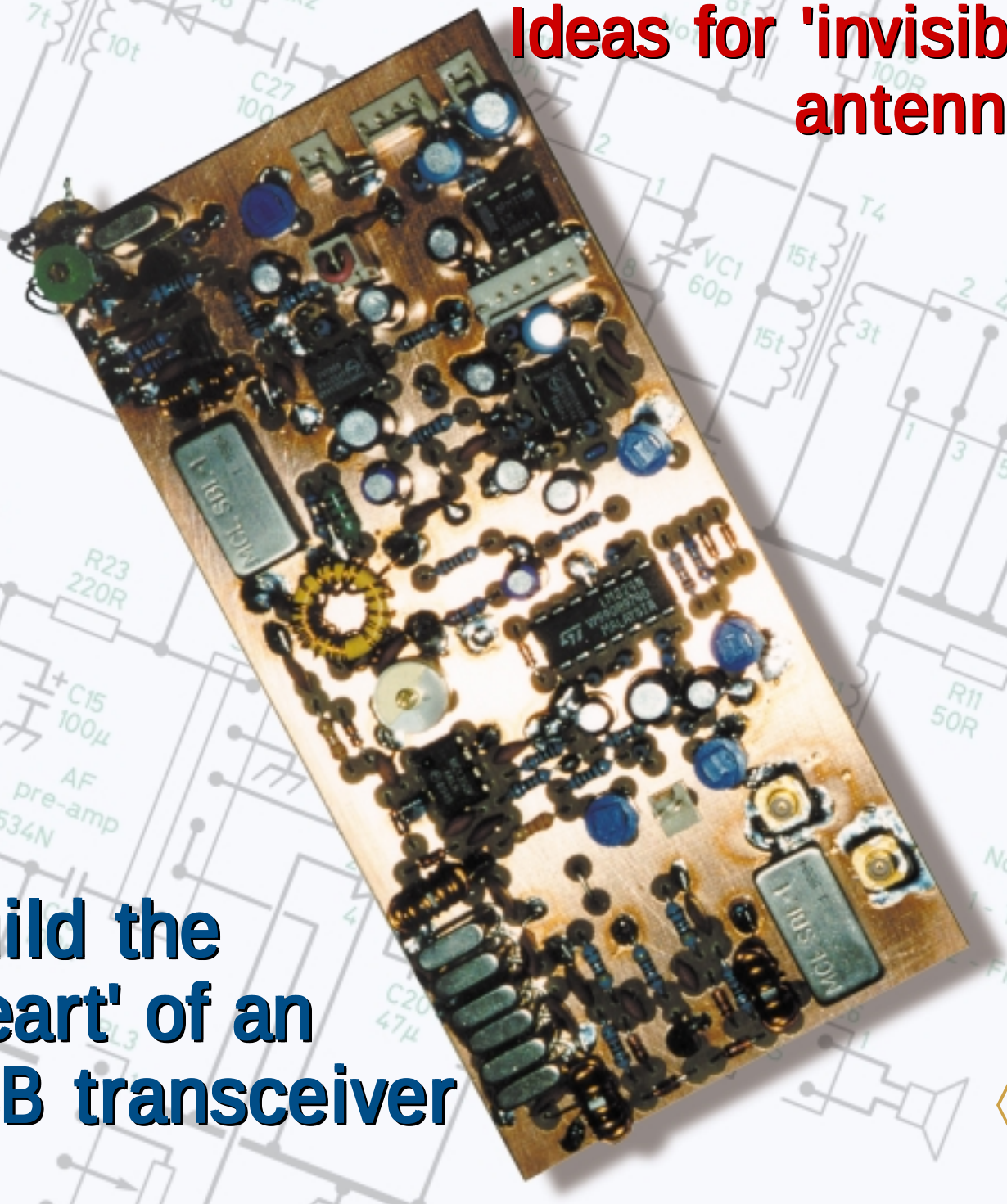
www.rsgb.org
0 4 0 0
Journal of The Radio Society of Great Britain
£3.95

# RadCom

Volume 76 No 4 ♦ **April 2000**
The Voice of Amateur Radio

## Undercover operation.
### Ideas for 'invisible' antennas



## Build the 'heart' of an SSB transceiver

## Annual Band Plan Listings

# FIRST IN Amateur Radio

# Waters & Stanton PLC

22,Main Road, Hockley, Essex, SS5 4QS
Fax:01702 205843
Enquires:01702 206835
01702 204965

**For the very best Bargains & Secondhand Listings,**
**Visit: Our large Web Site www.waters-and-stanton.co.uk**

All OFFERS subject to availability

***Orders only***
***Freephone 0500 73 73 88***

Secure e-mail order: Via our web site
General e-mail: Info@wsplc.demon.co.uk.

Retail Mon-Sat
9.00 - 5.30pm

## ICOM IC-756PRO 1.8 - 52MHz 100W

**Phone** 2 Year FREE Warranty

***Real-Time Spectrum Scope + Auto ATU***

19.4% APR Available

***New DX Rig***
***5" Colour Screen***
***32 Bit DSP***
***51 Bandwidths***
***RF Processing***
***Voice Memory***
***CW Memory***

The new IC-756PRO has arrived at Icom's top UK dealer. And of course you get best value from Waters & Stanton, whether it be part exchange, pre-sale or after-sale advice and technical assistance. This feature packed radio sets a new standard in HF operation and convenience and for the first time you can send and receive RTTY on the LCD screen. A new mode with no external boxes. Make no mistake, this is a very advanced transceiver, one that needs top dealer support that only comes from W & S. So give us a call and we'll send you the latest information.

## KENWOOD TS-570DG

160 - 10m All Mode

**£799**

Probably the most underestimated transceiver on the market. Don't be fooled by the low price, the TS-570 has one of the best receivers around. One of the best buys if you want top HF performance on a budget.

19.4% APR Available

## ICOM IC-746 Plus IC-2100H

160m - 2m All-mode
£1099 without IC-2100H

2m 50W mobile
with IC-746
subject to availability

**£1299**

Your chance to purchase one of the most popular "all-band, all-mode" transcevers at a very competitive price and also get FREE, the lovely IC-2100H mobile transceiver which has switched 12.5 & 25kHz filters. The IC-746 offers 100 Watts output on all bands and has a receiver performance to match.

## YAESU FT-1000MP DC

160 - 10m All Mode

SAVE

**£1699**

19.4% APR Available

***If you are looking for the rig with every feature including dual receive - then look no further!***

It has stood the test of time and used by the worlds top DXers and DXepeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts. AC and DC versions in stock. **AC version £1795.00**

## YAESU FT-100

160 - 70cm All Mode

Crazy Price

**£799**

SAVE £450!

This rig is the smallest all-bander available. 100 Watts on HF plus 50W on 2m and 20W on 70cms makes this rig ideal for base or mobile operation. We have used it extensively and it is absolutely great. Read Radcom's in-depth review or ask for leaflet and then come to us for the best deal around.

## SAVE FT- 920AF

HF 160m-6m-100w

**£1099**

19.4% APR Available

Still one of the best buys today. Includes full DSP and internal ATU. High tech receiver with dual tuning controls. Uses many of the FT1000 MP features but at a more attractive price. Full break-in on CW and includes a data port for TNC.

## ICOM IC-706IIG

160 - 70cm All Mode

*or pay 10% Deposit*
*and balance in 6 months Interest FREE*

£879 without IC-T8E

Plus IC-T8E
3-Bander Handy
with IC-706IIG subject to availability

**£999**

Next Day Delivery £7.00

The IC-706II G is the latest model of this classic transceiver. Great for mobile, portable or base use. Its got a great pedigree and offers 100 Watts on all bands up to 50MHz with 50 Watts on 2m and 20 Watts on 70cm. CTCSS encode and a lovely display with removable front panel.

**TUNE CONTROL** Plugs into the back of your IC-706. Now when you press "tune" you get 10W of RF for tuning up via manual ATU etc. A lovely idea that costs you only **£29.95** post £2.00

## YAESU FT-847

SAVE

160m - 70cm All Mode
*or pay 10% Deposit*
*and balance in 6 months Interest FREE*

£1399 with switch mode power supply

**£1249**

Next Day Delivery £7.00

PRICE MATCH

The FT-847 has firmly established itself as a true all-band, all-mode transceiver. Loved by the VHF & UHF operators, and superb for satellite operation, it also offers great HF performance. We have sold more than any other dealer, which says a lot about our reputation and our price. Phone for free leaflet today. And remember, our stock is genuine UK, not modified overseas models!!

# We Will Beat Competitor's Prices By up to £100

On genuine UK Stock

wsplc.com is coming

CHECK IT OUT!

## ADI AT-600 Dual Bander Airband Rx

£199

* 2m & 70cm Handheld
* 5W Output on 13.8V DC
* Full CTCSS & 12.5/25kHz Steps
* 110 Alphanumeric Memories
* 29 Programmable Functions
* DTMF Keypad & AM Airband
* Ni-cads & AC charger

## Kenwood TM-700DE

NEW

£459

2m / 70cm Data Mobile

SAVE

Just arriving, this new model has built-in TNC, port for GPS, Data connector for SSTV, RTTY etc., CTCSS/DCS, Switchable TX/RX deviation, Dual receive, Wide receive option, Detachable head unit, 50 Watts on 2m, 35 Watts on 70cm, 200 memories, Alpha tag memo capability and a lot more. And who has the best price? - look no further!

## Hoka Decoding Software

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and RX audio. Can be loaded on any number of PCS. This is a very advanced programme.

**£349.95**

## C-150 2m Handy

£99.95

* 2m Handheld
* 5W Output on 13.8V DC
* 1750Hz Tone Included
* 25 / 12.5kHz Steps
* 20 Memory Channels
* Wideband Receive
* Uses 6 x AA cells (not inc.)

## YAESU VX-5R

£269

* 6m / 2m / 70cm Handheld
* 5W Output on 13.8V DC
* CTCSS Encode / Decode
* 25 / 12.5kHz Steps
* Auto Repeater Shift
* AM Airband Receive
* Lithium Cells & Charger

## YAESU FT-50R

£199

* 2m / 70cm Handheld
* 5W Output on 13.8V DC
* CTCSS Encode / 1750Hz tone
* 25 / 12.5kHz Steps
* 30 Memory Channels
* AM Airband Receive
* Ni-cad Cells & Charger

## SAVE C-408 70cms Handy

Previously £89.95

£69.95

CTCSS
Repeater Shift
Digital Display
12.5 / 25kHz Step
20 Memories
230Mw Output
Uses 2 x AA

NEW

Offer Extended

## CD-100 MULTICOUNTER

Reads Frequency & Codes

£379.95

Range: 10MHz -1GHz
Memory: 100 Channels
Decode: CTCSS, DCS, DTMF, LTR.
Power: Internal ni-cad battery
Charger included

## KENWOOD TH-D7E

£259

* 2m & 70cm Handheld
* 6W Output on 13.8V DC
* CTCSS & 1750Hz Tone
* Built-in Packet Modem
* 200 Alphanumeric Memories
* DTMF Keypad & AM Airband
* Ni-cads & AC charger

## FT-90R Can you believe the size?

2m/70cm Dual Band

SAVE

£309

The tiny dimensions of the FT-90R from Yaesu, are hard to believe. Yet it produces 50W on 2m and 35W on 70cm. Auto repeater shift on UK channels and switched 12.5 / 25kHz deviation, make this a number one choice.

## ADI AR-147

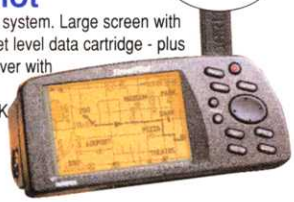
AM Airband Receive

£199

* 2m 50 Watt Mobile Airband Receive
* Full CTCSS Encode / Decode
* 81 Memories 25 / 12.5kHz Steps
* Keypad microphone & Mounting Kit

## GARMIN In-Car GPS Street Pilot

£419



The complete car navigational system. Large screen with UK mapping and optional street level data cartridge - plus lots more! Designed for the driver with easy routing and special data screen for car use. Optional UK CD **£69.95,** memory storage card 8Mb **£64.95.**

## GARMIN In-Car GPS-III Plus

£349

Detailed maps of UK and Europe plus street data upload feature via PC. Great value. Sits easily on the dash board and gives extremely comprehensive data including GB national Grid. Powered by AA cells or external 13.8V.

## ICOM IC-2800H

In Full Colour!

£329

* 2m & 70cm Mobile
* Colour TV Screen
* Full CTCSS and 1750Hz Tone
* 50W 2m 35W 70cm

Includes FREE Remote head cable.

## ICOM IC-207H

£279

* 2m / 70cm
* 50W / 35W
* 180 Memories and 7 Tuning Steps
* Detachable Head Unit / Clear Display
* Microphone, Mounting Bracket etc.

## KENWOOD TM-G707E

£279

* 2m and 70cm
* 50W and 35W
* Full CTCSS
* 180 Alphanumeric Memories
* Detachable Head with Amber Display

## YAESU FT-8100R

Phone

* 2m and 70cm
* 50W and 35W
* Wideband RX AM & FM 208 Memories
* 7 Tuning Steps DTMF Remote Front panel
* Very compact, supplied with all hardware.

## KENWOOD TM-V7E

£339

* 2m / 70cm Mobile
* 50W 2m, 35W 70cm
* Clear LCD Readout
* CTCSS & DTMF
* 8 Frequency Steps & 280 Memories
* Includes Microphone & Mounting Bracket

# Waters & Stanton

**FREE MFJ Catalogue - Just Phone!**
***Beware of grey imports. All MFJ products should have serial numbers and UK Warranty cards issued by us.***

## MFJ
FREE CATALOGUE

Every Model Stocked

### MFJ-969 300W ATU
£139.95

160 - 6m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning

### MFJ-949E 300W ATU
£115.95

160 - 10m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Built-in Dummy Load

### MFJ-948 300W ATU
£99.95

160 - 10m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Built-in Balun, 12v Illumination

### MFJ-901B 300W ATU
£59.95

160 - 10m Wire, Coax or Balanced

### MFJ-962D 1.5kW ATU
£198.95

160 - 10m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning, T-Network

### MFJ-986 3kW ATU
£243.95

160 - 10m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning, Differential Tuning.

### MFJ-989C 3kW ATU
£269.95

160 - 10m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning, T-Network

### MFJ-914 Auto ATU Extender

Extends the range of your internal auto atu. Having trouble with G5RV? Fit it between transceiver and antenna - MFJ-914 does the rest.

£59.95

### MFJ-260C Load
£32.95

"N" model £39.95

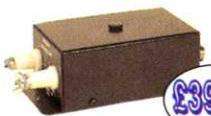
300W max 1.5 - 150MHz

### MFJ-264 Load
£64.95

"N" model £59.95

1.5 kW max 1.5 - 150MHz

### MFJ-912 Ladder Feed Balun



£39.95

Connect between ladder feeder and coax and enjoy very low loss and all-band operation (when used with manual atu).

### FB1 - 9 Skin Coloured Earpiece
£9.95

The FBI-9 is a brand new design that is skin coloured to make it far less obvious when worn. Its curly lead means it is much easier to wear neatly. And it is very tough indeed. The cable exits will take a strain of 12kg so it won't break in commercial applications. And finally, it is exactly the same unit as supplied to the FBI, hence its code!

### Diamond - SMA Antennas For Portables

From the tiny SRH - 805 upwards, there's an antenna to enhance the performance of your handheld radio.

| | | |
|---|---|---|
| **SRH-805** | SMA 2m/70cm dualband mini handheld antenna 4.5cm long | £19.95 |
| **SRH-815** | SMA 2m/70cm dualband handheld antenna 15cm long | £24.95 |
| **SRH-835** | SMA 2m/70cm dualband handheld antenna 35cm long | £29.95 |
| **SRH-999** | SMA 6m/2m/70cm/23cm 4 band handheld antenna 50cm long | £34.95 |

### MFJ-418 CW Tutor
£58.95

The easy way to learn CW. Sends real QSOs or random characters. Clear LCD display

### MFJ-1704 4-way Switch.
£49.95

Ideal for HF or VHF. This switch, fitted with SO-239 sockets, is ideal for antenna selection. Has earth centre position

### MFJ Compact 3ft Loop Antennas
£299

A magnetic loop could be the answer to your antenna problems. Just 3ft diameter, they will accept 100W with ease. Just connect a single coax cable between antenna and the control box.

| | | |
|---|---|---|
| **MFJ-1788** | 7 - 22MHz | £389.95 |
| **MFJ-1786** | 10 - 30MHz | £299.95 |

### MFJ-259B Antenna Analyzer
£199.95

This battery powered analyzer will check the resonance and impedance of your antenna system in seconds. Make adjustments and watch the changes. Saves hours of work.

### MFJ-1026 Noise Phaser
£129.95

Reduces local electrical noise by up to 3 S points

Simply insert between antenna and transceiver. Using a small "sniffer" antenna, just phase out the local noise to uncover the signals. Offered on our usual 10-day approval.

## LINEAR AMP UK Amplifiers


£895

**Ranger 811H**

* 1.8 - 30 MHz. 800 watts output
* Drive: - 10-100W * Built in Power Supply

**UK Discovery - Two Amplifier** £1395
*144 - 146MHz *400 - 1KW Output
*Drive:-10-25W *Built-in Power Supply

**UK Explorer 1200 Amplifier** £1595
*1.8-30MHz x 100W-1300W Output
*Drive:-10-120W *Built-in Power Supply

**GREAT VALUE**

**British made Amplifiers with a Pedigree**

## Cushcraft

**5 Band Compact Beam From Cushcraft**

### NEW MA5B Mini - Beam
£289.95

NEW


***This mini-beam works! 5.2m Long.***

***Peter Hart in RadCom November,*** *says - "The MA5B significantly outperformed my vertical on all bands" - - "MA5B was better than my main antenna on 10m" - - an excellent antenna" - - "one of the few five band beams offering modest gain" - - "should give years of trouble-free service" - - "excellent value for money." For copies of this review give us a call.*

**Full Cushcraft range stocked - Check our Web Catalogue**

## Carolina Windoms

### CW-80 Special
£84.95

Just 66ft long yet covers 80m - 10m. It will out perform a G5RV and give lower angle of radiation because of the 10ft vertical section which is forced to radiate. It will handle 1.5kW


**Other Models** (all with low angle radiator stub)

| | | |
|---|---|---|
| **CW-160** | 160 - 10m 171ft long | £109.95 |
| **CW-160S** | 160 - 10m 133ft long | £99.95 |
| **CW-80** | 80 - 10m 133ft long | £84.95 |
| **CW-40** | 40 - 10m 66ft long | £79.95 |
| **CW-20** | 20 - 10m 34ft long | £77.95 |

## Power Supplies

**SEC-1223**
**13.8V PSU**


£99.95

**23 Amps - 3.2lbs!**

**Back In Stock**

Lighter than an IC-706 and about the same size! The **SEC-1223** switch mode power supply delivers 23 Amps at 13.8V Thermo fan cooled, it measures just 57 x 177 x 190mm. Will power all 100W rigs and can be changed for 115V AC

WATSON

**UK's top selling power supplies.**


£89.95

Watson power supplies guarantee the very best performance and value for money. Tried and tested, they have been submitted for independent laboratory testing for safety and electrical performance.

| | | |
|---|---|---|
| **W-3A** | 3 Amp fixed supply. | £22.95 |
| **W-5A** | 5 Amp fixed supply | £29.95 |
| **W-10AM** | 10 Amp variable supply | £59.95 |
| **W-25AM** | 25 Amp variable supply | £89.95 |
| **W-30AM** | 30 Amp variable supply | £119.95 |

### Compact 10 Amp Switch Mode PSU
£49.95

The W-10SM is small enough to fit in a brief case. Measuring just 230 x 100 x 65mm, it's ideal for 50 Watt mobile's etc. Over voltage and current protection.

**Order Details on inside Front Cover**

# Number ONE in Amateur Radio

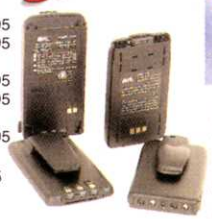
# Waters & Stanton

Order Details on inside Front Cover

## Replacement Batteries

SAVE

| | | List | Ours |
|---|---|---|---|
| **FT-50R** | | | |
| NBP-40Y | 6V 650mAh | £43.00 | £27.95 |
| RFNB-42 | 9.6V 1100mAh | £46.00 | £29.95 |
| **IC-T8E** | | | |
| NBP-200 | 9.6V 680mAh | £40.00 | £25.95 |
| NBP-199 | 6V 700mAh | £30.00 | £25.95 |
| **TH-D7E** | | | |
| NBP-39K | 9.6V 600mAh | £45.95 | £29.95 |
| **TH-22** | | | |
| RPB-32 | 6V 600 mAh | £31.95 | £21.95 |



## RF Metering

### Avair AV-600 1.8 - 525MHz 400W

£59.95

VSWR and power meter. Reads RMS and PEP. The ideal all-band VSWR meter. Reads up to 400W (3 ranges)

### WATSON VSWR / Power Meters.

£59.94

Measure VSWR and RMS or PEP power. Large easy to read meter. 3 ranges: 5W, 20W and 200W.

| | | |
|---|---|---|
| W-220 | 1.8 - 200MHz | £49.95 |
| W-420 | 118 - 530MHz | £49.95 |
| W-620 | 1.8 - 525MHz | £89.95 |

### WATSON 144/ 430MHz Dual Band Yagi.

£79.95

Amazing Performer

Superbly Built

.142-146,428-442MHz
.Single feed
.SO-239, 50 Ohms
.100W max power
.VSWR 1.1 -1.5:1
.Gain 10 dBi 2m
.Gain 13 dBi 70cm
.Boom length 114cm
.5 elements 2m
.9 elements 70cm
.Gamma match
.Weight 2.3kg

Extremely well engineered 2m/70cm dual band Yagi. Can be mounted either vertically or horizontally. Each band has separate gamma match but single coaxial feed.

### WATSON Watson Frequency Counters

£59.95

High quality units supplied with antennas, ni-cad packs and AC chargers. They are very sensitive and may be used for near-field checking.

**Hunter** - 10MHz - 3GHz £59.95

**FC-130** - 1MHz - 3GHz, switched gates, 16 segments. £79.95

**Super Hunter** - 10Hz to 3GHZ and with signal strength meter. £149.95

## Antenna Rotators

£49.95

### AR-300XL Lightweight

Ideal for VHF and UHF systems of small to medium size. Includes control box, motor and Brackets. Support mast sizes can be up to 50mm.

### YS-130 Medium Weight VHF

£79.95

Made in Japan, this rotator will support medium sized VHF arrays. The diecast motor housing will fit masts up to 40mm diameter. Includes motor, control box and brackets.

### New Create RC5-1 Rotator

NEW £299.95

We are pleased to be able to offer one of the most popular rotators from Japan. The RC5-1 will handle 3-4 element HF beams. It has a torque of 6kg (rotation) and 80kg braking. Uses 7-core cable.

### Yaesu Rotators for HF Systems

| | | |
|---|---|---|
| G-450C | Smaller Tri-band Yagis etc. | £379.00 |
| G-650C | Larger Tri-banders etc. | £499.00 |
| G-1000C | 4 element HF Yagis (cw with 25m cable) | £559.00 |
| G-2800SDX | Really large HF Yagis | £1229.00 |
| G-550 | Elevation Rotator | £309.00 |
| G-5500 | Az/El Rotator | £569.00 |

***We have extensive stocks of tower mounts, bearings and rotator cables. Phone if you need advice. Leaflets available.***

## Cushcraft HF Yagis - In Stock

*High quality DX Yagis. More Cushcraft Yagis are used in the UK than any other brand. Buy from W&S and be assured of long-term spares back-up.*

| | | |
|---|---|---|
| A3S | 10-15-20m 3 el. 4.27m boom 8.45m el. 2kW | £389.95 |
| A3WS | 12m, 17m 3 el. 4.27m boom 7.66m el. 2kW | £299.95 |
| A4S | 10-15-20m 4 el. 5.48m boom 9.75m el. 2kW | £469.95 |
| X7 | 10-15-20m 7 el. 5.49m boom 11.33m el. 2kW | £549.95 |
| X9 | 10-15-20m 9 el. 8.53m boom 11.12m el. 2kW | £799.95 |
| TEN-3 | 10m 3 el. 2.44m boom 5.49m el. 2kW | £139.95 |
| XM-510 | 10m 5 el. 5.8m boom 5.6m el. 2kW | £249.95 |
| XM-515 | 15m 5 el. 7.3m boom 7.3m el. 2kW | £325.95 |
| XM-520 | 20m 5 el. 9.75m boom 11m el. 2kW | £529.95 |
| XM240 | 40m 2 el. 6.7m boom 13.3m el. 2kW | £469.95 |

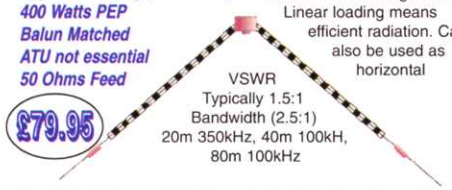
## 80/40/20m Dipole 50ft Long!

### G3OJV 80-Plus-2 Space Saver

*Approx 50ft long (Horizontal)*
*400 Watts PEP*
*Balun Matched*
*ATU not essential*
*50 Ohms Feed*

Ideal for the small garden. Linear loading means efficient radiation. Can also be used as horizontal

£79.95




No soldering, just assemble the elements, check the dimensions and fine tune as per instructions. Unlike the G5RV, it self-resonates with low VSWR on all three bands. A unique design that offers LF operation from your back garden.

## SGC SG-230 Smartuner 1.8 - 30MHz Wire ATU

£329


The SGC - 230 is a remote auto ATU that tunes any length of wire in the range 1.8 - 30MHz. Requires a 12V feed of 1 Amp. It is totally weatherproof. Just connect a coax cable back to the transceiver and the SGC-230 will tune instantly RF is applied. The ideal long wire system. Rated at 200Watts.

## Telescopic Masts

Much Stronger than Alloy Poles!

