHH operating day. 12, French evening. 19, Informal. 26, Shack visit to member. Jim, G0AOT, 01895 476933 / 020 7 2786421.

**READING & DARC**

11, McMichael Rally preparation. Pete, G8FRC, 0118 969 5697.

**SILVERTHORN RC**

26 -29, Club Camp at Hertford. David, G0KHC, 020 85042831.

**SURREY R CONTACT C**

1, BBQ at G3ZPB QTH (Pound Cottage). Ray, G4FFY, 0208 6447589.

**VERULAM ARC**

14, Watford &D Classic Vehicle Trust charity event. 22 - 29, 9M6AAC Borneo DXpedition. 27/28, RSGB IOTA contest. Walter, G3PMF, 01923 262180.

**WIMBLEDON & DARS**

12, PicATUne, Paul Berkeley, M0CJX. 27 Jul - 4 Aug, Summer camp. Jim, G4WYJ, 01737 356745.

## Region 10: South & South East

**BASINGSTOKE ARC**

1, Internet linking, Paul, G4HLF. 6/7 VHF NFD, Woodgarston Farm. 28, 'Foxhunt', Peter, M1DGQ. Peter, M1DGQ, 0118 983 6545.

**CRAWLEY RC**

21, LF round table. 24, Decca Navigation, G3JKV. Derek Atter G3GRO 01293 520 424.

**CROWBOROUGH & DARS**

25, IOTA contest preparation, Crest Farm, Duddleswell. Eric, G3TXZ, 01892 654633.

**FAREHAM & DARS**

3, On air. Steve, G7HEP, 01329 663673.

**FARNBOROUGH & DRS**

10, Open evening: *non-members welcome*. 24, Ultrasonic Ranging of Bats, Colin, G8BCO. Norman, G0VYR, 01483 835320.

**HARWELL ARS**

9, Summer DF hunt. John, M3LNU, 01235 223250.

**HASTINGS E & RC**

17, Summer auction. R C Gornall, G7DME, 01424 444466.

**HORNDEAN & DARC**

2, Club social. 6/7, GB5OM at Queen Elizabeth Country Park Show. 23, 'Bees and Beekeeping', Roy Godfrey. Stuart, G0FYX, 023 92472846.

**HORSHAM ARC**

4, '100 Years of Electricity in the Home'. David, G4JHI, 01403 252221.

**ITCHEN VALLEY RC**

6/7, VHF NFD. 12, Quiz with Waterside and Andover. 26, Radio test. 27 Jul - 3 Aug, GB2HGW at Flame International

Camp, Foxleaze. Mike, G6AIQ, mamjh@yahoo.com

**MID SUSSEX ARS**
5, Prepare for VHF NFD. 6/7, VHF NFD. 12, Shack ops. 20, Summer supper, Sue, G6YPY. 26, PicATUne, Paul, M0CJX. Geoff, G6MJW, 01273 845103.

**OXFORD & DARS**
11, Computer clinic, Ray Goff, G4FON. Dave, G3BLS, 01865 247311.

**SOUTHDOWN ARS**
1, BBQ at Beachey Head. John, G3DQY, 01424 414319.

**SWINDON & DARC**
4, VHF NFD preparation. 18, DF hunt. 25, RSGB IOTA Contest preparation. Den, M0ACM, 01793 822705.

**THREE COUNTIES ARC**
25, On air. Damian, KammDP@btinternet.com

**WORTHING & DARC**
3, DF hunt. 10, Construction project. 17, Discussion evening. 24, Fire brigade special event planning. Roy, G4GPX, 01903 753893.

## Region 11: South West & Channel Islands

**BLACKMORE VALE ARS**
2, On air. 9, 'Summits on the Air (SOTA)', Mathew, M1EVT. 16, HF On air. 23, 'Foxhunt'. 30, WAB. Tony, G0GFL, 01258 860 741.

**BRISTOL RSGB GROUP**
29, 'Basic QSOs in a Foreign Language', Martyn, G3RFX. Martyn, G3RFX, 01179736419.

**CORNISH RAC**
4, General Meeting. 8, Computer Section. 13, Rally at Penair School. John G4LJY, 01872 863849.

**NORTH BRISTOL ARC**
19, 'DXpedition to Madagascar', Phil Whitchurch, G3SWH. Dick, G0XAY, G0XAY@aol.com

**POLDHU ARC**
9, BBQ at Marconi Centre. Keith, G0WYS, 01326 574441.

**SOUTH BRISTOL ARC**
3, Working the SBARC team on Lundy Island. 10, VHF NFD debriefing. 17, BBQ. 24, 70cm Post Code Challenge. 31, Summer darts match. Len, G4RZY, 01275 834282.

**TORBAY ARS**
19, Radio receivers, G4VFG. Walt, G3HTX, 01803 663200.

**TROWBRIDGE & DARC**
3, 144MHz DF. Ian, G0GRI, 01225 864698 evenings/weekends.

**WEST SOMERSET ARC**
2, BBQ. Jean, G0SZO, 01984 633060.

## Region 12: East & East Anglia

**BRAINTREE AR & CCC**
1, Essex Repeater Group talk. Keith, M0CLO, 01376 347736.

**BURY ST EDMUNDS ARS**
10, Curry supper at Whepstead. George, G3LPT, 01359 259518.

**CAMBRIDGE & DARC**
5, Informal. 12, I-Link System, Daryl, G0ANV. 14, BBQ at Longstow. 19, Using an Oscilloscope, Clive, G8BOU, Ron, G3KBR. 26, Video evening. Ron, G3KBR, 01223 501712.

**CHELMSFORD ARS**
2, 'From Rig to Radiator', Brian, G3CVI. David Bradley, M0BQC, 01245 602838.

**COLCHESTER RAC**
4, Rally planning. 18, 'The Home of the Future? X10 Home Automation', Andy Straw, M1MOD. Andy, M1MOD, 01206 735122.

**FELIXSTOWE & DARS**
7, GB2FX Darrell Day special event. 22, Microwave Update, Sam, G4DDK. Paul, G4YQC, 01394 273507.

**HARWICH ARIG**
10, On air, BBQ. Eugene, G4FTP, 01206 826633.

**IPSWICH RADIO CLUB**
3, Quiz, Ipswich vs Felixstowe. 15 - 21, Activity Week at Otley. 20, BBQ. Keith, G7CIY, 01394 420226.

**LOUGHTON & EPPING FOREST ARS**
12, Friedrichshafen debriefing, John Ray, G8DZH & John Mulye, G0VEH. 26, 40th Anniversary Garden Party. Marc, G0TOC, 07803 023501.

**MAIDSTONE YMCA ARS**
*No meetings* - holidays. Andy, M0CST, 01622 661035.

**MEDWAY ARTS**
5, Coherers & crystals, Colin Sumner, G0POS. 12, Connecting cables, Alan Stanley, G1OMH. Pauline, 2E1HRY, pauline.odle@blueyonder.co.uk

**NORFOLK ARC**
10, Waters & Stanton plc, Mark Francis. 17, 31, Informal Morse practice / instruction. 24, PSK31, Malcolm, G3PDH. Peter, G3ASQ, QTHR.

**SUDBURY & DRA**
2, Visit to Ridgewell Commemorative Museum, Derek, G3MMA. Bryan, G1TWY, 01787 247893.

## Region 13: East Midlands

**EAGLE RG**
9, Fibre optics: networking & Internetting, Paul, 2E1BDC. G0SWS, 01507 478590.

**LINCOLN SW CLUB**
10, *PW* editor Rob Mannion. 13, Special event at Boultham Fair. 24, Walking treasure hunt. John, G1TSL, 01522 793751.

**NORTHAMPTON RC**
5/6, VHF NFD. 21, CW contest. Norman, G0GBZ, 01327 349188.

**RAF WADDINGTON ARC**
11, Club dinner at Pyewipe Inn. Bob, G3VCA, 01522 528708.

**SCUNTHORPE STEEL ARS**
2, VHF NFD planning.9, VHF NFD 'inquest'. 16, Five-minute talks. 23, GB3WJ Internet linking update, John, G0JRB and Mark. 30, Junk sale, BBQ. Alistair, M1ECF, 01427 872976.

**SOUTH NOTTS ARC**
3, On air. 10, Open forum, members only. 17, Summer dinner. 01509 569679.

**SHEFFORD & DARS**
4, Final planning and equipment check for VHF NFD. 6/7, VHF NFD. 11, Mobile 'foxhunt'. 18, BBQ and end-of-term party. Derek, G4JLP, 01462 851722.

| 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 / M3CNY |
| 4. North East | Geoff Darby, G7GJU / M3GJU |
| 5. West Midlands | Roy Clarke, G8AYD / M0RLY |
| 6. North Wales | Liz Cabban, GW0ETU |
| 7. South Wales | Simon Lloyd Hughes, GW0NVN |
| 8. Northern Ireland | Jeff Smith, MI0AEX |
| 9. London & Thames Valley | Alan Ross, G1SQB |
| 10. South & South East | Ivan Rosevear, G3GKC |
| 11. South West & Channel Islands | Dick Atterbury, G4NQI |
| 12. East & East Anglia | Malcolm Salmon, G3XVV |
| 13. East Midlands | Bryn Llewellyn, G4DEZ |

**RSGB Regional Managers as of 12 June 2002.**

## DOVER CLUB MEETS WEEKLY

DOVER ARC meets every Wednesday at 7.30pm *during term time* at Dover Boys' Grammar School. It is a centre for Foundation, Intermediate and Morse courses and is an RAE examination centre. Visit the website at www.darc.org.uk for further information or call Jim Cairns, M1BKI, tel: 01304 852773, or Ian Keyser, G3ROO, on 01304 821588.

## A TITANIC SUCCESS

GB90MGY, THE special event station commemorating the heroism of Jack Phillips, Chief Wireless Telegraphist on the *Titanic*, was on the air over the weekend of 13 - 15 April. The world-wide interest was phenomenal, with nearly 3000 QSOs, all CW, in more than 100 countries. Visitors to the station in Godalming, which featured a replica of the *Titanic's* wireless room, exceeded 500 in number.


**Alex Wickham, G3XHK (a member of the Titanic Wireless Commemorative Group), operating GB90MGY, encouraged by Malcolm Constantine, G0MIC (left), and Simon Harris, G0SJH (right), members of Guildford and District Radio Society.**

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*.**

## FOUNDATION LICENCE COURSE NEWS

**WREXHAM ARS's** first Foundation course was held at Wrexham Scout HQ over the weekend of 19 / 20 April. Lead Instructor Ian, GW0VML, with help from Mike, MW0BLL, as invigilator for the exam; John, GW0TBT, invigilator for the Morse Assessment; Mark, MW1MDH / MW3MDH; Stephen, G6ZMD / M3ZMD; and John, GW3RBM, are all shown in the photo. 13 people sat the course and a 100% pass rate was achieved. Congratulations to all concerned.

**Bishop Auckland Radio Amateurs Club** ran its first Foundation Course in March. Teaching the syllabus was Tim, M0ACV, while Morse Assessments were carried out by Brian, M0BAR, and Iain, M0PCB, who, at 17, is possibly the youngest Morse Assessor in the country. There were 10 successful candidates, and since then a second course produced a further eight new M3 licensees. The club plans to hold another course in the near future: contact Tim Bevan, M0ACV, tel: 01388 832948 or Mark Hill, G0GFG, tel: 01388 746353, for further details, or see the club's website at www.qsl.net/g4ttf

**Mike, now M3MBB (left), making transmissions under the supervision of Iain, M0PCB.**

The **Paisley (YMCA) ARC** Completed its first Foundation Course on 8 May when 16 students sat the examination - all passed. The youngest was 14, five were 18 or under and the rest were rather older. At the start the students asked that the course should be run in seven two-hour sessions each held fortnightly. Since most had no experience of amateur radio or electronics, it was felt that this would allow for study between classes. By the night of the examination, all were confidently discussing antennas, propagation and other amateur radio topics and the examination proved to be no problem. There are now 16 brand new calls in use in South West Scotland.

The **Yeovil ARC** has been successful in maintaining a 100% pass rate in its Foundation Licence course recently run by George, G3ICO. Of the six who passed, the youngest is Ashley, M3ARS, aged 12, who attends Westfield School in Yeovil. He is the youngest licensee in the Yeovil club. Further foundation courses are available in Yeovil and are currently being run by M0WOB. For more details call Derek, tel: 01935 414452 or e-mail: m0wob@tiscali.co.uk


**Ashley, M3ARS, seen here in the M0WOB shack, enjoying the thrill of radio communication.**

## TELFORD RALLY

THE ORGANISERS OF THE Telford Radio & Electronics Rally are seeking the involvement of as many local radio groups as possible. The clubs and societies will be the main focus of the annual rally, which this year takes place on 1 September at the RAF Aerospace Museum, Cosford, near Wolverhampton. Since admission will be free, a very high attendance is anticipated. Many Midlands clubs have already been contacted by post, but any club that has not received the circular is requested to contact Martyn Vincent, G3UKV (QTHR), as soon as possible. Further details may be obtained from Martyn, tel: 01952 255416 or e-mail: ukv@globalnet.co.uk


**11-year old Robin Dinning, MM3RJD, the youngest member of the Kilmarnock & Loudoun Amateur Radio Club in Ayrshire, proudly displays his pass slip after passing the Foundation Licence exam.**

## INTERNATIONAL MARCONI DAY AT CHELMSFORD

THE CHELMSFORD ARS (CARS) operated two HF stations for International Marconi Day on 27 April, using the club call GX0MWT. The stations were located in the Sandford Mill Science and Industrial Museum, one in the original wooden hut used by the famous broadcast station 2MT in the 1920s. A doublet antenna running over the river was used on 80 and 40m, while for the higher bands a 3-element triband beam was mounted on a flat roof. A kite antenna was also used, but poor weather prevented it being flown for very long. The stations were manned by a team of operators co-ordinated by Brian, G3CVI. Special mention must be given to John, M0CQK, who operated the 20m station continuously during a marathon 10-hour stint from 0200 to 1200. Around 700 contacts were made all over the world. The museum was open to the public and Geoff, G3EDM, organised a team of 'hosts', whose task it was to explain to visitors what amateur radio is all about, leaving the operators free to concentrate on the operating. In all, 293 people visited the stations and the club gained several new candidates for its next Foundation Licence course. Chris, G0IPU, ran Morse Assessment sessions and during the day, 15 B licensees took the assessment and can now operate on the HF bands.

**Tony, G4YTG, with the kite antenna.**

## DUNSTABLE DOWNS RADIO CLUB BOOT SALE

THE 2002 Dunstable Downs Radio Club boot sale took place on 12 May and, like all those before it, was a great success. The event has been held at Stockwood Park in Luton, near junction 10 of the M1, for several years. Like all such outdoor events, the weather has a lot to do with its success or failure, and this year the sun was shining all day. The great variety of old, new and not-so-new equipment being offered for sale was also a positive factor. Radios were being sold alongside computing equipment and a wide variety of electrical and electronic surplus as well as TV and satellite dishes and things that defied exact identification. There were plenty of sellers and a constant stream of interested buyers arrived throughout the day including some who were just enjoying a visit to the park on a pleasant Sunday and were bemused by the fact that people were paying to take home other peoples' junk. The event is due to run again about the same time next year and details can be found on the club's website at www.ddrcbootsale.freeserve.co.uk

**Former WACRAL President G3TWS presents Mike Horner, G6AIQ, with the WACRAL Construction Trophy for his winning noise bridge. The noise bridges were built by members from kits specially prepared by G3LRQ and based on the April 2001 *RadCom* article 'Antenna Tuning by Stealth' by ZL3KB.**

# VHF/UHF

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

THE SPORADIC E (Es) season is now well under way on 50MHz and there were several auroral events to liven things up on the VHFs. WSJT mode contacts are providing some good DX for stations with limited ERP and the JT44 version is now attracting experimenters using moonbounce.

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, (CM), (FK) etc refers to the postcode area and (IM68), for example, is the Maidenhead grid.

## *VALE* G4APA

THE VHF FRATERNITY suffered a great loss when Tony Ashcombe, G4APA, passed away on 23 February 2002 following a long struggle against cancer. He became interested in radio through a shared interest with his father, building radios and listening to radio amateurs. After passing the RAE and Morse tests he soon took a keen interest in contesting and for many years was a member of the Hillbillies Contest Group. Later he became a founder member of the Northern Lights Contest Group. He enthusiastically used meteor scatter, EME and auroral propagation modes and his most recent experiments were with WSJT. Tony had been a keen teacher of both the Novice and RAE courses helping many to gain their licences. He would go out of his way to help his local radio clubs and scout groups with special events and activity nights. He will be missed by his many friends and we extend our deepest sympathy to his wife Chris and family. My thanks to Robert Ferguson, GD4GNH, for passing along this sad news.

## CONTEST NOTE

THIS YEAR'S *CQ* World Wide VHF Contest starts at 1800 on **20 July** and finishes at 2100 the next day. Contest director Gene Zimmerman, W3ZZ, says the full rules are available on a website - see the list. The results of last year's contest are in the June 2002 issue of *CQ Magazine* but not on the web.

## MOONBOUNCE

ROY REED, G3ZIG (JO02), was QRV on 2m in the *DUBUS*/REF contest and managed 67 CW QSOs with 34 multipliers. Conditions weren't too bad most of the time but some auroral activity didn't help EME communications. His 11 new initials were RA1ZC, UX3LV, KC4VI, OK1VVP, PA5MS, WA4NJP, PA3CMC, OH3TR/P, 7J6CCU, UY5HF and SK7MW.

In last year's ARRL EME Competition he gained an excellent 4th place out of 68 entries in the 144MHz Single Operator section. The only other British entrant was David Anderson, GM4JJJ (IO86), who came 10th. This year's ARRL dates are 26/27 October and 23/24 November.

Howard Ling, G4CCH (IO93), reports great conditions on 23cm in the Italian ARI EME Contest on 18/19 May but remarks, "Shame about the poor activity". He claims 20 scoring QSOs, one on SSB the rest on CW for 263 points.

G4YTL believed that his 70cm QSO with W7MEM on 20 April was the first successful JT44 EME QSO on the band, but In the May *432 and Above Newsletter* DL4KG reports, "I had a good time in April. On the 17th I played a bit with the new JT44 mode in the WSJT program and had a good QSO with DK3BU for initial number 72. The signals were not audible, but the program decoded all details. The QSO was completed in 13 minutes!"

Niels Montanana, G8RWG (IO91), whose new 2m antenna array is shown on page 76, copied a JT44 QSO on 25 April between S52LM and WA4PGI and he had some skeds lined up for a try.

Simon Freeman, G3LQR (JO02), was QRV on 23cm in the second leg of the *DUBUS*/REF contest running 150W at the feed of his 4.2m dish. He worked 26 stations including initials F6KHM, OK1CA, WA1JOF and WA6PY. Over the same 20/21 April weekend Peter Blair, G3LTF (IO91), completed with 31 stations on 23cm. In the small hours of the 24th a sked with KL6M came off for initial 188.

Stuart Jones, GW3XYW (IO71), was also QRV on 23cm on 20 April completing with 16 stations with a multiplier of 12. Dave Dibley, G4RGK (IO91), was QRV on 70cm for the April sked weekend and worked DJ5NV, K1FO, UA3PTW and DL7APV who had an outstanding signal. I assume that all the aforementioned QSOs were CW mode.

Photo: Henryk Kotowski, SM0JHF

**The impressive moonbounce antennas of Gilles, F5FEN.**

## PROPAGATION

THERE HAS BEEN a drop in solar activity and in the 30 days to 21 May the radio flux never reached 200 units. The maximum, 191, occurred on 6 and 10 May while the minimum was 147 on 28 April, giving a average of 171.9.

47 new sunspot regions were recorded. The geomagnetic data show that the A-index reached sub-storm level on two days, the maximum middle latitude value at Fredericksburg being 27 on 11 May. It was unsettled on seven days the remainder being quiet, ie 10 or less.

There is a wealth of solar data on the NOAA Space Environment Center website - see the list.