NEW

We are now able to supply a range of telescopic tiltover masts, galvanised to BS729. Heights available from 7.6m to 12m extended. Models for wall mounting or post mounting are included. The post mounted versions tilt-over and are supplied with a socket for mounting in concrete. *Phone or write for full information and drawings*

## VHF/UHF Antennas

| | | |
|---|---|---|
| **Base Station Fibre Glass** | | |
| WVA-100 | 2m/70cm 2/4.5dB 1.09m | £29.95 |
| W-30 | 2m/70cm 3/6dB 1.15m | £39.95 |
| W-50 | 2m/70cm 4.5/7.2dB 1.8m | £49.95 |
| W-300 | 2m/70m 6.5/9dB 3.1m | £59.95 |
| W-2000 | 6m/2m/70cm 2.5m | £69.95 |
| **Mobile Antennas PL-259 bases** | | |
| W-285 | 2m 5/8th foldover base | £14.95 |
| W-77LS | 2m/70cm 0.39m low profile | £14.95 |
| W-770HB | 2m/70cm 1.1m 3/5.5dB | £24.95 |
| W-7900 | 2m/70cm 5/7.6dB 1.5m | £32.95 |
| W-627 | 6m/2m/70cm 1.62m | £34.95 |
| **Mounts** | | |
| W-3HM | Hatch / Boot Mount | £14.95 |
| W-3CK | 5m low loss cable kit | £18.95 |
| W-ECH | 5m RG-58 standard cable | £12.95 |
| WMM-7 | Magnetic mount | £11.95 |
| WAM-2 | BNC window mount | £12.95 |

## IR- 270 MONO PHONES

~~£34.95~~ £19.95

**IR - 270**

**INFRARED HEADPHONES**

Connects to your Receiver without need for long Cable.

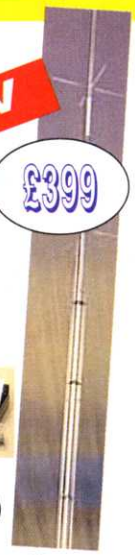
**Includes:** 2 x AA cells, AC Adaptor Connecting lead with 3.5mm Stereo plug and 1'4 Mono adaptor.

# Cushcraft

NEW

### R8 8-Band Antenna 40m to 6m 1500 Watts

£399



### A Great Vertical

The R8 is a robust vertical designed to take full US power limits. It has a very broad bandwidth, effectively working to the edges at 2:1 VSWR. Only two traps are used, so reducing the losses. At around 30ft tall, it is designed to give high performance, even on the lowest bands. A true DX-ers antenna in a very small space. Uses very short rigid base radials similar to R-6000.

## TEN-TEC 40/20m CW TRANSCEIVER KITS

£94.95

- 3W RF output
- VFO tuning any 50KHz
- Full break-in keying (QSK)
- 4-pole crystal IF Filter (3dB at 1KHz)
- Rx sidetone
- RIT adjustment
- Supply 12V at 800mA (Tx)
- 69 x 152 x 152mm
- Case and all hardware included
- Absolutely nothing else to buy
- 50 page step-by-step manual with circuits

Build yourself a new transceiver over the weekend. Everything you need, including case and all controls.

## SEC - 1223 13.8V PSU

23 AMPS - 3.2lbs!


Amazing Value

£99.95

Lighter than an IC - 706 and about the same size! **The SEC-1223** switch mode power supply delivers 23 Amps at 13.8V Thermo-fan cooled, it measures just 57 x 177 x 190mm. It will power all 100W rigs effortlessly and can be changed for 115V AC.

## Motorola Talkabout 200

### PMR-446 New Low Price

£78

**446MHz 500mW Handy**
**8 Channels**
**38 CTCSS Tones**
**3 Kilometres Range**
**3 x AA Cells Reqd.**


Now you can use a 446MHz handheld without a license. Ideal for a wide range of uses. The package provides everything you need for personal communications. Just add 3 x AA cells and you are on the air!

£149 pair

NEW

## Every Street in GB on CD!

***Search on Postcode or address***

Try out: www.travelmanager.co.uk

£47.95
Post £2.00


Every street in Great Britain on one CD. Search by Postcode or address. Zoom in to A-Z style road maps, or zoom out to larger areas. Route planner shows graphic route plus text route instructions. Measure distances, edit symbols. Really amazing database for your laptop.

**Order: Travelmanager**

# 'Masterclass'

## Ham Radio Products

KENWOOD

M&S

A WINNING TEAM

### Kenwood TH-D7E

Not a dual band handie, more a VHF/UHF Data Communicator. The TH-D7E is the only handie with a built-in 1200/9k6 packet TNC. Include a Dot Matrix display, 200 memories (with Alpha-tag), CTCSS encode/decode, computer port & GPS port and you can see why the TH-D7E has the competition licked.

### Kenwood VCH-1

For those of you that may have thought our friends at Kenwood have been 'resting' over the last few years, innovative products like the VCH-1 are testimony of their dedication to introduce unique designs into amateur radio.
The VCH-1 is a small handheld device that enables the user to send and receive slow scan pictures over HF or VHF/UHF when coupled to a suitable transceiver. Plug in the 'visual communicator' to the THD-7E for example, and send your contact a picture of your birdcage, kitchen table or even your latest hair do. Sounds funny but the uses for being able to instantly send pictures as easy as a THD-7E + VCH-1 set-up is endless. Just ask all the commercial users.

### Kenwood TS-870S

The TS-870S carries on where the TS-850S finished. Superb design offering Digital Signal Processing technology, the Flagship HF Base station from Kenwood was unique in design when it was first introduced and still is today. For SSB and CW operators the TS-870S offers features unmatched by its competition. Call the sales desk for a full specification sheet or see our web site.

### Kenwood TS-570DGE

Still using that tired TS-440S? Whilst the new TS-570DGE is the same size, that is where the similarity ends. The best display in the business, DSP operation that frankly embarrasses most of the competition and a tuner that tunes in fraction of seconds are just some of the TS-570 highlights. Then see how well the 50Hz bandwidth on CW works together with the CW auto tune. Wonderful. If you want the best performance H.F. only mid range available then look no further. Call the sales desk for a full specification sheet or see our web site.

M&S

**Web site, well worth a look:**
**www.MLandS.co.uk**

Dial 0208 566 1120 Today!


**MARTIN LYNCH & SONS**
**140-142 NORTHFIELD AVENUE, EALING, LONDON W13 9SB**
FAX: 0208 - 566 1207 ■ Web site: www.MLandS.co.uk ■ e-mail: sales@mlands.co.uk

Front Cover:
This month's Lead Feature, the Belthorn SSB IF module.

**RadCom**
*Radio Communication*

**Publications Manager**
Mike Dennison, G3XDV

**Editor**
Steve White, G3ZVW

**News Editor**
George Brown, M5ACN

**Technical Illustrator**
Bob Ryan, 2E1EKS

**Designer**
Suzanne Dunnett

**Secretarial**
Pauline Reid

All contributions and correspondence concerning the content of *RadCom* should be posted to:

**The Editor**
**Radio Communication**
**Lambda House, Cranborne Road**
**Potters Bar, Herts EN6 3JE**

**Tel: 01707 659015**
**Fax: 01707 645105**

**ADVERTISING**
All display and classified advertising enquiries (excepting Members' Ads) should be directed to:

**Janice Forde**
**Advertising Sales, RSGB**
**Lambda House, Cranborne Road**
**Potters Bar, Herts EN6 3JE**
Tel: 01707 851199 **(advertising ONLY)**
Fax: 01707 851206 **(advertising ONLY)**

**RadCom is published by the Radio Society of Great Britain as its official journal on the first day of the relevant month and is sent free and post paid to all members of the Society.**

Closing date for contributions, unless otherwise notified, is five weeks prior to publication date.
All material in RadCom is subject to editing for length, clarity, style, punctuation, grammar, legality and taste.
No responsibility can be assumed for the return of unsolicited material (if in doubt, call us first!)



Filmset by JJ Typographics Ltd, Southend, Essex.

Printed by Southernprint (Web Offset) Ltd, Poole, Dorset.

**RSGB membership at 30 April 1999: 27,025**
**ISSN No: 0033-7803**

**Band Plans**

*Simply being a good neighbour to your fellow amateur*

See pages 45-48 and 53-56 for details



# Contents

## News and Reports



## Technical Features



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



## Regulars

# 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.


**Headquarters and registered office:**
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
**Telephone** 01707 659015 - Members Hotline and book orders
**Fax** 01707 645105. **Web Site** http://www.rsgb.org
**E-mail addresses** subscriptions@rsgb.org.uk; sales@rsgb.org.uk; GB2RS@rsgb.org.uk; RadCom@rsgb.org.uk; AR.Dept@rsgb.org.uk; IOTA.HQ@rsgb.org.uk; GM.Dept@rsgb.org.uk




## Annual Subscription Rates

| | |
|---|---|
| ***Home Corporate*** | **£38.50** |
| ***Overseas Corporate*** | **£38.50** |
| ***Corporate (Senior Citizens)*** (Applications should provide proof of age at last renewal date) | **£29.50** |
| ***Corporate after 50 years membership*** | **50% DISCOUNT** |
| ***Corporate after 60 years membership*** | **FREE** |
| ***Family member*** (Must reside with existing member. Does not include *RadCom*) | **£14.50** |
| ***Student Members*** (Applications should include evidence of full-time student status) | **£24.50** |
| ***Affiliated Societies (UK or Overseas)*** (including *RadCom*) | **£22.50** |
| ***HamClub (under 18)*** | **£14.50** |

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

Telephone 01707 659015
Fax 01707 645105
Website www.rsgb.org

## The RadCom Leader

# Investing in the Future

ONE OF THE questions I am often asked is why doesn't the Society put more effort into the support of young people coming into amateur radio? The answer is really quite clear. We do support the development of young amateurs far more than people realise, but perhaps not as much as we would like.

We continue to support amateur radio in schools through STELAR (Science and Technology through Educational Links with Amateur Radio), but only in a small way.

We have for a number of years run the 'Young Amateur of the Year' competition in conjunction with the Radiocommuncations Agency. We would like to do much, much more, but we are restricted financially in making greater efforts.

We have a number of projects being developed, which are especially aimed at young people, not only to encourage them to become involved with amateur radio but also to take up a career in electrical engineering. The projects include bursaries for young amateurs doing engineering degrees, and a demonstration/classroom vehicle to tour schools, events and clubs up and down the country.

You can help the Society to achieve this aim. How? By leaving a financial legacy to the Society. 'Cheek of the man', I can hear you say, but is it really cheeky? Personally I think not. We do have a ring fenced 'Legacy Fund' which until recently we used to provide an annual bursary for one student at Kings College, London. This scheme had been in place for a number of years, but has now come to an end. The legacy fund is an ideal way to support specific projects and a perfect way for members to contribute in the future of amateur radio. The Society does get left all manner of things, from piles of old *RadComs* and QSL cards, to vintage and modern equipment. The *RadComs* and QSL cards are not of much use, the vintage equipment finds its way into the museum, and the modern equipment is normally passed on to the Radio Amateur Invalid and Blind Club. We do occasionally receive financial legacies, which are placed in the legacy fund. More contributions from you will enable us to build up the fund, which in turn will be used to financially support projects designed to promote and preserve the future of amateur radio.

A small financial gift at the end of your life will be passed on to encourage young people to get as much pleasure in working the bands as you yourself have enjoyed. Please consider this when making your plans. Thank you.

***Peter A Kirby, G0TWW, General Manager***

RadCom NEWS

## Win some...

JAPANESE amateurs are having their Top Band allocation expanded. Currently it is 1,907.5-1,912.5kHz, CW only. From 1 April it will be extended to 1,810-1,825kHz. There has been no statement yet as to which modes will be permitted.

## Lose some...

AUSTRALIAN amateurs are losing 2.302-2.400GHz. This had been shared on a secondary basis with pay-TV distribution systems, among others. In addition, 3.425-3.4425GHz and 3.475-3.4925GHz have been withdrawn in some of the major Australian capitals and regional areas, both for spectrum-licensing purposes.

● THE RSGB NATIONAL Field Day takes place on 3/4 June 2000. Registrations must reach D J Lawley, G4BUO, no later than 8 May 2000. Details can be found in the October 1999 issue of *RadCom*.

*36-hour solo QSO marathon raises cash for school*

# In the Swim - Amateur Radio Style

RAUNDS WINDMILL Primary School in Wellingborough had a swimming pool in need of repair and, after several months of fund-raising, was still short of its target. That was until Richard Evans, G0VCW, and his wife Gill heard about it from their daughter, Ceri. A Special Event marathon was planned – a sponsored 36-hour shift for one operator - Richard!

With the help of John, M0ASM, and Tony, G0EKD, the station was set up at the school. Richard started his stint at 0400 on Saturday 30 January, under the callsign GB0RWS. He was still human (just) by the end of the 36 hours, having made 150 contacts in 36 countries. In all, the sponsorship was excellent, raising a total of £1,308.17.

The school now has a functional swimming pool, thanks to the efforts of the amateur radio team.

**Richard, G0VCW, presents the cheque for £1,308.17 to the Headmaster, Mr Sturgess.**

## Repeater & Internet Update

RSGB has reached agreement with the Radiocommunications Agency over two changes to the arrangements for repeater authorisation and use.

The existing policy of no coverage overlap in considering applications for additional repeaters is to be relaxed somewhat, provided that sufficient frequencies can be found to avoid co-channel interference. The full implementation of the IARU Region 1 12.5KHz channel spacing on the 144MHz band in June 2000 enables the introduction of additional repeaters. On the 430MHz band there may be some difficulties with available frequencies and the RA is prepared to consider applications for new additional dedicated Internet linked repeaters with wide frequency spacing, as has been allowed for in the existing band plan. Details can be found in the RSGB *Yearbook 2000* on page 54. Frequency co-ordination will have to be carefully carried out and the Data Communications Committee Chairman has agreed that, if necessary, some packet links may have to be moved. Care will also be needed to preserve the interests of ATV enthusiasts and the RSGB Repeater Management Committee (RMC) will keep up dialogue with BATC to ensure mutual interference is minimised.

The relaxation of linking the Internet to amateur radio was announced by the RA in its December 1999 Press Release. Arrangements have now been concluded for the issue of the necessary Notices of Variation, as described in that Press Release, for individuals who wish to operate an Internet gateway via their local repeater.

This policy revision will be incorporated in the new *Guide to Repeater Licensing*, due to be published later this year. In the meantime, amateurs who wish to move forward with proposals are invited to contact the RMC which will be willing to help processing any applications.

For further details about the work of the RMC or comments on any matters regarding speech or television repeaters, please contact Carlos Eavis, G0AKI, RMC Chairman, c/o RSGB Headquarters, Lambda House, Cranbourne Road, Potters Bar, Herts, EN6 3JE.

# Canada lowering Morse speed?

THE BOARD OF Directors of the RAC (the Canadian equivalent of the RSGB) has voted unanimously in favour of a motion to approach Industry Canada with a proposal to drop the requirement for a 12 WPM Morse code test in Canada. Following the lead of the recent decisions in the UK, US and elsewhere, the RAC proposes that Canadian amateurs who have passed a 5 WPM Morse test as well as the necessary written examination, should be allowed full access to the HF bands. A formal proposal will be submitted to Industry Canada in the near future.

**In 1999, David, G3TJY, presented Trudi Smyth, HP6QM, with the Royal Cruising Club Medal. Trudi, now 8P6QM, featured in our lead news story on p9 of the January 2000 *RadCom*. G3TJY died on 10 December 1999.**

# K5NX Retires

THE ARRL HAS announced the retirement of Bill Kennamer, K5NX, its Membership Services Manager, effective from 28 March. Bill joined the staff in 1992 as the DXCC Specialist, and is remembered for clearing a huge backlog of QSL cards.

In 1993 he wrote for QST and quickly became the DXCC Manager, assuming his present position in April 1998.

He is well-known to visitors to the RSGB International HF and IOTA Convention, having made a number of presentations on the DXCC programme and the ARRL over the past few years.

**Bill Kennamer, K5NX.**

# Everyday Stories of Country Folk

### A Test to Remember?

A recent Morse examination was due to be held in a local school room. Because of a mysterious case of double-booking, the examiners found a jumble sale in progress as they entered the school. Being ever-ingenious, the organisers moved the test into the local church and held it at the altar, making it a unique event in more ways than one. According to the Examiners' Report, the candidates enjoyed 'a very special test to remember' – helped, no doubt by the Head Examiner…

### Sign(al)s of the Times

A group of parishioners became locked in a village church recently.

The villagers, including several pensioners and the vicar, became trapped when the door of their church in Thruxton, Herefordshire slammed shut. In desperation, they rang out an SOS message in Morse code on the church bells, but no-one outside realised what it meant.

They escaped only after one of them climbed up through the belfry onto a parapet and shouted to a farmer for help.

# Cool it!

NOW THAT THE University of Surrey's satellite, UO-22, has entered full sunlight, its temperature has risen appreciably. Chris Jackson, G7UPN, the control station manager in Guildford, has pointed the satellite 'upside down' to make the critical systems face cold space. This has reduced the temperature of systems such as the batteries by between five and 10 degrees. Consequently, the downlink is quite weak. It will be late March before the satellite can be righted again. However, the situation will get worse during the next couple of years as the time spent out of eclipse will increase.

# ARDF Invitation

THE UKRAINIAN ARDF Championships 'Kiev Spring 2000' take place in Kiev, from 19-23 April. Your team can apply for entry , and you will be accommodated in the 'comfortable rest home' located in the green zone of Kiev. The competition is organised according to the IARU ARDF rules. Two days are devoted to 145MHz, and two to 3.5MHz. There is also a hamfest and a cultural programme. For guests there are planned excursions to the city, its museums and churches.

For further information, contact Igor 'Garry' Lazarev, US0VA, whose e-mail address is us0va@hotmail.com

# RSGB VHF Awards

### Summary of Award Recipients for January

Supreme Award: ..... G8TOK

**50MHz:**

Standard Transmitting Award ..... G8TOK

10 countries (2-way) ..... G8GNI, G8TOK
20, 30, 40 & 50 countries ..... G8TOK
60 countries ..... G6FQZ

20, 25, 75, 100, 125,
150 & 175 squares ..... G8TOK
200 squares ..... G6FQZ

**70MHz:**

Standard Transmitting Award ..... G8TOK

20 squares / 4 countries ..... G8TOK, G4MKF/P
25 squares / 6 countries ..... G8TOK

**144MHz:**

40 squares / 10 countries ..... G6FQZ
60 squares / 15 countries ..... G6FQZ
80 squares / 18 countries ..... G6FQZ
125 squares / 20 countries ..... G8TOK

**432MHz:**

50 squares / 13 countries ..... G8TOK

**1296MHz:**

5 squares ..... G8TOK, G0EHV
10, 15 & 20 squares ..... G8TOK

**1.3GHz:**

Distance Award ..... G8TOK, G0EHV

Standard Transmitting Award ..... G8TOK

### Summary of Award Recipients for February

**50MHz:**

10 countries (2-way) ..... G6BFP
20 countries ..... G8GNI
25 squares ..... G8GNI

**70MHz:**

25 squares / 6 countries ..... GM4WLL/P

**144MHz:**

Senior Award ..... G6FQZ
475 squares / 55 countries ..... G4YTL
100 Years ..... G4AFJ

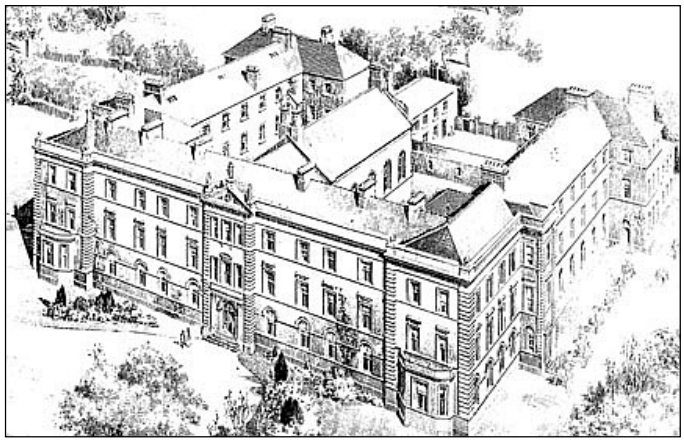
Details of all VHF, UHF and Microwave awards can be obtained from Tony Jarvis, G6TTL, QTHR, or on http://www.argonet.co.uk/users//tonyg6ttl/awards/awards.htm

# Dublin QRP Convention

A HIGH-profile QRP conference called *Celticon 2000* is being organised by the G QRP Club and will be held from 1 - 3 September 2000 at the Marino Institute of Education in Dublin. There will be a full weekend programme of conference and leisure activities, with guest speakers on QRP subjects, practical workshops, master classes, a QRP sale and socialising in abundance.

The Marino Institute of Education is set in its own grounds close to Dublin airport. It is a teacher training college and is the Dublin house of the Christian Brothers. The Director of the Institute, Brother Donal Leader, EI5IT, is a keen QRP enthusiast. The Institute has full conference facilities with single and twin accommodation, and there is a frequent bus service from the gates into the centre of Dublin.

Further details and booking forms are available from the Reverend George Dobbs, G3RJV, whose e-mail address is g3rjv@gqrp.demon.co.uk Remember to include your postal address.



**The Marino Institute of Education in Dublin, the venue for *Celticon 2000*.**

# Old Timer Honoured

DURING A RECENT visit to the Southdown Amateur Radio Society, Peter Kirby, G0TWW, General Manager of the RSGB, presented a Certificate Of Merit to Cyril Collins, G8SC. The certificate recognised Cyril's service to amateur radio. He has been a member of the RSGB for over 60 years and has read the GB2RS News for 25 years, a duty from which he has now retired, except for standing-in occasionally. Cyril is also a founder member of SARS, which has been in existence for over 30 years. He still attends club meetings and is always ready to give help and advice.

**Cyril, G8SC, receiving his certificate from Peter Kirby, G0TWW.**

# Another Ham Radio Film

WE ARE ALL aware of the media's views of amateur radio, but you may like to be warned of the imminent release of yet another film involving our hobby in a key role. The film is called *Frequency*, and stars Dennis Quaid.

The ARRL was consulted in the interests of accuracy, and came up with an unused W2 callsign for use in the story.

The film is a sci-fi thriller; a long-dead father and his adult son meet up again via amateur radio, during a sunspot cycle the like of which we can but dream. The son tries to meddle with the past in order to prevent his father's death.

Look out for a piece of old Heathkit gear, minus cabinet, with valves aglow.

Information on the film, cast and crew, together with a trailer, is available at www.frequencymovie.com

# Call for HF Papers

PAPERS ARE invited for the International HF and IOTA Convention to be held at the Beaumont Conference Centre, Old Windsor, Berkshire, over the weekend of 13-15 October.

If you have particular knowledge of HF-orientated subjects, especially new technological developments, and would like to be a speaker at HFC2000, please submit a brief abstract or the subject matter to the Chairman of the HF Convention sub-committee before 15 April. Abstracts should be sent in electronic form to HF.Chairman@rsgb.org.uk or sent by post to Colin Thomas, G3PSM, 83 Salisbury Road, Totton, Hants SO40 3HY.

For the purpose of HFC2000, both the LF and 50MHz bands are considered to be included within the HF spectrum.

# The LF Trans-Atlantic Challenge

THE LF TRANS-Atlantic Challenge is a memorial to the late Peter Bobek, DJ8WL/DA0LF, for his work on 160m and 136kHz. The DARC, AMRAD and RSGB are collectively sponsoring the Challenge..

Two pairs of trophies are to be awarded, one for each of the pair of amateur stations who make the first confirmed 2-way LF Trans-Atlantic QSO on the 136kHz amateur allocation. Awards will also be issued for reception and distance records. The details are given below. For the purpose of this challenge, by 'trans-Atlantic', we require that one of the two Amateur Radio stations be located in the US or Canada, and the other one in Europe. For the purpose of this challenge 'Europe' is taken to mean Continental Europe, Gt Britain, Northern Ireland and Eire (regrettably we have decided to exclude Greenland, Iceland and the Azores from qualifying for the challenge).

Certificates will be awarded twice a year. For the winter period (1 October to 31 March), the certificates will be presented for the leading claimants for the distance record at the RSGB International HF & IOTA Convention in October of that year. For the period 1 April to 30 September, the certificates will be presented at the HAMRADIO event at Friedrichshafen the following June. A certificate will not be presented if the record has not been exceeded by at least 100km in the specific category. The first certificates will be presented at the RSGB HF & IOTA Convention 13 – 15 October 2000. For these and subsequent claims for the winter period, send details to RSGB HF Awards Manager Fred Handscombe, G4BWP, Sandholm, Bridge End Road, Red Lodge, Bury St. Edmunds, Suffolk IP28 8LQ, England, or e-mail hf.awards@rsgb.org.uk For summer period claims after 30 September 2000, send details to DARC HQ, Att: HF Manager, Lindenallee 4, 34225 Baunatal, Germany.

## Rules

1. An Award will be issued to recognise the first European amateur or SWL to receive either a USA or a Canadian amateur station operating at 136kHz, once the band is allocated to the Amateur Radio Service in either country.
2. An Award will also be issued for the first USA station and another Award for the first Canadian station to receive a European amateur 136 kHz station.
3. The LF Trans-Atlantic Challenge is a pair of trophies for the first two-way Europe-USA 136 kHz contact, once the band is allocated to the Amateur Radio Service.
4. Additionally, a pair of trophies will also be awarded for the first two-way Europe-Canada 136kHz contact, conditions as defined above.
5. A necessary condition for making the award of the trophies is that the claimant(s) must provide a reasonable explanation as to how their transmitting station conformed to their licence conditions.
6. Prior to the award of the two trophies, Certificates will be awarded to the pair of amateur stations who currently hold the distance record on the 136kHz amateur band. Certificates will be awarded in the following categories:
   (a) 2-way QSO, with callsign and signal report exchange using receiving and transmitting equipment and communication modes common on the HF bands, eg normal speed CW, PSK31, etc.
   (b) 2-way QSO, with callsign and signal report exchange using receiving and/or transmitting equipment where low-information rate techniques are used which require something in excess of 30 minutes to complete a QSO.
   (c) A reception report verified by the transmitting amateur station.
7. Contacts must be made under the normal licence conditions for the band. Contacts made under special high-power permits are not valid.

**Peter Bobeck, DJ8WL/DA0LF.**

## Meet the RSGB

THE RSGB WILL have a bookstall and membership information stand at the following rallies and events during the remainder of 2000.

**19-21 May**

Dayton Hamvention, USA

**11 June**

Elvaston National Radio Rally, Derby

**22-24 June**

Ham Radio 2000, Friedrichshafen, Germany

**25 June**

Longleat Rally, Wiltshire

**30 July**

RSGB Hamfest, Hatfield House, Herts

**20 August**

Telford Rally, Shropshire

**22-23 September**

Leicester Amateur Radio and Electronics Exhibition, Castle Donington, Leicestershire

**13-15 October**

RSGB International HF and IOTA Convention, Old Windsor, Berkshire

**4-5 November**

North Wales Radio and Electronics Show, Llandudno

**25-26 November**

London Amateur Radio and Computer Show

**2 December**

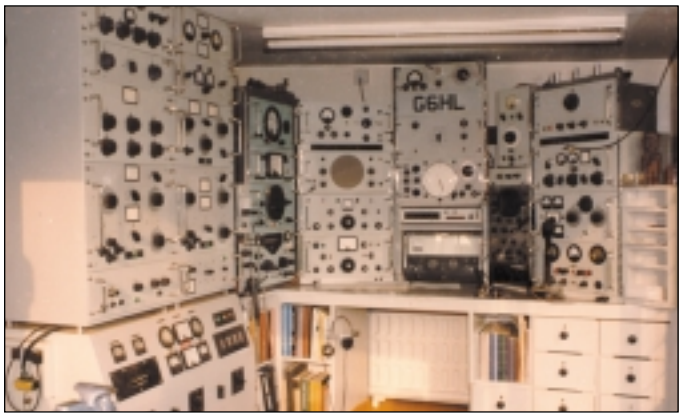
RSGB Annual General Meeting, London

## G6HL's Station

IN FEBRUARY, Mrs Rosemary Cox requested a home for her late father's amateur radio station. Many people asked for a closer look, and the response to Mrs Cox was amazing. She has decided that the entire station will form a prominent part of the Muckleborough Amateur Radio Group's display at the Muckleborough Collection in north Norfolk. The group plans to return the equipment to full working order so that future generations can see how things were done in the not-so-distant past.

## Planning Vacancies

THE RSGB PLANNING Advisory Panel requires two volunteers to help members with their planning permission problems. A good working knowledge is needed of the Planning system as it is operated within the UK, and reasonable out-of-pocket expenses are payable. If you are interested, please contact the Chairman of the Planning Advisory Committee, Geoff Bond, G4GJB, via RSGB HQ.




**The station of the late G6HL, now bound for the Muckleborough Collection.**

## More Scottish Activity

FURTHER TO THE news item about the Scottish Activity Weekend on 15/16 April, comes news of a specific station. André, GM3VLB, will be in the Outer Hebrides around this time and has permission to operate, weather permitting, from several islands qualifying for the IOSA (Islands of Scotland Award). These include the Monachs (EU-111 for IOTA), Vallay, Ronay, Boreray, Kirkibost and Ensay; confirmation is awaited for Wiay.

If time allows in North Uist, André will again operate from Berneray, Grimsay and Baleshare islands. He expects to be accompanied again by Keith, MM0BPP.

For the IOTA contest in July, André will activate St Kilda (EU-059) with Keith and Alex, G0DHZ. Lorraine, MM0BCR, another "weel-kent" IOSA activator, may also accompany them.

**André, GM3VLB/P, at his operating position on Flannan Island. His inverted-V for 20-80m is shown perched precariously on the cliffside.**

# In a Changing World
# It's time to - - - -

Brought to you by wsplc.com

# Change to KENWOOD

## TM-D700E

### VHF / UHF 50W / 35W

### Costing Less
### Than you Think!


**TNC Built-in (1200/9600bps)**
*DX cluster monitoring*

**Wide / Narrow Channel Ready**
*Switched deviation*

**Remote Display Head**
*Cable supplied*

**GPS Terminal (NMEA)**
*For APRS operation*

**D-sub 9-pin terminal**
For direct connection to PC

**Full Dual-Band Operation**
VHF/VHF, VHF/UHF, UHF/UHF

**200 Memories**
8 Character tagging.

Kenwood's latest dual band mobile is being heralded as the design that brings amateur radio very firmly into the 21st Century. Today's amateur needs to be able to communicate on a variety of modes including data. Now with the TM-D700E you can have your TNC with you while you're in the car. Plug in your lap-top and you are Packet Ready. Want to check out the DX-cluster? - It's there on the TM-D700E screen - you don't even need to connect your PC for this. The TM-D700E will introduce you to the world of APRS (Automatic Packet/Position Reporting System). You'll be able to see other operators position information on the display, and if you have a GPS unit, you can plug it into the NMEA port so that your own position information is transmitted. And owners of Kenwood's VC-H1 will be able to send and receive SSTV pictures. So if you have an "old fashioned" voice only mobile, perhaps it's time to get switched on and switch to Kenwood.

## Order today from Your NUMBER ONE Kenwood Dealer

# Waters & Stanton PLC

22, Main Road, Hockley, Essex. SS5 4QS

| | | |
|---|---|---|
| Orders | 0500 | 73 73 88 |
| Technical | 01702 | 204965 |
| | | 206835 |
| Fax | | 205843 |

e-mail sales@wsplc.demon.co.uk

# The Belthorn SSB IF Module

*Part one, by Ron Taylor, BSc, CEng, MIEE, G4GXO**

THE IDEA OF a simple, easy to construct SSB IF system is not new. During the 1970s and 80s several designs were published which made use of a new generation of semiconductor ICs and packaged diode ring mixers [1] [2]. Many of these designs used bilateral circuitry, where certain stages were used during both during transmit and receive, allowing component counts to be kept small [3]. Another feature that led to circuit simplification was the use of the popular Plessey SL600 and SL1600 families of ICs, which, with sensible layout, could be assembled 'Lego fashion' to produce working IF and audio systems with no requirement for inter-stage matching. These devices are now obsolete and difficult to find at reasonable prices. However, with a few design tricks it is possible to produce simple designs that perform well using readily available, standard components.

After constructing several small SSB QRP transceivers I decided to invest some time in developing a simple, modular SSB IF system that could form the basis for many of my future SSB projects. The unit would contain all the circuitry necessary to provide the mixer IF and common audio functions of a single conversion SSB receiver or transceiver.

The design criteria were:

- Simple PCB design that is easy to replicate
- Easily sourced, standard components
- Low component count
- One crystal CIO (LSB operation with ladder filter described, USB selectable by LO placement)
- All common transceiver circuitry to be on one circuit board
- RF range from VLF to VHF

The frequency span may seem extreme, but with applications from cave radio and SCUBA SSB ultrasonic diver voice communications through to HF and VHF amateur radio, this was *the* basic design criterion! As in the Plessey and G4CLF designs, versatility was paramount if the module was to be easily adapted to a wide range of SSB applications. By identifying all the stages of a transceiver that are 'independent' of the operating frequency and placing them within the module, the familiar configuration shown in **Fig 1** was derived.

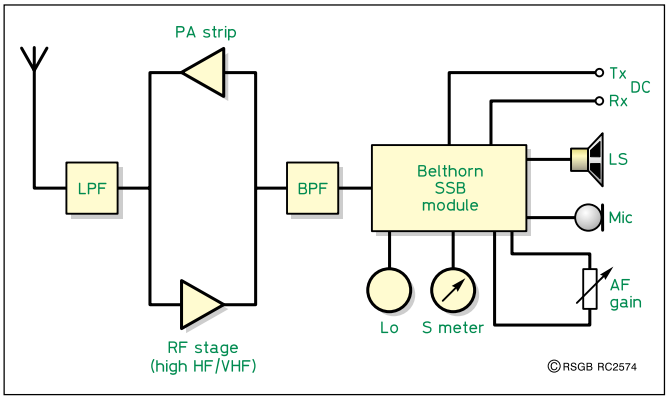



**Fig 1: Use of the module in a typical transceiver.**

The development of the circuit followed an empirical approach, with lots of bread boarding and experimentation**.** Before any readers accuse me of plagiarism I must hold my hands up and make it clear that the inspiration for sections of this circuit came from several first rate constructional articles and designs, notably by W7ZOI [4] and the Plessey designs by G3RZP and G4CLF. With so many good circuit ideas already developed and proven, the development of the Belthorn SSB IF Module became little more than an integration exercise.

## CIRCUIT DESCRIPTION

THE ARCHITECTURE of the IF module is shown in **Fig 2**, with signal flows during transmit and receive indicated by labelled dashed lines, and the circuit diagram in **Fig 3**.

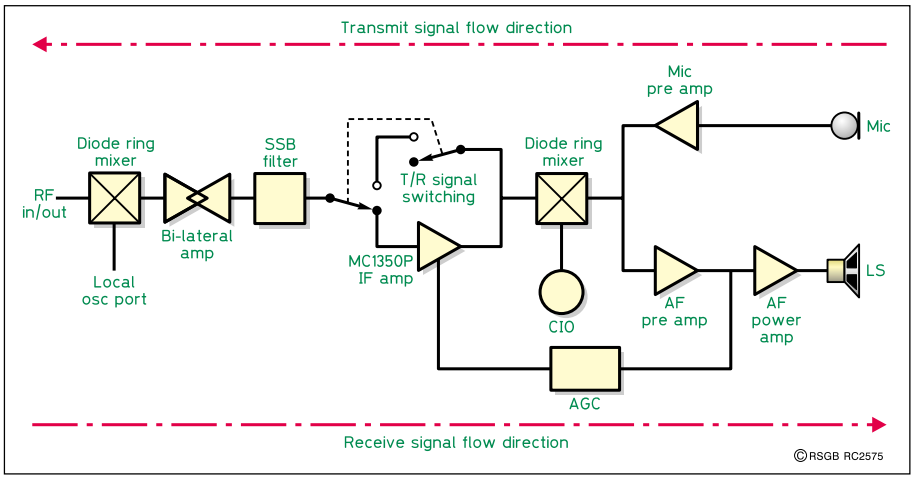



**Fig 2: Signal paths.**

## FRONT END

The front end of the IF module is an SBL-1 diode ring mixer (IC1). This gives a potential upper operating frequency limit of 500 MHz. The mixer DC port is used as the module's RF port. This allows operation down to VLF (eg for Cave Radio). The two remaining ports are specified for operation above 5MHz. One is used for the IF port the other for the local oscillator. This arrangement works well, provided there is sufficient local oscillator drive (at least +10dBm). No degradation in performance is noticeable with local oscillator frequencies down to 2MHz, indeed a prototype unit used in a 40m transceiver with a 9MHz IF and a 2MHz LO works extremely well.

The front end bilateral amplifier was taken straight from the G4CLF design. A J310 (TR1) runs at high current (getting noticeably warm), with gain direction being set by the bias on four signal steering diodes. In the original circuit low capacitance BA182 switching diodes were used, but in this design these are replaced by cheap 1N4148s. The gain of this stage is high enough to provide a good Noise Figure, but not so high so as to cause instability when using 1N4148 diodes for signal path switching.

## CRYSTAL FILTER

Whilst a commercial crystal filter can be used in this circuit, I recommend 'having a go' at building a ladder filter. It can be argued that without adequate test equipment it is difficult

* *89 Belthorn Road, Belthorn, Blackburn, Lancs BB1 2PA. E-mail: ron.taylor@cwcom.net*

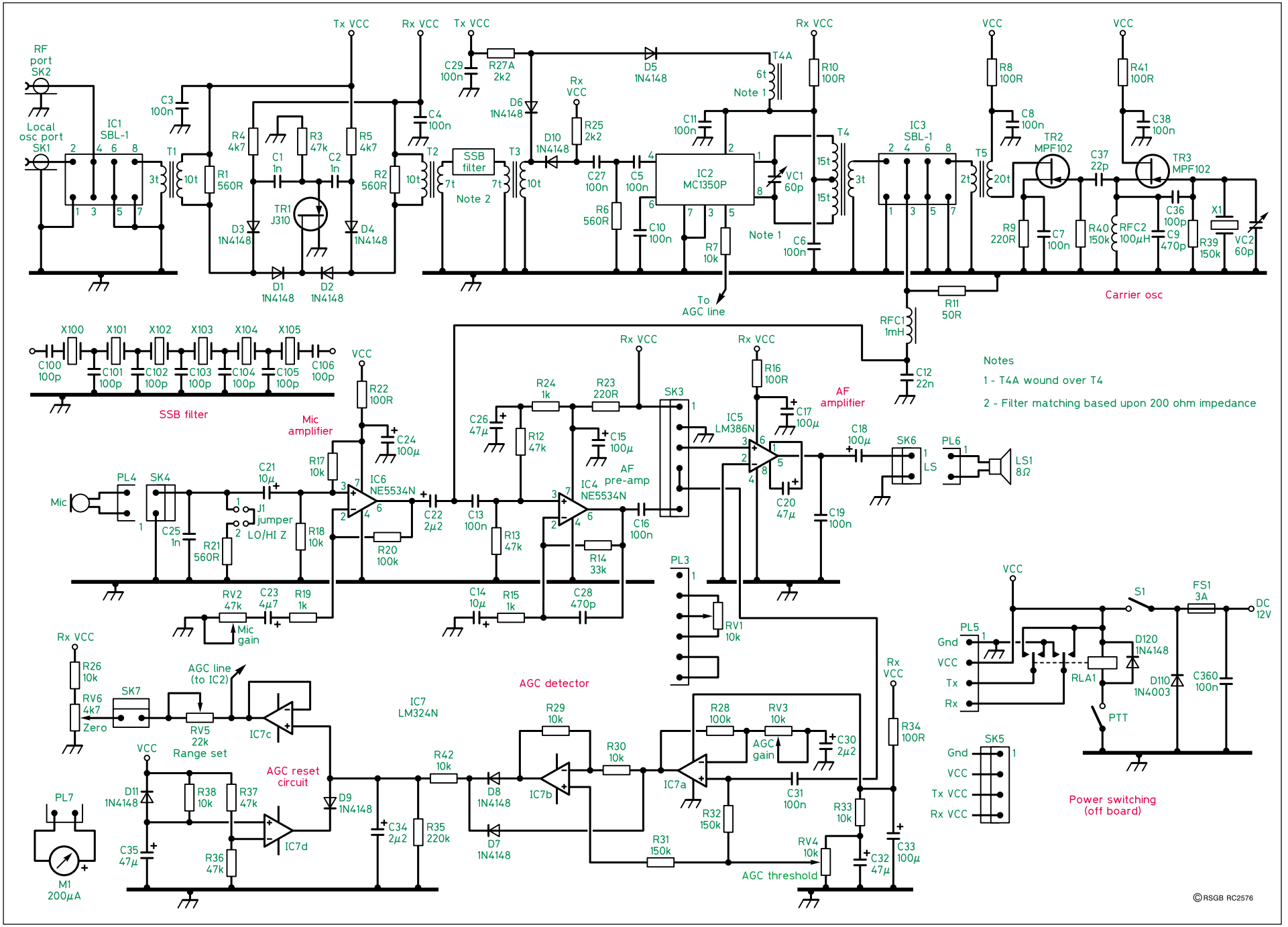



**Fig 3: Circuit diagram of the bilateral SSB IF. Various crystal filter options may be employed.**

to match the performance of a commercial filter, however surprising results can be obtained from carefully constructed simple designs. Over the years I've built many ladder filters using various design techniques. Interestingly, I've found that the most successful and consistent results are obtained from what is perhaps the least scientific design technique, described by Wes Hayward [6]. The filter shown in the circuit diagram is a six-crystal Cohn filter at 10MHz using stock Farnell crystals (20 ppm) and 5% 100pF ceramic capacitors. It costs about £7 to build, a fraction of the cost of a commercial filter. I have built two of these, without crystal selection, and swept them on an spectrum analyser - they are superb, with >90dB stopband and a 6:60dB shape factor of around 2 (*provided they are correctly terminated*).

With the component values shown this filter design and performance are easily reproduced, provided care is taken to match component values closely. The easiest and quickest way to do this is to use close tolerance parts such as the 20 ppm crystals and 5% or better capacitors. This leaves the terminating impedance as the single most important filter response driver; a low impedance (tens of ohms) will narrow the passband; a high impedance (several hundred ohms) will widen the pass band at the expense of introducing ripple. With the values shown, 220Ω should produce good SSB results with a bandwidth of around 2.5kHz. The response of all simple crystal ladder filters is asymmetric, with the HF skirt being the steepest. This favours LSB use for the best carrier and unwanted sideband suppression. This asymmetry can be reduced by increasing the number of poles (crystals) in the filter. Although I haven't tried it, the filter response plot suggests that satisfactory USB operation will be possible with the filter described by placing the carrier oscillator on the low frequency side of the passband.

Other crystal filters may be used in this design, provided the circuit is modified to present the correct terminating impedance. Transformer coupling is used to allow other filter impedances to be matched easily, by adjustment of the turns ratios. For example, to install a 600Ω filter, T3 and T4 turns ratios are set to 1:1 to present a unity impedance transform of the R2 and R6 terminating resistors.

## IF STAGE

This was where the fun started! I wanted to use readily available parts so that this circuit could be easily replicated by anyone with a bit of constructional experience. The prohibitive cost of the SL1612 (my first choice from past designs) is a classic sign of obsolescence. After checking with suppliers it was confirmed that the device is no longer in production, which drove me to look for an alternative. I calculated that I needed about 30dB gain and an AGC range of around 70dB in this design to achieve good performance. To complicate matters, it had to be bilateral. I had a frustrating time trying to source suitable parts and was surprised at how scarce and limited old faithfuls such as dual gate MOSFETs have become. I noticed that many of the American designs used Motorola MC1350Ps. These are available in the UK through various suppliers, including Farnell [7] and JAB Electronics [8]. The MC1350P in the configuration shown (IC2) provides about 45dB of gain and 65dB of AGC range.

On transmit, the MC1350P IF amplifier is bypassed by a simple diode switch connecting the 50Ω balanced modulator port to the crystal filter. Matching is provided by T4A. On receive, no provision has been made to reverse bias the diodes to improve isolation. With higher IF gains this would most certainly be necessary, but with the gain distribution in this design the 'off' resistance of the diodes provided adequate isolation. ♦

*To be concluded...*

## COMPONENTS

**Resistors**

| | |
|---|---|
| R1 | 560R |
| R2 | 560R |
| R3 | 47k |
| R4 | 4k7 |
| R5 | 4k7 |
| R6 | 560R |
| R7 | 10k |
| R8 | 100R |
| R9 | 220R |
| R10 | 100R |
| R11 | 50R |
| R12 | 47k |
| R13 | 47k |
| R14 | 33k |
| R15 | 1k |
| R16 | 100R |
| R17 | 10k |
| R18 | 10k |
| R19 | 1k |
| R20 | 100k |
| R21 | 560R |
| R22 | 100R |
| R23 | 220R |
| R24 | 1k |
| R25 | 2k2 |
| R26 | 10k |
| R27 | 2k2 |
| R28 | 100k |
| R29 | 10k |
| R30 | 10k |
| R31 | 150k |
| R32 | 150k |
| R33 | 10k |
| R34 | 100R |
| R35 | 220k |
| R36 | 47k |
| R37 | 47k |
| R38 | 10k |
| R39 | 150k |
| R40 | 150k |
| R41 | 100R |
| R42 | 10k |
| RV1 | 10k |
| RV2 | 47k |
| RV3 | 10k |
| RV4 | 10k |
| RV5 | 22k |
| RV6 | 4k7 |

**Capacitors**

| | |
|---|---|
| C1 | 1nF ceramic |
| C2 | 1nF ceramic |
| C3 | 100nF ceramic |
| C4 | 100nF ceramic |
| C5 | 100nF ceramic |
| C6 | 100nF ceramic |
| C7 | 100nF ceramic |
| C8 | 100nF ceramic |
| C9 | 470pF ceramic |
| C10 | 100nF ceramic |
| C11 | 100nF ceramic |
| C12 | 22nF ceramic |
| C13 | 100nF ceramic |
| C14 | 10µF electrolytic |
| C15 | 100µF electrolytic |
| C16 | 100nF ceramic |
| C17 | 100µF electrolytic |
| C18 | 100µF electrolytic |
| C19 | 100nF ceramic |
| C20 | 47µF electrolytic |
| C21 | 10µF electrolytic |
| C22 | 2.2µF electrolytic |
| C23 | 4.7µF electrolytic |
| C24 | 100µF electrolytic |
| C25 | 1nF ceramic |
| C26 | 47µF electrolytic |
| C27 | 100nF ceramic |
| C28 | 470pF ceramic |
| C29 | 100nF ceramic |
| C30 | 2.2µF electrolytic |
| C31 | 100nF ceramic |
| C32 | 47µF electrolytic |
| C33 | 100µF electrolytic |
| C34 | 2.2µF electrolytic |
| C35 | 47µF electrolytic |
| C36 | 100pF ceramic |
| C37 | 22pF ceramic |
| C38 | 100nF 5% ceramic |
| C100 | 100pF 5% ceramic |
| C101 | 100pF 5% ceramic |
| C102 | 100pF 5% ceramic |
| C103 | 100pF 5% ceramic |
| C104 | 100pF 5% ceramic |
| C105 | 100pF 5% ceramic |
| C106 | 100pF 5% ceramic |
| C360 | 100nF ceramic |
| VC1 | 60pF trimmer |
| VC2 | 60pF trimmer |

**Inductors**

| | |
|---|---|
| RFC1 | 1mH |
| RFC2 | 100µH |
| T1 | Pri, 3t. Sec, 10t. Wound on 850ui T37 ferrite toroid. |
| T2 | Pri, 10t. Sec, 7t. Wound on 850ui T37 ferrite toroid. |
| T3 | Pri, 7t. Sec, 10t. Wound on 850ui T37 ferrite toroid. |
| T4 | Pri, 15t + 15t. Sec 3t. Wound on Amidon T50-6 powdered iron core. |
| T4A | 6t. Wound over T4. |
| T5 | Pri, 2t. Sec, 20t. Wound on 850ui T37 ferrite toroid. |

**Semiconductors**

| | |
|---|---|
| TR1 | J310 |
| TR2 | MPF102 |
| TR3 | MPF102 |
| D1-D11 | 1N4148 |
| D110 | 1N4003 |
| D120 | 1N4148 |
| IC1 | SBL-1 |
| IC2 | MC1350P |
| IC3 | SBL-1 |
| IC4 | NE5534 |
| IC5 | LM386 |
| IC6 | NE5534 |
| IC7 | LM324 |

**Miscellaneous**

| | |
|---|---|
| J1 | 2-way |
| SK1 | coaxial, for LO input |
| SK2 | coaxial, for RF I/O |
| SK3 | 6-way |
| SK4 | 2-way |
| SK5 | 4-way |
| SK6 | 2-way |
| SK7 | for S-meter |
| X1 | 10MHz |
| X100 | 10MHz 20ppm |
| X101 | 10MHz 20ppm |
| X102 | 10MHz 20ppm |
| X103 | 10MHz 20ppm |
| X104 | 10MHz 20ppm |
| X105 | 10MHz 20ppm |
| RLA1 | 12V DPDT |
| FS1 | 3 amp |
| S1 | SPST |

# NEVADA® GROWING BIGG


## USED EQUIPMENT

*ALL SAFETY TESTED & GUARANTEED FOR 3 MONTHS*

| | | |
|---|---|---|
| ADI AT400 | 70CM HANDIE TRANSCEIVER | 75.00 |
| ALINCO ALM-203E | 2M MTR HANDHELD TRANSCEIVER | 99.00 |
| ALINCO DJ-C1E | 2M MINI HANDIE | 79.00 |
| ALINCO DJ-C5 | 2M/70CM MICRO HANDIE | 125.00 |
| ALINCO DJ-V5E | 2M/70CM HANDIE TRANSCEIVER | 169.00 |
| ALINCO DJ-480E | 70CM HANDIE | 99.00 |
| ALINCO DJ-G1E | 2MTR HANDHELD TX + AIR RX | 139.00 |
| ALINCO DR-MO6DX | 6M, 20W FM MOBILE | 189.00 |
| DENPA MZ22 | 2M FM MOBILE TRANSCEIVER | 125.00 |
| ICOM IC207H | 2M FM MOBILE | 225.00 |
| ICOM ICT8E | 6M/2M/70CM HANDIE | 225.00 |
| KENPRO KT-22 | 2M HANDHELD TRANSCEIVER | 59.00 |
| KENWOOD TM-201 | 2M FM MOBILE TRANSCEIVER | 159.00 |
| KENWOOD TM-451E | 70CM MOBILE TRANSCEIVER | 199.00 |
| KENWOOD TM733E | 2M/70CM MOBILE | 295.00 |
| STANDARD C-5200 | 2MTR/70CMS MOBILE TX | 299.00 |
| STANDARD C-8900 | 2MTR MOBILE TRANSCEIVER | 159.00 |
| TRIO TR2200GX | 2MTR MOBILE TRANSCEIVER | 75.00 |
| TRIO TS700 | 2M MULTIMODE BASE | 250.00 |
| TRIO TS711E | 2M MULTIMODE BASE | 395.00 |
| YAESU FT411 | 2M HANDIE TRANSCEIVER | 125.00 |
| YAESU FT290R | 2M MULTIMODE + ACCESSORIES | 195.00 |
| YAESU FT690R | 6M MULTIMODE PORTABLE | 175.00 |
| YAESU FT770RH | 2M FM MOBILE | 125.00 |
| YAESU FT790RII | MULTIMODE UHF TRANSCEIVER | 225.00 |
| YAESU FT726R | 2M/70CM/HF BASE STATION | 599.00 |
| YAESU FTL2014 | VHF PMR TRANSCEIVER | 75.00 |
| AOR AR1500 | MULTIMODE SCANNER | 125.00 |
| AOR AR8000 | HANDHELD SCANNING RECEIVER | 179.00 |
| COMMTEL 510 | HANDHELD SCANNER | 145.00 |
| ICOM IC-R1 | HANDHELD SCANNING RECEIVER | 150.00 |
| ICOM IC-R2 | HANDHELD SCANNING RECEIVER | 100.00 |
| REALISTIC PRO 2006 | BASE SCANNER | 149.00 |
| TRIDENT TR2400 | HANDHELD SCANNER | 149.00 |
| YUPITERU MVT7100 | HANDHELD SCANNER | 145.00 |
| YUPITERU MVT9000 | HANDHELD SCANNER | 249.00 |
| KENWOOD R5000VHF | HF RECEIVER + UHF + FILTERS | 699.00 |
| REALISTIC DX394 | HF RECEIVER | 99.00 |
| SANGEAN ATS-803A | SHORTWAVE RECEIVER | 99.00 |
| TRIO R1000 | HF RECEIVER | 125.00 |
| YAESU FRG-7700 | HF RECEIVER | 169.00 |
| ICOM IC706 MKII DSP | HF + 6M 100W + 2M 20W TX | 799.00 |
| ICOM IC707 | HF TRANSCEIVER | 329.00 |
| KENWOOD TS-680 | HF 100W TX + CTCSS | 549.00 |
| KENWOOD TS-850SAT | HF TRANSCEIVER | 799.00 |
| TRIO TS-940S | 100W HF TRANSCEIVER | 795.00 |
| YAESU FT-757GX | HF TRANSCEIVER | 399.00 |
| ADONIS AM503 | DESK MICROPHONE | 45.00 |
| AEA SWR121 | HF ANTENNA ANALYSER | 199.00 |
| AMDAT ADC-60 | FREQUENCY STANDARD CLOCK | 99.00 |
| COMET CF-706 | HF + 6M + 2M DUPLEXER | 29.00 |
| CTE BS-25E | VHF AMPLIFIER/DOCKING BOOSTER | 59.00 |
| DATONG ASP | AUTOMATIC SPEECH PROCESSOR | 49.00 |
| DATONG FL3 | AUDIO FILTER | 59.00 |
| DATONG P C1 | HF CONVERTER | 59.00 |
| GOLDLINE | ANTENNA MATCHER | 9.00 |
| HI-MOUND BK100 | BUG KEY | 49.00 |
| ICOM PS-15 | POWER SUPPLY (20AMP) | 95.00 |
| ICS AMT-2 | RTTY/CW/AMTOR UNIT | 29.00 |
| KONTRONICS KCM+ | MULTIMODE DATA TERMINAL | 189.00 |
| KENWOOD AT200 | ANTENNA TUNER | 125.00 |
| KENWOOD AT250 | AUTO ANTENNA TUNER | 189.00 |
| KENWOOD PS430 | POWER SUPPLY (12 AMPS) | 80.00 |
| LESON TW232 | BASE MIC | 29.00 |
| MIZUHO KX3 | RECEIVER ATU | 59.00 |
| MW MODS MM4001KB | MWMODS RTTY RX/TX INC KB | 49.00 |
| MW MODULES 432/50 | 70CM LINEAR AMP | 99.00 |
| MW MODULES MMT 70/28 | 70MHZ TRANSVERTER | 79.00 |
| 'N' TYPE SWITCH | ANTENNA SWITCH | 15.00 |
| NEC SPEAKER/CLOCK | SPEAKER/CLOCK | 35.00 |
| PALSTAR PS-04 | 2/4 AMP POWER SUPPLY | 14.00 |
| SISKIN MULTICAT | COMPUTER INTERFACE | 39.00 |
| SYMEK TNC 2H + RF UNIT | 9K6 TNC + TRANSCEIVER | 179.00 |
| TOKYO HL100B | 21MHZ - 28MHZ 100W AMP | 129.00 |
| TRIO MC-50 | DESK MIC | 39.00 |
| TRIO TM-220 | MONITOR SCOPE | 179.00 |
| TRIO VB-2200GX | 10W AMP FOR TR2200GX | 49.00 |
| YAESU AT767 | FT767 INTERNAL ATU | 79.00 |
| YAESU FC-757AT | AUTO ANTENNA TUNER | 150.00 |
| YAESU FP-757GX | SWITCH MODE PSU | 79.00 |
| YAESU FRA7700 | ACTIVE ANTENNA | 39.00 |
| YAESU FRV7700 | VHF CONVERTER | 145.00 |
| YAESU FTS17 | CTCSS UNIT FT411/FT811 ECT | 39.00 |
| YAESU MH-26E8 | MIC TO SUIT YAESU MOBILES | 30.00 |
| YAESU MM821 | MOBILE ADAPTOR | 5.00 |
| YAESU NC1828U | WALL CHARGER | 6.00 |
| YAESU PA3 | MOBILE DC ADAPTOR | 12.00 |
| YAESU YM48 | DTMF MIC 8 PIN | 19.95 |