## METEOR SCATTER

IN A MESSAGE dated 10 May, the NASA Science News service reported, "Experts say another Leonids meteor storm is due in 2002. Rumour has it that a glaring full Moon will ruin the display . . . but perhaps there's hope for a marvellous show, after all".

On 2m G0ISW completed on FSK441 with DD1JN (JO50) on 11 May, HB9DDS (JN47) on the 12th and OK1DIG (JO60) on the 13th using 50W to a log periodic antenna 7m AGL. Ken Punshon, G4APJ (BL), completed with F1FIH (JN23) on 22 April during the peak of the Lyrids shower. On 15 April G4YTL completed on HSCW with EM5U (KN39), a QRB of nearly 2000km.

G8RWG worked DL1GGT (JN58) for his first random MS QSO using FSK441. On 6m on 10 May Jamie Ashford, GW7SMV (NP), completed with SP3VSC (JO92) on WSJT. On 2m he used the mode to work DL1GGT on 15 April, F5LRL (JN25) on the 21st, IK0BZY (JN61) on 4 May and HB9DDS (JN47) and S51AT (JN75) on the 13th.

## BAND REPORTS

### 50MHz

Es is the main topic this month and Arne Nilsson, SM7AED, reports an hour-long opening to the south-east on 14 April. On 5 May Bryn Llewellyn, G4DEZ (JO03), completed with IW5ACZ in a five *second* opening but the first major event was on 15 May. He caught five continuous days of Es activity up to 20May and new grids worked were SV2AVP* (KN10) and SV8DTD (KM39), also UT1YV (KN28) who was only running 10W to an indoor dipole. Bryn worked ZS6AVP (KG44) on the 16th and ZS6NK and ZS6WB next day. He says that restrictions have been lifted in Norway so there will be much more activity from LA in TV hours.

Ken Punshon, G4APJ (BL), was QRV in the aurora on 19 April and worked MM0AMW (IO75), MM0DSP (IO97 and a rare grid) and MW1MFY (IO81). Ross Wilkinson, G0WJR, operated /P in 'backpacker mode' on top of the Mendip Hills on 21 April during the RSGB contest. Using just 5W and a dipole antenna he made 15 contacts. Peter Taylor, G8BCG (PL), has installed a 6m7jhv M² Yagi at 8m AGL. He wonders how many fields in a straight line can be worked? He has 14 in a row, DK to QK, so has anyone got all 18 in any row?

Clive O'Hennessey, GM4VVX (IO78), running just 5W to a 3-ele Yagi, enjoyed his first Es opening on 16 May when he worked S57RR (JN65) and EH1AHA (IN73). On the 19th he completed with I0TWX (JN62).

Jim Rabbitts, GM8LFB (IO88), took part in auroras on 17-19 April mainly listening for auroral-E signals which he found on the 19th working OH3NWQ (KP11), ES2NA and ES2RW (KO29), YL2KA (KO26) and OZ1KEF (JO56). Another aurora on 11 May produced signals from G, GM, OZ and JX7DFA (IQ50) which was S9+ for over an hour from Jan Mayen. In the Es on the 15th he contacted OE8HWQ (JN76). Next day there was Es to S5, HB9, I and F; on the 19th to SP, I and 9A; 20th to SP and SM with ODX SP7ATY (KO10). The 21st was "spotty" with QSB. He worked ES1EQ (KO39) and I4ZQS (JN63) and wasted a lot of time calling HV3PUL.

GW7SMV made auroral QSOs with a few GMs on 19 April and 11 May. In the Es on 15 May Jamie's ODX was CN8LI (IM63), other countries worked being LY, OK and SP in JO60 and KO00, 11,14, 24 and 25. On the 20th it was the turn of Scandinavia with six LAs and a couple of SMs worked in JP32, 42, 50, 52, 80 and 82, plus SP3VSC (JO92).

Steve Jones, GW8GEI, on Anglesey (IO73) reports his first hour-long Es opening on 8 May when he worked SM3BQY (JP91), OH3BHL (KP10), SM6CTQ* (JO77), SM3VEE (JP81) and OH2TP (KP20) who was only running 2W. Steve runs an FT-920AF plus an amplifier giving 400W to an 8-ele Yagi on a 30.5ft boom at 50ft AGL.

Ted Collins, G4UPS (EX), made auroral contacts on 17 and 19 April with EI, G, GM, GW, LA and OZ stations, ODX being SP2MKO (JO93). Then things quietened down till 7 May when he worked 9A4HK* (JN75). On the 13th he contacted M0HEN/MM* in JM09 followed by EH9AI* (IM75). On the 15th there was an opening to EH7, EH9, LY and SP: on the 16th to OE, OK, OM, S5 and 9A: on the 18th to EH3: on the 19th to S5, SP, T9, YU and 9A: on the 20th to LA, LY, OH, OY and SM and on the 21st to OE, OK, OM, S5, YU, 5B4 and 9A. The 7Q7SIX beacon was S9 at 1551 on the 17th and he heard 5R8FU* working PA stations. A22JE was heard briefly at 1600.

On the beacon front Ted reports that VE2RCS (FN25) is a new 5W one on 50.033MHz 50km north-east from VE3KKL's QTH. From *DUBUS 1/2002* I note that ON0SIX (JO20EP) has been QRV since 3 March on 50.041MHz running 5W to a crossed dipole antenna. CN8MC (IM64) on 50.027MHz started up on 3 February with 8W to an omni-directional J-pole antenna. ZS1SIX (JF96FB) is on 50.080MHz running 10W to an inverted-V antenna.

### 70MHz

G0WJR has operated in four of this year's Cumulatives plus the contest on 14 April. Up to 9 May he had made more QSOs on the band than on all the other VHF and HF bands put together this year. Outside of contests, he is QRV from any convenient hilltop on Sunday mornings using FM and SSB, so listen for him towards the Mendips.

Phil Catterall, G4OBK (YO), is only QRV on 4m at the moment and caught the aurora on19 April. Between 1555 and1730 he worked GM4DIJ (IO85) and EI3IO (IO63) for new countries and grids, GW3HWR (IO71) and Gs in the Midlands and south-east, the furthest being G4FUF (JO01). He uses an FT-847 plus amplifier running 75W to a 5-ele Yagi 25m AGL. On 12 May he operated for 30min in the CW contest making 8 QSOs, ODX being G3TCU (IO91) at 338km.

G4YTL was also on in the 17 April aurora but David only worked GM4DIJ. No other GMs, EIs or GWs were heard. He is keen to try with EI, GI and GM stations on tropo using JT44 and MS using FSK441. His e-mail address is david.hilton-jones@clinical-neurology.oxford.ac.uk

Brian Williams, GW0GHF (CF), has heard a beacon on 70.147MHz sending "TST de GW3MHW in Powys IO82IP". Can anyone shed any light on this? He says that G0ESB near Minehead is new to the band running 60W to a 3-ele Yagi. The nets on 70.197MHz mentioned in previous months are on most evenings from about 7.45 to 9.15 *local* time.

### 144MHz

Angie Sitton, G0HGA (SG), has treated herself to another IC-271E, PSU and keyer and with 20W to a 5-ele Yagi only 10ft AGL managed to work GM4VVX (IO78), MM0CIN (IO75) and GM3WOJ (IO77) on CW in the 19 April aurora. Her reflector - see the list - currently has 58 members and the Monday night activity period is well established.

In the 19 April aurora G4APJ contacted GM4VVX who was a consistently good signal on CW and SSB. He also worked PD2DB (JO22) and ON7CL (JO20). G8RWG was QRV in the 4/5 May European contest and worked into DL, F, ON and PA adding several new grids. ODX was F5HLQ/P (JN36). On the 10th, club station DL0BZ (JO43), operated by DO8DW, was another new grid.

G4DEZ was QRV in the 4/5 May contest and in six hours made 154 QSOs in 11 coun-

**ANNUAL VHF/UHF TABLE - JAN TO DEC 2002**

| | 50MHz | | 70MHz | | 144MHz | | 430MHz | | 1.3GHz | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Callsign | Dist | Ctr | Dist | Ctr | Dist | Ctr | Dist | Ctr | Dist | Ctr | Points |
| G4DEZ | 51 | 52 | 22 | 3 | 81 | 19 | 20 | 7 | 10 | 5 | 270 |
| G4APJ | 8 | 4 | - | - | 15 | 6 | 24 | 2 | - | - | 59 |
| G3FIJ | 7 | 2 | 1 | 1 | 17 | 6 | 18 | 3 | 1 | 1 | 57 |
| G7CLY | 3 | 8 | - | - | 6 | 7 | 4 | 3 | - | - | 31 |
| G8RWG | - | - | - | - | 16 | 8 | - | - | - | - | 24 |

**The District Codes are the 124 listed on page 52 in the January 2002 *RadCom*. Up to six different GI stations and up to three different GM stations in each Scottish district may be counted. Countries are the current DXCC ones plus IT9. The deadline for the next issue is 16 July.**

**This is the new 2m array at Niels Montanana's, G8RWG, QTH. The two Yagis are 9-element, 2-wavelength antennas to the DK7ZB design, 12m above ground. He hopes to try some EME skeds using JT44 software.**

tries with a 63 multiplier. ODX was HB9. On the 9th Bryn worked into LX - five QSOs in five countries and only one G. He averages one G for every 10 continentals from his prime east coast location. On the 11th he heard I2FAK at RS31 working ONs and PAs. Bob Harrison, G8HGN (CM), was QRV in the Cumulative event on 7 May and made 24 QSOs with 12 grids, ODX was DF2OO (JN39). Activity seemed good with high serial numbers being sent.

Colin Smith, GM0CLN (IO85), made 22 CW QSOs in the 17 April aurora with DL, G, GM, LA, ON and SM stations, ODX being DL3BUE (JO72) at 1225km. Next day he missed most of the action and completed 10 QSOs, ODX being LA0BY (JO59) at 930km. He runs a TR751E, 100W solid state amplifier to a 14-ele Yagi only 8ft AGL. GW7SMV lists four auroral SSB QSOs on 19 April, a couple of EA1 tropo contacts on the 23rd and several contacts with continentals in the 4/5 May contest.

David Dodds, GM4WLL/P (IO85NR), was QRV in the 18/19 May RSGB contest. Conditions were appalling on the Saturday but Sunday was somewhat better. He made 66 QSOs into 4 countries, 49 districts and 21 grids running 25W to an 8-over-8 slot fed Yagi 10m AGL.

GM4VVX was QRV in the April auroras. In summary he completed 52 QSOs on CW and SSB on the 17th with 36 grids between 1500 and 1757. Between 1222 and 1740 next day he made 22 contacts with 17 grids. The 19th resulted in another 76 QSOs with 46 grids from JP92 in the north to JN19 in the south between 1257 and abrupt fade-out at 1743. On the 20th it was all CW resulting in 43 contacts with 33 grids between 1430 and 1738. Another five CW QSOs were completed on the 23rd. 7 May brought another weak event, 1700-1741 which resulted in eight QSOs.

**430MHz UP**

John Quarmby, G3XDY (IP), was QRV on 5 May on 70cm in the contest, best contacts being with OK1KIM (JO60), GM4WLL/P, DL0GTH (JO50) and DK2GR (JN59), the last three also worked on 23cm CW. He has been checking an 860km troposcatter path with SK7MW (JO65MJ) on 70cm during activity periods with success three times out of five this year. The SM station runs 750W to an 8x8-ele array vertically stacked and they beam to the UK at 2030 *local* time on 432.205MHz on the second Tuesday every month. They have a website - see the list. G8HGN was QRV in the 4/5 May contest to give away a few points in poor conditions. Bob worked into IN98, JN39 and 49.

GM4WLL/P was out portable again at Lauder Common for last seven hours of the 4/5 May event in the mediocre conditions. David only completed 11 QSOs on 70cm and four on 23cm. ODX on 23cm was G3XDY at 488km. ODX on 70cm was PA6NL (JO21) at 620km. GS3HAM/P and GM3SBC/P were also on 70cm. David has nearly completed a water-cooled 7289 amplifier for 23cm, based around a UPX-6 cavity, surplus from an IFF radar system.

## DEADLINES

QUITE A BUSY month and I've had to omit some publications, contest and WSJT copy. The September deadline is **16 July** and the October date is **13 August**. My telephone answering and fax machine is on 020 8763 9457 and the CompuServe ID is g3fpk ♦

## WWW.

| | |
|---|---|
| CQ WW VHF Contest rules | http://www.cq-amateur-radio.com/VHFRU102pdf |
| NOAA solar data | gopher://solar.sec.noaa.gov/ |
| G0HGA reflector | http://groups.yahoo.com/group/twometrecw |
| G0HGA home page | http://www.qsl.net/g0hga/2mCW |
| SK7MW | http://www.go.to/sk7mw |
| G4CQM antenna info | http://www.antennadesigner.co.uk (correcting URL given on page 78, June *RadCom*) |

# CONTEST

**TIM KIRBY, G4VXE**
*11a Vansittart Road,*
*Windsor SL4 5BZ*
*E-mail: tim@g4vxe.com*

THERE'S LOTS for the contest enthusiast to enjoy this month, ranging from VHF NFD at the start of the month, to the now firmly-established RSGB IOTA Contest at the end of the month. In between, there's the IARU HF Championship, which this year incorporates the World Radio Team Championship to be held in Finland. For those who like to enjoy contesting with a simple station, the VHF Backpackers or the HF Low Power contests may appeal. These events prove that simple equipment and good operators can make lots of contacts - and most importantly - have lots of fun!

## POINTS MEAN PRIZES!

VIA ROGER WESTERN, G3SXW, comes the information that you can have the chance to win special prizes for working the OJ1 - OJ8 prefixes to be aired for the first time by the stations taking part in the World Radiosport Team Championship (WRTC) in Finland.

WRTC2002 takes place between 10 July and 16 July and the UK will be represented by Andy Cook, G4PIQ, and Fred Handscombe, G4BWP. The on-air WRTC competition coincides with the IARU HF Championship contest, which takes place this year from 1200UTC on 13 July until 1200UTC on 14 July. Look for the OJ1 to OJ8 prefix stations to be on the air between these times.

The same WRTC2002 station can be worked once on CW and once on SSB on each band. Each correct two-way CW or SSB QSO with a WRTC2002 station counts 1 point. A duplicate QSO on same band and mode counts zero points. Your score is the total sum of QSO points. Only e-mail logs (ASCII) are accepted. The preferred log formats are Cabrillo, CT.ALL and TR.DAT. The 'Early Bird' logs should be submitted by 1800UTC on Sunday 14 July. Regular latest submission date is 31 July 2002. All logs should be sent via e-mail to: logs@wrtc2002.org The *subject* field of the e-mail should contain *your* contest *callsign*. Early Bird logs, submitted in this way, will help the adjudicators cross-check the accuracy of the entrants. *Do* submit a log - it should be fun, and you might win a prize!

## CONTEST CALENDAR

### HF Contests

| Date | Time | Mode | Contest | Bands | Exchange |
|---|---|---|---|---|---|
| *1 July* | *0000-2359* | *CW/SSB* | *RAC Canada Day* | *3.5–144* | *RST + SN* |
| *13-14 July* | *1200-1200* | *CW/SSB* | *IARU HF Championship* | *1.8-28* | *RST+ITU Zone* |
| 21 July | 0900-1200 | CW | RSGB Low Power Session 1 | 3.5 | RST + SN |
| 21 July | 1300-1600 | CW | RSGB Low Power Session 2 | 7 | RST + SN |
| 27/28 July | 1200-1200 | CW/SSB | RSGB IOTA | 3.5-28 | RST + SN + IOTA |

### VHF Contests

| Date | Time | Mode | Contest | Bands | Exchange |
|---|---|---|---|---|---|
| 2 July | 1900-2130 | ALL | RSGB 144MHz Activity | 144 | RST+SN+Locator |
| 6/7 July | 1400-1400 | ALL | RSGB VHF NFD | 50-1.3 | RST+SN+Locator |
| 7 July | 1100-1500 | ALL | RSGB 144MHz Backpackers#3 | 144 | RST+SN+Locator |
| 9 July | 1900-2130 | ALL | RSGB 432MHz Activity | 432 | RST+SN+Locator |
| 14 July | 1100-1500 | ALL | RSGB 50MHz Backpackers | 50 | RST+SN+Locator |
| 16 July | 1900-2130 | ALL | RSGB 1.3/2.3Ghz Activity | 1.3/2.3 | RST+SN+Locator |
| 20 July | 1400-2200 | ALL | RSGB 144MHz Low Power | 144 | RST+SN+Loc+Postcode |
| 21 July | 0800-1400 | ALL | RSGB 432MHZ Low Power | 432 | RST+SN+Loc+Postcode |
| 28 July | 1100-1500 | ALL | RSGB 144MHz Backpackers#4 | 144 | RST+SN+Loc+Postcode |
| 23 July | 1900-2130 | ALL | RSGB 50MHz Activity | 50 | RST+SN+Locator |

### Microwave Contests

| Date | Time | Mode | Contest | Bands | Exchange |
|---|---|---|---|---|---|
| 28 July | 0900-2000 | ALL | RSGB 10GHz Cumulative #3 | 10GHz | RST+SN+Locator |

The full rules of RSGB HF, VHF/UHF and Microwave 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 websites from which comprehensive details are available. These are www.rsgbhfcc.org and www.blacksheep.org/vhfcc RSGB Microwave Contest rules can be found on the Internet at: http://www.g3pho.free-online.co.uk/microwaves/calendar2002.html

## RoPoCo 1, 2002

ROPOCO1 IN 2002 differed from recent events in several respects. Most importantly, it was a much closer-run affair, and even after several reviews of the adjudication process, three stations could not be separated at the top of the table. Congratulations therefore to Don Beattie, G3BJ; Dave Lawley, G4BUO; and Robert Morgan, M0TTT/P, who jointly head the table. Special mention should be made of M0TTT, who achieved this accolade at the first attempt, and at the tender age of 15 years: clearly the senior citizens of RoPoCo must look to their laurels! However, Don and Dave saved their blushes by submitting error-free logs, and therefore share both the Verulam Silver Jubilee Trophy, as well as that for the highest-scoring error-free log.

Nearly everyone once more expressed how much they enjoyed the event, and many submitted suggestions for improvement. These are too numerous to mention here, but as always include variation of the timing. The adjudicator feels that action in this regard would invigorate an already popular contest.

Another difference on this occasion was the facility kindly provided by Ray, G4FON, which enabled direct conversion of all electronic logs to the database format which has been used for cross-checking since RoPoCo2 2000, even several non-standard, idiosyncratic formats: well done Ray! This produced, as usual, over 2000 lines of QSO information. The other side of this coin was that paper-based logs increased to 11 in number, all of which had to be retyped for the adjudication process.

The error rate in respect of postcodes and RST reports, was once again in the order of 5%, a very commendable performance, well done everyone. See you all in RoPoCo2.