***NEW ITEMS ARRIVING DAILY - CALL!***

## CUSHCRAFT

***VERTICALS***

**R6000** ....6, 10, 12, 15, 17, 20m ..... **£299.95**
**R7000**....10,12,15,17,20,30,40m ..... **£369.95**
**NEW R8** .7 - 50MHz (8.7mtrs high)... **£399.95**

***HF MULTIBAND BEAMS***

**MA5B** ..New Mini Beam ..... **£289.95**
**X7**.....10,15,20m 7 el.Yagi ..... **£499.95**
**A3S**.....10,15,20m 3 el.Yagi ..... **£389.95**
**A3WS**..12, 17m 3 el. Yagi ..... **£299.95**

p&p £10 on each item * £12 p&p on each item

***HF ROTARY DIPOLES***

**D3W** ....12,17,30m Dipole ..... **£199.95**
**D40**.....40m Dipole.....~~£229.95~~ **£199.95**

***6 METRE ANTENNAS***

**A505S** .6m 5 el.Yagi 10.5 dBi..... **£149.95**
**A506S** .6m 6 el.Yagi 10.5 dBi..... **£249.95**
**ARX6** ....6m Ringo ranger 7.3m 5.5 dBi..... **£199.95**
**AR6**.....6m Ringo 3.1m 3 dBi..... **£59.95**

p&p £8 on each item

## GOODMANS TRACKER

**2 WAY BUSINESS & PERSONAL COMMUNICATIONS SYSTEM**


**PMR 446 LICENCE FREE RADIOS!**

Now you can keep in touch with -
**NO** LICENCE FEE
**NO** CALL CHARGES
**NO** LINE RENTAL
Typical range: up to 3km

**COMPLETE PACK**
- PAIR TRACKER RADIOS
- DROP IN CHARGER
- NiCad BATTERIES

## ALINCO DJ-SR1


Lightweight and small enough to fit in a shirt pocket! It has the performance to achieve max range on the new PMR 446 allocation with outstanding clarity on both received & transmitted signals.

- 8 channels
- 39 CTCSS codes/ch
- 20 memories
- Memory scan
- Battery level indicator
- Switchable hi/low pwr
- Speaker/Mic jack
- Monitor (open squelch) key
- Selectable pwr output

## ZX Yagi

**• POWER • PERFORMANCE • QUALITY**

### Mini Beam

A mini beam with just 2 metre boom length, and 5 mtr elements, that really performs. Low profile elements so it won't upset the neighbours!

| | 28MHz | 21MHz | 14MHz |
|---|---|---|---|
| GAIN | 4.35dBD | 3.61dBD | 3.35dBD |
| FRONT/BACK | 18.4dB | 16.3dB | 16.1dB |
| BOOM | 2 mtrs | ELEMENT | 5 mtrs |
| MAX POWER | 1500 Watt | | |

MINI 2000 ..... **£193.00** £12 P&P

### Low Cost Verticals

Lightweight and easy to erect

**GP3**
- 10/15/20 mtrs
- 3.9 mtrs long
- C/w wire radials
- 500W PEP

**£59.95** £8 P&P

**GP4**
- 12/17 mtrs
- 4.3 mtrs long
- C/w wire radials
- 500W PEP

**£59.95** £8 P&P

### Mono Band Yagis

**ALL FEATURE** • Strong Aluminium (2004 Titanan+6061 T6) • 3KW Gamma Match
• Customisation - *if required*

| BAND | ELEMENTS | BOOM(M) | GAIN(DB) | PRICE |
|---|---|---|---|---|
| 18MHz | 2 | 1.45 | 6.3 | £123.95 |
| 18MHz | 3 | 4.9 | 9.1 | £156.95 |
| 21MHz | 3 | 4.15 | 9.1 | £115.95 |
| 21MHz | 4 | 6.4 | 11.4 | £182.00 |
| 24MHz | 2 | 1.1 | 6.3 | £99.25 |
| 24MHz | 3 | 3.5 | 9.1 | £123.95 |
| 28MHz | 3 | 3 | 9.1 | £115.95 |
| 28MHz | 4 | 5 | 11.4 | £149.00 |
| 50MHz | 2 | 0.60 | 6.2 | £48.95 |
| 50MHz | 3 | 1.75 | 9.1 | £81.95 |
| 50MHz | 4 | 2.75 | 11.4 | |
| 50MHz | 5 | 4.35 | 12.1 | £114.95 |
| 50MHz | 6 | 6.40 | 12.5 | £147.85 |

£12 P&P ON ALL ANTENNAS ABOVE

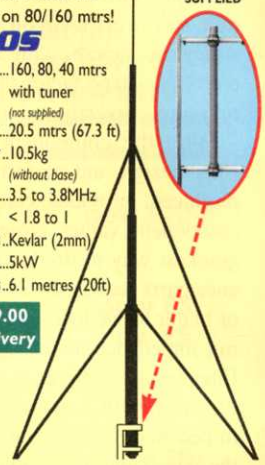
## TITANEX

**WORLD FAMOUS VERTICALS**

Using space-age **TITANIUM ALLOY** for ultra light weight but immense strength these Verticals have been the choice of many major DXpeditions such as ***9M0C, K7K, VK9CR, 3B7RF*** etc.

Even our boss *Mike G3SED* uses the V160S on 80/160 mtrs!

**V160S,V80S BASE MOUNT SUPPLIED**



### V80S

**BANDS** ....160, 80, 40 mtrs with tuner *(not supplied)*
**HEIGHT**...20.5 mtrs (67.3 ft)
**WEIGHT**..10.5kg *(without base)*
**VSWR** ...3.5 to 3.8MHz < 1.8 to 1
**GUYING**..Kevlar (2mm)
**POWER**....5kW
**SHIPPING**..6.1 metres (20ft) LENGTH

**£399.00 + delivery**

### V160S

**BANDS** .....160, 80, 40 mtrs with tuner *(not supplied)*
**HEIGHT** .....26.7 mtrs (87.6 ft)
**WEIGHT**.....13kg *(without base)*
**VSWR**.....1.815 to 1.9MHz < 2 to 1
**GUYING**.....Kevlar (2mm)
**POWER** .....5kW
**SHIPPING**.....6.1 metres (20ft) LENGTH

**£575.00 + delivery**

## Palstar Wire Antennas

**G5RV E/H** *Half Size* — Economy model. 40 - 10 metres 1kW — **£24.95** £3.75 P&P
**G5RV E/F** *Full Size* — Economy model. 80 - 10 metres 1kW — **£27.95** £3.75 P&P
**Windom** *Full Size* — 80 - 10 metres 500W — **£49.95** £3.75 P&P
**Windom** *Half Size* — 40 - 10 metres 500W — **£59.95** £3.75 P&P

## Palstar Power Supplies

**PS50** *50A 13.8V Supply* — 13.8V DC 40-50 Amp w/meters — **£169.95** £8 P&P
**PS30M** *30A Variable Voltage* — 13.8V Variable with meters — **£99.00** £8 P&P
**PS15** *15A 13.8V Supply* — 13.8V Bench Supply — **£59.95** £8 P&P
**PS06** *6A 13.8V Supply* — DC cigar socket & short CCT protection — **£29.95** £8 P&P
**PS04** *4A 13.8V Supply* — 220pf 4kV for Amps & ATU's — **£19.95** £8 P&P

## Palstar Tuners

**AT300** *150W Tuner* — 1.8 - 30MHz W/Balun — **£99.95** £8 P&P
**AT300LCN** *180W Tuner* — 1.8 - 30MHz X needle mtr w/balun — **£139.95** £8 P&P

## Palstar Meters & Accessories

**WM150** *SWR/PWR Meter* — 1.8 - 150MHz 3kW X Needle — **£89.95** £6 P&P
**WM150M** *SWR/PWR Meter* — 1.8 - 150MHz 3kW X Needle — **£79.95** £6 P&P
**VC350** *Hi Pwr Variable Capacitor* — 350pf 6kV for Big Amps/ATU's — **£69.95** £6 P&P
**DL1500** *Dummy Load* — 1.5Kw 50Ω Dummy Load — **£59.95** £6 P&P

*for the most up-to-date info*
**NEVADA ONLINE**
**www.nevada.co.uk**

**WHILE OTHERS CLOSE DOWN WE HAVE EXPANDED INTO A MASSIVE NEW 11,500 SQ FT WAREHOUSE AND SHOWROOMS. WE GUARANTEE YOU BIGG**


**Hotline 023 9231 3090**
fax: 023 9237 6565
e-mail: info@nevada.co.uk
• Unit 1• Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT


**USE YOUR CREDIT CARD FOR SAME DAY DESPATCH!**

# ER - BY BEING BETTER!


CHEQUE SPREAD

- NO HASSLE
- NO CATCH
- NO PROBLEM!

*Buy the radio of your choice at the best price and pay by three cheques - INTEREST FREE! or part exchange your old radio & pay the balance by CHEQUESPREAD - EASY ISN'T IT!*

## LOW LOSS COAX SPECIALS!

**SIVA R-H100** — Semi airspaced double screened low loss 50 Ω cable

| FREQ | LOSS PER 10 MTRS |
|---|---|
| 28MHz | 0.20dB |
| 50MHz | 0.25dB |
| 100MHz | 0.35dB |
| 400MHz | 0.82dB |

100 METRE DRUM QUANTITY PRICE ~~£95~~ **£59** £8 p&p

**SIVA RG-213U** — Popular low loss 50 Ω cable

| FREQ | LOSS PER 10 MTRS |
|---|---|
| 28MHz | 0.36dB |
| 50MHz | 0.45dB |
| 100MHz | 0.67dB |
| 400MHz | 1.47dB |

100 METRE DRUM QUANTITY PRICE ~~£73~~ **£45** £8 p&p

**SIVA RG-58CU** — Popular lightweight coax cable

| FREQ | LOSS PER 10 MTRS |
|---|---|
| 28MHz | 0.78dB |
| 50MHz | 0.97dB |
| 100MHz | 1.4dB |
| 400MHz | 3.0dB |

100 METRE DRUM QUANTITY PRICE ~~£38~~ **£18** £8 p&p

**SIVA MINI RG-8** — Low loss small diameter cable

| FREQ | LOSS PER 10 MTRS |
|---|---|
| 28MHz | 0.69dB |
| 50MHz | 0.86dB |
| 100MHz | 1.28dB |
| 400MHz | 2.82dB |

100 METRE DRUM QUANTITY PRICE ~~£45~~ **£29** £8 p&p

## PALSTAR KH-6

- 50 - 54MHz
- 4W RF out (12V)
- 2W RF out (9V)
- UK Repeater offsets
- Intelligent Power Save circuit
- CTCSS Encode/Decode
- Scan functions • Memory recall
- C/w 8 cell AA battery case *(batteries not inc)*

~~£159~~ **£99** £8 p&p

NEW LOW PRICE!

OPTIONAL EXTRAS

KH6/BC...Empty Battery Case .....£8.95
KH6/DA..Slide on DC Adaptor .....£7.95
KH6/HF...Flexi Hi-Gain Antenna.....£12.95
KH6/NP..NiCad Battery Pack.....£29.95
KH6/CP...Cigar Adaptor PWR Lead .£8.95

## YAESU Rotators

**G1000C HEAVY DUTY** C/W Control Box & 25 Cable..**£559***

**G650C MEDIUM DUTY** C/W Control Box & 25 Cable..**£499***

**G450C LIGHT DUTY** C/W Control Box & 25 Cable .....**£379***

*£10 p&p on all Yaesu rotators

## SGC

NEW! PRICE MATCH UPGRADED MODEL

**SG-230** LATEST MODEL HF AutoTuner WITH IMPROVED QUALITY AT NOT EXTRA COST! **£329** £8 p&p

**SG-231** HF-50MHz SmartTuner **£349** £8 p&p

**SG-237** HF - 60MHz SmartTuner **£289.95** £8 p&p

**SG-237** PCB Unit **£219.95** £8 p&p

## YAESU FT-1000MP

LATEST STOCK

STILL THE TOP DX'S CHOICE **£1999** £8 p&p

## ICOM IC-756 PRO

NEW! ICOM'S LATEST SUPER RIG

~~£2499~~ **£2099** £8 p&p

## YAESU FT-847

70cm - Top Band All Mode

~~£1499~~ **£1349** £8 p&p

## YAESU FT-100

NEW! 70cms - Top Band

~~£1299~~ **£999** £8 p&p

## ICOM IC-746

100W 160M - 2M

~~£1495~~ **£1395** £8 p&p

## ICOM IC-706 MkIIG

100W HF/6 + 50W 2M + 20W 70cms

~~£1195~~ **£989** £8 p&p

## YAESU FT-920 AF

100W HF+100W 6M Base

~~£1499~~ **£1249** £8 p&p

## KENWOOD TS-570 DGE

Brilliant 100W HF

**£899** £8 p&p

## KENWOOD TM-707E

Dual Band Mobile Wide RX function **£299** £8 p&p

## YAESU FT-90

NEW! Micro-sized Twinbander wide RX inc AM Airband

~~£399~~ **£369** £8 p&p

## YAESU FT-8100

Dual Band High Power Mobile + Wideband Receive

**£399** £8 p&p

## KENWOOD TM-D700E

NEW! Dual Band DATA Mobile Radio

ITS GOT THE LOT! **£469** £8 p&p

## YAESU FT-2600M

NEW! Heavy duty 2 metre mobile - 60W output!

~~£299~~ **£249** £8 p&p

## SGC 2020

Portable HF Transceiver

**£599** £8 p&p

## ICOM IC-R2

- 500kHz -1310MHz
- AM/FM/WFM
- 400 memories • 10dB Attenuation
- Auto Squelch
- Tone Squelch

~~£149.99~~ **£139.90** £6 p&p

## AOR AR5000

10kH - 2.6GHz All mode top class receiver & scanner

~~£1445~~ **£1395** £8 p&p

## AOR AR3000A

100kH - 2036MHz - Classic receiver as used by Government, Military etc

~~£799~~ **£749** £8 p&p

## YAESU VR500

Multi Mode Wideband Scanner

- 100kHz - 1300MHz
- All Modes
- Packed with features!

**£299** £8 p&p

## ICOM IC-R75

0.03-60MHz Synchro AM Detector

**£699** £8 p&p

## ICOM IC R8500

Covers 100kHz - 2GHz and lots of features including computer control

**£1599** £8 p&p

## YAESU FRG-100

Covers 50kHz - 30MHz FM Option + LOTS MORE!

~~£429~~ **£399** £8 p&p

## ICOM T81E

6M - 23cm HANDIE
- Ultra Wide RX
- Alphanumeric Display

~~£419~~ **£369** £8 p&p

## YAESU VX-5R

50-144-430MHz Wide Band Receiver Ultra Rugged Construction

~~£359~~ **£299** £8 p&p

## KENWOOD THD7E

Dual Band HANDIE Up to 6W Output Built in TNC! **£299** £8 p&p

ER STOCKS, BETTER SERVICE, FASTER DELIVERIES THAN EVER BEFORE!

CHEQUE SPREAD

## IT'S EASY TO PAY!

- by three post dated cheques

*minimum order: £99*

- Simply divide the price (including carriage) into 3 equal payments.
- Write 3 cheques dated in consecutive months starting with today's date.
- Write your telephone number, cheque card No & expiry date on the back of each cheque.
- Post them to us, enclosing your name & address & we will (subject to status) send your goods immediately.

ICOM

# IC-2800H

# 3" COLOUR LCD!
# A first for mobile rigs

**GET THE BIG PICTURE WITH THE NEW IC-2800H, ICOM'S LATEST DUAL-BAND, MOBILE TRANSCEIVER. THE IC-2800H'S UNIQUE LCD HAS USER-SELECTABLE DISPLAY MODES AND VIDEO CAPABILITIES. BUT IT'S NOT JUST PRETTY - IT'S GOT DURABLE CONSTRUCTION, INSTALLATION FLEXIBILITY, A BANDSCOPE FUNCTION, INDEPENDENT TUNING CONTROLS, CONVENIENT MEMORY EDITING AND MUCH MORE - ADVANCED FUNCTIONS, CONVENIENT FEATURES AND SUPERIOR PERFORMANCE - GOOD GRIEF!**

### 3-inch, multi-function colour LCD
The IC-2800H's unique colour LCD provides four different display modes and switch labels to help night-time viewing.

### Separate controller
The controller is separated from the main unit for installation flexibility. Install the controller on your vehicle's dashboard with the main unit under your seat.

### External video input
The IC-2800H's external video terminal can monitor TV broadcasting with a TV tuner; recorded pictures from a video/digital camera or display a GPS map via a car navigation system.

### Simple bandscope function
Easily find busy frequencies or unoccupied frequencies within a specified frequency bandwidth (up to ±500kHz; according to selected tuning step).

### 9600bps packet socket
The packet socket connects directly to a packet modem, 1200bps packet is also possible via this or the mic connector.

### Independent tuning controls
Icom's independent tuning control system is employed with tuning dial, AF and squelch level controls and 4 function control switches for each band.

### Convenient memory editing
Current transceivers require you to transfer a memory to VFO, then reprogram it after doing any editing. Not so with the IC-2800H.

### Remote control capability
The HM-98 remote control microphone controls almost all functions remotely. Key backlighting in the HM-98 provides easy operation even at night.

### Cloning capabilities
All memory channel contents and set mode contents are programmable from your PC with the optional CS-2800 cloning software and OPC-478 cloning cable.

### Convenient memories
A total of 232 channels, 99 regular, 5 for log and repeater and 1 call channel for each band, are available.

### FM narrow capability
To improve operation on narrow band VHF FM channels the IC-2800H is equipped with a dedicated narrow band FM mode

### Plus much much more...


Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.
URL: http://www.icomuk.co.uk e-mail: icomsales@icomuk.co.uk

Count on us!

# technical feedback

## Frequency-Selective Impedance Bridge

*RADCOM, DECEMBER 1999*

REFERRING TO Fig 3, the bridged outer tags of VC2 should connect to the bridged centre and upper tags of RV1, not to the lower tag of RV1. Mea culpa!

Nevertheless, you may be interested to learn that the article has already brought a pleasing level of genuine interest and thanks from the UK and overseas. I have personally sorted out a few constructional errors for one delighted reader. A watchmaker's loupe is still the radio amateur's best friend when it comes to checking a finished stripboard.

***Ed Chicken, G3BIK***

## Eurotek

*RADCOM, DECEMBER 1999*

THE AUTHOR, DF0ANN, noted two errors in the diagram of his crystal oscillator temperature compensation. C1a, like C1, should be connected to the drain (top pin) of the left hand BF245B, not to the source (bottom pin). The capacitor between the final 3pF trimmer and the 567MHz output should be 1pF, not 1nF.

***Erwin David, G4LQI***

## Technical Topics

*RADCOM, NOVEMBER 1999*

IN FIG 5(b), which relates to 'New Life for the FT-200/250', there should be a wire link between the two valve bases, so that pins 1, 4 and 6 on each are joined together. See **Fig 1** for details.

***Tony Hall, G0MQG***

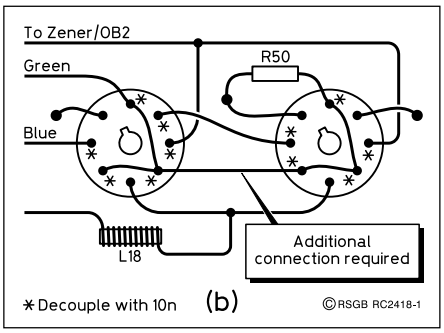



**Fig 1: Corrected Fig 5(b), from the November 1999 *Technical Topics*.**

---

RadCom Helplines FOR MEMBERS

- Ian, G8ORG, is looking for a source of the **SL6270 VOGAD chip** (Maplin no longer stock it). G8ORG, QTHR. Tel: 01270 782944.
- Eric, G1WCQ, is looking for a copy of the workshop manual and parts index for the **Hitachi CPT-2158** television. All costs reimbursed. G1WCQ, QTHR. Tel: 01772 686708.
- John, G4YSI, is trying to locate the source of a **bulk eraser** for standard audio tapes. G4YSI, QTHR. Tel: 01932 889113.
- Snowy, G0HZE, is looking for a copy of the circuit diagram of the **Cleartone CM6000** high-band transceiver (the version that is programmed via the radio's own keypad). All costs reimbursed. G0HZE, QTHR. Tel: 01733 342439.
- Mike, G7NBE, is looking for a copy of the circuit diagram and manual of the **Emerson RBZ receiver** type CEX-46203 NXss-15891. It was made during WW2 and covered 5-13MHz. G7NBE, QTHR. Tel: 01530 414473.
- Mike, G3OOQ, would like to know if the **Garmin GPS12** can be programmed to read Ordnance Survey grid references, rather than latitude and longitude. Alternatively, can anyone provide a formula that will permit the grid references to be calculated from latitude and longitude? G3OOQ, QTHR. Tel: 01789 205973.
- Peter, G3GGK, is looking for a **Collins winged emblem**, to complete the restoration of a 75-series receiver. It is the type that was used on all the series and 32V transmitters. The circle is 11/16in diameter and the overall length is 2in. G3GGK, QTHR. Tel: 01954 210374.
- Laurindo, CT1DRX, is looking for details of modifications for the **Yaesu FT-101ZD**. Fax: 00 351 711 2151.
- Henry, G0NBQ, is looking for a copy of the circuit diagram and service manual for the **KW202** receiver. All costs covered. G0NBQ, QTHR. Tel: 0161 485 2054.
- G8HLJ is looking for a copy of the service manual for the **Racal RA71** receiver. All costs covered. G8HLJ, QTHR. Tel: 0151 632 0614.
- Peter, G3PVX, is looking for a good home for a bundle of **RSGB Callbooks** from the 1950s, 70s, 80s and 90s. He does not want any money for them, but as they are rather heavy it will be necessary to collect them or pay postage. G3PVX, not QTHR (9 miles E of Exeter). Tel: 01404 813059.
- Watson Inness is helping with the restoration of a former RAF launch, a **Seaplane Tender 1500**. To bring it back to its former glory, an **R1082/T1083** and a **TR9** set are required. They do not need to be operational. Information leading to the securement of any of these items would be most welcome. Tel: 0131 669 7170.
- Francis, G3IVG, is looking for a servicing manual for the **Trio TR-7500** 2m FM transceiver. All costs covered. G3IVG, QTHR. Tel: 01706 225906.
- Mike, GJ0PDJ, needs a copy of the circuit diagram of the **Microwave Modules MML144/200S** linear amplifier. GJ0PDJ, QTHR. Tel: 01534 863350.
- Ray, G4HRH, would like to borrow a manual for the **Yaesu SP-980** (a speaker with phone patch facilities), for photocopying. Postage paid, plus a small donation to a charity of the provider's choice. G4HRH, QTHR. Tel: 01962 714990.
- John, G0VEH, is looking for information on the **Storno CQM-5664** (spec 20XI) and on the conversion of a **Pye PF85** handheld to 70cm. G0VEH, QTHR.
- Willie, ZS5WI, is looking for a copy of the manual and circuit diagram for the **KW Atlanta**, model **4A VFO** and **PSU**. ZS5WI. Tel: 00 27 35 474 4667. E-mail: zs5wi@iafrica.com
- Geoff, G4DED, would like to know if anyone has adapted an LCD display in or outboard, for use with a **Yaesu FT-290R Mk1** that has a failed display. Yaesu can no longer supply replacements. G4DED, QTHR. Tel: 07931 528269.
- Des, G0JCF, is looking for a copy of the assembly instructions and SWR adjustments for the **AEA ISO-440** Isopole antenna. All expenses covered. G0JCF, QTHR. Tel: 01895 633118.
- Bruno, G4FZG, is looking for a copy of the circuit diagram for the **Telequipment S51B** oscilloscope. G4FZG, QTHR. Tel: 01242 256295.
- Sam, G3HVI, is looking for a source of supply for the **Toshiba S-AV7** RF PA chip. G3HVI, QTHR. Tel: 01782 393349.
- Trevor, M0BPU, is looking for a copy of the manual, circuit diagram and service information for the **Yaesu FT-707** transceiver. M0BPU, QTHR. Tel: 01424 730787. E-mail: tlyne@waitrose.com
- Peter Fox, G2YT (formerly G4MCK) is looking for historical information on the **callsign G2YT**. The original G2YT was **Crispin Redshaw**, the callsign having recently been reallocated to Peter Fox at the request of the original owner's daughter. Apparently the callsign was originally 'ZT', later being re-issued as '2YT', plus there is said to be a connection with Dorchester Radio. E-mail: peter.fox@airsense.co.uk

*Helplines is a free service to members. Requests for help are published in the order they are received. We regret it is not possible to provide an undertaking of when any submitted request will be published.*

# The Neighbours'll Never Know!

***A compilation of ideas for antennas that won't be noticed***

IN THE JANUARY 2000 edition of *RadCom*, Alex Dick's 'Last Word' letter contained an editorial PS, asking members for their suggestions for low profile antennas. The response was such that it has been possible to compile a whole feature devoted to achieving some operating satisfaction from a location where it is not possible to erect antennas with impunity.