***Clive Whelan, GW3NJW***

### RoPoCo 1, 2002

| Pos | Callsign | | Score | Eqpt code |
|---|---|---|---|---|
| 1 | G3BJ | * | 630 | 4C16 |
| 1 | G4BUO | * | 630 | 4C14 |
| 1 | M0TTT/P | | 630 | 4C16 |
| 4 | G4RCG | | 620 | 4C16 |
| 5 | G3SXW | * | 610 | 3C14 |
| 6 | G3LET | | 600 | 4W19 |
| 6 | G3WUX | * | 600 | |
| 6 | G4BJM | | 600 | 4C1 |
| 6 | GU3SQX | * | 600 | 4C13 |
| 10 | G4OGB | | 590 | 3C13 |
| 11 | G0IVZ | | 580 | |
| 11 | G3KHZ | | 580 | 3C1 |
| 13 | G0CKP | | 570 | 4C1 |
| 13 | G4CZB | | 570 | 4C13 |
| 13 | GW3NJW* | | 570 | 4C12 |
| 13 | GW3WWN | | 570 | 3C12 |
| 17 | G4IIY | | 560 | 3C14 |
| 17 | GM3JKS | | 560 | 4C1 |
| 19 | G3RSD | | 550 | 3C12 |
| 20 | G3TJE | | 540 | 3Q13 |
| 20 | G3ZGC | * | 540 | 4C13 |
| 22 | G2HLU | | 530 | 4C12 |
| 23 | G3LHJ | | 530 | 3W1 |
| 23 | G4CWH | | 530 | 4W13 |
| 25 | G3GLL | | 520 | 3C12 |
| 25 | G3JJG | | 520 | 4C11 |
| 27 | G3JJZ | | 500 | 3W1 |
| 27 | G3LIK | | 500 | 3C13 |
| 29 | G3TXF | | 490 | |
| 30 | G4EBK | | 480 | 3C13 |
| 30 | GM4SID | * | 480 | 4C23 |
| 32 | G3KKP | | 460 | 3C11 |
| 33 | G3RFH | | 450 | 3C1 |
| 33 | G4BLI | | 450 | 3C13 |
| 35 | G3JKY | | 440 | 3C1 |
| 35 | G4XPE | * | 440 | 3C11 |
| 37 | G0DHZ | | 430 | 3C1 |
| 38 | G3JYP | | 400 | 3C14 |
| 38 | G3MA | | 400 | 3 |
| 38 | G3YEC | | 400 | 3W1 |
| 41 | G3VQO | | 370 | 3W1 |
| 42 | G4PTE | | 360 | 3 |
| 43 | G4RLS/P | | 350 | 3C1 |
| 43 | GW3SB | | 350 | 3W1 |
| 45 | G3JSK | | 320 | |
| 46 | G3GMM | | 310 | 3G |
| 47 | G4ARI | | 300 | 1C14 |
| 48 | G3YMC | * | 290 | 1W1 |
| 49 | G8OO | | 250 | |
| 50 | GM3UM | | 230 | 3W |

* = Perfect log. Checklogs gratefully acknowledged from G0ATR and G3HZL.

**One of the joint leaders in RoPoCo - here's Dave Lawley, G4BUO, in his shack.**

## Affiliated Societies CW Contest 2002

WHO SAYS CW is dead? The 400+ stations active during in this year's CW AFS generated over 43,500 CW (mostly inter-UK) QSOs in four hours on a Sunday afternoon. The total number of logs received was 271, representing 83 teams.

Thanks to a cunning piece of software developed by Tim, G4VXE, it was possible to cross-check fully some 38,500 QSOs. In addition there were some 5000 QSOs made with participants who did not submit a log. The automated cross-checking included a check of the incoming serial numbers. Under the RSGB's current scoring rules, the logging of just one incorrect digit in the received serial number resulted in the loss of the full 10 points for that QSO. This may seem harsh, but it does explain why all the final scores end in a zero.

Logging accuracy was generally good, although with 43,500 QSOs being crammed into some 80kHz in four hours (AFS CW had a 'run rate' of over three QSOs per second), it can be all too easy for a call or incoming serial number to be miscopied. The overall accuracy in logging was about 91%, which means that the average station lost 9% of his claimed score. However, accuracy varied dramatically across the range of scores. Generally speaking the higher the

***(Continued below right)***

### Affiliated Societies Contest (CW), 2002

#### Affiliated Societies Section

| Place | Team | Call | Call | Call | Call | Call | Score |
|---|---|---|---|---|---|---|---|
| 1 | Lichfield ARS A | G3SJJ | GW3YDX | G3NKC | G3VHB | G0MTN | 12,590 |
| 2 | Mid Beds CG A | G4BWP | G5LP | G4PIQ | G4BJM | G4MRS | 12,520 |
| 3 | De Montfort Uni ARS A | G3OAY | G3RIR | G4ARI | G4EOF | G3SDC | 11,680 |
| 4 | Addiscombe ARC A | G3SJX | G3UFY | G4ALE | G3VYI | G3JJZ | 11,380 |
| 5 | Chiltern DX Club | G3RTE | G4BUO | G0CKP | G3WPH | G0WAT/P | 11,140 |
| 6 | Grimsby ARS A | G3TBK | G3RXP | G3PDL | M0AJT | G3RSD | 10,060 |
| 7 | Cheltenham ARA A | G3NKS | G4PDQ | G4ERP | G3TA | G4ENA | 9,970 |
| 8 | Echelford ARS A | G4TSH/P | G0OPB | G3KKQ | G3NOH | G4IRN | 9,670 |
| 9 | Newbury & D ARS A | G3RVM | G3KLH | G3ZGC | G0ORH | G3NVO | 9,670 |
| 10 | RNARS Colchester | G3GLL | G3OOK | G3YAJ | G0IBN/P | G3YEC | 9,440 |
| 11 | York Cluster SG A | G4OBK | G4RCG | G3LZQ | G4BYG | G4OOC | 9,400 |
| 12 | Hadley Wood CG | G4KZD | G3ZVW | G0IDA | G3KTZ | G3RWL | 8,730 |
| 13 | Three As CG | G3TXF | G3WVG | G3SXW | G4VXE | | 8,440 |
| 14 | Bristol CG A | G3XSV | G0WKW | G3YHV | M0XXX | G0HFX | 8,110 |
| 15 | Dragon ARC | GW4VEQ | GW0GEI | GW3EIZ | GW3VVC | GW3HCL | 7,880 |
| 16 | Horsham ARC | G3LET | G3WZT | G3TNO | G3VQO | G3ZBU | 7,870 |
| 17 | Maidenhead & D ARC A | G3PQA | G4RGK | G3RZF | G4WJS | G3TWG | 7,840 |
| 18 | RAFARS Waddington A | G4KGG | G2AFV | G3IGU | G3JRY | G3ZDW | 7,040 |
| 19 | Chesham & D ARS | G3XZG | G3VRY | G4XRV | G3MEH | M0CRK | 6,630 |
| 20 | RNARS Portsmouth | G3LIK | G3KKJ | G3LWI | M0AEK | G3JTG | 6,460 |
| 21 | RNARS Rosyth A | GM4SID | GM3CFS | GM3NCS | GM3UM | GM3HUN | 6,390 |
| 22 | Cheltenham ARA B | G4BGW | G3JJG | G4MEM | G3HJF | G4NSZ | 6,070 |
| 23 | Torbay ARS | G0IVZ | G3LHJ | G0RDO | M0APB | G0WWD | 6,070 |
| 24 | Peterborough ARC | G3KHZ | G3MCK | G4WFQ | | | 5,370 |
| 25 | Sutton & Cheam RS | G0KBL | G4CWH | G4HSD | | | 5,270 |
| 26 | Leicester RS | G5UM | G4OOS | G3HYH | G0WBC | | 5,100 |
| 27 | Harwich ARIG A | G0DVJ/P | G4EYE | G4YJQ | G4FTP | G4AQZ | 5,070 |
| 28 | RAFARS Cosford | G3MRP | G8FC | G0EYX | G0BYA | M0BYJ | 5,000 |
| 29 | Edgware & D RS | G3WUX | G4HMD | G3ASR | G4KEW | | 4,990 |
| 30 | Weston-super-Mare RS | G3TJE | G0JQN | G3YOL | G4DPH | | 4,860 |
| 31 | Cockenzie & Port Seton ARC | GM0CLN | GM4ZRR | MM0CCC | MM0CPS | GM4GVJ | 4,520 |
| 32 | Norfolk ARC | G3PDH | G4DYC | G4GVR | G3PZX | G0MQG | 4,470 |
| 33 | Lichfield ARS B | G3BJ | G3ZBE | | | | 4,210 |
| 34 | Stockport RS | G3SHF | G4APA | G3GMM | M0BEX | | 4,150 |
| 35 | Hereford ARS | G4ASR | G3ZRJ | G3LCK | | | 4,080 |
| 36 | Reading & D ARC | G0VQR | G0LHZ | G4ELY | G3DMQ | | 3,660 |
| 37 | Addiscombe ARC B | G3RQZ | M0BIN | G4CMF | G0STE | | 3,560 |
| 38 | Cheltenham ARA C | G3IFB | G3TEV | G3ZKN | G0UPU | G3SZS | 3,430 |
| 39 | Horndean & D ARC | G0DHZ | G0MBQ | G0UHM | G0RPX | G4FBS | 3,360 |
| 40 | Scarborough ARS | G0WHO | G4ZGP/P | G4FCH | G4DWU | | 3,290 |
| 41 | Yeovil ARC A | G3ICO | G3TSK | G3CQR | 2E0NPB | G3BEC | 3,290 |
| 42 | Crawley ARC | G3WSC | G3YSX | G3VKW | | | 3,240 |
| 43 | RNARS Barrow | G3IZD | G0CHV | | | | 3,040 |
| 44 | RNARS Plymouth | G4KJD | G0JCY | G3AQM | | | 2,960 |
| 45 | Scunthorpe Steel ARC | G4OGB | G4FUH | | | | 2,940 |
| 46 | Swansea ARS | GW3WWN | GW3INW | GW0SGG | | | 2,930 |
| 47 | Grimsby ARS B | G4EBK | M0BZU | | | | 2,760 |
| 48 | Blackwood & D ARS | GW4BLE | GW4HBK | MW5EPA | GW0RYT | | 2,740 |
| 49 | Hastings E&RC | G6HH | G3YYF | G4KLF | | | 2,740 |
| 50 | RNARS Chatham | G4FRN | G4PTE | G0SCY | | | 2,730 |
| 51 | Flight Refuelling ARS | G0WAL | M0AKY | G4POF | M0PTR | M0MJS | 2,660 |
| 52 | RNARS Liverpool | G3RFH | G4SYC | G3HWS | G4RBE | | 2,530 |
| 53 | Worthing & D ARC | G4SLE | G4MRH | M0GMT | | | 2,490 |
| 54 | Mid Beds CG B | G3PJT | | | | | 2,250 |
| 55 | Northampton RC | G3GWB/P | | | | | 2,050 |
| 56 | De Montfort Uni ARS B | M0TTT/P | | | | | 1,970 |
| 57 | Surrey Radio CC | G3BFP | G4DJR | G8TB | | | 1,970 |
| 58 | Echelford ARS B | G3EAO | G3XTZ | G3JUL | | | 1,930 |
| 59 | Clifton ARS | G0UJK | G0DCG | G4FAA | M0HAL | | 1,870 |
| 60 | Southdown ARS | G3SVL | | | | | 1,780 |
| 61 | Oxford & D ARS | G4AZN | | | | | 1,650 |
| 62 | Stevenage & D ARS | G4DDX | M0AJF | | | | 1,500 |
| 63 | Farnborough & DRS | G4BJQ | G0VYR | | | | 1,490 |
| 64 | RNARS Birmingham | G4SFO | | | | | 1,420 |
| 65 | Guernsey ARS | GU3SQX | | | | | 1,360 |
| 66 | RAFARS Waddington B | G3SET | G0SWO | G3UYV | | | 1,320 |
| 67 | RNARS Newcastle | G3AWR | | | | | 1,310 |
| 68 | Newbury & D ARS B | G3WYW | | | | | 1,120 |
| 69 | Guildford & D ARS | G3ZDD | | | | | 1,050 |
| 70 | RNARS Rosyth B | GM3XGX | GM4FGD | | | | 1,050 |
| 71 | Welwyn Hatfield ARC | G8OO | | | | | 990 |
| 72 | Colchester RA | G4KTI | | | | | 960 |
| 73 | Lothians Radio Society | MM0TSS | GM4DIJ | GM4DTH | | | 960 |
| 74 | Meirion ARS | GW3SB | | | | | 950 |
| 75 | Maidenhead & D ARC B | G3LVW | | | | | 820 |
| 76 | RNARS Swansea | GW4XQK | | | | | 720 |
| 77 | Harwich ARIG B | G3VMP | G0SCP | | | | 580 |
| 78 | Finningley ARS | G0GHK | | | | | 480 |
| 79 | Midland CG | M5HDF/P | | | | | 350 |
| 80 | York Cluster SG B | G4LYM | | | | | 260 |
| 81 | Cheltenham ARA D | G4RFU | | | | | 130 |
| 82 | Yeovil ARC B | M5EVT | | | | | 130 |
| 83 | Harwell ARS | G0THY | | | | | 110 |

### Individual Placings

| Pos | Callsign | Score |
|---|---|---|
| 1 | G3SJJ | 2,700 |
| 2 | G3TXF | 2,690 |
| 3 | GW3YDX | 2,650 |
| 4 | G4BWP | 2,630 |
| 5 | G3OAY | 2,620 |
| =5 | G5LP | 2,620 |
| 7 | G3RTE | 2,590 |
| 8 | G3SJX | 2,570 |
| =8 | G4BUO | 2,570 |
| 10 | G4PIQ | 2,560 |
| 11 | G3NKC | 2,490 |
| 12 | G0IVZ | 2,450 |
| =12 | G3RIR | 2,450 |
| =12 | G3VHB | 2,450 |
| =12 | G4ARI | 2,450 |
| 16 | G3TBK | 2,440 |
| =16 | G4BJM | 2,440 |
| 18 | G3BJ | 2,430 |
| 19 | G3UFY | 2,410 |
| 20 | G4ALE | 2,390 |
| 21 | G4OBK | 2,380 |
| 22 | G4RCG | 2,320 |
| =22 | G4TSH/P | 2,320 |
| 24 | G0MTN | 2,300 |
| 25 | G3LET | 2,290 |
| =25 | G3RVM | 2,290 |
| 27 | G3KHZ | 2,280 |
| 28 | G3LZQ | 2,270 |
| =28 | G3WVG | 2,270 |
| =28 | G4MRS | 2,270 |
| 31 | G3KLH | 2,250 |
| =31 | G3PJT | 2,250 |
| 33 | G3NKS | 2,240 |
| 34 | G4PDQ | 2,230 |
| 35 | G0KBL | 2,220 |
| 36 | G0CKP | 2,210 |
| 37 | G3WUX | 2,200 |
| 38 | G3SXW | 2,190 |
| =38 | G3VYI | 2,190 |
| 40 | G3GLL | 2,170 |
| 41 | G3WZT | 2,150 |
| 42 | G4KZD | 2,110 |
| 43 | G3ZGC | 2,100 |
| =43 | G4CWH | 2,100 |
| =43 | G4EOF | 2,100 |
| 46 | G3IZD | 2,090 |
| 47 | G3XSV | 2,080 |
| 48 | GW4VEQ | 2,070 |
| 49 | G3SDC | 2,060 |
| =49 | GM3JKS | 2,060 |
| 51 | G0OPB | 2,050 |
| =51 | G3GWB/P | 2,050 |
| =51 | G3ZVW | 2,050 |
| 54 | G3PDH | 2,040 |
| =54 | G3RXP | 2,040 |
| 56 | G3LIK | 2,030 |
| 57 | G0WKW | 2,020 |
| =57 | G4ERP | 2,020 |
| =57 | GW0GEI | 2,020 |
| 60 | G3KKQ | 2,000 |
| =60 | G3TJE | 2,000 |
| 62 | G3PDL | 1,990 |
| 63 | M0TTT/P | 1,970 |
| 64 | G3OOK | 1,950 |
| =64 | G3PQA | 1,950 |
| 66 | G3NOH | 1,930 |
| =66 | G3YAJ | 1,930 |
| =66 | G4OGB | 1,930 |
| 69 | G0JQN | 1,920 |
| =69 | G4ASR | 1,920 |
| 71 | GM4SID | 1,910 |
| 72 | G0IBN/P | 1,900 |
| =72 | G3WPH | 1,900 |
| 74 | G4RGK | 1,900 |
| 75 | G0WAT/P | 1,870 |
| =75 | G3YHV | 1,870 |
| 77 | G3BFP | 1,860 |
| 78 | G0IDA | 1,840 |
| =78 | G3SHF | 1,840 |
| 80 | G3TA | 1,830 |
| 81 | G3JJZ | 1,820 |
| 82 | G0ORH | 1,810 |
| =82 | G0VQR | 1,810 |
| =82 | G5UM | 1,810 |
| 85 | M0AJT | 1,800 |
| 86 | G3RSD | 1,790 |
| =86 | G4BYG | 1,790 |
| 88 | G3SVL | 1,780 |
| =88 | G3ZBE | 1,780 |
| 90 | G4KGG | 1,740 |
| 91 | G2AFV | 1,730 |
| =91 | G3MCK | 1,730 |
| 93 | G0WHO | 1,710 |
| =93 | G4EBK | 1,710 |
| 95 | G3XZG | 1,690 |
| =95 | GW3WWN | 1,690 |
| 97 | G0DVJ/P | 1,680 |
| =97 | G3MRP | 1,680 |
| 99 | G6HH | 1,670 |
| 100 | G4AZN | 1,650 |
| =100 | G4ENA | 1,650 |
| =100 | GM0CLN | 1,650 |
| 103 | G3KKJ | 1,600 |
| 104 | G3LHJ | 1,580 |
| =104 | G3TNO | 1,580 |
| 106 | G4EYE | 1,570 |
| 107 | G3KTZ | 1,560 |
| 108 | G3VQO | 1,540 |
| 109 | G3RZF | 1,510 |
| 110 | G3VRY | 1,490 |
| =110 | G3YEC | 1,490 |
| 112 | G4XRV | 1,450 |
| 113 | GM4ZRR | 1,440 |
| 114 | G3MEH | 1,430 |
| 115 | G3WSC | 1,420 |
| =115 | G4SFO | 1,420 |
| =115 | G4WJS | 1,420 |
| =115 | GW3EIZ | 1,420 |
| 119 | G4KJD | 1,410 |
| 120 | G3ZRJ | 1,390 |
| =120 | GW3VVC | 1,390 |
| 122 | G4BGW | 1,370 |
| =122 | G4IRN | 1,370 |
| 124 | G4WFQ | 1,360 |
| =124 | G8FC | 1,360 |
| =124 | GM3CFS | 1,360 |
| =124 | GU3SQX | 1,360 |
| 128 | G3IGU | 1,340 |
| 129 | G4DDX | 1,320 |
| 130 | G3AWR | 1,310 |
| =130 | G4DYC | 1,310 |
| 132 | G4VXE | 1,290 |
| 133 | G0DHZ | 1,270 |
| 134 | G0RDO | 1,260 |
| 135 | G0MBQ | 1,250 |
| =135 | G3JJG | 1,250 |
| =135 | G3RFH | 1,250 |
| 138 | G0UJK | 1,240 |
| 139 | G3LWI | 1,230 |
| =139 | G4MEM | 1,230 |
| 141 | G3NVO | 1,220 |
| =141 | G4OOS | 1,220 |
| 143 | G3HJF | 1,200 |
| 144 | G3RWL | 1,170 |
| 145 | G3HYH | 1,160 |
| =145 | G3RQZ | 1,160 |
| =145 | M0BIN | 1,160 |
| 148 | G4FRN | 1,150 |
| 149 | MM0CCC | 1,130 |
| 150 | G3JRY | 1,120 |
| =150 | G3WYW | 1,120 |
| 152 | G3ZDW | 1,110 |
| =152 | GM3NCS | 1,110 |
| =152 | GM3UM | 1,110 |
| =152 | M0XXX | 1,110 |
| 156 | G4CMF | 1,090 |
| 157 | G3ICO | 1,060 |
| =157 | G3TWG | 1,060 |
| =157 | GW3INW | 1,060 |
| 160 | G3ZDD | 1,050 |
| =160 | M0BZU | 1,050 |
| 162 | G4APA | 1,040 |
| =162 | G4BJQ | 1,040 |
| 164 | G0HFX | 1,030 |
| =164 | G3SET | 1,030 |
| 166 | G0JCY | 1,020 |
| =166 | G3IFB | 1,020 |
| =166 | G4HMD | 1,020 |
| =166 | G4NSZ | 1,020 |
| 170 | G4FUH | 1,010 |
| =170 | G4SLE | 1,010 |
| 172 | G3ASR | 1,000 |
| 173 | G8OO | 990 |
| 174 | G0LHZ | 980 |
| =174 | GW3HCL | 980 |
| 176 | G4KTI | 960 |
| 177 | G0CHV | 950 |
| =177 | G4HSD | 950 |
| =177 | GW3SB | 950 |
| 180 | G0WAL | 940 |
| 181 | G3TEV | 930 |
| 182 | G3YSX | 920 |
| 183 | G0WBC | 910 |
| =183 | G4PTE | 910 |
| 185 | G3VKW | 900 |
| =185 | G4ZGP/P | 900 |
| =185 | GM3HUN | 900 |
| 188 | GW4BLE | 890 |
| 189 | GW4HBK | 880 |
| 190 | G4GVR | 870 |
| 191 | M0AEK | 850 |
| 192 | MW5EPA | 840 |
| 193 | G0EYX | 830 |
| =193 | G3GMM | 830 |
| 195 | G3LVW | 820 |
| =195 | G3TSK | 820 |
| 197 | G3EAO | 810 |
| 198 | G4MRH | 800 |
| 199 | G3LCK | 770 |
| =199 | G4ELY | 770 |
| =199 | G4KEW | 770 |
| 202 | G3JTG | 750 |
| =202 | G3ZKN | 750 |
| 204 | G3XTZ | 740 |
| 205 | GW4XQK | 720 |
| 206 | G4YJQ | 700 |
| 207 | G3CQR | 680 |
| =207 | G4FTP | 680 |
| =207 | M0GMT | 680 |
| 210 | G0SCY | 670 |
| 211 | GM3XGX | 660 |
| 212 | G0BYA | 650 |
| =212 | M0AKY | 650 |
| 214 | G4OOC | 640 |
| 215 | G3YYF | 620 |
| 216 | G3YOL | 610 |
| =216 | G4SYC | 610 |
| =216 | MM0TSS | 610 |
| 219 | G4FCH | 580 |
| 220 | M0APB | 570 |
| =220 | M0CRK | 570 |
| 222 | G3AQM | 530 |
| 223 | G4POF | 500 |
| 224 | G0GHK | 480 |
| =224 | M0BYJ | 480 |
| 226 | G0VYR | 450 |
| =226 | G4KLF | 450 |
| 228 | 2E0NPB | 440 |
| =228 | G0DCG | 440 |
| =228 | G4AQZ | 440 |
| =228 | M0BEX | 440 |
| 232 | G3HWS | 420 |
| =232 | M0PTR | 420 |
| 234 | G0UPU | 410 |
| 235 | GM4FGD | 390 |
| 236 | G3JUL | 380 |
| 237 | G0UHM | 360 |
| 238 | M5HDF/P | 350 |
| 239 | G4DPH | 330 |
| 240 | G3SZS | 320 |
| =240 | G3VMP | 320 |
| 242 | G3ZBU | 310 |
| 243 | G3BEC | 290 |
| 244 | GM4DIJ | 280 |
| 245 | G0RPX | 260 |
| =245 | G0SCP | 260 |
| =245 | G4LYM | 260 |
| 248 | G4RBE | 250 |
| 249 | G4FBS | 220 |
| 250 | G0WWD | 210 |
| 251 | GW0SGG | 180 |
| =251 | M0AJF | 180 |
| =251 | MM0CPS | 180 |
| 254 | G3PZX | 170 |
| =254 | G4FAA | 170 |
| 256 | G0STE | 150 |
| =256 | G0SWO | 150 |
| =256 | M0MJS | 150 |
| 259 | G3UYV | 140 |
| 260 | G4RFU | 130 |
| =260 | GW0RYT | 130 |
| =260 | M5EVT | 130 |
| 263 | GM4GVJ | 120 |
| 264 | G0THY | 110 |
| 265 | G3DMQ | 100 |
| =265 | G4DWU | 100 |
| 267 | G0MQG | 80 |
| 268 | GM4DTH | 70 |
| 269 | G4DJR | 60 |
| 270 | G8TB | 50 |
| 271 | M0HAL | 20 |