## TAKE THE TUBE

I THINK IT IS worthwhile recalling the useful antennas and attitude of Dick Pascoe, G0BPS, in his little book *Pascoe's Penny Pinchers*. I telephoned Dick when I had a similar problem to your reader. It came from a blind operator who mentioned to me how difficult putting up an antenna could be if you were living in a block of flats with a resident warden and a controlling authority. Part of my hobby is to read selections of *RadCom* onto tape for my blind chums, especially the articles that have pictures to be described, so I will put in writing one solution to the problem that has proved to be very useful.

The components are two lengths of 2.5in bore rain water down pipe, each 3m long, plus about forty metres of 16-14- or 12-SWG enamelled copper wire. **Fig 1** provides details. When buying the tubing from a DIY store, get a colour match to the house rainwater piping, together with six brackets to fix the tubing to the house wall. The tubing has a socket at one end. Cut one socket off one tube.

The idea is to wind an amount of wire onto the tubes, to form a resonant antenna on 40m. Most reference books tell to you in effect to suck it and see. On that basis I started with enough wire to make an 80m half-wave dipole and gradually reduced the windings to not more than seventy turns on each length. Those get you close to resonance, but definitely having enough left over for trimming to tune. You can, if circumstances are really difficult, put the antenna inside the tube, which will be fixed to the wall as though it is a working drain. Mine is wired on the outside because that was easy to do and has remained so because from 50ft you cannot see it. Make small wire anchoring holes at the tube ends to just clear the socket. Fix one wire end and simply wind the length on at about 3cm spacing by rolling the tube up the wire. Wind the wire on and spread it evenly afterwards, by slackening and tightening with two hands, finally pulling the ends hand tight.

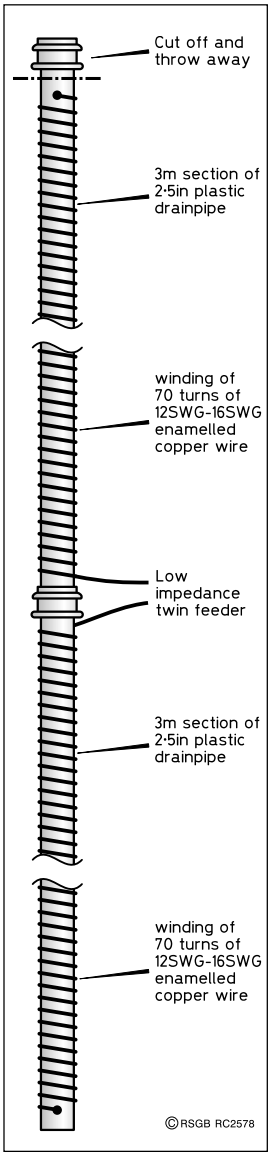



**Fig 1: How to make a helically wound 40m dipole on drainpipe.**

At the centre, bridge the socket in a 'Y' shape of twin feeder to the middle of the antenna and take that to a Z-match by your transceiver, but use a dip meter to provide the signal. The antenna will peak outside the band, so now you can choose to cut some wire off from either the outer or inner ends, and then re-stretch the coils to match the tube length. If you do not have a dip meter, cut ten turns off each half of the antenna. This will resonate close to the middle of the 40m band and will also work very well on 80m. To form capacitor hats I have soldered two pieces of double sided copper board, each about as big as a postcard, at the outer ends.

The results are about two S-points down on a dipole at 40ft high, and this from an antenna which is almost totally shielded by the building. It is at the inside corner of our house, with one wall facing south west and the other south east, but I can work all over the UK from 20 miles SW of Glasgow, even through the house to the rear. To test the antenna, one evening at about 9pm I called people around the coastal fringe. Not only did I make good contacts, but in the middle of calls heard a New Zealander talking about what he had just had for breakfast. Clearly the antenna has potential.

Given a particular situation I would shrink or stretch the antenna vertically to fit the soffit of the house and bring the lower end to about 1ft off the ground. But also, having tried its appearance and the reaction of neighbours to it, I would also erect it in full view in the most useful radiation position. Once up, the antenna looks just like all the other drain pipes and only close inspection shows that water does not run in this one.

***Alan Lovegreen, GM4FLX***

## DUMMY TV ANTENNA 1

A VHF VERTICAL antenna can be mounted inside a fibreglass tube *that appears to be* supporting a normal TV antenna (see **Fig 2**). From ground level, no one is likely to notice the fact that the coax that emerges from the bottom of the support tube never reaches the antenna at the top!

Suitable tubing, about 1¼-1½in diameter, can be purchased from some amateur radio dealers.

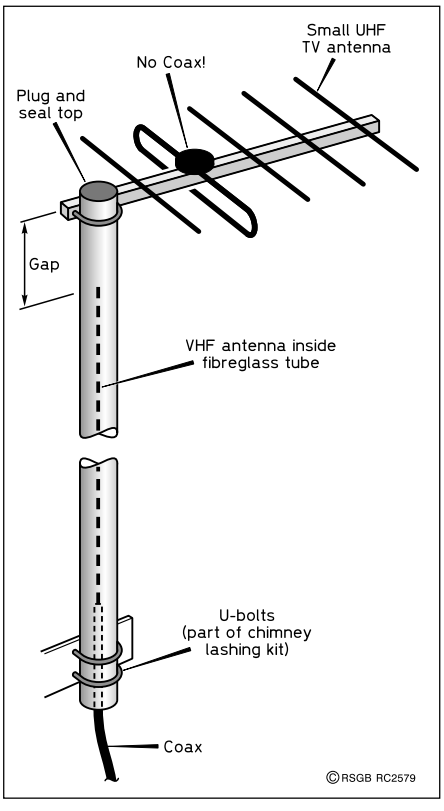



**Fig 2: This TV antenna isn't connected to anything. The *real* antenna is a VHF vertical, inside the support tube.**

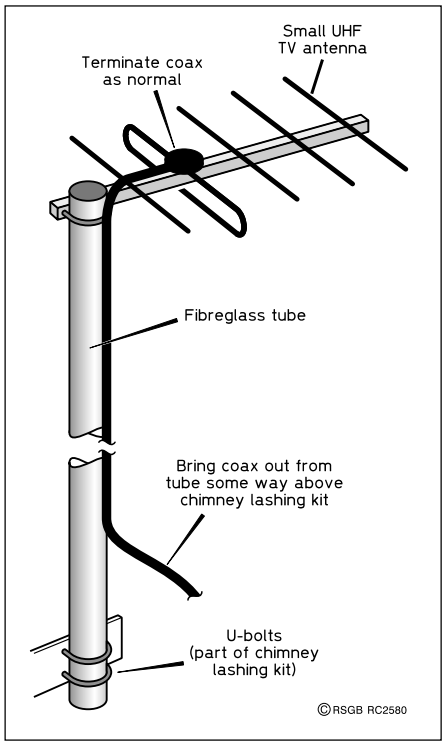



**Fig 3: Keep the downlead clear of the chimney lashing kit.**

## DUMMY TV ANTENNA 2

AN ALMOST VERTICAL long wire antenna can be made from TV coaxial cable, terminated to a real TV antenna [1] that is supported by fibreglass tube. It is necessary to keep the coax a respectable distance away from the chimney lashing kit (see **Fig 3**) and any metal guttering on its way down to ground. The braid of the TV coax should be shorted to its inner close to ground level (**Fig 4a**), then attached to the coax from the shack in the normal way or, ideally, a remote ATU (**Fig 4b**). With this type of antenna a decent earthing system will certainly pay dividends, and who's to know what wires are buried beneath ground?

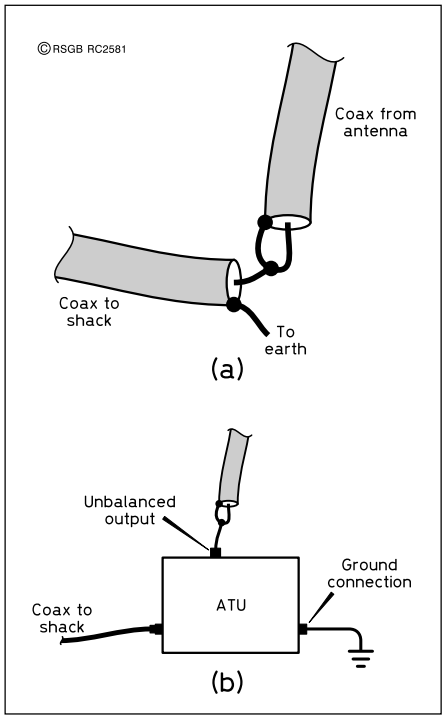



**Fig 4: (a) Connection of the dummy TV antenna's downlead direct to coax. (b) Connection via a remote ATU.**

## TACTICAL OPERATING

WORKING DX FROM a restricted locations isn't easy, but it is quite possible. One of my antennas consists of a 33ft length of wire taped down the drain pipe, with a couple of radials wedged between the cracks in the patio. This resonates on 40m, and I use an ATU to get it onto 30m. A also have a 15m dipole. The same tuner allows some sort of service on 17, 12 and 10m. 1999 saw 258 DXCC entities worked using these two antennas. My current all-time total is 305 entities with these simple wires and never more than 90 watts.

Alex's disappointing DX results through 1999 could be put down to a number of factors. May I share with readers some experiences of mine, which have helped when DX has been my objective:

- Plan your operating times around 'grey line' conditions, when propagation can favour your location.
- If possible, steer clear of weekends, when competition is fierce.
- Small stations have much more success on CW and PSK31.
- Plan activity at those times of year when paths favour you. For example, on 18MHz, JA/ZL favours the UK around 1000 UTC in January. Try much earlier and you will have too much competition from continental Europeans, who have been in the daylight longer. Also, 40m can be excellent to the Caribbean and Central America an hour or two after sunrise, when the rest of Europe has lost propagation.
- If you want to work a particular DXpedition, it is just as important to know when their finish date as their start date. Call towards the end of their operation, not on the first day when the pile-up is full of high-powered stations.
- Contests provide an opportunity for less competitive stations to work DX. Remember, it is in the interest of contesters to pull the weak ones through.

***Neil Carr, G0JHC***

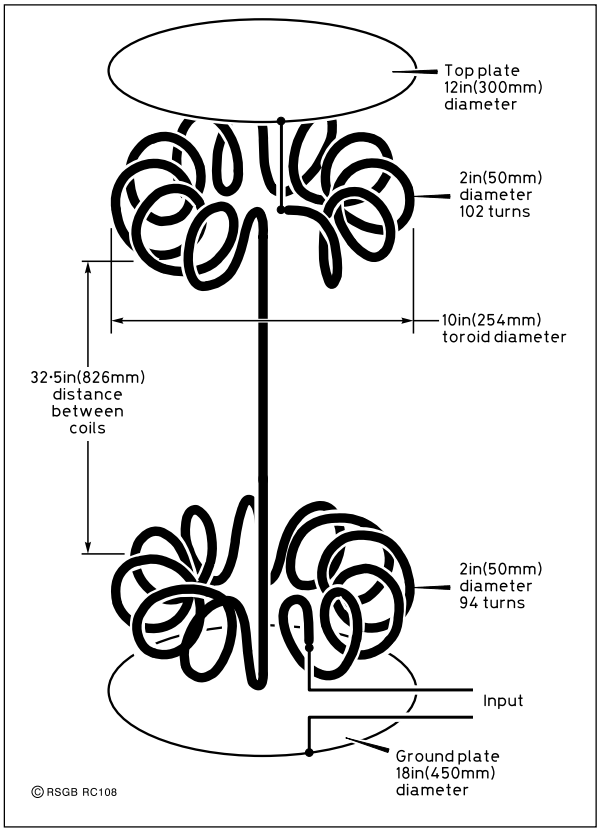



**Fig 5: From G2AJV's 1994 feature, an 80m toroidal antenna.**

## DUMMY CLOTHES LINE

HOW MANY neighbours would complain about a clothes line? Not many, so why not take advantage of the fact?

A low dipole from a clothes post to somewhere on the house isn't likely to attract much attention, especially if you leave pegs permanently dotted along its length!

## STEPS TO SUCCESS

LOAD UP AN aluminium ladder which is propped-up against or hung on wall brackets, inconspicuously (but very well) insulated and fed against a good RF earth. Alternatively, run a G5RV around the soffit/fascia boarding of the dwelling, with the feed concealed behind the surface [2]. But the best idea I have heard of was a series of dipoles in the format of the commercial Cobb Web, which - on non-operating days - was actually used as a rotary clothes drier [3].

***Howard Walton, M0CMG***

## TRUSTY TOROIDS

THERE IS A simple solution to operating from a terraced house in a conservation area. A tried and tested technique is a toroidal antenna, sited at any convenient place on the premises. Such antennas were detailed in *RadCom* April/May 1994 [from which **Fig 5** and **Fig 6** are reproduced – *Ed*].

The simplest form of toroidal antenna is formed from the combination of a single air cored toroidal coil, spaced an inch or two above a conducting sheet. A sheet of aluminium about 2ft-square is ample for the

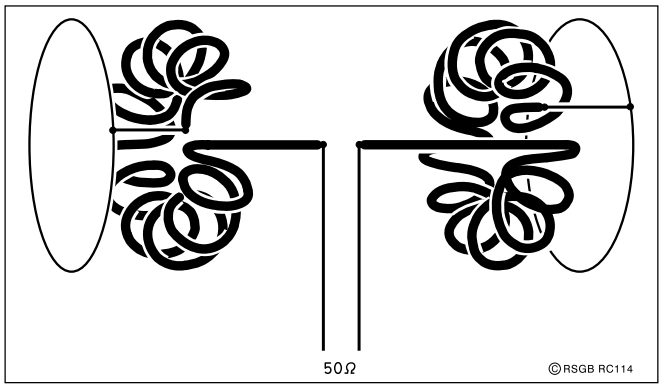



**Fig 6: Also from G2AJV's 1994 feature, a horizontal toroidal dipole for 80m. The toroids are spaced about 3ft apart.**

purpose (it reflects a contra-wound image of the coil and acts as the grounded terminal for the outer of the coax). The inner conductor of the coax is connected to one end of the toroidal coil via a small preset capacitor. In some cases a small parallel capacitor may also be required to obtain a perfect match.

I have had many DX phone QSOs on 21MHz with a toroid sitting on the washing machine in the kitchen on the ground floor of my house. It doesn't blast out like a full-sized beam, but it certainly gives me access to the world. For nearly a decade I have been using a 2in-high double toroid as a 2m antenna on the roof of my car. I still have a few toroids scattered in various parts of the house for 1.8, 7 and 21MHz, and would be delighted to demonstrate any of these in QSO with GM0IRZ if he would like to make a sked.

***Roger Jennison, G2AJV***

## REMEMBER THE JOYSTICK

WHEN I MOVED into sheltered housing some 13 years ago, I really thought that it was the end of my transmitting days. However, after settling-in at my one bedroomed flat on the ground floor, I began to weigh-up the pros and cons.

I dug out my old Partridge Joystick 8ft 6in vertical, with 40ft of single wire feeder. Spread around the bedroom and tuned with the Joymatch tuner, together with my old KW2000B transceiver, it gave me much pleasure on SSB/CW on all bands. However, I had to be careful not to interfere with the internal alarm system when operating on full power.

Although I was fairly happy with this, it presented problems for my cleaner and I was always conscious of BCI/TVI problems, so one day I tried a trick that I had done before at a previous poor location. This involved using the braiding *only* of my 2m vertical's 45ft feeder, via the Joymatch - a sort of inverted L. On all bands - with good SWR readings - it works a treat! I have cards from JA, ZS, W, VE, ZD9, OY, etc. Of course I go back to conventional feeding when I use the antenna for VHF.

***FCP Flanner, G3AVE***

## EDITORS' NOTES

[1] Don't try to use it to receive TV, as well as transmit!

[2] Fine if your guttering is plastic, but not recommended if it is metal.

[3] Adequate safety precautions required. ♦

# HAYDON COMMUNICATIONS

MasterCard SWITCH Access VISA

**MAIL ORDER: 01708 862524**

*NEXT DAY DELIVERY TO MOST AREAS, £10.00.*

## Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high
★ No ATU or ground radials required
★ (200W PEP). ONLY **£179.95** delivery £10

SEND SAE FOR LEAFLET

Wire version now available 45ft long end fed. (1.8-60MHz) spec. as above. Price £159.95.

## Q-TEK ZL SPECIALS *Delivery £9.00*

| | | |
|---|---|---|
| 2m | 5ele (boom 45"/9dBd) | £39.95 |
| 2m | 7ele (boom 60"/11dBd) | £49.95 |
| 2m | 12ele (boom 126"/13.8dBd) | £69.95 |
| 70cm | 7ele (boom 28"/11dBd) | £29.95 |
| 70cm | 12ele (boom 48"/13.8dBd) | £49.95 |

## Q-TEK YAGIS FOR 2/4/6M + 70CM *Del £9.00*

| | | |
|---|---|---|
| 2m | 5ele (boom 63"/9dBd) | £39.95 |
| 2m | 8ele (boom 125"/11dBd) | £49.95 |
| 2m | 11ele (boom 156"/12.7dBd) | £69.95 |
| 2m | 5ele crossed (boom 64"/9dBd) | £69.95 |
| 2m | 8ele crossed (boom 126"/11dBd) | £89.95 |
| 4m | 3ele (boom 45"/7dBd) | £44.95 |
| 4m | 5ele (boom 128"/9dBd) | £59.95 |
| 6m | 3ele (boom 72"/7dBd) | £54.95 |
| 6m | 5ele (boom 142"/9dBd) | £69.95 |
| 70cm | 13ele (boom 76"/12dBd) | £39.95 |
| 70cm | 13ele crossed (boom 83"/12dBd) | £59.95 |

## Q-TEK HB9-CV *Delivery £9.00*

| | | |
|---|---|---|
| 70cm | HB9CV (boom 12") | £17.95 |
| 2mtr | HB9CV (boom 20") | £21.95 |
| 4mtr | HB9CV (boom 22.5") | £29.95 |
| 6mtr | HB9CV (boom 32.5") | £39.95 |
| 10mtr | HB9CV (boom 52") | £69.95 |

## END FED HALF WAVES

Ground plane free. Made from glass fibre - no ground radials or tuning required.

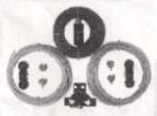
| | | |
|---|---|---|
| 4m | Length 92" (SO239) vertical | £39.95 *Del £9.00* |
| 6m | Length 126" (SO239) vertical | £49.95 *Del £9.00* |

## NEW HF MOBILE WHIPS (PL-259)

Easy to mount HF mobile whips ready to go with PL-259 fitting.

| | | |
|---|---|---|
| PL-80 | 80m whip (approx 1.5m long) | £21.95 *Del £8.00* |
| PL-40 | 40m whip (approx 1.5m long) | £19.95 *Del £8.00* |
| PL-20 | 20m whip (approx 1.5m long) | £19.95 *Del £8.00* |
| PL-62 | 6m/2m whip (approx 1.3m long) | £18.95 *Del £8.00* |

## DELUXE G5RV



Multi-stranded PVC coated heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings. Full size - 102ft.

ONLY **£39.95**

Half size 51ft. Only **£34.95**

*Carriage £6.00.*

Choke Balun Inline balun for G5RV ..... £24.95 P&P £2

## STANDARD G5RV

| | | |
|---|---|---|
| Full size | 102ft | £24.00 P&P £6 |
| Half size | 51ft | £21.00 P&P £6 |

## NEW Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end). **£22.95** P&P £2.50 (a pair).

## Q-TEK INTREPID

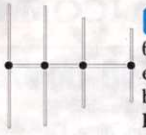
WIRE — SO-239

PRE-MATCHED END-FED HALF WAVES. SUPERB SINGLE BAND WIRE HORIZONTAL ANTENNAS. NO A.T.U. REQUIRED.

| | | |
|---|---|---|
| IPT-80 | 80m version (40.7m) | £69.95 P&P £7 |
| IPT-40 | 40m version (20.3m) | £59.95 P&P £7 |
| IPT-20 | 20m version (10.1m) | £49.95 P&P £7 |

NEW QT-20 11ele 23cm yagis boom length 1m gain 11.5dBd (n-type) ..... £49.95 + P&P £10

QT-40 19ele 23cm yagis boom length 1.5m gain 16dBd (n-type) ..... £69.95 + P&P £10

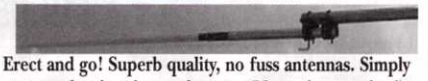


## Q-TEK TRITAN

6m + 2m + 70cm. A superb compact 4-element, 3-band yagi. 4.5dBd gain (all bands). Boom length 1.13m (max). Longest element 2.96m (max).

ONLY **£69.95** del £10

## Q-TEK COLINEARS *P&P £9.00*



Erect and go! Superb quality, no fuss antennas. Simply put together in minutes & erect. (No tuning required). All fibre glass & stainless fittings.

| | |
|---|---|
| QT-100 GF 144/70, 3/6dB (1.1m) | £39.95 |
| QT-200 GF 144/70, 4.5/7.2dB (1.7m) | £54.95 |
| QT-300 GF 144/70,6.5/9dB (3m) | £69.95 |
| QT-500 GF 144/70, 8.5/11dB (5.4m) | £125.95 |
| QT-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m) | £69.95 |

## ACCESSORIES *P&P £3.00 on the following*

| | | |
|---|---|---|
| TSA-6001N | Duplexer (+Coax) 2/70 (N/N259) | £24.95 |
| TSA-6003 | Duplexer (Coax) 2/70 (PL/259's) | £19.95 |
| MX-2000 | Triplexer (6/2/70) (Coax) | £56.95 |

## MOBILE ANTENNAS *£6.50 delivery*

| | | |
|---|---|---|
| TSM-1612 | 6/2/70 (2.15/6/8.4dB) 2.1M | £54.95 |
| DB-7900 | 144/70 cms, (5/7.6dB) 1.5m | £29.99 |
| DB-770M | 144/70 cms, (3/5.5dB) 1m | £24.95 |
| DB-1304 | 144/70 cms, (2.15 /3.8dB) .41cms | £19.95 |
| DB-EL2E | 144MHz, ⅛ths, 4.5dB (1.8m) | £29.95 |
| DB-285 | 144MHz, ⅝ths, 3.4dB (1.3m) | £15.95 |
| PL-6M | 50MHz ¼ wave (1.5m) | £16.95 |

## ACCESSORIES *P&P £3.50 on the following*

| | | |
|---|---|---|
| MT-1301 | H/Duty Mag Mnt + Coax Top Quality | £24.95 |
| MT-3302 | H/Duty Hatch/Trunk Mnt Top Quality | £24.95 |
| CF-BPF2 | 2m band pass filter | £49.95 |
| Q-Tek | 6m band pass filter | £42.95 |

## COPPER ANTENNA WIRE

(All 50mtr rolls)

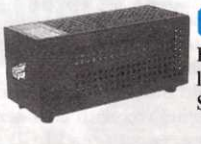
| | |
|---|---|
| Enamelled | £12.95 P&P £5 |
| Hard drawn | £13.95 P&P £5 |
| Multi-Stranded (Grey PVC) | £9.95 P&P £4 |
| Extra H/duty (Clear coated) | £30.00 P&P £5 |
| Flexweave (H/duty 50 mtes) | £30.00 P&P £5 |
| Flexweave H/duty (20 mtrs) | £15.95 P&P £5 |
| Flexweave (PVC coated 20 mtrs) | £18.95 P&P £5 |
| Flexweave (PVC coated 50 mtrs) | £40.00 P&P £5 |
| Earth wire (6mm) 30m roll | £10.00 P&P £5 |
| Copper earth rod (4ft) | £13.00 P&P £6 |
| Copper earth rod (3ft) + 10m wire attatched | £14.99 P&P £6 |

## Q-TEK BALUNS & TRAPS

Baluns are wound on ferrite rod and encapsulated into a dipole centre with an SO239 socket. Brass terminals form the balun output and stainless steel screw eyes offer an anchor point for antenna ends. Maximum power rating is 1kW.

| | | |
|---|---|---|
| 1.1 Balun | | £24.95 P&P £2 |
| 4.1 Balun | | £24.95 P&P £2 |
| 6.1 Balun | | £24.95 P&P £2 |
| 40 mtrs | Traps | (a pair) £25.00 P&P £4 |
| 80 mtrs | Traps | (a pair) £25.00 P&P £4 |
| 10 mtrs | Traps | (a pair) £25.00 P&P £4 |
| 15 mtrs | Traps | (a pair) £25.00 P&P £4 |
| 20 mtrs | Traps | (a pair) £25.00 P&P £4 |

1kw Handling



## Q-TEK DL-1000

HF 200W continuous dummy load (0-30MHz).

SSP ~~£89.95~~.

INTRO OFFER **£79.95** P&P £8

Q-TEK DL-60 DC-500MHz (PL-259). ..... £18.99 P&P £1

## ★ 20FT BARGAIN MAST SET ★

4 x 5' lengths of 2" extruded (16 gauge) heavy duty aluminium, swaged at one end to give a very heavy duty mast set

SSP ~~£60.00~~

LIMITED STOCK

**£35.00**

DEL £10

## FIBRE GLASS MASTS

| | | |
|---|---|---|
| 1½" Dia | £8.50 per metre | (Max length 3m delivered) *Delivery £10* |
| 1¾" Dia | £10.50 per metre | *Delivery £10* |
| 2" Dia | £12.50 per metre | *Delivery £10* |

NB. We can only deliver 3m lengths

## TELESCOPIC MASTS

6 section telescopic masts. Starting at 2½ in diameter and finishing with a top section of 1¼" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and stainless steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 10 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs **£79.95** Weight approx 6kg — 12 mtrs **£109.95** Weight approx 8kg *Carriage £10.00.*

## FREE STANDING TRIPODS

Superb quality heavy duty "quick erect" tripod for permanent or temporary installation. (Fits in the boot of a car). Available for our 8m or 12m masts.

**£84.95** *Carriage £10.00*

## GUY WIRE KITS ETC.

| | |
|---|---|
| Standard kits (complete with wire) | £23.95 P&P £6 |
| Heavy duty kits (complete with wire) | £26.95 P&P £6 |
| Ground fixing spikes (3 set) | £15.00 P&P £6 |
| 30m pack nylon guy rope | £10.00 P&P £2 |
| 30m pack (3mm dia) winch wire | £16.00 P&P £4 |

## MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling. (Fits up to 2" mast).

**£8.95** + P&P £2.00

## WALL BRACKETS + MAST BASE PLATES

| | | |
|---|---|---|
| 2" | Mast base plate | £12.95 P&P £5 |
| 6" | Stand off | £6.95 P&P £5 |
| 9" | Stand off | £8.95 P&P £5 |
| 12" | T&K Brackets | £12.00 P&P £8 |
| 18" | T&K Brackets | £18.00 P&P £8 |
| 24" | T&K Brackets | £20.00 P&P £8 |
| U bolts (1½" or 2") | | £1.10 each |
| 8 nut universal clamp (2" - 2") | | £5.95 |
| 3-way guy ring | | £3.95 |
| 4-way guy ring | | £4.95 |
| 2" mast sleeve | | £9.95 |
| 1½" mast sleeve | | £8.95 |

## COAX BARGAINS

100m roll of RG-213 coax

ONLY **£69.95** P&P £10

100m roll of RG-58 coax

ONLY **£35.00** P&P £8.50

## SP-350V

Be protected this summer! In-line lightning surge arrester. (Gas discharge type). Replaceable fuse.

INTRO PRICE **£19.99** P&P £1

# HAYDON COMMUNICATIONS

**MAIL ORDER: 01708 862524**

*NEXT DAY DELIVERY TO MOST AREAS, £10.00.*

**AUTHORISED DEALER FOR:- YAESU ● ICOM ● KENWOOD ● ALINCO**


## ICOM IC-706IIG

Buy IC-706IIG this month and we'll give you a free IC-T81E worth £420.00

**£939.00**

| | | |
|---|---|---|
| Icom IC-746 | + free IC-2100H worth £269 | £1295.00 |
| Icom IC-756PRO | | PHONE FOR UK's BEST PRICE |
| Kenwood TS-870S | HF transceiver | £1449.00 |
| Kenwood TS-570DG | HF transceiver | £829.00 |
| Kenwood MC-80 | Desk mic | £49.95 |
| Kenwood SP-31 | Extention speaker | £79.95 |
| Kenwood MC-60 | Deluxe mic & pre-amp | £75.00 |
| Yaesu FT-847 | HF, 6, 4, 2, 70cm trcvr | £1269.00 |
| Yaesu FT-100 | HF, 6, 2, + 70 trcvr | £849.00 |
| Alinco DX-70TH | HF + 6m trcvr | £599.00 |

## KENWOOD TM-V7E

True dual-band mobile transceiver. 2m, 70cm, FM operational dual receiver on same band ★ 50/35W output ★ CTCSS + DTMF H Optional extended Rx available. (108-950MHz).

ONLY **£349.95**

| | | |
|---|---|---|
| Kenwood TM-G707 | 2m, 70cm mobile trcv | £279.95 |
| Kenwood DFK-3C | Remote front panel kit | £34.95 |
| Kenwood DFK-4C | Remote front panel kit | £59.95 |
| Kenwood HS-5 | Deluxe headphones | £52.95 |
| Kenwood HS-6 | Lightweight headphones | £35.95 |
| PG-5ME | Mic extension lead | £4.99 |
| Yaesu FT-8100R | Dual-band mobile | £349.95 |
| Yaesu FT-90R | Miniature dual-band mobile | £319.95 |
| Alinco DR-430 | 70cm mobile | £199.95 |

## YAESU VX-5R

The toughest full performance 5W tribander ever (6-2-70). The VX-5R's ruggedness and durability are assured thanks to the die-cast aluminum housing. Ultra-wide frequency coverage (0.5-1GHz).

ONLY **£279.95**

| | | |
|---|---|---|
| Yaesu SU-1 | Barometric pressure sensor for VX-5R | £32.95 |
| Yaesu MH-34 | Speaker microphone | £27.95 |
| Yaesu EDC-6 | DC adaptor | £7.95 |
| Yaesu EDC-5B | Cigarette lighter DC adaptor | £22.95 |
| Kenwood TH-G71E | 2m + 70cm hand-held | £199.95 |
| Kenwood TH-D7 | 2m + 70cm h/h with packet modem | £279.95 |
| Kenwood PB-39 | High power nicad for D7/G71 | £45.95 |
| Kenwood SC-45 | Soft case for G-71 | £14.95 |
| Kenwood SMC-34 | Speaker microphone | £38.95 |
| Alinco DJ-G5 | Dual-band hand-held | £279.95 |


## SANGEAN ATS-909

Sythesized world receiver with RDS and 306 memories. Covers SW/MW/LW & FM stereo incl's free PSU.

ONLY **£129.95**

Sony SW-55 SW portable ..... £239.00


## REALISTIC DX-394

★ Superb performance SW receiver ★ True SSB ★ 0.2 - 30Mhz (AM/SSB) ★ 240 or 12V ★ Attenuator ★ S-meter ★ Timer

S.S.P. ~~£249.95~~ SPECIAL OFFER: **£149.95**

FRG-100 Communications receiver ..... £369.00


## AR5000

The ultimate wide-band receiver. Covers 10kHz-2600MHz.

SPECIAL OFFER

*With Spectrum Master Software worth £130.00* **£1269.00**

## ICOM PCR-1000

Computer radio system 100kHz-1300MHz (all mode).

Includes S.S.B

OUR PRICE **£249.00**

UT-106 DSP option for above ..... £79.95


## AR108

Palm sized dedicated airband scanning receiver. Covers airband 108-136.975MHz VHF 136-180MHz with 99 memories.

ONLY **£59.95**

Optional batteries + charger £13.99.

## MVT-7100

Wide-band hand-held scanner 0.5-1650MHz (all mode).

ONLY **£195.00**

MVT-9000MkII Our price ..... £319.95

Soft case for MVT-9000/7100 (specify) .. £19.99


## AR8200

The latest all mode innovation in handies. Covers 0.5-2GHz all mode. Buy one this month and we'll give you a free case worth £20.

OUR PRICE **£339.95**

AR8000 Our price ..... £279.00

Soft case for 8200/8000 (specify) ..... £19.95

★★★★★★★★★★★★★★★★★★ STAR BUY ★★★★★★★★★★★★★★★★★★


## SONY SW-100E

Award winning miniature portable all mode SW receiver. ★ Station presets for 50 frequencies (with station names) ★ Single side band system ★ Multi-function LCD display ★ FM stereo via headphones ★ Synchronous detector ★ Sleep function ★ Short wave tuning in 5Hz & 1KHz steps ★ Includes compact antenna/stero earphones/carrying case/comprehensiveshort wave handbook. Due to over stocing at Sony UK we are able to offer for a limited period the Sony SW-100E at £100 off retail price. RRP £229.95.

SPECIAL OFFER **£129.95** P&P £10

# PMR-446 TAKES UK BY STORM

**Haven't you ever wanted to play radio? Now you can! - No license required - Yes, anyone can buy and use this two way radio system with absolutely no running cost! Are you going on holiday and need some for the family - need communications for your work or leisure - then look no further. PMR-446 solves the problem. We've even seen families using them at fun parks to stay in touch and, don't forget, you can use them as much as you like - it will not cost you a penny.**


## MOTOROLA TA-200

★ Typically up to 3Km range dependent upon terrain
★ Large, easy to read LCD screen with user-friendly icons
★ You choose who to talk to and select from 300 channel settings
★ Rugged and stylish design - choose from yellow or blue
★ One button operation - easy for adults and children to use, simply push to talk.

ONLY **£69.95** *or 2 for £129.00*

## NISSEI EP-300 TM

Over the ear earpiece with lapel mic & PTT
Fits Motorola TA-200.

ONLY **£24.95**

## MOTOROLA TA-288

Licence free PMR-446 radio with nicad and charger. ● No need for a walkie-talkie licence and there are no airtime charges. Just pick up your new Motorola Talkabout TA288 walkie-talkie and start using it. ● Your Motorola Talkabout TA288 is supplied with a rechargeable NiMH battery for up to 1 hour of continours talktime or 13 hours of standby time. ● With up to a 3km range out of sight does not mean out of touch. This dependable little walkie-talkie will help keep your group together.

ONLY **£109.95** *or 2 for £199.00*

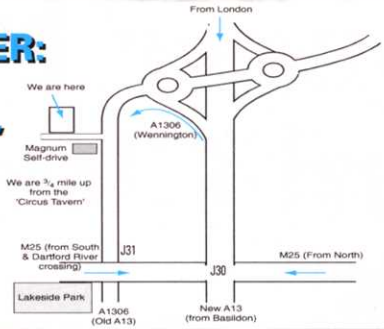
## MOTOROLA HANDIE PRO

★ Up to a mile in range (depending on terrain)
★ 38 channels
★ Rapid one-hour drop in charger
★ Internal vox with user sensitivity
★ Large, easy to read LCD screen

ONLY **£179.95**

# SHOWROOM & MAIL ORDER:

**Unit 1, Thurrock Commercial Park,**
**Purfleet Industrial Estate, London Rd,**
**Nr. Aveley, Essex RM15 4YD**
**TEL: 01708 862524**
**FAX: 01708 868441**
**Open Mon - Fri 8am - 4.30pm.**
**Sat 8am - 1.00pm**




# W. MIDLANDS SHOWROOM

**Unit 1, Canal View Ind. Est.,**
**Brettel Lane,**
**Brierley Hill**
**W. Mids. DY5 3LQ**
**Open Mon-Fri 9.30-5pm.**
**Sat 9.30-2pm**
***NO MAIL ORDER TO MIDLANDS BRANCH***


## RM-913 RADIO CONTROLLED CLOCK.

● 12/24hr function ● Auto clock from "Rugby" RF signal ● Alarm function ● Backlight & more ● Incl's batteries

**£11.99** P&P £2

## BA-928 WEATHER CLOCK.

● Weather forecast ● Atmospheric presure (+ 24 hour history) ● Moon phase ● Wireless outdoor temp sensor ● Time/date/alarm ● Table & wall mount ● Incl's batteries + 1 outdoor sensor

**£78.95** P&P £2


## YAESU G-650C

Extra heavy duty rotator for large HF beams, etc. Supplied with circular display control box and 25mtr of rotator cable. ~~£499.00~~.

ONLY **£349.00**

## YAESU G-450C

Heavy duty rotator for HF beams etc. Supplied with circular display control box and 25m of rotator cable.

ONLY **£319.95**

| | | |
|---|---|---|
| G1000 | Heavy duty rotator | £499.95 |
| GC-038 | Lower mast clamps | £25.00 |
| GC-065 | 2" thrust bearing | £48.00 |
| AR300XLT | Quality rotator for VHF/UHF | £49.95 |

## NISSEI PWR/SWR METERS

Super quality meters made to a professional standard with meter illumination.

| | | |
|---|---|---|
| RS-502 | 1.8-525MHz (200W) £99.95NOW | £59.95 P&P £5 |
| RS-102 | 1.8-150MHz (200W) £59.95 | £49.95 P&P £5 |
| RS-402 | 125-525MHz (200W) £59.95 | £49.95 P&P £5 |
| RS-101 | 1.8-60MHz (3kW) £79.95 | £69.95 P&P £5 |
| RS-40 | 144/430MHz Pocket PWR/SWR Meter (200W) (SO239) | £34.95 P&P £1 |
| RS-40N | As above with N-type | £39.95 P&P £1 |

## COAX SWITCHES (P&P £3.00)

| | | |
|---|---|---|
| CX-401 | 4 way (SO-239) | £49.95 |
| CX-401 'N' | 4 way (N TYPE) | £54.95 |
| CX-201 | 2 way (SO-239) | £18.95 |
| CX-201 'N' | 2 way (N-type) | £24.95 |

## GARMIN GPS-III PLUS

Upgradable GPS system supplied with data lead and free on-board maps. Shows cities, airports and much, much more.

SALE PRICE **£329.95**

| | | |
|---|---|---|
| Garmin Street Pilot | GPS | £419.00 |
| Garmin Street Pilot | Colour | £549.00 |
| Garmin GPS-12 | Navigator | £129.95 |
| Active magmount antenna | | £39.95 |
| "CD map source" | | £69.95 |

## RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells.

**£13.99** + £2.50 P&P.

*Please note that only the special cells can be recharged with this charger.*

8 x AA pack £10.99 4 x AA pack £5.99 4 x AAA £6.25 P&P £1

## BA-312E WEATHER CLOCK.

● 5 weather forecast ● Temp (Min/max) ● "Higlo" illumination ● Alarm/calender ● Much more ● Incl's batteries

**£27.99** P&P £2


## BAR-888U WEATHER/RADIO CONTROLLED CLOCK.

● Supplied with one remote (wireless) sensor ● Weather forecast ● Barometer ● 24 hr "radio" clock ● Thermometer

**£69.95** P&P £4


## NISSEI PS-300

Superb 30 amp/12V power supply built to combat most needs. *Features:* ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear ★ Multiple front outlets ★ Detatchable IDC lead (supplied) for mains connection ★ Ultra quiet fan ★ Professional build (black finish). *Dims:* L308 x W268 x H135mm. *Wt:* 9kg. SSP £149.00.

INTRO PRICE **£99.95** Delivery £10

## D-308B BLACK DELUXE DESK MIC (with up/down).

Every amateur using this mic (over 2000) has expressed extreme pleasure with it's performance.

**£49.95** P&P £6.00

OPTIONAL LEADS (P&P £1.50)

| | | |
|---|---|---|
| A-08 | 8 pin "Alinco" round | £9.95 |
| K-08 | 8 pin "Kenwood" round | £9.95 |
| I-08 | 8 pin "Icom" round | £9.95 |
| AM-08 | Modular phone "Alinco" | £9.95 |
| YM-08 | Modular phone "Yaesu" | £9.95 |
| IM-08 | Modular phone "Icom" | £9.95 |

## TH-887 HEADSET

A high quality headset that will fit most hand portable and most HF & VHF/UHF tcvrs via optional interface.

**£24.95** P&P £3.50

Supplied with two pin molded plug-will fit Alinco/Yaesu/Standard/ADI/Icom hand-helds. (Optional leads available for TH-887 to use with various mobiles £18.95 P&P £1.50).

TH-887K Headset for Kenwood ..... £24.95


## MFJ-259B MKII

HF digital SWR analyser + 1.8-170MHz counter/resistance meter.

ONLY **£189.00** P&P £5

| | | |
|---|---|---|
| MFJ-949 | 300W ATU + dummy load | £115.95 |
| MFJ-969 | HF + 6m ATU | £139.95 |
| MFJ-962D | 1.5kW versa tuna | £239.95 |
| MFJ-784B | DSP filter | £176.95 |
| MFJ-418 | CW tutor | £58.95 |

UK VERSIONS

## SGC-230 SMARTUNER

Auto ATU will tune any lengh of wire in the range 1.8-30MHz

ONLY **£289.00**

## BA-888

ELECTRONIC BAROMETER/CLOCK.

● Temp/weather/forecast/pressure barometric trend ● 24hr bargraph ● 12/24hr clock & alarm ● Humidity ● Table/wall mount

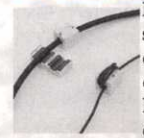
**£69.95** P&P £4


## JM-838 JUMBO WALL/DESK CLOCK.

● Wide screen/2" digit time display ● Barometer ● Calender ● Temp ● Auto RF synch clock from Rugby

**£59.95** P&P £4

## INTERFERENCE – STOP IT!



Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables.

Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done!

BULK PURCHASE hence **2 for £7.50** (P&P £2.50). HURRY – LIMITED STOCK

## FERRITE RINGS

10 for **£7.50** P&P £2.50

*Superb quality.*

## NISSEI EP-320

Hanging type earphone with boom mic & PTT. Fits Kenwood, Alinco, Yaesu or Icom.

**£24.95** P&P1

## NISSEI EP-300T

Over the ear earpiece with lapel mic & PTT. Fits Kenwood, Alinco, Yaesu or Icom.

*(Please specify brand of radio when ordering)*

OUR PRICE **£24.95** P&P £1

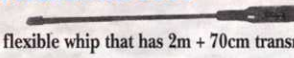
*This Ear/Mic comes with an "over the ear" earpiece as EP-300*

## REGULAR-GAINER RH-770

21cm flexible whip that has 2m + 70cm transmit and wideband receive.

ONLY **£14.99** P&P £1

## SUPER-GAINER RH-9000



40cm flexible whip that has 2m + 70cm transmit and wideband receive.

ONLY **£19.95** P&P £1

## QS-300

A fully adjustable desk top stand for use with all handhelds. Fitted coaxial fly (FAI) with BNC & SO239 connectors

ONLY **£14.99** P&P £3

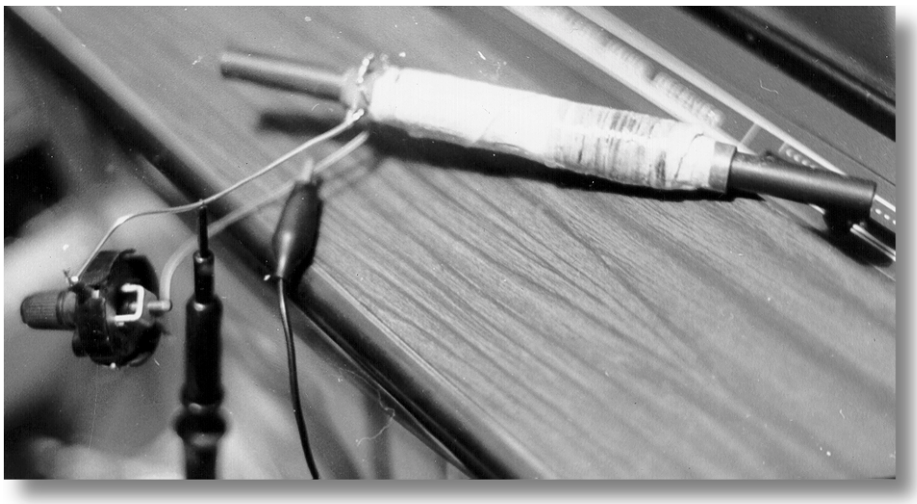
QS-200 Air vent holder for hand-helds with belt clip. £9.99

## EP-300 Deluxe over the ear earpiece.

ONLY **£9.99** + P&P £1

# The Poorer Man's Caesium Clock

*Dick Biddulph, M0CGN**



The pick-up on top of a monochrome TV set with 'scope probe attached.

THE ORIGINAL version of 'The Poor Man's Caesium Clock' by Dave McQue, G4NJU [1] was, in my opinion, and I'm sure he won't mind me saying so, 'a Rolls Royce job'. It is complex because it takes a composite video signal from the SCART socket of a TV, separates out the line time base (LTB) pulses and uses them to phase lock a 10MHz crystal oscillator. It uses six ICs. The main snag is that only the most modern colour TVs have SCART sockets; and there could be mains voltage on the earth lead of the socket if the plug has been incorrectly wired.

The following gives a simplified version, where the LTB signal is picked up directly from the TV without any direct connection and used to set a crystal to exactly 1MHz (within the limits of the LTB frequency) using an oscilloscope.

## THEORY OF OPERATION

SINCE THE 64th harmonic if the LTB frequency is exactly 1.000MHz, if a 1.00MHz signal is applied to the Y input of the 'scope when its timebase is synchronised to the LTB frequency, it will result in a stationary pattern. Of course, frequencies of the 63rd and 65th harmonics, 984.375 and 101.15625 kHz respectively, will also give a stationary pattern - but most 1.000MHz crystals cannot be pushed or pulled that far.

The LTB produces many harmonics and the second (30.125kHz) is particularly strong in my case. It is equally good for the purpose. The nearest alternative harmonics that give a stationary pattern are the 31st and 33rd (986.75 and 1,03125kHz respectively).

*59 Ditton Road, Surbiton, Surrey KT6 6RF.

## COMPONENTS

**Resistors** (all 0.25W metal film)
R1 470k
R2 470R
R3 470k
R4 470R

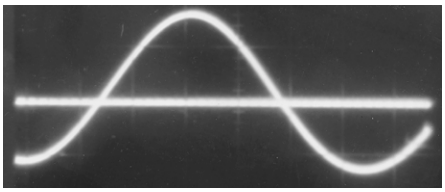
**Capacitors**
C1 300pF polystyrene
C2 300pF polystyrene
C3 0.1µF polyester
C4 100pF ceramic
C5 100pF ceramic
VC1 0-40pF trimmer

**Inductors**
RFC1 470µH
RFC2 100µH

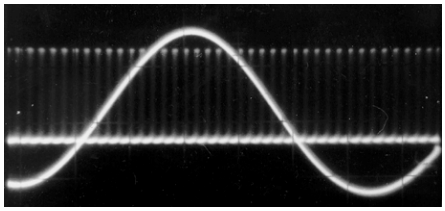
**Semiconductors**
TR1 2N3819
TR2 2N3819
D1 1N4148

**Miscellaneous**
X1 1MHz crystal

X1 and VC1 are the only critical components. All others may be substituted by similar types.



**The second harmonic signal (30.125kHz) displayed.**



**1MHz pulses on the 'scope second channel.**

## PICKUP COIL

THE LTB SIGNAL is picked up by a ferrite-cored antenna which is wound with about 400 turns of Litz wire on a SRBP former (see the photo below). Before starting the winding, make two nicks in one end of the former and bond in two short pieces of 1.5mm diameter tinned copper wire.

In order to solder Litz wire, the insulation must be removed by burning it off in a cool (methylated spirit) flame. I put a small quantity of meths in a metal bottle top, ignite it, burn off the insulation, then quench the wire in the spirit, putting out the flame by placing a piece of wood or metal over it. The wire should be bright and clean.

Quickly wrap it round one of the tags and solder it. Note that Litz wire is very weak, especially when it has been annealed (softened) by heating. Now wind the first layer of as many turns as possible on a layer of Kleenex®, but without getting closer than 6mm to the end of the former. After that, put on a strip of Kleenex and wind the second layer, followed by Kleenex, another layer and more Kleenex. When you have wound about 400 turns, stop, cut the wire, prepare the end as for the start, and solder to the other tag.

Finally, give the assembly a good soaking in polystyrene dope (polystyrene model makers' cement, or see below for a DiY dope recipe). Dry it thoroughly, preferably on a warm radiator (put it on some polythene film to avoid it sticking to the radiator and causing problems with the 'Station Manager'!), but not until most of the solvent has evaporated. My pickup coil had an inductance of 9.2mH, a self-capacitance of 125pF and a Q of about 80 at 70kHz (measured on an elderly Marconi Q meter).

## THE CIRCUIT

TO USE THE pick-up coil, fit a trimmer capacitor (the photos top right show two sides of the one I used, but any compression trimmer of about 2000pF will do) in parallel to tune it to 30.125kHz and connect it to the Y input of the 'scope (tuning for maximum display height). In my case, I put the pick-up coil on top of a 250mm black and white TV (a Ferguson type 3840) in the shack and used a (cheap) double beam 'scope. Although the waveform of the LTB is non-sinusoidal, it appears as a sine wave because the pick-up is tuned. If you want to pick up the fundamental, a further 4.7nF or so of parallel capacitance is needed; a little experimentation would be needed here.

**Two views of the trimmer used.**

My 1.000MHz oscillator is of conventional design (**Fig 1**) with an added harmonic generator. The trimmer on the oscillator is adjusted until the 1MHz pattern remains stationary, as shown in the photo below left. End of calibration.

## NOTE

THIS METHOD could equally be used with a 10.000MHz crystal oscillator and a divide by ten IC (eg a 7490).

## REFERENCE

[1] 'The Poor Man's Caesium Clock', by Dave McQue, G4NJU, *RadCom* January 1999, p35 (but see also April p31 and June p17). ♦

### DiY POLYSTYRENE DOPE

BREAK-UP SOME *clear* polystyrene. I use the containers for my wet-shave blades, but any polystyrene (eg old audio cassette tape cases) will do. Put it in a glass jar with a well fitting lid, cover with cellulose thinners, then screw down the lid tightly. Leave for day or three, agitating form time to time. When it has all dissolved it *should* have the consistency of light oil. If it is too thick, add more thinners; if too fluid, add more polystyrene.

A simple test for polystyrene is to drop a piece onto a hard surface. Polystyrene goes 'clink', rather than 'thud'!

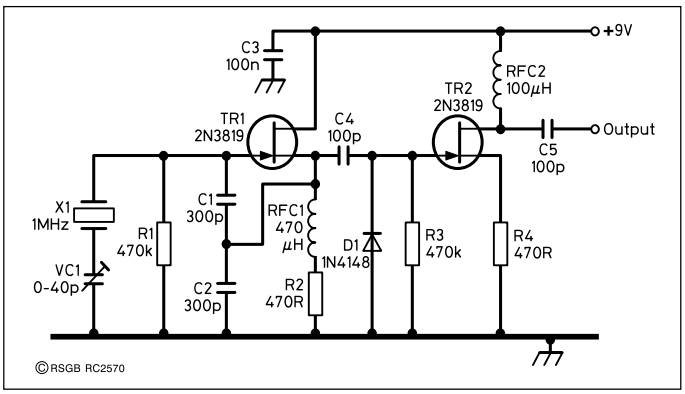
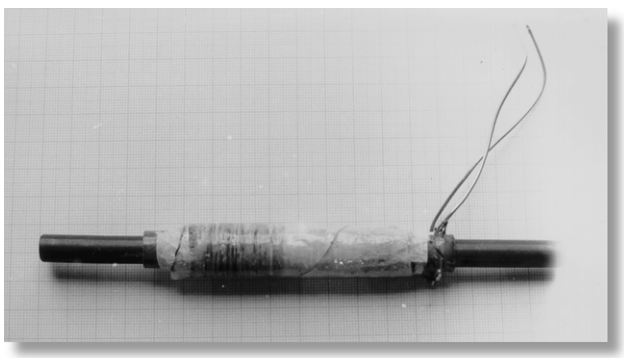



**Fig1: Circuit of the 1MHz crystal oscillator.**



**The completed pick-up coil (the background is 1cm squares graph paper).**

# inpractice

by **Ian White,** G3SEK*

**http://www.ifwtech.demon.co.uk/g3sek E-mail: g3sek@ifwtech.demon.co.uk**

## GAIN FROM STACKING

*IF TWO IDENTICAL beams are stacked, the gain goes up 3dB (at least that's what I've heard). If there is 100 watts going to the antennas, only 50 watts goes to each one, so what happened to the gain - it seems that the ERP is the same?*

FORTUNATELY, THAT'S not quite correct. The voltages received from each antenna add in phase (in the most favoured direction) which actually gives an increase of (2 x voltage) = (4 x power) = 6dB (**Fig 1a**). But you are only feeding half the available power to each antenna, so you lose 3dB there, giving a net stacking gain of 3dB for two identical antennas in free space. Note that this is only in the most favoured direction where the two voltage vectors add in phase. Gain in this direction is achieved at the expense of cancellation in other directions - you don't get anything for nothing! However, if you consider one antenna and its ground image, it almost seems as if you do. As shown in **Fig 1b**, once again the voltage vectors from the direct and ground-reflected rays add to give 6dB gain at the most favoured angle, and this time you get to keep the whole 6dB - or rather, you would if the ground were perfectly reflecting and flat for a large distance all around. Even so, the gain at the most favoured angles is still obtained at the expense of cancellation at other angles, and in practice there are also significant losses involved in ground reflection.