claimed score, the more accurate the log. The average accuracy of the top 10 stations was 97.8%. This compares with an accuracy of 94.2% for stations with scored logs in the range 101 - 110 and 89.8% for stations with scored logs in the range 201 - 210.

Congratulations to the winning teams: The Lichfield ARS A team (12,590 points) won first place just ahead of Mid Beds CG A (12,520 points) by a narrow margin of just seven QSOs. De Montfort Uni ARS A came in a close third with 11,680 points. The individual section was won by Chris, G3SJJ.

Thanks to G2HLU, G3GMS, GW3KDB, LY3BA, and PA0JED for their checklogs. This year we were able to cross-check for serial numbers over 85% of all QSOs. All calls were checked against a 'good-call pool'. Checklogs are much appreciated to assist in this process. However, there were several stations who made over 220 QSOs and who did not send in a log. The overall checking accuracy increases with the numbers of logs that are available. Hopefully next year we can encourage even more activity for AFS CW, the UK's top inter-G CW event, with an even higher rate of log cross-checking.

***Nigel Cawthorne, G3TXF***

# HF HF HF HF

**DON FIELD, G3XTT**
*105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.*
*e-mail: hf.radcom@rsgb.org.uk*

THE K1B expedition from Baker Island was highly successful, with over 95,000 contacts in the log. As far as I am aware, this is the third highest total ever to be achieved by a DXpedition. UK stations enjoyed some good high-band openings, managing to work K1B even on 10 and 12m. On their stopovers to and from the island, the team also made some 7600 contacts from Tuvalu and 6720 from Fiji. The Spanish husband and wife team who activated Congo as TN3B and TN3W made over 27,000 contacts. And P5/4L4FN continues to plug away from North Korea, with almost daily activity on 21225kHz and the occasional foray on to RTTY (these latter contacts are currently not valid for DXCC, but Ed says he hopes suitable paperwork will be forthcoming).

## DX NEWS

VICKY (YL), AE9YL, and Carl, K9LA, will join Seppo, OH1VR, at **Market Reef** (OJ0, EU-053) from 8 to 11 July. Vicky will sign OJ0/AE9YL and Carl will sign OJ0/K9LA, all bands. QSL to the respective home call.

There should be an operation from 1A0KM, the **Sovereign Military Order of Malta** (SMOM), sometime during July. However, there were no firm dates available at the time of writing.

CN2PM is Peter, G3WQU (ex E4/G3WQU), who is stationed at Laayoune (**Western Sahara** under **Moroccan Administration**). He will be active (CW and PSK31) most weekends for two years, maybe more.

Henk, PA3AWW, reports he will be working in **Ghana** during July and August. He plans to operate as 9G1AA on 40, 20 and 15, mainly CW. QSL via PA3ERA.

A French team will undertake a major expedition to **Benin** (TY) from 15 July to 14 August, with particular emphasis on LF and the WARC bands. They may also, if they can get a licence, do some operating from the neighbouring country of Togo (5V).

There have been some surprise developments concerning **Yemen** (7O). There has been no legal activity for a number of years, and none was expected during this time of tension in the Middle East. However, Pekka, OH2YY, was active recently as 7O/OH2YY during a work assignment in the country, and apparently has written permission for his operation. Chris, G4HCL, has also been working in Yemen and he too has written authority to operate. An expected visit in late May was postponed due to personal reasons, but keep an ear open (SSB and possibly PSK31) for whenever Chris does get out there.

The 'Crystal Clear DX Group' is planning a DXpedition to the **Maldives** from 29 July for about 10 days, signing 8Q7ZZ with three stations. Team leader is Mark, M0DXR (age 18). Other team members are Robert, M0TTT (age 15), Fabian, DJ1YFK (age 18), and Tony, EA2AIJ. Expedition objectives include promoting DXing and DXpeditioning for the younger age group. QSL via G3SWH.

Several US and Canadian amateurs will activate **St Paul Island** from 29 June to 8 July. No operation is planned on 80 and 160 due to the time of year. On HF they will be on RTTY, SSB and CW. QSL to W7XU.

David, K8AA, and Ted, K8AQM, plan to be active on 40 - 10m, mainly CW and digital modes, from **Samoa** (OC-097) from 2 to 12 July. Likely calls will be 5W0TR (K8AQM) and 5W0AA or 5W0DL (K8AA). QSL both calls via K8AA.

JH1EFP/JD1, Osamu Kaneko, will be on Marcus Island (**Minami Torishima**) from 16 July to 6 August. He expects to be active from the JD1YBJ club station on 17m CW and SSB from 0900 to 1100 or 2000 to 2200.

Ed, N1UR (ex-K8EP), will be at station PJ2T (**Netherlands Antilles**) in the IARU contest. He is trying to get the callsign PJ2E for the contest. Otherwise, he'll use PJ2/N1UR.

## IOTA ACTIVITY

PETER, GM3OFT/P, will be on from several of the **Orkney islands** (EU-009) from 26 June to 10 July.

ON4BAM will be 9H3Z from **Malta** (EU-023) on all HF bands, SSB and PSK31, from 15 to 30 July including the IOTA Contest.

Operators from UBA section 'NOK' will be active from the lighthouse (ARLHS NET-024) on **Texel Island** (EU-038) on 26-28 July. They will participate in the IOTA Contest as PA6TEX, while before the contest they will use PA/ON4NOK (also on the WARC bands). QSL via ON7YX (ex ON4ALW).

Eddy, ON6HE; François, ON4AUB; Dirk, ON5CT, and Frank, ON4AAC, will be active from **Samos Island** (EU-049) from 23 to 29 July, IOTA Contest included. They plan to request a special call. QSL via ON4AAC.

A Belgian team will activate **Île de Sein** (EU-068, DIFM: AT-007; ARLHS: FRA066 & FRA067) for the IOTA Contest. Activity should commence on 24 July and end on the 29th. The call TM2ON has been applied for to use in the contest, while outside the contest, individual operators will use F/owncall/P. The QSL manager for all calls will be ON4ON.

A group from Spain will be active as ED1URJ from **Sisargas Island** (EU-077) from 26 to 29 July, including the IOTA Contest. QSL via EA4URJ.

Jim, MM0BQI/P, plans to be on 80 – 10m SSB, CW, RTTY and PSK31 from Tanera Mor in the **Summer Isles** (EU-092) from 26 to 29 July, signing GB5SI in the contest.

Feco, HA8KW, plans a vacation on **Grado Island** (EU-130) between 25 July and 2 August. He will be on 10 to 30m as IV3/HA8KW/P. QSL to HA8KW.

Emir, 9A6AA, will be on 40 and 20 SSB from **Zeca Island** (EU-136) on 26 July and from **Visoki Island** (also EU-136) 27 July.

Nigel, G0DTQ, will make a return visit to **Grimsey** (EU-168) between 25 and 28 July, using an FT-817 and quarter-wave vertical, 20m CW only. He will sign TF/G0DTQ/P.

Several Turkish amateurs will activate **Kefken Island** (AS-159) on a number of weekends between now and August, including the contest weekend. They will use their homecalls/TA0 on 10 - 160m SSB and RTTY. QSL via home calls.

Linda, VE9GLF, and Len, VE9MY, plan to operate from **St Pierre & Miquelon** (NA-032) at the end of July including the IOTA contest.

Richard, VE2DX, will participate in the IOTA Contest as VE2DX/VY2 from **Prince Edward Island** (NA-029). In the week before and after the contest he hopes to activate other IOTAs (NA-068, NA-128 and possibly NA-177).

A group consisting mainly of German amateurs will be active (requested call HK0ZZ) from **San Andres Island** (NA-033) from 16 to 29 July, IOTA Contest

**QTH Corner**:

| | |
|---|---|
| 7O/OH2YY | Pekka Ahlqvist, OH2YY, Vapaalanpolku 8B, 01650 Vantaa, Finland. |
| 7X2RO | Ivan Gombos, OM3CGN, Box 55, Rimavska Sobota 97901, Slovak Republic. |
| CN2PM | Peter McKay, Minurso, PO Box 80000, Laayoune, Western Sahara, Morocco. |
| HK0ZZ | Ulrich Moeckel, DH7WW, Muldenstrasse 1, 08304 Schoenheide, Germany. |
| JH1EFP/JD1 | Osamu Kaneko, 2-5-35-405 Miyazaki Cyuouku Chiba, Japan 260-0806. |
| ON4AAC | Frank Pletinck, Potaardestraat 70, B-9190 Stekene, Belgium. |
| TN3B, TN3W | Josep Gibert, EA3BT, C/ Col-legi, 1, 08800 Vilanova i la Geltrú, Spain. |
| VK9ML | P J Garden, VK4APG, 58 Minerva Court, Eatons Hill, 4037 QLD, Australia. |

included. They plan to operate on 160 - 10m (with an emphasis on the low bands) CW and SSB.

A group from the Federal Way ARC will sign WA7FW/7 from **Whidbey Island** (NA-065), 40 - 10m on 20 and 21 July.

Dany, F5CW, will be in **Guadeloupe** from 22 June to 12 July. Between 4 and 9 July he and F8CMT will activate **Saintes Islands** (NA-114) with the callsign TO8CW.

Lanny, W5BOS, will activate **Walrus Island**, Alaska (NA-121) from 8 to 10 July. He will sign /KL5 and will concentrate on 20, 15 and 10 CW and SSB.

Tony, WF1N, and Lou, W1DIG, will be on **Thacher Island** (NA-148) from 26 to 28 July, starting around 1500 Friday and ending about 1800 Sunday. QSL to their home calls. Thacher also counts for Lighthouse Awards: WLH, LH-0924 and ARLH, USA-105.

A US / Alaskan team will activate **Deer Island** in the Southern Alaska Peninsula West group (NA-NEW) from 31 July to 5 August on 10 to 80, CW and SSB. They will sign KL7AK and plan to concentrate on 20m, which has been the optimum band for past IOTA operations from Alaska. QSL via N6AWD.

Other announced IOTA contest operations will include GM5A (IOTA EU-008, IOSA NH22, WAB NR25, QSL via GM0RLZ); II7GR (Italian Islands Award LE-002 & IOTA EU-091, QSL via I7YKN (ex-I0YKN)); EA5KB/EA7 (EU-143); C6AJR (NA-001).

## AWARDS

TO COMMEMORATE the 700th anniversary of the Battle of the Golden Spurs (11 July), the Flemish Radio Association (FRA, or VRA in Flemish) is issuing an award for working Belgium stations using the special anniversary OS prefix. Each OS station worked between 18 May and 11 July counts 1 point, unless a member of VRA in which case the contact is worth 2 points. Contacts with the club station OS4VRA count 3 points except between 1200 and 2400 local on the anniversary itself, when they count 10 points. European (non-Belgian) stations need just 5 points to be able to claim the award, which costs 10 Euros (or $10). Send log extract (signed by two licensed amateurs) to FRA, PO Box 1630, B-1000 Brussels 1, Belgium. Further information, if required, from Gust, ON1BMJ, at on1bmj@vra.be

The Worked All WRTC2002 awards (see 'Contests') will be available for working the special WRTC stations. You can work each of them once per mode per band (1 point per contact). Send your log (e-mail logs only, please) to logs@wrtc2002.org by 31 July. 'Early bird' logs (by 1800 on 14 July) will participate in a lottery with special WRTC2002 prizes. The following Worked All WRTC2002 awards will be issued based on the above contest rules: Single op CW; Single op SSB; Single op Mixed; Multi op CW; Multi op SSB; Multi op Mixed; IARU HQ stations. Awards will be given to the stations with highest number of points in the following categories: 1st 2nd 3rd in World, Europe, North America, South America, Asia, Africa, Oceania, HQ stations, Finland. Also, there will be special plaques for working all the WRTC 2002 stations on CW, SSB and Mixed mode. European entrants can also claim a T-shirt for 200 points or more.

At the Dayton Hamvention the VP6DI (Ducie Island) operation was awarded DXpedition of the Year by the South West Ohio DX Association. Ed Giorgadze, 4L4FN, was awarded DXpeditioner of the Year for his activity from North Korea. Albert Bergren, W0AR, was inducted into the CQ DX Hall of Fame and Leif Preben Ottosen, OZ1LO, to the CQ Contest Hall of Fame.

**COUNTRIES WORKED, 2002**
(sorted this month by SSB totals)

| CALL | CW | SSB | DATA | MIXED |
|---|---|---|---|---|
| ZC4BS | 172 | 203 | 77 | 228 |
| G4PTJ | 176 | 194 | 0 | 240 |
| M0AWX | 0 | 165 | 0 | 165 |
| G0GFQ | 0 | 144 | 20 | 148 |
| G3YVH | 82 | 135 | 0 | 174 |
| M0CNP | 3 | 127 | 30 | 127 |
| G3SED | 166 | 125 | 0 | 199 |
| G3JFS | 136 | 124 | 113 | 189 |
| MW5VZW | 42 | 124 | 0 | 166 |
| G4WXZ | 116 | 116 | 0 | 173 |
| MU0FAL | 117 | 101 | 0 | 140 |
| G4FVK | 34 | 101 | 0 | 103 |
| M0BZK | 0 | 95 | 59 | 110 |
| M0CAL | 2 | 83 | 0 | 83 |
| GM4ELV(QRP) | 72 | 69 | 0 | 93 |
| G3LHJ | 143 | 67 | 104 | 173 |
| M5AEF(QRP) | 48 | 55 | 0 | 65 |
| ZC4DW | 104 | 45 | 78 | 120 |
| G3XTT | 45 | 45 | 46 | 97 |
| MM0BQI | 22 | 41 | 89 | 108 |
| G4OBK | 97 | 38 | 56 | 119 |
| G4IDL | 46 | 34 | 0 | 67 |
| G4DDL | 45 | 19 | 10 | 53 |
| ZC4VG | 125 | 14 | 0 | 127 |
| G0NXX | 215 | 0 | 0 | 215 |
| G3SXW | 212 | 0 | 0 | 212 |
| G4IRN | 164 | 0 | 0 | 164 |
| G4UCJ | 155 | 0 | 44 | 156 |
| G0ARF | 0 | 0 | 130 | 130 |
| G3ING | 102 | 0 | 0 | 102 |
| GU0SUP | 0 | 0 | 96 | 96 |
| G0URR | 0 | 0 | 81 | 81 |
| G4DJX | 78 | 0 | 0 | 78 |
| G3URA | 0 | 0 | 42 | 42 |
| M5AFA(QRP) | 0 | 0 | 37 | 37 |
| M5PLY | - | - | - | 188 |
| MU3DHI | - | - | - | 100 |
| G4YWY/M | - | - | - | 75 |

**The Smugglers Cove Beach Bar on Tortola, British Virgin Islands, which was the QTH of the late Bob Denniston, VP2VI. The ladder on the roof supports wire antennas. Inside the hut resides a rusting Lincoln Continental convertible (registration VI2) which was used by HM the Queen during her Silver Jubilee tour of the British Virgin Islands.**

## TABLES

PAUL, MW5VZW, JOINS the fray this time, reporting some excellent DX running 100 watts via a KW E-Z Match to a converted CB whip just 1 metre off the ground, with radials cut for each of the bands 10 through 20m. I won't list all his DX here but, to give a flavour, it includes 8R 5V YB on 10m, AP VR2 XW on 12m, BY EP ET on 15m, and lots more besides. Not a bad start at all!

David, M5AFA, continues to stick with 3 watts of PSK31 to an end-fed wire, and reports his best DX to date as FR5AB (Reunion). Robin, M5AEF, runs 1 watt or less, and reports SM0JHF/HI9 in Dominican Republic as a particularly nice catch. Robin will be in Norway during the last two weeks of August, signing LA/M5AEF/P on 18.080MHz CW using 1 watt and a FOXX3 kit transceiver from Kanga.

Please note that G3GIQ, who compiles the All Time tables which we run every quarter, has recently changed his e-mail address. You should now send updates to Henry at henryflewis@btinternet.com

## SILENT KEY

PAST ARRL president Robert W Denniston, VP2VI (W0DX, ex W0NWX), passed away recently. Bob, 83, had been licensed for 70 years and was a charter member of the Potomac Valley Radio Club. He was credited as being the originator of the modern DXpedition after his 1947 'Gon-Waki' VP7NG DXpedition in the Bahamas. Bob was also a team member of the first DXpeditions to Clipperton Island (FO8AJ) and Malpelo (1969). He was a founding executive member of IARU Region II, which was started in 1964.