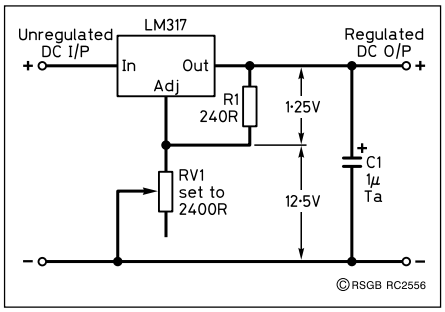



**Fig 2: Minimal circuit for an LM317 adjustable three-terminal regulator. Many other adjustable regulators follow this pattern.**

*BUT THE TYPICAL figure given for the stacking gain of two Yagis is 2.5-2.9dB. Why not 3dB there, too?*

SOMETIMES THE 'TYPICAL' figure includes an allowance for losses in the power splitter and the extra lengths of cable involved. More importantly, the maximum of 3dB is rarely achieved because the Yagis interact and detune each other. It's a misconception to treat each Yagi separately when they are stacked together, because all the elements interact with all the others. Particularly when two long Yagis are stacked, many of the elements are closer to those on the other Yagi than those on the same boom, so it's no surprise that the two interact (perhaps we should be more surprised at how *little* they interact). One of the marks of a well-optimised Yagi design is its tolerance to stacking without significant loss of gain, and in some designs the computed stacking gain can be as high as 2.9dB before you allow for the extra losses in the feed system. As a technical curiosity, there is always the possibility that a poor Yagi design may actually be brought *closer* to optimum by the interactions due to stacking, which explains why certain Yagis in computer modelling can show stacking gains of 3.1dB!

For further details of stacking Yagis for the same and different bands, see my web site.

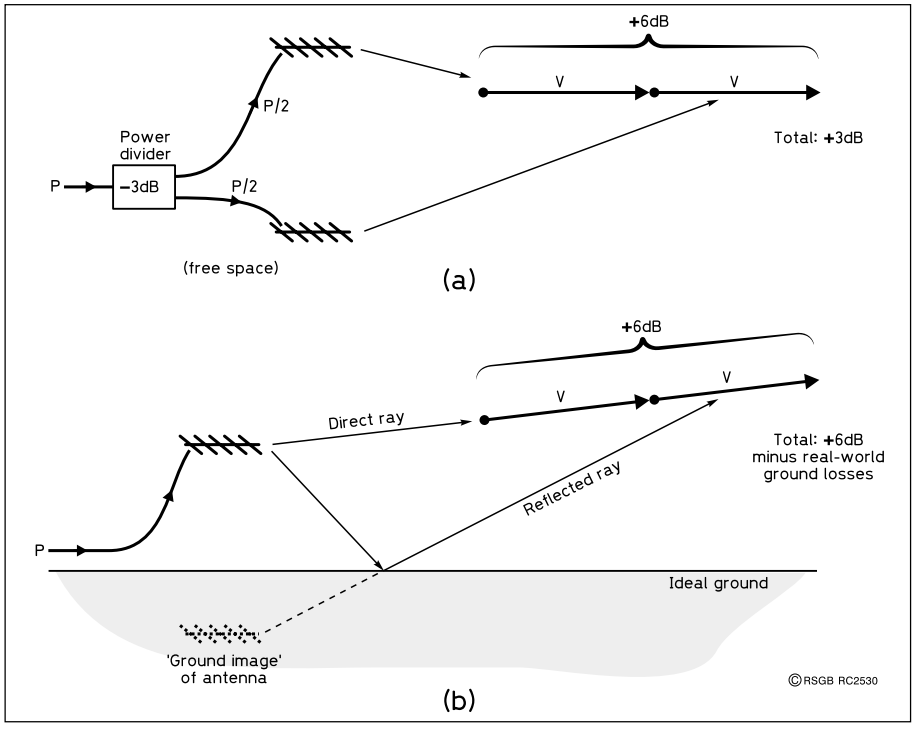



**Fig 1: (a) Voltage vectors from two stacked antennas in free space add to give 6dB gain, but equal power division brings this back to 3dB. (b) Voltage vectors from one antenna and an idealised ground image add to give 6dB gain at the most favoured angle (angles shown distorted). Practical ground gain over real earth is likely to be significantly less.**

## LM317 REGULATORS

*SOMEONE SHOWED ME a circuit for an LM317 adjustable voltage regulator that has a lot more components than the standard circuit. What are the extra components for?*

**FIG 2** IS THE minimum circuit for an LM317, and many similar adjustable three-terminal voltage regulators. There are just four essential components including the IC. When first introduced, the LM317 was revolutionary because it had no direct connection to the common (ground) rail. It works by always maintaining a constant 1.25V across the resistor R1 connected between the OUT and ADJ terminals, and the ground reference is via the voltage divider R1-RV1. Classically, R1 is 240Ω, so about 5mA flows through R1 and then through RV1 to ground. However, the current at the ADJ terminal is only about 50 microamps. Because R1 and RV1 form a voltage divider across the regulated output, the LM317 will adjust the output voltage to whatever it takes to obtain 1.25V across the R1 part of the divider. In Fig 2, RV1 is set to 2400Ω, exactly 10 times the value of R1. Therefore the LM317 will adjust itself so that the voltage across R1 is 1.25V (as ever) and the voltage across RV1 is 10 x 1.25 = 12.5V. This makes the total regulated output voltage 13.75V. If you adjust RV1 downward in resistance, the voltage drop across it will fall, and thus the regulated output voltage will fall. By setting RV1 to zero, the regulated output voltage comes down to its minimum value of 1.25V. Increase RV1 and the regulated output voltage will rise - but only up to the point where it's about 2V below the minimum unregulated voltage at the IN terminal.

That 2V figure is called the 'drop-out' voltage. Unless at least this much 'headroom' voltage is maintained between the IN and OUT terminals at all times, the regulator cannot hold the output voltage constant. Instead, it will follow the input voltage down with about a 2V gap. **Fig 3** shows what happens. The reservoir capacitor is charged through the rectifier diodes during the part of the AC cycle where the input voltage to the diodes is higher than the voltage on the capacitor. When the AC voltage

**52 Abingdon Road, Drayton, Abingdon, Oxon OX14 4HP.*

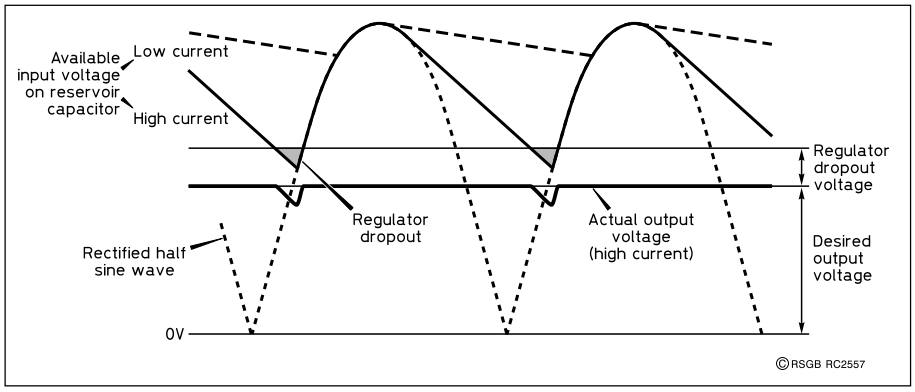



**Fig 3: Dropout in a voltage regulator at high current causes negative spikes on the output voltage. The cures are higher transformer voltage, higher reservoir capacitance and/or a low-dropout voltage regulator.**

falls below the capacitor voltage, the circuit has to survive on the stored charge in the capacitor, so the voltage on the capacitor falls continually until it is recharged from the mains transformer. As the current demand increases, the minimum voltage gets lower and lower - compare the 'low current' and 'high current' ripple waveforms in Fig 3. The voltage regulator can only function if its input voltage is greater than (desired output voltage plus regulator dropout voltage). Whenever the negative part of the ripple waveform falls below this critical value, the regulator 'drops out' and the output voltage will fall. Each time the ripple voltage climbs out of the dropout zone, the regulator takes hold again and keeps the voltage steady until the next dip a half-cycle later. This results in negative spikes on the output voltage, which get wider and deeper as the current demand is increased. The negative spikes can have quite severe effects on circuit performance before you notice the reduction in the averaged output voltage.

The fourth essential component in Fig 2 is C1, 1µF across the regulated output. This is essential in order to maintain stability against high-frequency oscillation if the load current shifts suddenly. The LM317 is a feedback regulator containing a high-gain amplifier and it is potentially unstable without the presence of C1 and some resistive load. Instability is at its greatest when C1 is between 500pF and 5000pF, so a higher value is necessary to 'swamp' any low-value capacitors in the downstream wiring. A minimum load current of 5mA is provided automatically by R1 and RV1, and you should not increase the resistor values significantly in an effort to save current. Sometimes you can get away without C1, if sufficient capacitance is provided in the circuit downstream, but it's sound engineering practice to include C1, to make it a tantalum bead electrolytic for good high-frequency performance, and to mount it quite close to the IC to minimise the inductance or resistance of the connecting wiring. Correction: sometimes you *think* you can get away without C1 - but a surprising number of so-called voltage regulators are actually oscillators! The instability doesn't show up in a DC voltage measurement, but it's very clear on the oscilloscope. AC on the supposed DC supply rails can be responsible for a wide range of strange circuit behaviour, and it's always worth checking the supply rails with a 'scope to confirm that they are free from oscillations and dropout spikes.

Fig 2 is simple enough - so how did we get from there to **Fig 4**? What are all those extra components for? Basically, they're to ensure that the IC will perform properly under all conditions and that it will survive some common situations that could destroy it in the simpler circuit of Fig 2. C2 provides high frequency bypassing close to the input of the IC. Usually the reservoir capacitor upstream of the IC serves this function well enough to maintain stability, but C2 makes certain of it. You will also notice that C1 has increased to 10µF, to give a better margin against instability caused by strange loads. C3 improves the AC ripple suppression by smoothing the voltage at the ADJ terminal. However, C3 can cause a fatal problem if the load is short-circuited, or even when you merely switch off. While the OUT terminal is being pulled down by the load, C3 tends to hold the voltage at the ADJ terminal up, and this voltage reversal between the OUT and ADJ terminals can destroy the LM317. D1 limits the reverse voltage to about 0.6V, discharging C3 through the load resistance, and thus saves the IC. In normal operation D1 is reverse-biased and has no effect, but its current rating must be sufficient to handle the discharge pulse out of C3; any 1N400x-series diode is good enough. D2 provides basic protection against reverse voltage being applied to the OUT terminal, for example if you had been charging a battery and forgot to disconnect the battery before switching off the mains. A high value of C2 could have the same effect of reversing the voltage between the IN and OUT terminals at switch-off, which would again destroy the LM317. D2 steers any reverse voltage around the IC, and once again any 1N400x-series diode is good enough. Remember: never use C3 without D1, and never use a high value for C1 (or allow one to be connected downstream) without also including D2.

Finally, you'll notice that we have added R2 and that RV1 is wired differently from Fig 2. R2 is there to set a minimum output voltage. This may not always be necessary, but if we wanted a specifically 13.8V power supply using the resistor values of Fig 2, it doesn't make sense to use a 5k pot for RV1 in order to get the required value of about 2400Ω. It's much better to use something like a 500Ω pot, and a 2200Ω resistor at R2. This gives ten times finer adjustment of the output voltage, over the relatively narrow range required. Note also that the slider of RV1 is now connected to one end of the track. Fig 2 is a bad way to connect a simple variable resistor, because if the slider loses contact with the track, RV1 will become a complete open-circuit. What happens next will depend on the specific circuit, but it usually won't be pleasant. In the case of Fig 2 it will fool the LM317 into believing the output voltage has fallen, so the IC will yank the output up to its maximum value. You may not notice a momentary loss of contact as the wiper of RV1 slides along the track - but whatever is connected to the output terminals surely will! Connecting the wiper contact of RV1 to one end of the track minimises the possible spike in output voltage, as also do the addition of R2 and reduction in the value of RV1.

Many other three-terminal regulators follow the same pattern as the LM317, and benefit from similar protection. However, you need to check the data sheet about the input and output bypassing requirements. Capacitor values that are necessary for one type of regulator IC can actually provoke instability in a different type, so don't assume they are all the same - they aren't! ♦

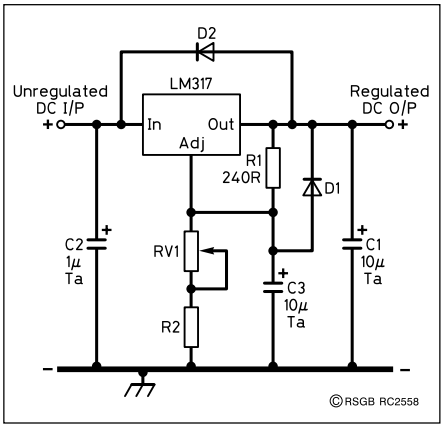



**Fig 4: More complete circuit for an LM317 and similar regulators, with essential protection against transient reverse voltages.**

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

# eurotek

edited and translated by **Erwin David,** G4LQI*

SILENT TUNING requires a dummy load in which, during tuning, almost all of the transmitter output is dissipated. The small remaining fraction of the RF is used to feed a bridge circuit with null-indicator. Zero indication denotes perfect tuning and matching of the antenna system. If the meter sensitivity is adjusted for full deflection with an infinite SWR (antenna disconnected), the meter indicates the SWR under operating conditions.

The technique is not new [1]. 100W dummy loads used to be made up of non-inductive carbon resistors, eg fifty 2W units or one very large one, generally in the shape of a tube with gold-coloured ends which clip into large fuse holders; the brand names 'Welwyn' and 'Globar' come to mind. To increase their rating, some such dummy loads were sealed in a tin full of oil. If a 50 or 75Ω dummy load for the full transceiver power already is available, it may be used externally to the OH9NB unit.

More modern thick-film resistors are featured in OH9NB's design. He used a 100W thick-film resistor no larger than 1½ x 1in; although this rating depends on it being mounted on a heatsink in the manner of power semiconductors. Another, 20W, thick-film resistor actually comes in a standard TO220 package.

## THE OH9NB DESIGN

THE CIRCUIT IS shown in **Fig 1a.** With the switch up, the transmitter is connected to the ASTU [2], bypassing the instrument. With the switch down, the transmitter power is fed into the 100W dummy load and, in parallel with it, through the 20W resistor to points A and C of the 51Ω bridge. The impedance of the antenna, as tuned and matched by the ASTU, is the fourth leg of the bridge, that between points C and D.

If the antenna is perfectly tuned and matched to 51Ω [3], purely resistive, the bridge will be in balance and the RF voltage between points B and D will be zero. If any other impedance appears between points C and D, there will be an RF voltage between B and D, which is rectified in the germanium diode and fed, through the 3.9kΩ resistor and the sensitivity pot, to the moving-coil microammeter.

When transmitting with the switch down and the antenna disconnected, the bridge sees an open circuit between C and D, ie an infinite SWR. If under this condition the sensitivity pot is adjusted for full-scale meter deflection, lower meter readings, with the antenna reconnected, will correspond with real SWRs; see **Table 1**.

Where a legal-limit power amplifier is used, the instrument should be inserted between the transceiver and the amplifier. When the switch is down, the amplifier must be kept off, either manually or by inserting a third pole of the switch into the amplifier's PTT line.

***Silent tuning** is an operating technique which permits adjustment of a manual ASTU without causing annoying and unnecessary QRM. **Benny Aumala, OH9NB**, designed a simple instrument for that purpose which doubles as a 100W dummy load and an SWR indicator. He demonstrated it to a UBA club, after which **ON5TQ** placed it in CQ-QSO 12/99.*

| µA | SWR | µA | SWR |
|---|---|---|---|
| 0 | 1.0 | 17 | 2.0 |
| 6 | 1.2 | 25 | 3.0 |
| 10 | 1.5 | 50 | ∞ |

**Table 1: SWR readings.**

## PERFORMANCE

WITH THE components indicated in Fig 1, less than 1/200th of the transceiver output will reach the antenna during 'silent' tuning.

With the antenna disconnected, the potentiometer can be set for full-scale meter deflection at any transmitter output between 5 and 100W; it is not necessary to reduce transceiver output for silent tuning. If a less-sensitive meter is used, the 5-watt level may be insufficient, but zero meter deflection will still indicate a proper match.

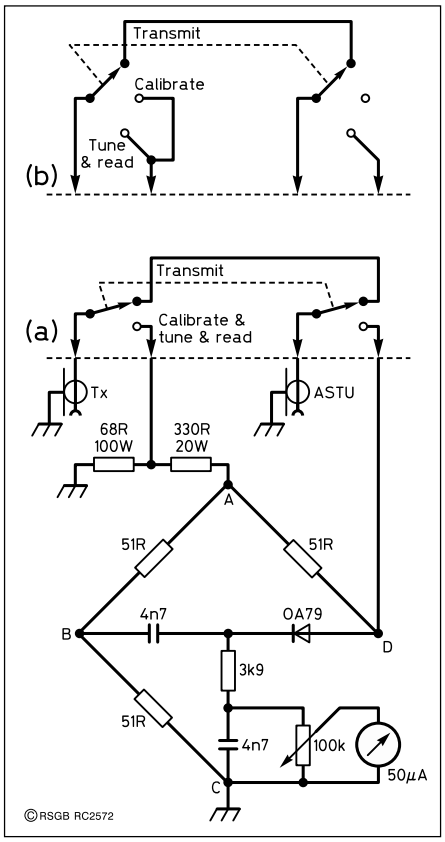



**Fig 1: OH9NB's silent tuning instrument. (a) with the original DPDT toggle switch, (b) with a 3-way switch which adds a 'calibrate' position.**

The instrument works fine on all bands from 1.8 - 50MHz. At 75MHz, its insertion caused an SWR of 1.2:1, suggesting that it would still be useful on our 70MHz band.

## COMPONENTS

SEVERAL PARTS deserve some consideration.

The 68Ω/100W BDS resistor is Farnell number 776-324 or RS number 225-1216. The 330Ω/20W MPR resistor is Farnell number 551-612 or ES number 426034D. Maplin number M51R (1% carbon, 0.6W, 50ppm/ºC) would make ideal bridge resistors.

At 100W, the switch must handle 1.4A at 70V RF if the load is a perfectly resistive 50Ω, much more if the antenna is not well matched. If a mains-type switch is used, as OH9NB did, it must be derated for RF. A DPDT toggle switch rated 250V AC at 10A (Maplin JK29G) is fine. A 3-pole 3-way switch obviates disconnecting the antenna for SWR calibration and also can switch an amplifier PTT line; See **Fig 1b**. Lorlin rotary model CK1027, Cirkit number 53-21027 would do if no switching were attempted while transmitting, but you would not want to do that to your transmitter anyway! More robust ceramic transmitter band-switches are frequently seen at rallies.

No 50µA moving-coil panel meters appear in the catalogues of any of the vendors named above, and 100µA models only at prohibitive prices. Suitable meters can be found in obsolete instruments sold at low prices at rallies. It is also possible to use an external analogue multimeter, but care must be taken that it is not affected by stray RF; a capacitor directly across the meter movement sometimes helps.

The case also serves as a heat sink for the power resistors. OH9NB uses a diecast aluminium box similar to Eddystone model 10758PSL, which measures 145 x 95 x 47mm and is sold by ES. It is not nearly large enough to transfer 100W continuously to the ambient air, but will do so long enough to tune the ASTU. Benny's rule: as long as the case is not too hot to touch (60ºC), you are OK.

## NOTES

[1] See G3LHZ's article in *RadCom* May 1981, pp420-422; and PA0FRI's in 'TT', *RadCom* April 1995, p63.

[2] See G5RV's 'Improved Z-match ASTU' in *RadCom* October 1985, or *HF Antenna Collection* (RSGB).

[3] Though nominally 50Ω, 51Ω bridge resistors were chosen because of their easy availability. The error introduced is insignificant. ♦

** 22 Island Wall, Whitstable, Kent CT5 1EP.*
*E-mail: eurotek.radcom@rsgb.org.uk*

# Newcomers' News

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


**Project Millecom - World Youth on the Air (see Millennium Events).**

COMMUNICATION is a two-way process and your feedback is coming in thick and fast. Many thanks to those who have written, phoned or e-mailed. Keep it coming!

## INTERNATIONAL NEWCOMERS

I HAVE TO CONFESS that I had forgotten that *RadCom* has an international readership until I received news from Kenya. Ted, 5Z4NU, hopes to have some Scout or youth club activity off the ground soon and has promised to let us have some photographs in due course.

## SLOW MORSE

FEBRUARY'S column prompted some feedback from Esde, G0AEC. Apparently, slow Morse for newcomers can be found on 3.575MHz at 1400 UK local time on Mondays. The transmissions are run by the Royal Navy Amateur Radio Society with Norrie, G3UEC, or Chris, G3AWR, on the key. Esde also reminded me that FISTS, the society devoted to Morse code, also provides slow Morse practice. You can obtain more details of FISTS by writing to the secretary, George Longden, G3ZQS, 119 Cemetery Road, Darwen, Lancs BB3 2LZ.

Alan, M0MVN, who prompted the earlier piece on slow Morse, is still keen to police the RSGB Slow Morse Contests to see fair play. Are there any other volunteers? Alan is QTHR.

## NOVICE CONSTRUCTION

DAVID BERRY, G4DDW, has been teaching Novices for some time now, with some 23 passes to his credit. During that time he has developed a medium-wave receiver to use with the course AF amplifier. The receiver has just a few discrete components and uses a PCB method that involves no drilling. Six of the receivers have been built at the Rugby ATC and all worked well, even with slight changes to component values. David has provided me with construction details which I am happy to pass on to any interested party. Send me an SASE, please.

Tim Walford has sent me details of the latest kits in his 'Somerset' range and in particular the *Chedzoy* receiver. The receiver was first featured in the August 1999 edition of *Radio Today* and is specifically aimed at newcomers to construction.

Back issues of *Radio Today* are available from RSGB Sales.

Other kits that have found favour with Novice students are those produced by Lake Electronics. John, G0VZD, is the Senior Novice Instructor for Norfolk and he reports great success with the AM receiver kits from Alan Lake who advertises regularly in *RadCom*.

Watch this space for a review and further details on kits for Novices.

## TELEDATA FREEPOST

NEWCOMERS TO data communications will be pleased to learn that the British Amateur Radio Teledata Group, BARTG, has set up a freepost contact address.

Membership of the group is open to anyone interested in data communication within the hobby. Newcomers, whether short-wave listeners, Novices or full licence holders, are always welcomed. If you would like to find out more please write to BARTG, Freepost, NEA8763, Rotherham, S66 7BR. The group also has a web site at www.bartg.demon.co.uk

## EXAM REPORTS

DECEMBER'S RAE and NRAE exam reports have been published by the City & Guilds Institute. The reports should prove useful to those still studying for the exams and to instructors who would like tips for the future.

The RAE report highlights the need to obtain up-to-date copies of the licence conditions. Over half of the candidates were unaware that it is no longer a licence condition to complete the log at the actual time of sending and receiving, although doing so is good practice! The licence conditions for both the Novice and the full licence are now available from the Radiocommunications Agency web site www.radio.gov.uk or by postal application to The Radiocommunications Agency, Wyndham House, 189 Marsh Wall, London E14 9SX.

Well done to all those who made the grade and I hope those who did not make it this time will try again.

The reports are available on the City & Guilds web site, www.kippax.demon.co.uk/c-and-g Copies can also be obtained by sending an SASE to RSGB headquarters marked with the report(s) required.

**Medium-wave receiver by G4DDW (see Novice Construction).**

## MILLENNIUM EVENTS

DURING 2000 we all have the opportunity to bring amateur radio to the attention of the next generation of newcomers to the hobby. Project Millecom aims to involve young people around the world by contacting each other through amateur radio.

I always enjoy showing schoolchildren what amateur radio is all about and Project Millecom provides added interest to Special Event Stations involving youngsters. Why not put on a Special Event Station at your local school's summer fair, or contact the nearest Scout group to see if you can help out with this year's Jamboree On The Air?

Further details of Project Millecom and how to apply for a Special Event Station callsign can be obtained from Fiorina or Catherine respectively, at RSGB HQ. ♦

**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*

# An Op-Amp Tester

By David Clark*

WHEN BUILDING a circuit it is not unusual to find that it doesn't work first time. After fault finding it's not unusual either to find that one of the supply rails had been connected to either an input or output of an Operational Amplifier (Op-Amp). This could be either because of an incorrect link, an unnoticed short circuit between copper tracks, or a direct connection between the IC pins due to a 'whisker' of solder. With a stripboard project it could also be due to an intended break in one strip that has not been completely cut through, or a burr of copper that is shorting onto an adjacent track. It might also be due to a required break that has been omitted.

When the fault has been rectified and the circuit still doesn't work, it then isn't possible to say whether this is now due to there being another fault present or whether it is because the Op-Amp was damaged by the initial fault. The best solution to this dilemma is to check independently that the Op-Amp is working correctly. This simple project will perform just such a check. It can also be used to check that an Op-Amp salvaged from unwanted equipment, for use in another project works correctly. It will prevent time being wasted in checking for construction faults, when it is in fact the component that is faulty.