**IARU HF Championship 2001**
Call, score, category (A = single-op mixed-mode; B = single-op phone; C = single-op CW; D = multi-op)

| | | |
|---|---|---|
| MØSDX | 1,963,668 | A |
| MØTTT | 637,960 | A |
| GØMTN | 610,192 | A |
| G4VGO | 13,021 | A |
| MMØBQI | 11,685 | A |
| G3VZT | 1,233,265 | B |
| GØVSN | 402,824 | B |
| MW5EPA | 163,676 | B |
| GØWJN | 67,362 | B |
| GØKTH | 27,336 | B |
| G4AXX | 25,296 | B |
| MØCOP | 21,630 | B |
| GW7X (op GW3NJW) | 867,060 | C |
| G4OGB | 295,934 | C |
| GM3CFS | 276,734 | C |
| G3LZQ | 213,367 | C |
| GØORH | 171,120 | C |
| G3TXF | 130,944 | C |
| G3MPB | 99,724 | C |
| G4WFQ | 55,110 | C |
| G4DDX | 39,228 | C |
| M4T | 29,136 | C |
| M6T (ops G4PIQ,G4BWP) | 1,515,898 | D |
| GM2T (ops MMØCCC, MMØDXC, GM4XZZ, MMØANT, GMØCLN, MM1CPP) | 264,896 | D |
| G3PJV | 59,454 | D |

## CONTESTS

THE IARU Radiosport Championship takes place over the weekend of 13 / 14 July (1200-1200) and, co-incident with it, the World Radiosport Team Championship which, this year, is held in Finland. 52 two-man teams will travel there to compete from stations which are, to the maximum extent possible, directly equivalent, the idea being to find the best contest operators in the world (while having plenty of fun!). Fred, G4BWP, and Andy, G4PIQ, will represent the UK, while Roger, G3SXW, leads the international team of referees. If previous experience is anything to go by, those of us operating from home will have a lot of fun working the special WRTC stations. You will easily be able to spot them, as they have been allocated the new prefix block OJ1 to OJ8 with '2 x 1' callsigns (eg OJ1A). See 'Awards' for details of special awards for working these stations.

Results of last year's IARU Radiosport Championship appear in the table. The ARRL has posted all-time records for the contest on its website (see WWW.).

I need hardly add a reminder that the RSGB Islands on the Air contest takes place on 27 / 28 July (1200 to 1200) and is a great opportunity to work new islands for the various IOTA awards. Since last year I have been manager for this contest, and would urge any of you who make contacts, even if not as a serious entry, to take a few moments to send in your log (electronically if possible) as it all helps the adjudication process. Ric, DL2VFR, is once again collecting details of IOTA Contest DXpeditions and publishing them on his web page. His list should, of course, be more up to date than the list I included earlier in this column.

The Venezuelan Independence Day Contest takes place between 0000 on 6 July and 2400 7 July (phone) and between 0000 27 July and 2400 28 July (CW). Everyone works everyone. Exchange RS(T) plus QSO number, starting at 001. Score 1 point for own country, 3 for own continent and 5 for other continents. Multiplier is one for each YV call area and for each DXCC country worked on each band.

In the 2001 Marconi Contest UK entrants were: 17th G4RCG * 42402, 18th G4OGB 40812, 20th GM3CFS 38114, 58th G0RDO 9916, 83rd M0EEE 2503, 96th G0MRH 1350 (* Denotes high power, 120 entrants)

In the ON Spring Contests 2002, the following UK callsigns appear in the results: CW – 2nd G5LP 3888, 3rd G4RCG 3645 (7 Entries); SSB – 1st G0AOZ 4350, 2nd G3VAO 3600, 3rd G4RCG 3024, 6th G0VQR 495, 7th G0MTN 396 (seven entries).

## 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). Thanks also to G4OGB for contest results. Please send items for the **September** issue by **20 July.** ♦

## WWW.

| | |
|---|---|
| 8Q7ZZ: | www.8q7zz.com |
| GM5A: | http://islay.freehomepage.com/ |
| IARU Contest Records: | www.arrl.org/contests/records/iaru.html |
| IOTA Contest DXpeditions: | www.iota-post.com/ |
| TY expedition: | http://perso.wanadoo.fr/f5cwu/html/benin02.htm |

## HF F-Layer **Propagation Predictions** for **July 2002**

| | 3.5MHz | 7.0MHz | 10.1MHz | 14.0MHz | 18.1MHz | 21.0MHz | 28.0MHz |
|---|---|---|---|---|---|---|---|
| Time | 0000111112220 | 0000111112220 | 0000111112220 | 0000111112220 | 0000111112220 | 0000111112220 | 0000111112220 |
| (UTC) | 2468024680 20 | 2468024680 20 | 2468024680 20 | 2468024680 20 | 2468024680 20 | 2468024680 20 | 2468024680 20 |
| *** Europe | | | | | | | |
| Moscow | 1.....56 | 751.....2688 | 774211115788 | 467766657887 | 678888789977 | 356777667765 | .....  |
| *** Asia | | | | | | | |
| Yakutsk | ..... | ..... | 31111.124555 | 765666777777 | 3..777776554 | ...565543222 | ....2..... |
| Tokyo | ..... | ..... | .....11.. | .....244.. | .....124552. | .....2333.. | ..... |
| Singapore | ..... | .....156. | .....6872 | .....38873 | .....268863 | .....25773. | .....33.. |
| Hyderabad | ..... | .....122 | .....2677 | 5.....37888 | 454212688887 | 226556788875 | ..345446544. |
| Tel Aviv | 7.....677 | 87.....4888 | 9861..158999 | 996665678889 | 553266734487 | 33.2877.2275 | ....544...42 |
| *** Oceania | | | | | | | |
| Wellington | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Perth | ..... | .....311 | .....13.5 | .....5 | .....6 | .....4 | ...23..... |
| Sydney | ..... | .....15.. | .....46.. | .....331. | .....2436. | .....4. | ...2..... |
| Honolulu | ..... | ..... | ..... | ..221..... | ...22..... | ..... | ..... |
| W. Samoa | ..... | ..... | ..... | ...11..... | ...2221.... | ....2..... | ..... |
| *** Africa | | | | | | | |
| Mauritius | 1..... | 4.....1666 | 2.....5775 | .....17762 | .....3763. | .....365.. | .....2... |
| Johannesburg | 66.....165 | 78.....6898 | 22.....8885 | .....2974. | ..62112795.. | ..6533588... | ..5655674... |
| Ibadan | ..... | 43.....333 | 883.....2888 | 8874112578 98 | 6578778899 98 | 4367667799 76 | 2.4545567764 |
| Nairobi | ..... | 4.....333 | 63.....1556 | 77.....15777 | 4752112678 87 | .4655467888 6 | ...2455674 3. |
| Canary Isles | 76.....577 | 886.....2888 | 8872...16888 | 8887324588 99 | 7578877899 99 | 5358878899 87 | .....33.. |
| *** S. America | | | | | | | |
| Buenos Aires | 32..... | 886.....17 | 887.....47 | 877.....68 | 877.....788 | 745..1..2788 | .....2.3643 |
| Rio de Janeiro | ..... | 66.....36 | 772.....167 | 762.....367 | 874.2...2999 | 75..42225888 | ....3222575 3 |
| Lima | ..... | 651.....3 | 764.....16 | 6441.....36 | 7677.....188 | 6246.2..1477 | .....33. |
| Caracas | ..... | .....1 | 221.....12 | 4552.....34 | 51252....245 | 1..2321123 53 | .....233. |
| *** N. America | | | | | | | |
| Guatemala | ..... | 11..... | 321.....2 | 322.....3 | 1.....12 | .....1 | ..... |
| New Orleans | ..... | 1..... | 221..... | 444.....2 | 645..6555678 | 423..3657776 | .....223342 |
| Washington | ..... | 31.....1 | 663.....15 | 787331..1267 | 632.361.5778 | 3....5..2785 | ..... |
| Quebec | 5.....2 | 86.....28 | 641.....136 | 3..2.1.12456 | 42.2443367 76 | 2...2322455 4 | .....232. |
| Anchorage | ..... | ..... | ..... | 3221211112223 | 4353323566 86 | 22222.233453 | ..... |
| Vancouver | ..... | ..... | ..... | .1..... | 222....35666 | .....2333 | .....2. |
| San Francisco | ..... | ..... | .1..... | .1..... | 322.....123 | .....12 | ..... |

Key: Each number in the table represents the expected *circuit reliability*, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 29% of days etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low; **blue** when it is expected to be fair and **red** when the signal is expected to be strong.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated monthly. The provisional mean sunspot number for May 2002 issued by the Sunspot Data Centre, Brussels, was 120.8. The maximum daily sunspot number was 172 on 5 May and the minimum was 74 on 15 May. The predicted smoothed sunspot numbers for July, August and September are respectively: (SIDC classical method – Waldmeier's standard) 103, 101, 99 (combined method) 88, 83, 79.

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# SWL

THIS COLUMN will find you experiencing 'summer conditions', where 14MHz is providing you with little of interest during the day, 28MHz is helping you fill in all your 'missing' European DXCC counties and, for those interested in VHF, 50MHz - and hopefully 144MHz - are providing Sporadic E conditions to the furthest parts of Europe.

The summer Sporadic E season started for Simon, RS177448, on 15 May when he heard stations from Poland, Portugal and Lithuania on 50MHz. Before this, on 19 April, he caught an aurora on 50MHz, hearing MM0AMW, OZ1DPR and SM7FJE. David Whitaker, BRS25429, also caught the aurora in IO93. In one hour's listening he heard 11 countries - G, GM, GW, EI, SM, OH, LA, OZ, ES, PA, and DL. Best stations heard were OH2TP, SM6MPA, LA7AJ, ES2CM, OZ1LEP, OZ1KEF and OZ0JX.

## SPECIAL EVENT QSL CARDS

GRAHAM Ridgeway, G8UYD / M5AAV, is the sub-manager for GBnN to GBnZ series callsigns.

He explained his horror when looking at a recent list of GB calls that were to be active for the Jubilee period, to see how few, actually one, wanted to receive QSL cards. Graham is concerned that this would have precluded SWLs from getting what in truth will be 'rare' cards. He feels that this does not exude what he understands to be the spirit of amateur radio. He is also concerned that he will be inundated with incoming cards that will be consigned to the bin.

From a personal point of view, I have to say that any SWL who heard GB50 need not fret about receiving a special GB50 QSL card – provided that the QSO details match *exactly* what is in the GB50 log. I am handling all SWL cards. Any special event station organised by Cray Valley Radio Society has a definite policy of replying to SWL cards – so, if you heard GB2SJS, GB2FB or GB8ST in 2001, you will receive a card. The QSL Manager for these three stations was Owen, G4DFI. I hope that other societies running special event stations will review their QSL policy to ensure that the SWL is able to get his QSL card.

While on the subject of QSL cards, Anthony Nowell, RS94177, is the QSL sub-manager for M1Axx and all G1 callsigns. Anthony is concerned that a great many amateurs with M1Axx or G1 callsigns have not sent Anthony envelopes so they can receive their incoming QSL cards. Anthony holds a large number of cards, including SWL cards, which quite soon will find their way into the bin. Anthony's address is 3 Laburnum Grove, Bromsgrove, Worcestershire B61 8NB.

As an aside, I would also mention GB5SI, the annual bash from the Summer Isles, who also does not collect cards. Yet another disapointment for many SWLs. I would suggest that reports go directly to MM0BQI who holds that special event call.

## DXCC STATISTICS

SWLs ARTHUR MILLER and David Whitaker have combined their listening records, by each band, for the first three months of 2002 in an exercise to establish the level of activity in what must have been one of the best propagation periods in the current sunspot cycle. Each had excellent individual months of listening but, by putting three months results together, and so early in the year, they have fairly accurate records of band happenings so far this year. All results are SSB. Here are their findings.

Total DXCC entities active was 255 countries. Individual bands totals are as follows:

10 metres...214 countries heard
12 metres...158 countries heard
15 metres...227 countries heard
17 metres...134 countries heard
20 metres...214 countries heard
40 metres...138 countries heard
80 metres...116 countries heard
160 metres... 51 countries heard

## MORE 'FAKE' SWL REPORTS

DAVID Rankin, 9V1RH, e-mailed me following my May comments about SWL reports and the Greek amateur who received a report made up from a spot on a *DX Cluster*.

Unfortunately, David told his own story about the SWL report he received earlier this year, alleging that an east-European-based SWL had heard him in QSO with a mid-west US station on 40m SSB.

David reflects that he was indeed on 40m SSB at his sunrise on that day, but working into South America at the time and date reported. He was most surprised to see that he was spotted by a mid-west US amateur at that time as he had *never* been successful in working into North America at his sunrise.

Consider David's further surprise when, about a month later, he received an SWL report from an east-European SWL claiming that he had heard the QSO!

There can be no doubt that the SWL had read the DX Cluster spot and was trying his luck to get a QSL the easy way. To make matters worse, the SWL sent his report direct without any return postage or SAE!

Needless to say, the SWL did not get a 9V1RH QSL card, and his 'report' went into the bin - where it belonged! Such 'try-ons' do nothing to enhance the image of the SWL fraternity.

On the positive side, David recently received a very good SWL report through the bureau from an SWL in southern Spain. The SWL correctly reported hearing three successive contacts that David had on 21MHz and it was a pleasure for David to reply to his QSL. I am in no doubt that he really did hear 9V1RH.

As a final comment, listeners will do well to heed David's final piece of advice: "I wholeheartedly support your comments about supplying SAE and return postage when one wishes to have a direct reply from a DX station". You have now been told by a respected, and very active, DX station. Take heed! ♦


**The new QSL card for Bob, BRS32525, and his son Simon, RS177448, that was first used for their holiday operation from Wales last year. They will be back in Tenby in late July and early August to try to build on their current DXCC totals from GW.**

WWW.

**Titanic Wireless Commemmorative Group**
**http://www.gdrs.net/titanic**

**Broadcast listeners contest**
**http://www.swlcontest.homestead.com**

# Antennas

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I RECEIVED a further e-mail from Peter Martinez, G3PLX, regarding the EWE antenna discussed in May 'Antennas'. He writes "Imagine a 1 metre cube which is metallised on the top and bottom surfaces. Between the centre of one edge of the top face and the corresponding point on the bottom face, connect a 377Ω resistor. A signal generator is then connected to the centres of the opposite faces, which is set to give an output of 1V. Now, stand in the centre of the cube with an E-field and an H-field probe. The E field here is clearly 1 volt per metre. Because of the presence of the 377Ω resistor at one edge, you can work out the current (=1 / 377A) flowing 'around' you and deduce the H field, which is exactly in the 377Ω ratio. It follows that the field at the centre of the cube is a true free-space TEM field (transverse electromagnetic field). Furthermore, it is also everywhere else (since it gets everywhere else by radiating from the centre). This antenna has no near field region. What I have described is known in the trade as a TEM cell and is used for EMC immunity measurements, but it is a crossed field antenna in that it intrinsically generates E and H in the 'right' ratio."

However, it is not a transmitting antenna. It has a calculated gain of around -15dBi on 28MHz and -50dBi on 3.5MHz.

## W4RNL

AN E-MAIL has been received from L B Cebik, W4RNL, who designed the Moxon rectangle, described in the March 'Antennas'. He writes: "I thought I might add some quick notes about my design aims. Initially, I strove for versions of the antenna with the best performance combined with a 50Ω feedpoint impedance for direct feed (with the usual choke for suppression of currents on the braid of the coax). This work culminated in a *GW BASIC* utility for designing rectangles with only two input variables - the element diameter and the design frequency (which I usually recommend to be about 1/3 up from the bottom of the desired band, given the manner in which performance and SWR curves go). This program is included in *HAMCALC* by VE3ERP, and a model-by-equation model for NEC-Win Plus is available at the NSI web site [1]. The benefit of the equation-based model is that one can run the emergent model and obtain a full profile of projected performance. The relevant item describing the program is at my site [2].

"I have used VHF and UHF Moxon rectangles as well as HF varieties. Vertically, their null is an almost ideal direction finder for 'foxhunts'. Or we can use three at equal angles and poll them for a repeater receiving antenna. Pointed straight up, we can turnstile a pair for a pattern with a broad dome of very nearly even gain above about 30° elevation. To simplify turnstiling, I redeveloped the design program, striving for about 95Ω feedpoint impedance (RG-62 becomes the phaseline and the result is a direct 50Ω feed from the turnstile array). The article shows the revised regression-based values for the equation-based model, which one can also plug into the *GW BASIC* program in place of the values for 50Ω versions, see [3]. As your March column shows, there is slightly less peak forward gain in the squarer 95Ω rectangle but, in satellite use, the dome is equal to the 50Ω version. However, the program itself is perfectly general (in both 50Ω and 95Ω versions), yielding buildable designs from very thin wire to quite fat tubing from the AM broadcast band through to 900MHz or so - where we should be using PCB construction."

## THE 'EFA' ANTENNA

IF YOU ARE a 160m or 80m operator, with an average-size garden, the EFA (Elevated Feed Antenna) described by Colin Draper, G3TSK, may be of interest to you. The layout is shown in **Fig 1**. It has a feedpoint at resonance of around 50Ω for a fair portion of the bands, so an ATU is not required.

The antenna is fed against earth, so a good RF earth is required for efficient operation. It also has a single buried insulated counterpoise. High voltages can be generated at the ends of the ground wire, (even with modest power levels), so the wire is insulated and taped at the end.

The antenna can be used with just the RF earth and no counterpoise, but the minimum SWR is about 1.4:1.

The loading coil is wound on a 21.5mm diameter round former, 254mm long. The windings consist of 292 turns of 21 or 22SWG enamelled copper wire (close wound), occupying a length of 240mm for the main body of the coil, with four turns at the high end occupying 10mm and three turns at the low end (nearest to the feedpoint) occupying 6mm. The winding is covered with shellac and the former and coil are then wrapped with 'stretch rubber tape' layered to give protection against the weather. The measured inductance using a home-brew inductance meter was approximately 150µH.

The EFA is adjusted for resonance using a dip meter coupled into a two-turn link at the feed point, altering the lengths shown in Fig 1. ♦

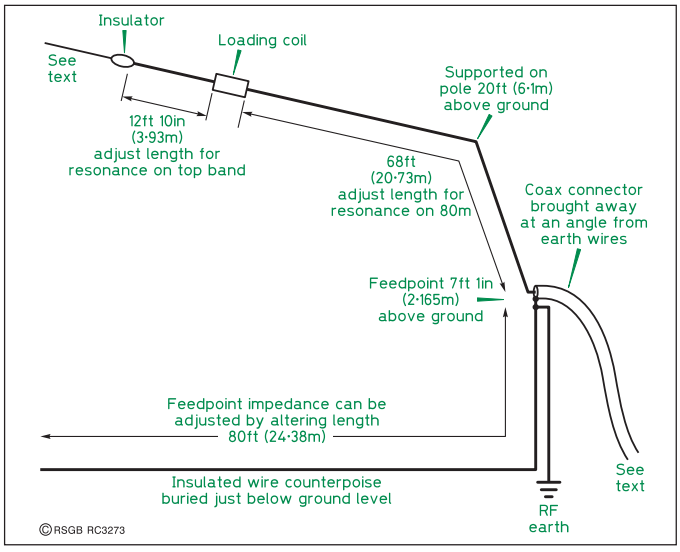


**Fig 1: The EFA antenna. The antenna feeder is coiled several times at ground level to choke off any antenna current that may be present on the feeder.**

WWW.

[1] NEC Win Plus www.nittany-scientific.com
[2] Equation-based model www.cebik.com/moxgen.html
[3] Use of [2] www.cebik.com/ms2.html

## THE 50 - 50 JUBILEE ANTENNA COMPETITION

I AM OFTEN ASKED, usually by those who live in restricted locations, if certain commercial antenna products will solve their antenna problems. In many cases, a simple wire antenna suitably placed and fed will outperform most of them, even in the most restricted of locations. I propose the following experiment in the form of a competition to illustrate this.

The competition is to construct the cheapest of all antennas - a 50ft piece of wire. The objective is to see how many stations you can work using the 50ft wire, over a period of 50 days from 1 September to 20 October 2002. You can use any band and any mode, although only one station on any band or any mode counts towards the total. Each DXCC country that you work will give a multiplier of 1 (ie 10 countries give a multiplier of 10). Maximum transmit power is 100W (or 1W ERP on 136kHz). There is a QRP section for stations with a maximum transmit power of 5W.

Because these are normal QSOs, there is no need to have special serial numbers or contest identifiers. However, if you *do* enter a contest during the test period, these QSOs count provided they meet the conditions already described.

The antenna can be constructed from wire, and be of any diameter up to 2mm (excluding insulation). The wire can be orientated in any direction, folded to fit any space, and even wound as a continuously-loaded antenna on, say, a fibreglass rod. The maximum height of any part of the wire must not exceed 10m. The wire can be fed at any point using any length of feeder, but the feeder must not be part of the radiating system.

If the wire is end-fed then elevated radial(s) cannot be used as they could be deemed to be part of a wire longer than 50ft. Ground radials are OK because they are part of the RF ground system.

If the wire is end-fed from a first floor shack, the shack RF ground system may be used.

You are permitted to re-orientate the antenna during the test period as part of the experimental process.

If you participate, please write and describe your findings as well as the results. It is hoped that these will form part of an article on the competition. Book prizes will be awarded for the highest scores in each category.

Send entries to 'Peter Dodd "Antennas" Competition', Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE (no e-mail entries accepted), to arrive by **31 October**. Please do not send any other correspondence with your entry.

# ATV

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THIS SUMMER marks the 40th anniversary of Telstar 1; this was the first satellite to provide a television link between the United States and Europe. The UK uplinks and down links were via the BT site at Goonhilly Down in Cornwall. There is a rumour that on the first pass the French were reporting near perfect P5 pictures, while the best that UK systems could do was a watery P1. Raymond Baxter filled in with an ever-more difficult voice over. Then came the horrible realisation that there had been a mix-up with the receive antenna polarisation. The dish feed had been built LHCP when it should have been RHCP.

The next pass had perfect pictures and it is doubtful that such an error could have been corrected on that time-span, but it makes a good story.

Telstar was not a geostationary satellite, so as it passed over the Atlantic it gave about a 9-minute window of TV communication with the States. In the UK, the uplink pictures were often pre-recorded on a Quadruplex VT and the VT engineer sat and waited for a "go" command from Goonhilly, then he would 'roll' and pray that the servos locked and any physical edits held together while the window was open. In those days, the US was using 525-lines, the UK was still on 405 and, in France, the standard was 819 lines. The only standards converters available at the time were optical devices.

## ATV IN FRANCE

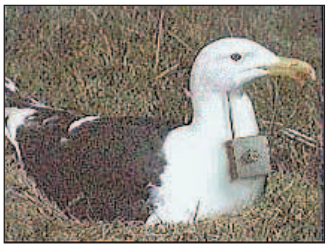
WHILE ON THE SUBJECT of summer, one or two of you have written to ask me about taking ATV equipment to France. This was once fraught with problems and unpopular with the rest of the family but, to quote Mr Dylan, "The times they are a changing". The family camcorder is an accepted part of the holiday luggage. A low power transmitter and a small receiver that can drive the viewfinder are now of the size that you can pack in with the spare wheel. What family objections can there be if you can pass the aerial off as a fishing rod?

There is an ATV network in the south of France, with three repeaters in Nîmes, two in Marseille, and one each at the top of Mont Aigoual, Treille, Lure, near Narbonne and a project in Montpellier. Most of them are 23cm in-band repeaters, some have a second input on 13cm and some have 10GHz capability, so you may also need to pass off a small dish as a barbecue accessory.

A visit to the F5AD website will give you all the necessary information you will need to work any of these repeaters.

## DON'T TRY THIS AT HOME

ALSO ON F5AD's website is a report on equipping a seagull with ATV equipment. I am not sure what the RSPB would have to say about this and I am not sure about the licence ramifications. The bird was friendly and it seems that every possible consideration was given to its power to weight distribution.



**Jojo the seagull, making ATV history.**

The payload was much lighter than the fish these birds frequently carry. The full report covers the development of the equipment, the circuit of the three-transistor transmitter, and problems with the ingress of sea water. The next stage is a 100mW transmitter and a camera that weighs less than 10g, the end product to fit in a matchbox.

## UNDERWATER ATV

THE FINAL ITEM of interest on this site was how to waterproof a small black-and-white TV camera and use it underwater.

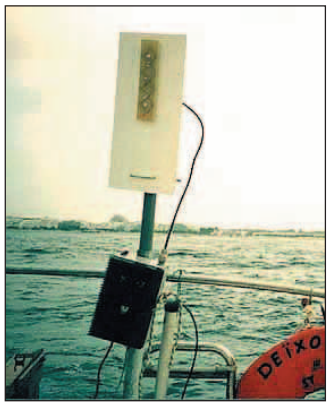
The author trailed his unit between Port Camargue and Palavas on a six-metre boat. The end result was transmitted on 13cm.

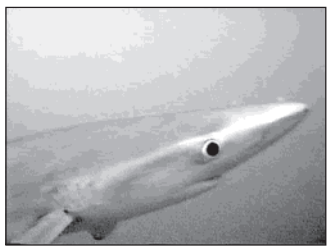
**A small black-and-white TV camera sealed in a home-made plexiglass box, with O rings. It is connected to a screened cable with three conductors: video output, 12V supply, and common. The cable measures 17 metres, the maximum operating depth. (Photos: F5AD)**

As an avid scuba diver, I would have loved to have been the cameraman; but then I saw the pictures and thought otherwise!

**The camera is attached to a perforated cylinder which is filled with crushed sardines in order to attract the underwater ATV stars, some wanted, some not (see later).**

This website is definitely worth a visit.





**Top: the boat used in the trials. Centre: the transmitter on 2320 MHz and its antenna, which accessed the F5ZGN repeater at the top of mont Aigoual at a distance of 1600m. Bottom: a worrying visitor that made me withdraw my offer of being the underwater camera operator. It subsequently wreaked havoc with the underwater TV cables.**

## INTERNATIONAL ATV CONTEST

THE BATC IS organising the IARU Region 1 International ATV Contest on 14/15 September. You have got almost three months to blow the cobwebs off your ATV station. The BATC web pages have been updated to include the rules. Any problemsregarding the contest can be e-mailed to Richard Parkes: contest@batc.org.uk ♦

WWW.

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BATC www.batc.org.uk

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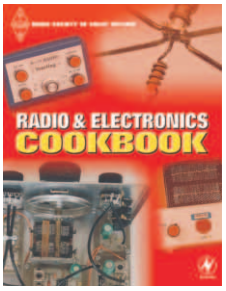


## Radio & Electronics Cookbook

This is a collection of the very best weekend projects from the popular Radio Society of Great Britain magazine D-I-Y RADIO. The simple step-by step instructions also make this book ideal for DIY enthusiasts and radio amateurs seeking to build up their electronics skills and knowledge.

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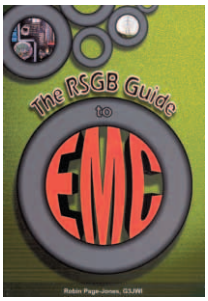


## The RSGB Guide to EMC

Achieving electromagnetic compatibility (EMC) with the increasing number of electronic devices in surrounding buildings can be a major problem for anyone operating radio equipment. This guide will help you avoid EMC problems by practising good radio housekeeping, and assist you in the diagnosis and cure of any ones which do occur.

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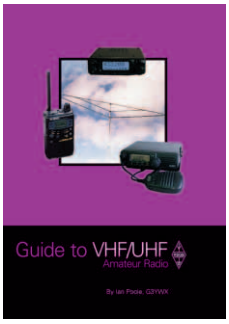


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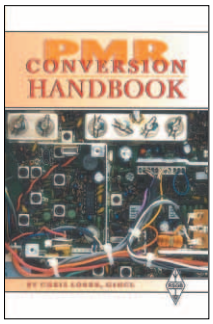


## PMR Conversion Handbook

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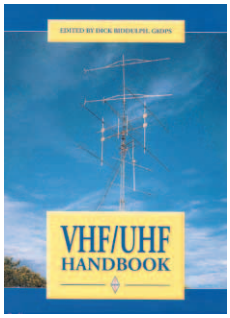


## VHF/UHF Handbook

This guide to the theory and practice of amateur radio reception and transmission on the VHF and UHF bands gives the reader the background to such essential topics as antennas, EMC, propagation, receivers and transmitters, together with constructional details of many items of equipment.

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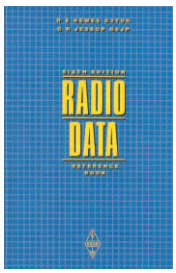


## Radio Data Reference Book

Presents a wide range of essential reference data in convenient graphical and tabular form without needless repetition of basic theory, and arranged in sections to simplify retrieval. This handy volume will fulfill a real need in university, college and electronic company libraries, as well as being invaluable to the amateur radio enthusiast.

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# TECHNICAL SELECTION

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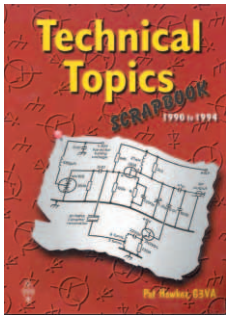



A collection of all of the very popular Technical Topics articles by Pat Hawker, G3VA,by far the most successful regular column in the RSGB's journal RadCom, and a blend of clippings from other publications and contributed material. Pat has produced a wealth of ideas, modifications, and tips for the radio amateur for many years, and these books contain a sample of his contribution to amateur radio in the most popular RadCom column of all time. These book s could well provide that vital 'spark' for your next project!

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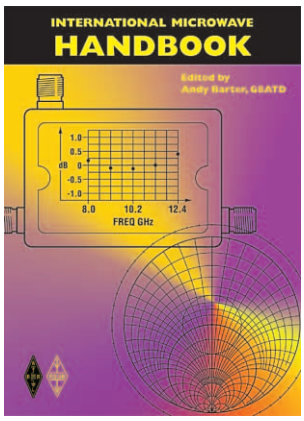


## International Microwave Handbook

The microwave bands are an excellent area for radio amateurs who want to experiment and construct their own equipment. The RSGB in partnership with the ARRL has produced this invaluable source of reference information for those interested in this area, along with excellent designs from around the world. Material has been drawn from many sources including RadCom and QST & QEX.

480 pages

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## RSGB Technical Compendium

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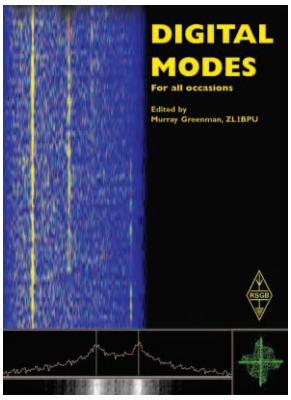


## Digital Modes
### For all occasions

The book for every person who is interested in digital modes, as it is simply the most complete book yet written on this subject. Written by a leading expert on digital modes this book describes serial trans-mission and various data and error correction techniques, differences between a bit, a byte and a symbol, and much more. The history of digital modes is covered along with reviews of all the important modes and tools available for PC sound card.

208 pages

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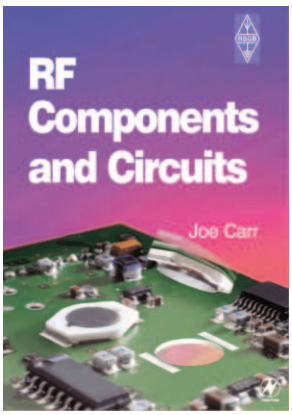


## RF Components and Circuits

For those who are interested in RF design, this is the first RSGB book on the subject written by the legendary author Joe Carr, in an easy to understand style with the minimum of theory whilst offering a comprehensive introduction to the design and understanding of RF circuits. Developed from a highly popular series in Electronics World magazine, this book covers the practicalities of designing and building circuits, fault-finding and use of test equipment.

416 pages

ONLY £19.12 - £22.50 (non-members)

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**ANDY GAYNE, G7KPF**
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ACCORDING to BR68, the stated purpose of the amateur radio licence is for "self-training in communications", however the opportunities to use that training for the good of the community are relatively rare. One voluntary organisation that would welcome any experienced radio operator is Raleigh International, whose web site details the charity's work with young people on expeditions around the world. Each 13-week expedition relies heavily on radio communications, so skilled 'Communications Officers' are in high demand. [*See p10 of the June* RadCom - Ed.]

Taking part will obviously require a great deal of commitment, plus the ability to raise some funding, but I'm sure the rewards would be enormous in terms of personal satisfaction. The full job description for the Communications Officer has been made available for download via my Quick Links web site, so if you think it could be for you, Raleigh International are waiting for your call.

## REMOTE RECEPTION

IT HAS BEEN possible to operate a radio receiver remotely via the world wide web for some time now, but one site that is now making the most of the concept is Javaradio.com by Kelly Lindman, SM7NHC. Javaradio provides access to a growing community of stations using Icom PCR100 or PCR1000 receivers linked to Linux web servers. Currently the network consists of stations located in Sweden, Australia, USA, Great Britain and Italy, but there's potentially no limit to the number of stations that could become involved.

To use any of the receivers, users must first follow a simple registration procedure which assigns a password to your chosen login name, after which you can theoretically access any of the stations and have full control of the receiver operation. I say theoretically because, unfortunately, I could not get the system to work for me; I received audio but had no control of the receiver. The 'Technical Notes' page on the Javaradio site mentions problems that could occur when your computer is behind a "very tricky firewall", I guess my rather complex home network falls into this category!

This is a pity (for me), as the potential of the system for carrying out some very useful diagnostic work on your own transmissions is enormous. One example of this is cited by Peter Kendall, G7RPG, who originally pointed me towards the Javaradio site. Peter has written a short article, which is carried on the site, describing the remote reception of SSTV pictures using software freely available via the Internet. It is very easy to see how for this or any other mode, the ability is there to hear your own transmissions, allowing you to check that your signal quality is optimised, improving your chances of subsequent successful QSOs.

The software used to run the remote receivers is freely available from SM7NHC for anyone wishing to set up a receiver station and expand the community. This would be an ideal way for an SWL to participate in amateur radio activities, as the only transmission of signals is via the Internet which, of course, does not require a licence.

## A FEW QUICKIES

PORTABLE OPERATION is the mainstay of the increasingly popular Summits on the Air programme, whose website describes the aims and criteria of this relatively new award scheme. The SOTA programme is professionally presented, with all the key information being available for download as extremely well-written PDF files. Anyone can take part in SOTA, with awards being available for those who prefer to remain in the comfort of a warm shack as well as those who activate the qualifying hills and mountains around the country. While being predominantly UK-based, this scheme is likely to expand to other countries, and should encourage many amateurs to venture out into the fresh air.

Although it is unusual to mention commercial websites in this column, Reg André, G0SSG, thought that *RadCom* readers may be interested in the US specialist supplier International Radio [*See p23 of this issue* - Ed.]. This company can supply the 'optional' crystal and ceramic filters for Yaesu, Kenwood and many other older rigs that can sometimes prove difficult to obtain. Reg tells me he managed to get a CW filter for a Yaesu FT-980 within a few days, after months of fruitless searching on the web, "and it just dropped in as an original would have done".

Leigh Preece, M5GWH, is putting together a focused resource for those interested in converting ex-PMR equipment. Leigh suggests he may have "more links than anywhere else on the web for ex-PMR mods", and his 'Intro' and 'Primer' pages are good starting points for anyone who knows little about this source of low-cost radio equipment. The links are not sorted in any particular order, and internal site links have an annoying habit of opening a new browser window, but the site serves its purpose by grouping together everything PMR-related.

## AND FINALLY...

OVER THE LAST four years I hope I have introduced many *RadCom* readers to some very useful amateur radio resources that are available on the world wide web, and maybe even prompted a few to get themselves on-line for the first time. I've thoroughly enjoyed researching the web on your behalf, but now find myself wanting to concentrate more on other activities; getting on air a lot more would be a good start! So, from September, your 'WWW' column will be penned by the well-known authority on all things Internet, my good friend Jeremy Boot, G4NJH. I, on the other hand, might well be atop a hill starting my SOTA points collection. 73, Andy Gayne, G7KPF. ♦

**WWW.**

| | |
|---|---|
| Raleigh International | www.raleighinternational.org |
| Job description download | www.users.zetnet.co.uk/kama/raleigh.zip |
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| Summits on the Air | www.sota.org.uk |
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**Javaradio in action – almost!**

# QRP QRP QRP QRP QRP

**REV GEORGE DOBBS, G3RJV**
*St Aidan's Vicarage,*
*498 Manchester Road,*
*Rochdale OL11 3HE.*
*E-mail: g3rjv@gqrp.com*

THE new ARRL QRP DXCC is beginning to excite radio amateurs in the UK. I have had several readers write to tell me they have received the award. Eddie Searle, G3VMY, obtained his using a 5W home-brew multi-band solid-state rig feeding a trap dipole at 25ft.

So far he has made contacts with 150 countries, mainly on CW. Eddie's entire station is home-brew. He has used this gear to win world first in the CQ WPX CW 7MHz QRP section on two occasions, and world first on one occasion in the CQ WW CW 7MHz QRP section. Eddie also achieved world second in the 21MHz QRP section of the CQ WPX CW section without using a beam.

## QRP SSB DX

BRIAN JONES, G0UKB, dispels the idea that DX is only possible using CW. Brian is a QRP SSB DXer. He wrote to me after working H7DX in a pile-up to bring his QRP SSB DXCC count to 150 countries. All contacts were made with a Elecraft K2 transceiver, with most of them using a 132ft Windom at 25 feet. This antenna was lost in the winter winds and has recently been replaced - see later. A few contacts may also have been on the Cushcraft R7 vertical, mounted 5ft above the ground.

Brian writes "My first rig was a Ten-Tec Argosy II, and I discovered QRP SSB by forgetting to push in the 50W switch, and contacting an FY5 station with 5W by accident. Since then I have been an advocate of low-power SSB and simple QRP antennas. Like so many other radio amateurs, I have a small garden and don't want to upset the neighbours. I am particularly keen to see a raised awareness of QRP SSB in light of the Foundation Licence. I obtained my K2 kit (#1115) in April 2000 and had it built and enjoyed my first QSO by 30 May. I forget when I reached the 100 DXCC score, but it was early in 2001. I don't operate too much (I have a day job!) and most of the DX is either during contests or snatched moments, before and after work or late evening. Nearly all the contacts are on 20m and above.

Brian Jones, G0UKB, in his shack.

"My DX includes all continents (including EM1HO for Antarctica) and I have broken into several pileups. I worked D68C on five bands SSB and even 3 bands CW! I also worked Gerry, VK7GK, in Tasmania, on 18m and he dropped his power to match my 10W and we had quite a chat - not bad for two stations over 10,600 miles apart.

"My furthest contact has to be ZL2BDW in Wellington, a little under 12,000 miles on the short path. On the QSL card he commented that he hadn't realised I was QRP as my signals were the same strength as the other UK stations he worked. "My most notable DX includes D2BB, E30NA, FR5D, FS/K4ZA, HH2/F8CUP, HL1CG, VP8CTM, VQ9NL and, more recently, H7DX, V51/SP1XF, PW0T, 5U0T and V26S, amongst others. I have also worked 43 US states (including AL) but I am missing WY, UT, HI, ID, NV, ND and MT. I managed to work 38 states in the 2002 ARRL DX contest.

"The station is just the K2 transceiver with the built-in ATU and a standard Kenwood fist microphone to the 102ft doublet at 32ft. I wanted 450Ω line all the way to an outboard ATU, but the XYL also uses the antenna from an upstairs room so she wouldn't be happy running downstairs to manual-tune the system each time she changes band. I terminate the ladder-line externally with a Radio Works 4:1 remote balun and coax feed into my shack with an option to connect to an upstairs coax line. The K2 will put out up to 15W on most bands, but I keep it down at 10W PEP, which is the accepted QRP level. Working with 10W, you expect to contact the DX and become disappointed when you fail."

## THE G QRP CLUB MINI-CONVENTION

AS USUAL, the G QRP Club will be holding its Mini-Convention in Rochdale. The date this year is Saturday 12 October, and the venue is St Aidan's Church Hall, Manchester Road, Rochdale. The event begins at 10am with an admission charge of £1. As in previous years, the event is an 'old style' radio rally with component, junk and kit vendors. No expensive new equipment will be on sale, and there will be a notable absence of computer equipment. The convention will also include a full programme of lectures throughout the day plus the tradition pie and peas lunch. Details can be had by sending me a stamped addressed envelope to the address above or by sending an e-mail request. ♦

## THE ORIGINAL QRP CONTEST, JULY 2002

**Organised by Hartmut Weber, DJ7ST, the twice-annual "O QRP Contest" provides an opportunity for a 'genuine' QRP contest.**

**Participants**: operators of original QRP rigs, commercial or homebrew, including commercial QRP rigs not exceeding 5W output, like QRP Plus, FT-7 and QRP versions of QRO transceivers like TS-130V, FT-707S etc. QRO-equipment (>20W out) temporarily turned down to QRP criteria is not allowed.
**Date**: Saturday 6 July 1500UTC, till Sunday 7 July 1500UTC; rest period of nine hours minimum in one or two parts.
**Frequencies**: CW segments of the 80, 40, and 20m bands. Call: "CQ OQRP" (Original QRP).
**Categories**: VLP (1W out or 2W in); QRP (5W out or 10W in); MP (20W out or 49W in).
**Operation**: Single-operator CW. Various transmitters and transceivers may be operated, but only one at a time.
**Exchange**: RST, serial no / category, eg 559001/VLP. No series reports, please.
**QSO-points**: The log checker will count four points for a QSO with another contest station whose log has been submitted. All other QSOs count one point. The exchange of RST is sufficient with stations not in the contest.
**Multiplier**: The log checker will count two multiplier points for each DXCC country from a QSO with a station whose log has come in. Otherwise each DXCCC country counts one multiplier point per band.
**Final score**: Sum of QSO points multiplied by the sum of multiplier points. (This is calculated by the log checker. Do not try your own calculation; you cannot foresee who will send logs).
**Summary sheet**: Must show name, address, callsign and the minimum rest periods. Indicate the types of all equipment used with output or input power on each band, according to manufacturer or measured under contest conditions. Home-brew rig descriptions should name PA-transistor / valve and possibly a reference.
**Logs**: List QSOs sorted by band. Add the DXCC prefix if you claim a multiplier for a QSO.
**Deadline**: 31 July 2002.
**Entries to**: Dr Hartmut Weber, DJ7ST, Schlesierweg 13, D-38228 Salzgitter, Germany.

**DAVE PICK, G3YXM**
*178 Alcester Road South,*
*Kings Heath,*
*Birmingham B14 6DE.*
*E-mail: lf.radcom@rsgb.org.uk*

AT THE END of March, Ed, RU6LA, with UA6LV and others, made a trip to a site with a 135m tower near Taganrog, Russia, where they operated on 136kHz with 100W. The signal certainly radiated well with reports coming in from Italy, Greece, Germany and the UK at distances of almost 3000km. Unfortunately, the large aerial was picking up far too much noise and the receiver just couldn't handle it; there were also computer problems with the waterfall display and no contacts were made.

It was exciting to observe the number of stations calling and to watch the traffic on the packet cluster, which was full of stations passing on reports and trying to arrange skeds.

Ed was back the next weekend with an improved receiving system using a 1km-long Beverage aerial, and in came the QSOs. They first tried very slow CW (QRSS) with three-second dots and made several contacts. On Saturday evening, Reino, OH5UFO, was worked, then IK5ZPV in QRSS and also in CW. Early on the Sunday morning, they made it with OM2TW and M0BMU (best DX at 2824km), both contacts in QRSS. OK1FIG was a near miss despite Petr making a special trip to his cottage.

Ed received many reports from other Russian stations and reckons that this success has rekindled interest in LF there. He predicts that several more stations will be active soon. On 2 May, they had to take down their big vertical for agricultural reasons(!) and they expect to be able to re-start LF activities around the end of September.

At the beginning of May, RK2FWA was active with a good signal into the UK. RK2FWA is the callsign of a very well-known contest club from Kaliningrad (UA2 is a separate country in DXCC). It was operated by RN2FA and UA2FF, both LF enthusiasts (see below).

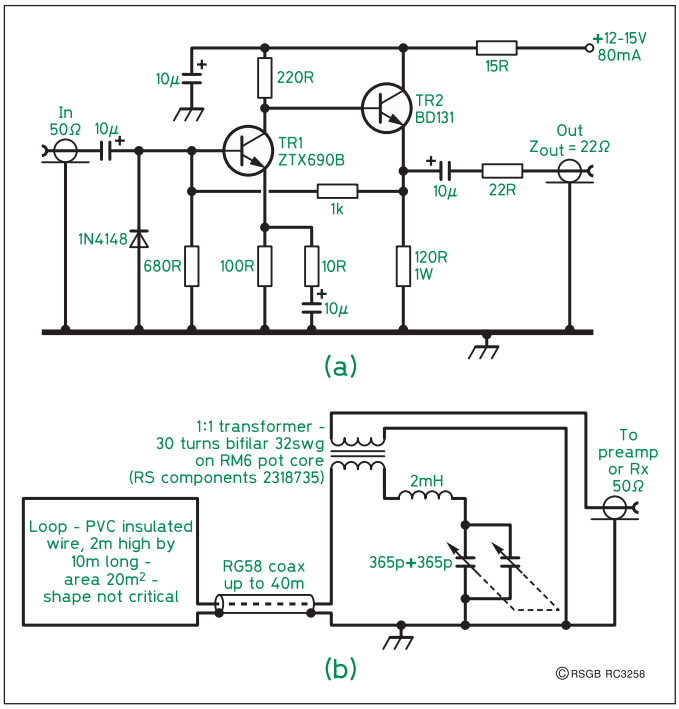
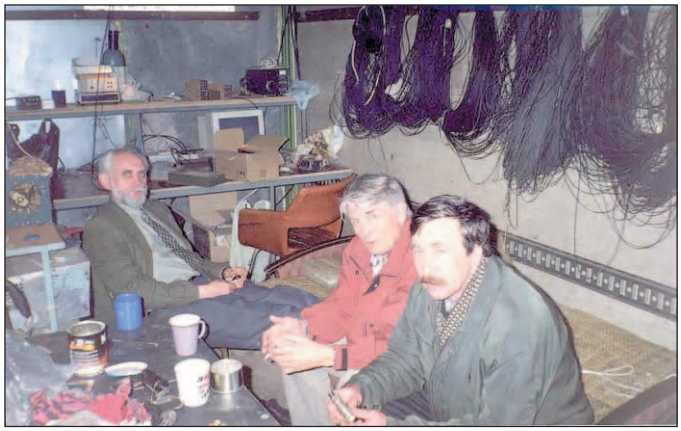



**Fig 1: M0BMU's 'lazy' receiving loop and preamplifier.**



**UA6LV, UA6LO (chief operator of RU6LWZ) and UA6LFQ in the shack, with miles of wire.**

It's been a long time coming. Radio amateurs in Russia have had permission to use 135.7-137.8kHz since 29 June 1998. They are allocated various transmitter output powers: Category 1 licence-holders can run 100W; categories 2 and 3 can use 50W and category 4, 10W. These restrictions mean that only those who have access to really efficient aerials (like Ed's) are going to be heard in the UK.

A brief history of 136kHz in Russia:

- **1998-99**: experiments between UA9OBA and RW9OWN at 2km;
- **19 May 2000**: CW QSO between RN2FA and UA2FF over 10km.

## ZL6QH RECEPTION

THE BOYS were back at the Quartz Hill club station again in late March. The signals were again received in the north-west USA by W1TAG in Massachusetts and by W4DEX in North Carolina. A first this time was a copy in California by KB6WFC, obviously closer, but it fills in a gap they left last time! No records were broken, but it is amazing that the station has been copied at huge distances every time it has conducted a 136kHz test.

## SUMMER TIME AND THE STATIC IS LOUD...

IT'S A CASE of dodging the static at this time of year, but there will be stations about, from holiday locations or testing new aerials, so it's worth keeping a listening watch. I suggest that, in periods of light activity, calling CQ near 136.5kHz would be a good idea. This will allow people to leave a receiver running in the CW part of the band and be reasonably sure of hearing your call.

This is a good time of year to sort out those aerials ready for the autumn, prune the trees and bushes that come too near the wire, improve the insulation, raise the height.

## MORE ON RECEIVING LOOPS

RECENTLY Jim, M0BMU, was doing some experiments in an attempt to null-out some of his local noise. High-Q multi-turn loops are effective but hard to keep weatherproof and on-tune in wet and windy weather. This system tackles both problems: it is not as sharp as a multi-turn loop and it is tuned from the shack so there are no vulnerable components to seal against the elements. The aerial consists of a single turn of insulated wire, which could just be thrown over a tree, having an enclosed area of about 20m$^2$. The ends are connected straight to a coax cable running back to the shack where a high-Q coil and C bring it to resonance. A low noise preamp with good signal-handling then raises the level to approximately that of the main aerial. The bandwidth of this loop is broad enough to cover the 136kHz band and, with a change of inductor, is useful down to 12kHz. The circuit is shown in **Fig 1**.

## LF 'ROUND TABLE' MEETING

THE CRAWLEY CLUB has kindly offered to host this year's informal LF meeting on 21 July. Full details should be on its website **www.carc.org.uk** ♦

**ROGER BALISTER, G3KMA**
*La Quinta, Mimbridge, Chobham, Surrey, GU24 8AR.*
*E-mail: g3kma@dial.pipex.com*

THE BASIC IOTA 100 Islands Award requires a confirmed contact with Antarctica as well as the other six continents. From correspondence received it seems that some of you are having difficulty finding an Antarctic station. They come under various prefixes but at the time of writing the most active ones are HF0POL on the South Shetlands and R1A** stations on the Antarctic mainland, followed by the occasional VP8, CE9, LU*Z, EM1 etc. It's best to keep an up-to-date prefix list by you when tuning the bands so as not to miss them. A good time to listen is when the bands are open to South America, but there is no set rule and at this time of the sunspot cycle Antarctic stations can come through on HF at almost any time.

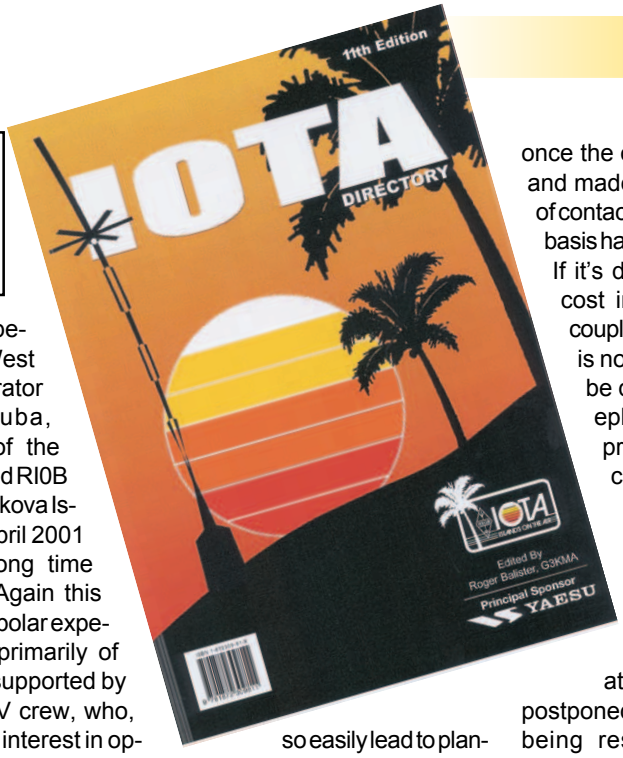
## ACTIVITY ON THE BANDS

THE VP6DI CREW, who aired Ducie Island OC-182 for a new DXCC in the second half of March, delighted the IOTA gang by calling in at Henderson Island OC-056 on their way back to Pitcairn Island. In a 40 hour operation VP6AJ, VP6VT and VP6MW managed to give out contacts with this rare one to the many who needed it. The pile-ups seemed just as big! Somehow it reminded me how during the pandemonium accompanying the Ducie Island operation the DX Cluster showed a VP6DI spot with a plaintive "What's the IOTA number?"

After a quiet period during April, R3CA/0 put two new ones on the air in mid-May from the Russian Arctic, the first from Makar Island and the second from Nemkov Island, respectively in IOTA's Laptev Sea Coast East and East Siberian Sea Coast West groups. The operator was Yuri Zaruba, UA9OBA, one of the team who activated RI0B from remote Ushakova Island AS-156 in April 2001 and who is a long time friend of IOTA. Again this was essentially a polar expedition made up primarily of polar explorers, supported by a professional TV crew, who, knowing of Yuri's interest in operating radio from remote Arctic islands, invited him to join them. This is another example of amateur radio combining with other interests to mutual advantage. Pressures arising from cost and difficulties of securing landing permission and access are likely to require more multi-interest expeditions of this type if some of the remoter, environmentally-protected islands are ever to be activated.

*RSGB IOTA Programme, PO Box 9, Potters Bar, Herts EN6 3RH; e-mail: iota.hq@rsgb.org.uk*

**Yaesu, Principal Sponsor of the IOTA Programme**




## IOTA NUMBERS

WHY NOT NUMBER all the unnumbered groups in the *Directory* and avoid the business of having to issue the number over the air? A question often thought, if not often asked!

There is a simple answer: the programme would not run as smoothly and as effectively as at present. The current system encourages close contact between the activator and the IOTA Committee from the initial planning stage through to validation and acceptance of the operation. The actual issue of the number to the operator on a provisional basis ensures a degree of management control, necessary with a programme that is governed by a firm rule structure requiring compliance. Why it is necessary for the first operation and not subsequently is because this is the operation that generates the buzz of huge pile-ups, the one that anchors the IOTA number.

The siren call to put on a new IOTA is difficult to resist and can so easily lead to planning mistakes, particularly where amateurs unfamiliar with the IOTA rules are involved. More often than not these relate to the validity of the island or the securing of landing / operating permission.

Having the groups pre-numbered in the *Directory* carries a high risk that such mistakes would not surface until the operation had started, by which time it would be too late to correct. The Committee considers that any procedure that reduces the risk of operations not being accepted for IOTA must be preferred. Issuing the new number once the operation has started and made a minimum number of contacts and on a provisional basis has obvious advantages. If it's done over the air, the cost in terms of time is a couple of minutes. And there is no reason why it cannot be done via e-mail or telephone if the operators prefer it and have access.

Why not issue the number before the operation? It's an unfortunate fact that occasionally an operation is cancelled at the last moment or postponed without certainty of being rescheduled. Once a number is issued, even provisionally, it can be difficult to withdraw it, particularly if there is a chance of the operation taking place later. Experience many years ago showed that having 'reserved' numbers worried members in case they had missed an operation. Questions resulted and in such quantity that it was never possible for the IOTA Manager to complete a contact on the air without being asked to "QSY up"! With e-mail now it would be far worse.

Taking everything into consideration we believe that the present procedure is the best. ♦

**One method of getting heavy radio equipment on to a rock where it is difficult to land. This raft was used by the Indian team who activated Sacrifice Rock AS-161 (see May 'IOTA' column).**

### NEW REFERENCES

| | | |
|---|---|---|
| AS-162 | 3W | South China Sea Coast North group |
| AS-163/Pr | R0Q | Laptev Sea Coast East group |
| AS-164/Pr | R0Q | East Siberian Sea Coast West 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/

# MICROWAVE

**SIMON LEWIS, GM4PLM**
*Creoch Farm, Ochiltree, Ayrshire KA18 2QH.*
*E-mail: uwave.radcom@rsgb.org.uk*

THE BRITISH are renowned for their interest in the weather, and I certainly have that interest as I write this! May and June in Scotland are usually warm and sunny with periods of dry fine weather, but the rain and gales are lashing Creoch Farm at the moment and the day is as dark as any in December, and with the temperature only 8°C, it certainly feels like winter and not 'portable' weather that's for sure! Anyway, we can only hope the weather improves, or there will be no shortage of rainscatter contacts to be made this summer!

## RUSSIAN 24GHz EME

BARRY Malonwanchuk, VE4MA, recently sent me an e-mail with news that Russia has now joined the ranks of 24GHz EME. He writes: "On 18 and 20 April Sergei, RW3BP, had his first QSOs on 24GHz with Al, W5LUA (M/M), and Barry, VE4MA (O/M). On Sunday 21 April, Sergei worked Lars, AA6IW, for initial #3, and a first 24GHz EME QSO for Lars. What is more remarkable is that the moon was only at about 7.5° elevation for Sergei at the end of this QSO. The atmosphere normally absorbs RF at low angles on 24GHz and adds noise due to the temperature of the atmosphere. This is certainly a new 24GHz distance record (KO85WS to CN87VI). Lars observed a very much narrower speading of RW3BP than VE4MA."

Sergei writes: "My station comprises a 2.4m offset dish with rectangular horn as a feed. I can set speed of azimuth and elevation motion to provide auto-tracking with better than 0.1° accuracy in a 30-minute period. The 50W TWT is placed at the feed-point on a water-cooled aluminium plate. The PSU (5.6kV to 13kV) is homemade and placed inside the house. The receiver is a DB6NT LNA with 1.65dB noise figure. The converter and local oscillator are by RA3ACE. I use separate feeds for transmit and receive. T/R change-over is provided by moving the TWT - LNA block up and down 40mm. It takes 0.25s to move it down to the receive position, so it is possible to receive my own echo very well. In the transmit position, the receive feed is shielded by lossy rubber. It is also a good reference for noise measurements." Congratulations, Sergei; it seems that there may be more surplus gear in Russia than over here!

**The EME antenna used by Sergei, RW3BP, and described in the text.**

## USEFUL MICROWAVE URLs

STEVE DAVIES, G4KNZ, collates an excellent selection of microwave URLs and e-mail addresses for many of the world's active microwave operators. The list is regularly updated and fairly comprehensive. If you want to find microwave information on the web, this would be a good place to start. Additionally, if you're interested in adding your details to the site, please drop Steve an e-mail and he will gladly add you to the list. Steve's page can be found at the excellent site of Peter Day, G3PHO (see WWW.).

## ATV

MICROWAVES OFFER much more than just narrow-band modes such as SSB and CW. Many people are very active on other modes too, and it's worthwhile reminding ourselves occasionally that there is a very busy band of amateurs pursuing its own activities around the microwave spectrum as well. One busy mode on the 10GHz band is amateur television, and I was recently sent the latest copy of the British Amateur Television Club (BATC) magazine, *CQ-TV*. A quick read through this fascinating magazine will highlight just how active microwave ATV really is, with the 23, 13 and 3cm bands all in wide use. Many of the advertisements are showing that the widespread use of wireless TV links and satellite TV for the home market are allowing the use of these mass-marketed items for amateur use, and at a much lower cost. All the better for the hobby! One fine example of microwave ATV can be seen in the station of Bernd, DJ9PE. Bernd has built up a fine ATV station on the 10 and 24GHz bands using the DB6NT modules. Bernd says that his best DX on the 24GHz band is 172km from his 1800m ASL mountain-top site. Both dishes are 48cm diameter and he runs 2.5W on 10GHz and 0.6W on 24GHz. For more information on ATV please see the 'ATV' column on p85, and visit the BATC website.

## WEATHER AGAIN

BARELY HAD I mentioned the weather when I came across an updated web page from the UK Government's Meteorological Office. The Met Office provides weather information for many UK organisations and is an excellent source of up-to-date weather information. It has recently updated its rainfall radar page, and this now shows an hourly update image and a nice animated display of the last six hours. The display covers some of the North Sea and the English Channel, so will be useful for predicting potential rainscatter openings. The map is also in colour and gives seven different scales of precipitation intensity, from 'very slight' to 'downpour'. I found the site very useful and it was quite easy to predict accurately where larger showers could be found or were about to visit! This is a very useful site and one worth a visit. ♦

WWW.

**UK Met Office**
www.meto.gov.uk/weather/europe/uk/radar/index.html#top

**BATC**
www.batc.org.uk

**Microwave Internet resources**
www.g3pho.free-online.co.uk/microwaves/emails.htm

**G3PHO**
www.g3pho.free-online.co.uk/microwaves/emails.htm

**JOHN HEATH, G7HIA**
*Chestnuts, Desford Lane, Kirkby Mallory, Leicester LE9 7QF.*
*E-mail: g7hia@amsat.org*

# SPACE

AMSAT North America's Board of Directors confirmed that one of the next AMSAT projects will be an FM satellite with similar orbit and operating characteristics to the popular AO-27. The two current FM LEOs (Low Earth Orbiters), UO-14 and AO-27, are sometimes referred to as 'Easy Sats', as they can be worked QRP from a handheld. They can be a lot of fun and consequently, they get very busy, especially at weekends. The new satellite will be multi-channel and so capable of supporting more QSOs per pass. AMSAT-NA estimates a two-year time scale from design through to build and launch.

## KEPLERIAN ELEMENTS

AN EXCELLENT SOURCE of these is Dr T S Kelso's website Celestrak.com Select 'Current Data' from the home page, then click on the box for 'amateur radio'. You can also download element sets for weather satellites, scientific and engineering satellites, and much more. To make a copy of the NASA 2 line elements, use 'File' and 'Save'. The file created, amateur.txt, is a plain text file which can be read directly by most tracking software.

Opinions vary on how often should you update your elements. For the Shuttle and the ISS, do it often; both of these manned platforms are being controlled, and have their orbits modified for operational reasons. For most of the amateur radio satellites, once a month is fine. If you visit the site don't just grab the element sets and run. The Satellite Tracking Index lists a whole host of tracking software for a variety of computer platforms. The telemetry archive can provide some interesting research material when correlated with solar activity data. The Keplerian elements for the satellites are calculated mainly from radar observations. The government agency responsible for this activity is NORAD (North American Air Defense Command) On the Celestrak site, you can find comprehensive information about the orbital models used by NORAD to calculate the element sets.

## RS-12/13 ON HF

ATTENTION HF operators. RS-12/13, at the time of writing, is in Mode KT, USB/CW. With a 15m band uplink, HF propagation effects enable some impressive DX to be worked. Low power to HF beams should produce excellent results with the satellite at low elevations.

**RS-12/13 ON HF**

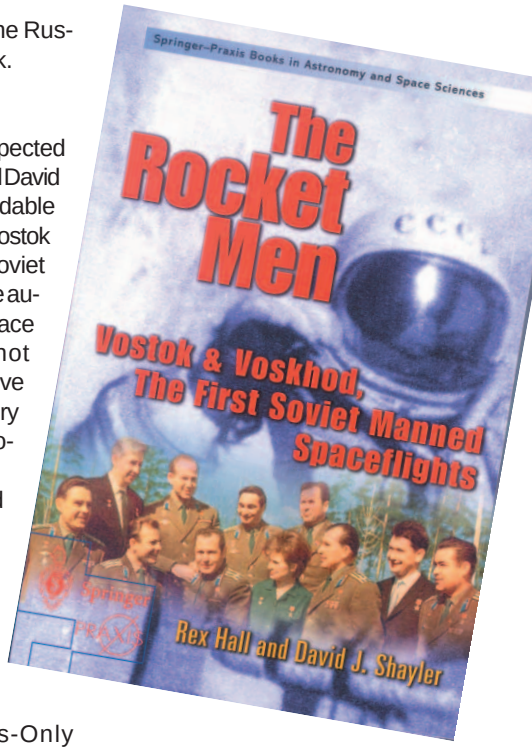
**Mode K**
RS12 uplink: 21.210 to 21.250MHz
Downlink: 29.410 to 29.450MHz
Beacon: CW 29.408 or 29.454MHz
RS13 uplink: 21.260 to 21.300MHz
Downlink: 29.460 to 29.500MHz
Beacon: CW 29.504 or 29.504MHz
**Mode T**
RS12 uplink: 21.210 to 21.250MHz
Downlink: 145.910 to 145.950MHz
Beacon CW: 145.912 or 145.959MHz
RS13 uplink: 21.260 to 21.300MHz
Downlink: 146.960 to 146.00MHz
Beacon: CW 145.862 or 145.908MHz

NB: the above frequencies are taken from material published some while ago. Frequencies will drift a little over time and, of course, Doppler shift must be taken into account.

There is no published sked, so it's a matter of checking the beacon frequencies to determine the current operating mode K or T and the whether the transponder is RS-12 or RS-13. If the dual designation sounds strange, the explanation is that there are two transponders (12 and 13) on one spacecraft. The combination, RS-12/13 forms a secondary payload on COSMOS 2123, a maritime navigation satellite launched in 1991 from the Russian complex at Plesetsk.

## ROCKET MEN

THIS BOOK, by two respected space writers, Rex Hall and David J Shayler, is a highly-readable reference work covering Vostok & Voskhod, the first soviet manned spaceflights. The authors have access to space archive materials not previously available, and give biographical details of every cosmonaut in the two programmes.




With 319 pages, and including many illustrations, this is a very thorough and information-packed book. Published by Springer-Praxis, ISBN 1-85233-391-X, it is available through the RSGB Members-Only website.

## BBC COMPUTERS

IF YOU HAVE a BBC computer and need software take a look at the Acorn website. Thanks to AMSAT-UK member Clive Wallis, G3CWV for this. Clive writes for the AMSAT-UK journal *Oscar News* as well as being something of an authority on the capture and analysis of telemetry from Oscar-11. This satellite was designed and built at the University of Surrey, under project manager Martin (now Sir Martin) Sweeting, G3YJO, and launched in March 1984. Oscar-11's main beacon still transmits in AFSK on 145.825MHz FM. It also carries a 2401.5MHz beacon designed by Colin Smithers, G4CWH. This provides a useful spaceborne beacon for testing AO-40 antennas and downconverters. What is the BBC connection? Clive uses a BBC computer to decode the AFSK data stream.

## FREE SOFTWARE

GODFREY Manning, G4GLM, sent me a very neat little program that runs under Windows and displays the telemetry values for LUSAT from a text file. Godfrey has kindly offered to supply the program free of charge on receipt of a formatted 3.5in disk and a stamped addressed return envelope. Godfrey's address is correct in the current *RSGB Yearbook*. He also tells me that he has other electronics software available.

## ISS

AMATEUR RADIO on the ISS is an approved crew recreation activity and fully supported by NASA. There is a full programme of scheduled contacts with schools using non-disclosed uplink frequencies, but most of us will be looking for the opportunity when an astronaut makes some random QSOs. The ISS crew work to a very detailed daily timetable, known as the 'mission timeline', and you can see this published on the web. You can use this to look for possible 'free time' when the crew might be available. This is an excellent site for a host of other information about the ISS. ♦

**WWW.**

| | |
|---|---|
| AMSAT-UK | www.uk.amsat.org |
| Celestrak | http://celestrak.com/ |
| BBC Computer etc | http://bbc.nvg.org |
| Mission timeline | http://spaceflight.nasa.gov/stations/timelines/2001/July/index.html |

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www.engineered-composites.co.uk

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**THE RF KIT CATALOGUE.** Send 2 x 2nd class stamps or browse www.rf-kits.demon.co.uk. Hands Electronics, Tegryn, Llanfyrnach, Dyfed SA35 0BL
Tel: 01239 698427.

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**SHACKLOG 5.5** - Probably the most popular UK written and UK supported logging software. £32.00. With IOTA add-ons £42.50. SASE + disk for demo copy. Alan Jubb, G3PMR, 30 West St., Gt Gransden, Sandy SG19 3AU. 01767 677913. www.shacklog.co.uk

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## MISCELLANEOUS

**CALL IN ON THE 'GOOD NEWS' CHRISTIAN NETS!** Every Sunday at 8am on 3747kHz and around 7047kHz and 144.205 at 3pm sharing Christian fellowship over the air. Info from WACRAL, 51 Alma Road, Brixham, South Devon TQ5 8QR
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## BUSINESS CARD SECTION

# Advertisement Index



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**Display advertisement copy date for AUGUST 2002 is 28thJUNE 2002**

# the last WORD

## Thanks, Finningley

I would like to thank Finningley Amateur Radio Society for their kind help in helping a disabled guy obtain his Foundation Licence [see 'Club News', page 75 *RadCom* June 2002 - *Ed*]. Being practically housebound, it was very kind of them to take the time to come to my home over two days, give me tuition, and obtain the licence. Gratitude is the order of the day to these four wonderful gentlemen who gave up their time to help someone like me. A special mention should be given to Harold, G0GUE; Peter, G3GWT; Eric, G3KPU; and Howard, G3SFO, to show appreciation that amateur radio and human kindness is still alive and kicking.

**Stuart Elvin, M3SRE**

## Internet and Amateur Radio

Your correspondent ('The Last Word' May 2002) is right to point out that the future of radio lies in RF and not in the Internet. Of course it does, but there is no need to fear what has already proved to be an invaluable tool to the hobby, a means of 'spreading the word' much more effectively than ever before and a means to educate and inform.

The use of the World Wide Web with its thousands of sites of interest to amateurs has allowed many people to become interested in radio either for the first time or it has rekindled an old interest and nudged them to come back to the hobby. I say this confidently from my experience in running my own site over the last six years and from the feedback I have received from countless readers.

Another example of something positive: Internet linking of computers, still amateur speaking to amateur, but where some of the linking repeaters is carried by Internet, allows the simplest of handhelds to speak to a VK or US station abroad. It has opened a whole new horizon to those with non-code licences without in any way destroying the essence of communication by radio, which is what it's all about.

Finally, the GB2RS news bulletins, read in Real Audio and published weekly on the Internet for the last few years, means our message gets much more widely heard than before. It is relayed in Australia, New Zealand, South Africa, Holland, and excerpts of the news have even appeared on HCJB, the Ecuadorian broadcasting station. These international exchanges have very much strengthened the hobby and bring home the universal nature of a hobby we can all be proud of.

Yes, people can hop between RF and Internet chat systems if they want to. That is their choice. We know what the essence of radio is: it's RF of course. But the important thing is that the Internet, properly used, greatly *enhances* amateur radio and helps to raise interest in it. It is a means to an end, not an end in itself. It is not something to be afraid of.

**Jeremy Boot, G4NJH**

## A G3 M3

I wish to thank the RSGB and the RA for providing the framework which is now allowing radio enthusiasts into the fascinating hobby of amateur radio without in the first instance having to undertake what is to some a very difficult examination together with learning the Morse code.

Together with my son Michael, partner Maree, and parents-in-law Ray and Wendy, I spent the weekend of 27 / 28 April in the company of seven members of the Wisbech Amateur Radio Club, all of whom gave up their entire weekend to teach us the Foundation Course.

When it came to it, I took the examination too, even though I have held a Full licence for 40 years. I still felt the tension and the feeling - the same as all my family - that I really must pass.

The instruction by the club members was excellent. We were made to feel at ease from the start, all the areas of the syllabus were covered with good planning by the instructors and with exacting detail. The instructors used their own individual strengths when explaining the course; this was completed in a very clear and concise manner. We were asked many times over the two days, did we understand what was being explained? If not, the particular areas were again covered until we had a clear understanding. During the two days we took two mock exam papers. I feel this is a very good idea as it really did teach us to read and understand the questions.

On the Sunday as the test time fast approached I could feel the tension, the exam papers were collected from a locked safe where they had been stored, the sealed envelope opened and the exam commenced. This was a real test under strict examination rules. We were told when to start - exactly 3.00pm - and when to stop - 3.30pm - we were told how far apart to sit, no talking, nothing on our desk apart from our pen and the exam paper.

Please take it from me, if there is any doubt that passing the Foundation Course and obtaining an M3 prefix is easy and given away, it is not. This is a serious examination of the candidate's knowledge; there are 20 multiple-choice questions covering all aspects of the two-day course.

The instructors from the Wisbech club are Ted, M0BRM; Steve, M0CKI; Alan, M0DUQ; Andy, M0CHK; Jim, M0CKE; Pete, M0CNX; together with Ian, M1CZM, who very kindly allowed us to use the Wisbech Council Offices where the training was held. Our sincere thanks go to the instructors who in our opinion conducted the course at professional level.

**David L Cole, G3RCQ** (licensed since 18 July 1962)
PS We all passed!

## Poynting to the Truth?

The *RadCom* review of the Crossed Field Antenna (May 2002) prompts me to suggest a simple experiment which could prove once and for all whether the CFA is remarkable or not. For this experiment, instead of feeding one transmitter (say on 7000kHz) via the internal phase shift network to both the electric and magnetic elements of the antenna, we connect two transmitters, one on 7000kHz driving the electric field and the other on 7001kHz driving the magnetic field. A few moments thought will show that the phase of the magnetic field is advancing relative to that of the electric field at a rate of 1000 cycles per second. In particular we can note that the phase shift passes through the optimum value 1000 times every second. We have made a CFA cycling at 1kHz.

We now receive the signal some distance away on a spectrum analyser. If we see only two carriers, one on 7000 and one on 7001, we can deduce that the CFA is nothing more than two co-located small antennas and is not therefore very remarkable. If the two fields interact, which I understand is the claim for this antenna, we will see something different. Mathematical analysis can show that such interaction will always result in sum and difference frequencies, just like those generated by intermodulation distortion. Of course we must ensure that there is no intermodulation distortion in the rest of the experiment.

**Peter Martinez, G3PLX**

## High Praise

Through the pages of *RadCom* I would like to express my thanks to three of your major advertisers: Waters & Stanton for outstanding speed in delivering items from their catalogue, and excellent customer services. Martin Lynch & Sons for excellent quality new and used equipment and excellent service. Nevada for excellent customer sales and after-sales service - extremely helpful.

Very helpful staff at all three companies. Thank you!

**Ken Wells, G4CNE**

## Plagued with Noise

I am a member of a net which makes contact every Sunday morning on 3728kHz. We always used to enjoy good communications, despite the fact that our stations were well apart, myself in Ipswich, one in Wimborne, one at Camberley, another at Rickmansworth and one in Birmingham. For at least a year now we have been plagued with a large amount of noise. It can be as loud as S8 sometimes, and effectively drowns our signals.

I at first assumed it was local interference but later realised that all members of the net were experiencing it. We are of the opinion that it is man-made, especially as we have experienced several occasions when it has suddenly ceased, as if a human had switched it off. We are surprised that other amateurs have not complained about this noise which we now wonder whether may be caused by experimental work on data transmission via power lines. I am reasonably certain the noise is present on all of the lower frequency bands, but becomes less obvious the higher one goes in the spectrum.

We would like to hear whether other users of 80m experience the same phenomenon and whether it is predominant over the whole of the UK.

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88
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• 432MHz 144MHz 50MHz • 2dB (6m) 4.5dB (2m)
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• Tx 144 & 430MHz • 0dBi & 2.5dBi • VSWR < 1.5:1
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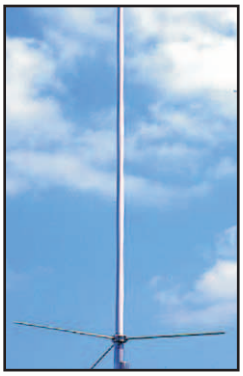

**W-30**
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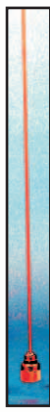
• 1.15m • 0.885kg **£39.95 C**

**W-50**
• 2/70MHz • 4.5/7.2dB • 200W • 3x1/4, 3x5/8
• 1.8m • 1.2kg **£49.95 C**

**W-300**
• 2/70MHz • 6.5/9dB • 200W • 2x5/8, 5x5/8
• 3.1m • 1.46kg **£59.95 C**

**W-2000**
• 6/2/70MHz • 2.15/6.2/8.4dB • 150 (50W 6m)W
• 1/2, 2x5/8, 4x5/8 • 2.5m • 1.2kg **£69.95 C**

**W-2LE 2m 1/4 wave**



• Tx 144MHz • 2.15dBi • 200W max) • Spring foldover
• Length 0.48m • Base PL-259 **£9.99 A**

**W-7900 2m/70cm**

• Tx 144 & 430MHz • 5 & 7.6dB • 150W max
• Spring foldover • Length 1.58m • Base PL-259 **£32.95 B**

**WSM-138 Mini-Mag**

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• Output: Ceramic terminal
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• Fully weatherproof housing
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• Weight: 1.7kg

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• VSWR: <1.4:1 (typical)
• 170 non-volatile memory addresses
• Antenna: Min length 2.4m 3.5-30MHz, min length 7m 1.8-60MHz
• Input impedance range 45 - 55 Ohms
• Output: Ceramic terminal
• DC supply 13.8V DC 1.4A
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• Fully waterproof housing
• Size: 406 x 305 x 76mm
• Weight: 3.5kg

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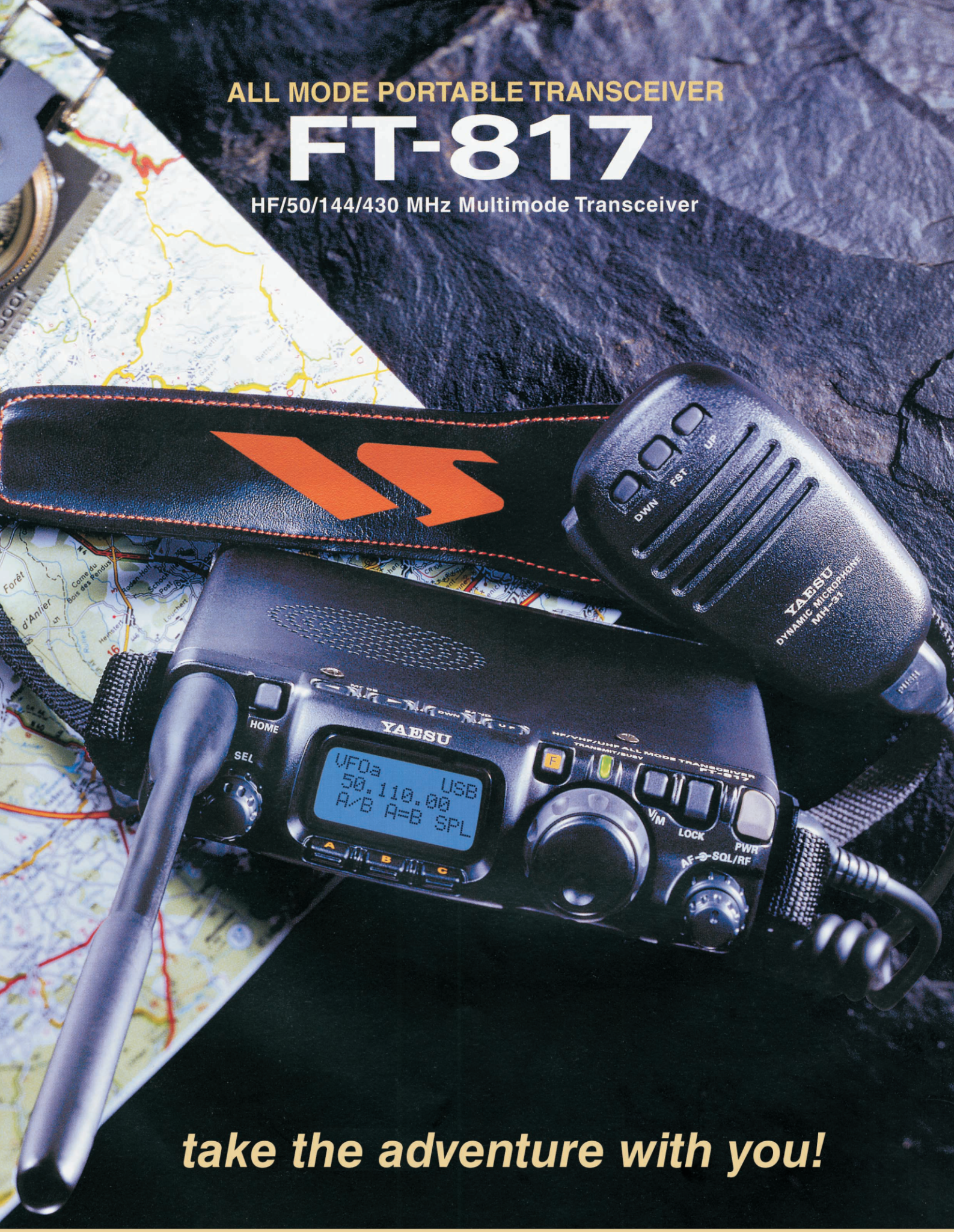


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