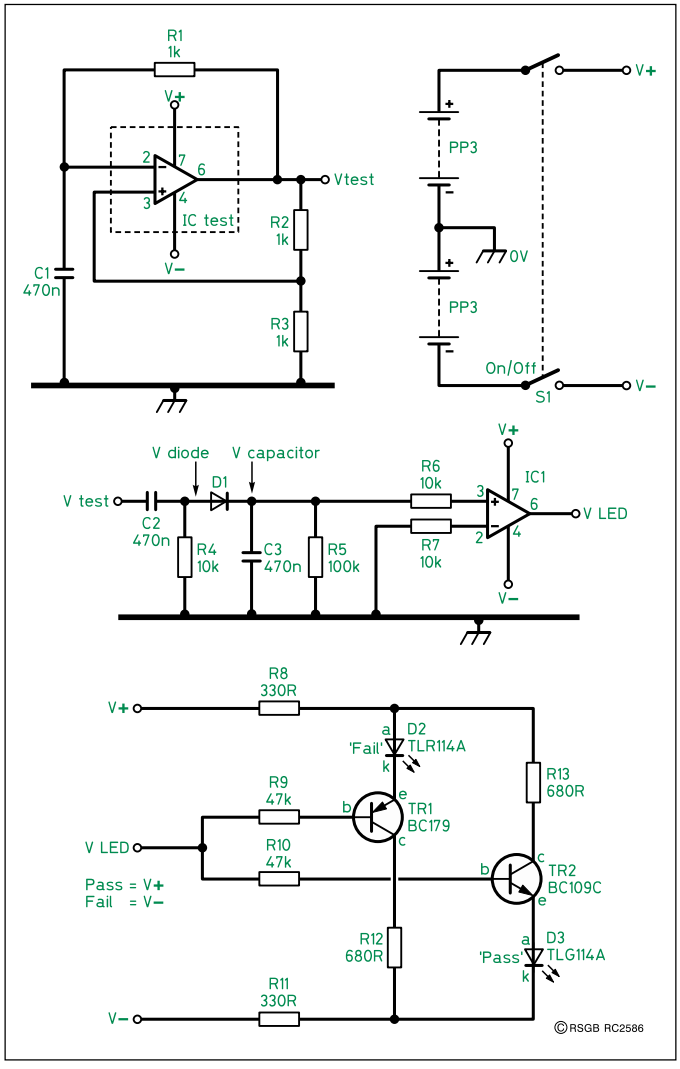



**Fig 1: Circuit diagram of the Op-Amp tester.**

## HOW IT WORKS

WHEN A COMPONENT fails, particularly a semiconductor device, it usually fails catastrophically; ie it fails completely and doesn't just work half-heartedly. In the case of an Op-Amp, this usually means that the output goes to the value of one supply rail or other and stays there. Another possibility is that the output goes to some fixed DC value between the two supply rail limits.

This circuit works by incorporating the Op-Amp under test into an astable oscillator circuit. If the circuit oscillates, the Op-Amp is fine; if not, it is damaged. So that an oscilloscope is not needed to observe the output waveform, the Op-Amp output is connected to a detector circuit and the output from this is connected to an indicator section. The indicator section drives two LEDs, a green one to indicate that oscillation is present, ie the Op-Amp passes the test; and a red one to indicate no oscillation, ie the Op-Amp fails the test.

## CIRCUIT

COMPONENTS R1 to R3 and C1, in combination with the Op-Amp under test, form an astable oscillator (see **Fig 1**). When this is operating correctly, the output Vtest is a square wave with a frequency of about 1kHz. Otherwise Vtest will be a DC voltage.

*58 Murray Road, Greystones, Sheffield, S Yorks, S11 7GG. E-mail: davidclark@btinternet.com*

If Vtest is a DC voltage it will be blocked by C2 and Vdiode will fall to 0V as the right hand plate of C2 discharges via R4 (with time constant C2 x R4). D1 then isolates IC1 from this part of the circuit and both inputs of IC1 are connected via resistors to 0V. The non-inverting ('+') input however is connected via 110k (R5 + R6), whereas the inverting ('-') input is connected via 10k (R7). This means that the bias current entering the '-' input will be greater than that entering the '+' input, deliberately creating a differential input offset voltage. Because of this, and the high gain of an Op-Amp connected without any negative feedback resistors, the output of IC1, V LED, will swing to very nearly the negative supply voltage. This switches TR1 on and TR2 off,

## COMPONENTS

**Resistors**
(all metal film, 0.6W, 1%)

| | |
|---|---|
| R1 - R3 | 1k |
| R4, R6, R7 | 10k |
| R5 | 100k |
| R8, R11 | 330R |
| R9, R10 | 47k |
| R12, R13 | 680R |

**Capacitors**
(all polyester film)

| | |
|---|---|
| C1 - C3 | 470nF |

**Semiconductors**

| | |
|---|---|
| IC1 | LM741CN Op-Amp |
| TR1 | BC179 |
| TR2 | BC109C |
| D1 | 1N4148 |
| D2 | TLR114A red LED |
| D3 | TLG114A green LED |

**Miscellaneous**

| | |
|---|---|
| S1 | DPDT on/off switch |
| Stripboard | |
| Battery clip x 2 | |
| PP3 battery x 2 | |

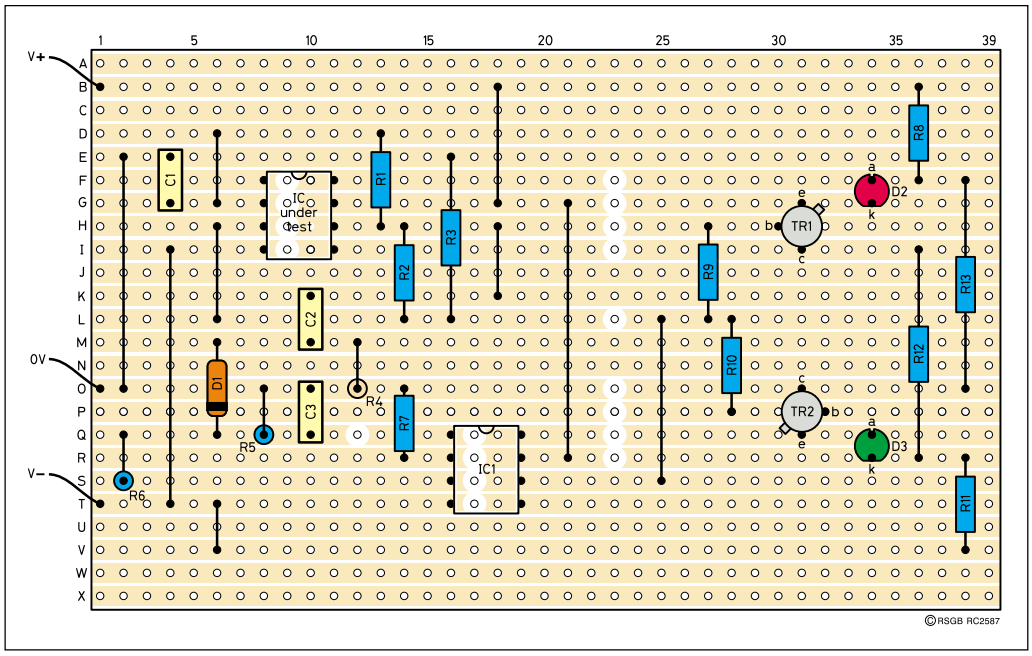



**Fig 2: Stripboard layout and wiring diagram.**

and so the 'Fail' LED D2 lights.

If however Vtest is a 1kHz square wave, C2 will not block the signal and D1 will conduct during the positive part of the waveform. This means C3 will charge up, as R5 is now acting as the discharge path for C3 and the time constant C3 x R5 is long compared to the period of the 1kHz signal. The resulting positive value of Vcapacitor causes the current flowing into the '+' input of IC1 to exceed the current flowing into the '-' input and Vled swings to nearly the positive supply voltage. This switches TR1 off and TR2 on, and so the 'Pass' LED D1 lights.

## CONSTRUCTION

THE STRIPBOARD layout for the Op-Amp tester is shown in **Fig 2**. An 8-pin DIL socket is of course needed for the Op-Amp under test, but IC1 can be inserted into a socket or soldered directly into place as preferred. It is always a good idea to install ICs in sockets though, since as well as eliminating the possibility of damage due to soldering it makes removal for testing much simpler. Care needs to be taken to ensure that the Op-Amp, transistors, diode and LEDs are connected the right way round, and **Fig 3** shows how to determine the correct orientations.

## COMPONENTS

ALL THE semiconductors used in this project are general-purpose types, and the values of the components associated with them are chosen to limit voltages and currents to their working values. Otherwise, values of capacitance and resistance are chosen to give suitable time constants to ensure reliable operation.

## IN USE

ANY SINGLE Op-Amp package with standard DIL pin-out connections that operates with a power supply of plus and minus nine volts can be tested, which covers most situations. Simply insert the Op-Amp to be tested into the test socket, again ensuring correct orientation, switch on, and note which LED lights.

## USING A 12V SUPPLY

IF THE USE of two 9V batteries to power the Op-Amp tester doesn't appeal to you, it is possible to adapt it to run from a 12V power supply. To do this, simply take two 100Ω resistors, make a potential divider (as shown in **Fig 4**), and use this instead of the top right hand part of Fig 1. ♦

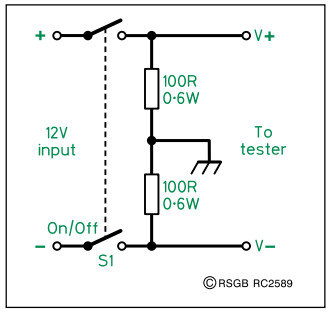



**Fig 4: To power the Op-Amp tester from a 12V supply, substitute the top right hand part of Fig 1 with this circuit. If you do this, remember that the 'chassis' of the tester (denoted by the chassis symbols) will not be at ground potential, so you will need to keep the unit isolated from ground.**

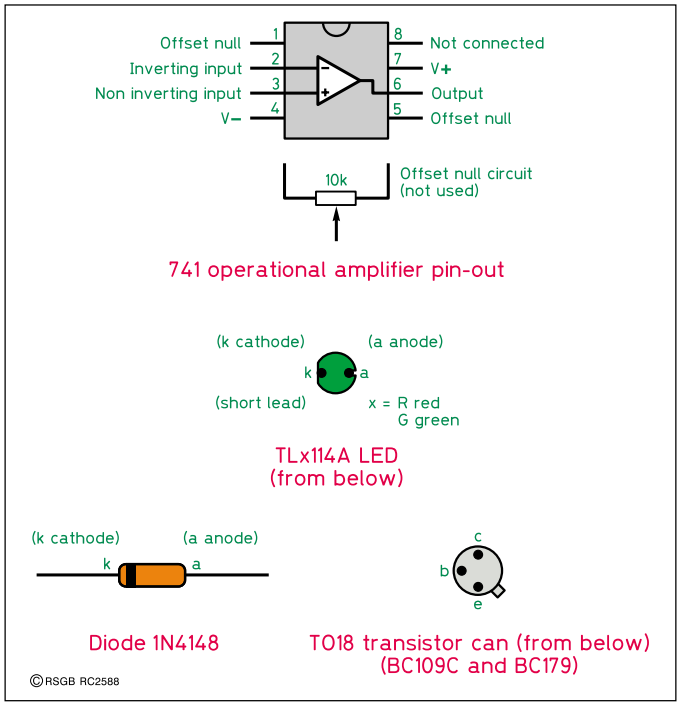
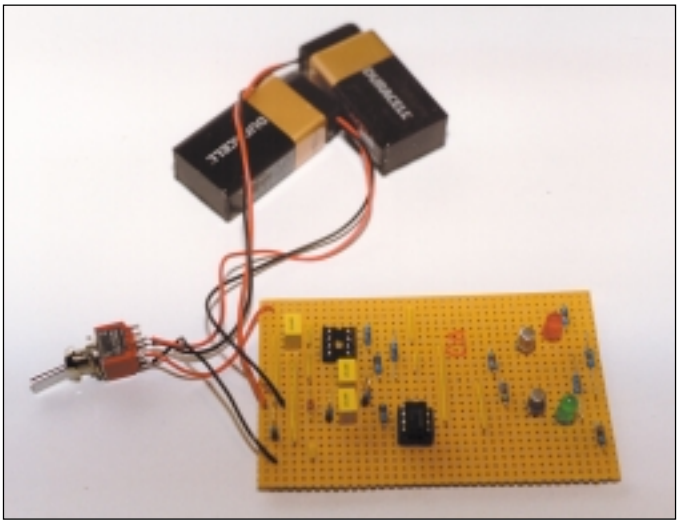



**Fig 3: Orientation of critical components.**



**The completed Op-Amp tester.**

Down To Earth

# An Introduction to Radiation Resistance

By Peter Buchan, G3INR *

RADIATION Resistance is a most interesting and very important phenomenon associated with antennas, but it is one that is not always fully understood. Assume for example that we are testing a transmitter and the indications are that it is supplying 100 watts of power to a resonant half-wave antenna at a height of 1/2 wavelength, fed at the centre with 72Ω flat twin cable. Appropriate steps have been taken to ensure that the balanced feeder and the unbalanced nature of the transmitter output have been catered for, also the VSWR is very low. If the antenna were replaced with a non-reactive 72Ω resistor sufficiently large to dissipate 100 watts, provided the frequency to which the transmitter was tuned was left unchanged, the change would be undetectable at the transmitter end of the feeder.

This is the way that the Radiation Resistance of an antenna is described, perhaps elaborated a little, but essentially the same. For example: *"The total amount of energy radiated from a transmitting antenna can be measured in terms of a Radiation Resistance which is the resistance that, when replacing the antenna at the end of the feeder will consume the same amount of power that is actually radiated"* is typical of the many text books dealing with antennas. Whilst conveniently describing the phenomenon, the impression given might lead you to assume that the Radiation Resistance is in fact a resistor.

## ALTERNATIVE VIEW

LOOKING AT AN antenna in a somewhat different way from that which we are accustomed, it might described as *'a region of transition between a wave guided by a transmission line and a free-space wave'*, or perhaps *'an antenna interfaces between electrons on conductors and photons in space'* (**Fig 1**). Both these quotations make you realise that an antenna is something rather special and that the point of departure of our electromagnetic energy cannot be just a resistor, for if it were, the energy would be dissipated at the site of the antenna and there would be none left to journey onwards.

The complex nature of an antenna when radiating energy, and indeed when receiving it, has been investigated mathematically. It is to the mathematician that we owe the calculation of the radiation resistance of many kinds of antenna, though the dipole is the fundamental building block. For example, the radiation resistance of 'short dipoles' has been carried out and produced the following results:

| Length | Radiation Resistance |
|---|---|
| 1/10λ | 7.9Ω |
| 1/100λ | 0.08Ω |

The radiation resistance of a short dipole is therefore small.

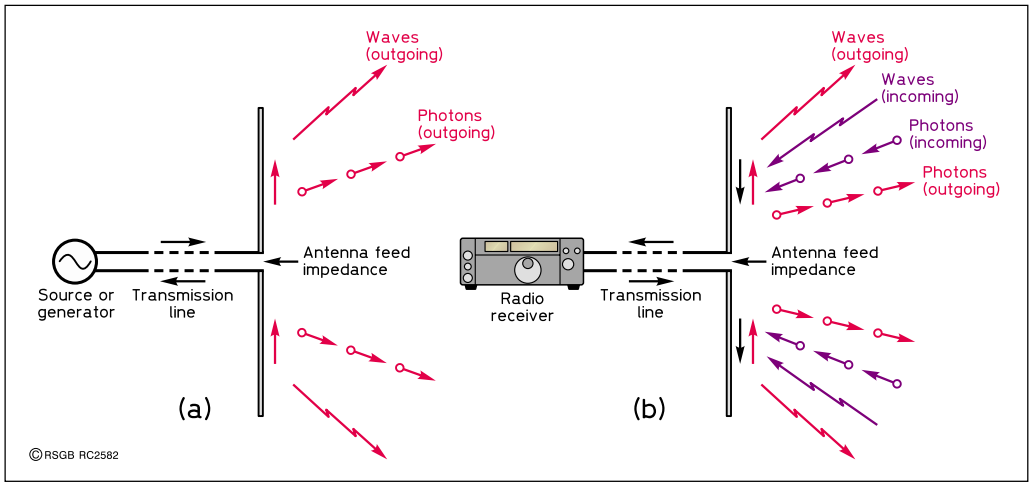



**Fig 1: Energy (a) leaving, and (b) leaving and being received on a dipole antenna. A photon is the quantum unit of 'electromagnetic energy'.**

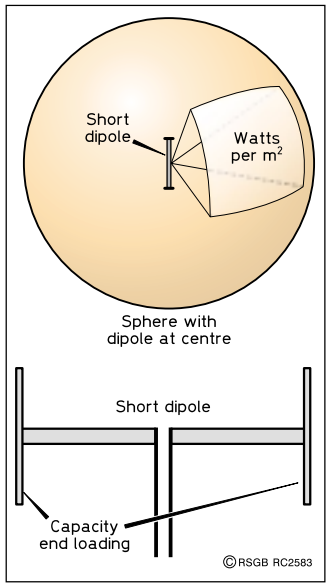



**Fig 2: Radiation resistance is calculated by placing a dipole at the centre of a sphere that is large with respect to wavelength.**

## CALCULATIONS

TO CALCULATE radiation resistance, the dipole is considered to be at the centre of a sphere (**Fig 2**) that is large with respect to wavelength, and here the 'Poynting Vector' of the 'far field' (ie many wavelengths from the dipole) is used to obtain the total power radiated. Assuming no losses, this power is equal to the power fed to the dipole. From Ohms Law it can be calculated that the power P must be equal to the square of the rms current flowing in the dipole, times a resistance R called the Radiation Resistance. This total power is the rate at which energy is streaming out of the sphere surrounding the dipole. For these calculations the length of the dipole is considered to be *very much less*

* 79 Cavendish Avenue, Cambridge CB1 7UR.

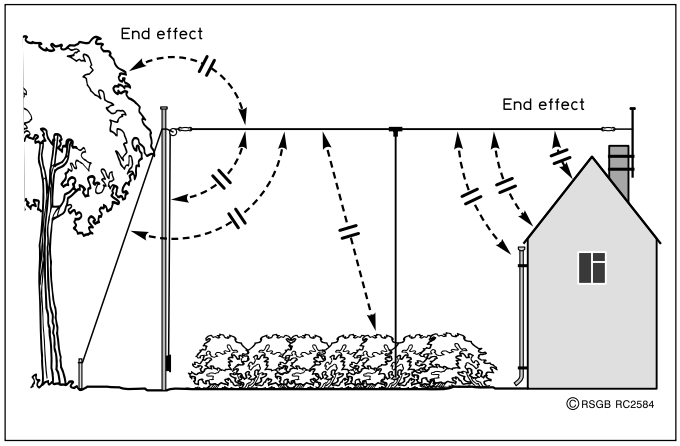



**Fig 3: How radiated energy is wasted due to dielectric losses.**

than the wavelength used in the calculation. All very theoretical, perhaps, but nevertheless shown to be sufficiently near the truth when investigated in a practical situation.

Virtually the same procedure (although different mathematically) is carried out for a half wave dipole, but this time the Radiation Resistance is found to be 72Ω. This is considered to be at the current maximum point on the dipole, ie the centre, which is also the point where the feeder is connected. The half wave dipole may be utilised on *odd harmonic frequencies*, the lowest being the third harmonic where the radiation resistance will be about 90Ω, on the fifth about 120Ω - all of these at the centre of the antenna. For even harmonics the centre point of the antenna will have a high (or very high) resistance, the 72Ω feeder would be unusable and open wire line would have to be utilised.

This of course describes the multi-band antenna. The popular G5RV is non-resonant, except perhaps nearly so on 20m, (about three half-waves), but on 80m the centre impedance will be something like 30Ω resistance and -500Ω reactance (ie 30 - j500Ω).

## PRACTICALITIES

WHEN LOOKING at a practical antenna there will be a number of other points which must be taken into consideration, not the least of which is the environment in which the antenna is erected. The working value of the radiation resistance depends on:

- the relation to ground of the antenna,
- the ratio of conductor diameter to length,
- the proximity of other conducting objects such as masts, buildings, house wiring, telephone wires, etc.

For example, the feed point impedance of a practical half wave dipole is about 73 plus 42.5Ω of inductive reactance (end effect), ie 73 + j42.5Ω.

In addition to the radiated energy, energy is also lost in the resistance of the antenna wire, the resistance of the ground, along with dielectric losses in trees, insulators, and losses in other objects with an imperfect dielectric (**Fig 3**). The losses are brought together and included with the natural radiation resistance when describing the 'feed impedance', which is often used in practice. It is perhaps evident that the true radiation resistance of a particular aerial is not normally measurable, due to the factors mentioned above, hence the feed impedance is equal to the radiation resistance plus the loss resistance, ie

$$R_{antenna} = R_{radiation} + R_{losses}$$

where $R_{antenna}$ represents the feed impedance.

The efficiency of the system is given by:

$$R_{radiation} / (R_{radiation} + R_{losses})$$

and is usually very high when dipoles and other centre fed systems are concerned (in the region of 90%).

Another type of half-wave antenna is the folded dipole. This antenna has a somewhat different feed impedance characteristic. A 2-wire folded dipole has a feed impedance of about 280Ω, though it is generally taken as 300Ω. The feed impedance of a folded dipole varies in a non-linear fashion. For a 3-wire half-wave folded dipole, the feed impedance is 630Ω. In general, for a half wave folded dipole with 'N' wires, the feed impedance is $70\ N^2$ ohms.

Beam antennas are a case where the proximity of reflecting and directing elements change the feed impedance substantially. For a two element beam with 0.3 wavelength spacing, the dipole or driven element feed impedance falls from about 72Ω to about 65Ω, due to mutual coupling. As the spacing is further decreased to the optimum of 0.11 wavelength, the feed impedance falls to 20Ω (**Fig 4**). This indicates that the presence of other antennas nearby any antenna in use will most certainly have an effect on its feed impedance.

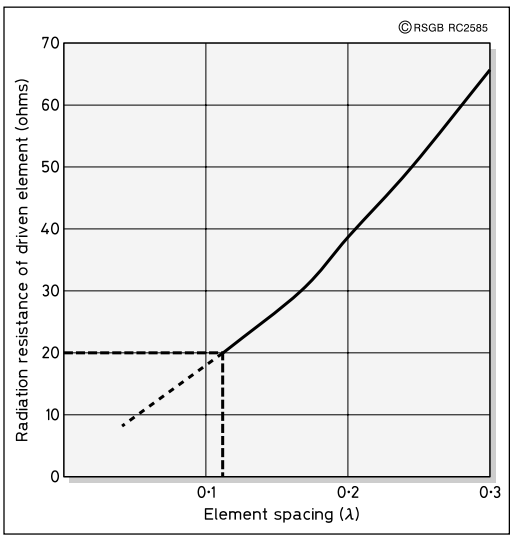



**Fig 4: How the radiation resistance of the driven element of a 2-element bean is affected be element spacing.**

Turning from the horizontal antenna to the vertical, and in particular the quarter-wave vertical fed against ground or radials, in theory this has a radiation resistance of about 35Ω (half the horizontal half-wave dipole). Whilst this may well be correct, the actual feed impedance is rarely - if ever - near to 35Ω. The problem lies mainly with the conductivity of the ground beneath the antenna. Experiments have shown that a number of radials laid out surrounding the vertical will bring the feed impedance to a value that can be matched, and the antenna will take energy. The efficiency of the vertical can be rather poor, but provided sufficient radials are used (up to 40) it can be brought up to about 70%. Whilst the vertical has low angle radiation, good for long distance communication, the nature of the vertical aggravates the mutual coupling, hence the presence of trees, foliage, etc, makes the losses greater, which of course affects the feed impedance.

## SUMMARY

THERE IS A considerable variety of different types of antenna and as many differing radiation resistances. There is also another way that is sometimes used to describe Radiation Resistance. Some textbooks will explain that "it all depends at which point along the antenna the current is measured and where the feeder is to be connected".

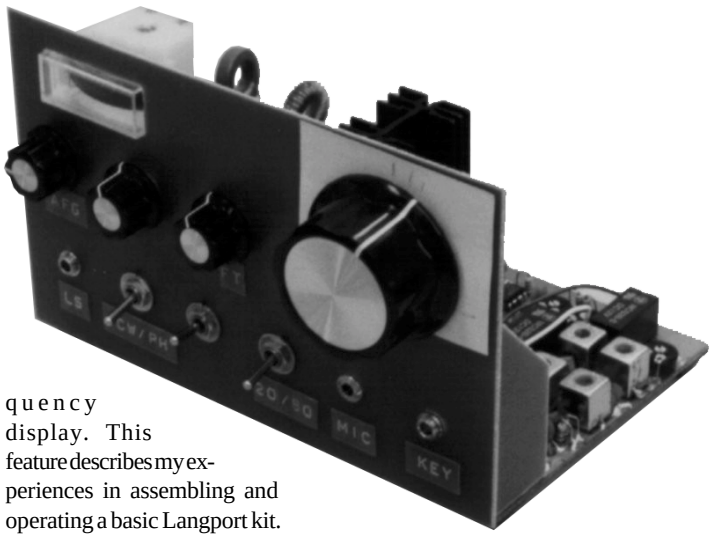
Many antennas are end fed and hence, like the vertical, have a return to the source via the ground. If the antenna happens to be a half wavelength and is fed at the end, the feed impedance is going to be high. But, nevertheless, the current squared times the resistance at that point will equal the energy radiated . . . just the same as the centre fed antenna. The resistance measured is sometimes called the radiation resistance. ♦

# The Langport 80m/20m QRP Transceiver Kit

*Reviewed by Phil Davies, M0AYB* *

THE VAST majority of contacts on the HF (and higher) bands seem to be made using increasingly high tech commercial 'black box' transceivers, and this is understandable given the tremendous capability of modern rigs. While home brewed equipment has always figured in our hobby, such equipment is increasingly seen as uncompetitive on the busy bands. Unless the aspiring home brewer has a very extensive junk box of new and reclaimed components (or knows someone who has), he or she has two choices: track down and acquire all the individual components from commercial sources; or buy a kit, where someone else has tracked down the parts and probably obtained them in bulk at relatively low prices. Kits normally include ready-made and drilled PCBs, a major attraction if you are not interested in - or set up for - PCB preparation.

Many constructional features and kits are for single-band rigs, often CW only. While these provide worthwhile construction experiences and operating enjoyment, if you are not a keen CW operator or if you wish to switch between bands to find good conditions, the constraints are clear. The Langport transceiver kit from Walford Electronics (block diagram shown in **Fig 1**) is more ambitious. It covers the 80m and 20m bands end to end (almost); operates both on CW (with semi break-in) and SSB (changing USB/LSB automatically), features push-to-talk; audio filtering; and it delivers around 5 watts RF output. Additional 'bells and whistles' that can be added include: RIT, AGC, an S-meter, and a digital frequency display. This feature describes my experiences in assembling and operating a basic Langport kit.



At the outset, it is worth stating that such a dual-band/dual-mode transceiver kit is probably not suitable as a first project. Unless the would-be builder has experience of construction (perhaps within the context of the Novice RAE

* *Brooklands, High Brigham, Cumbria CA13 0TJ.*
*E-mail: xenophon@ukonline.co.uk*

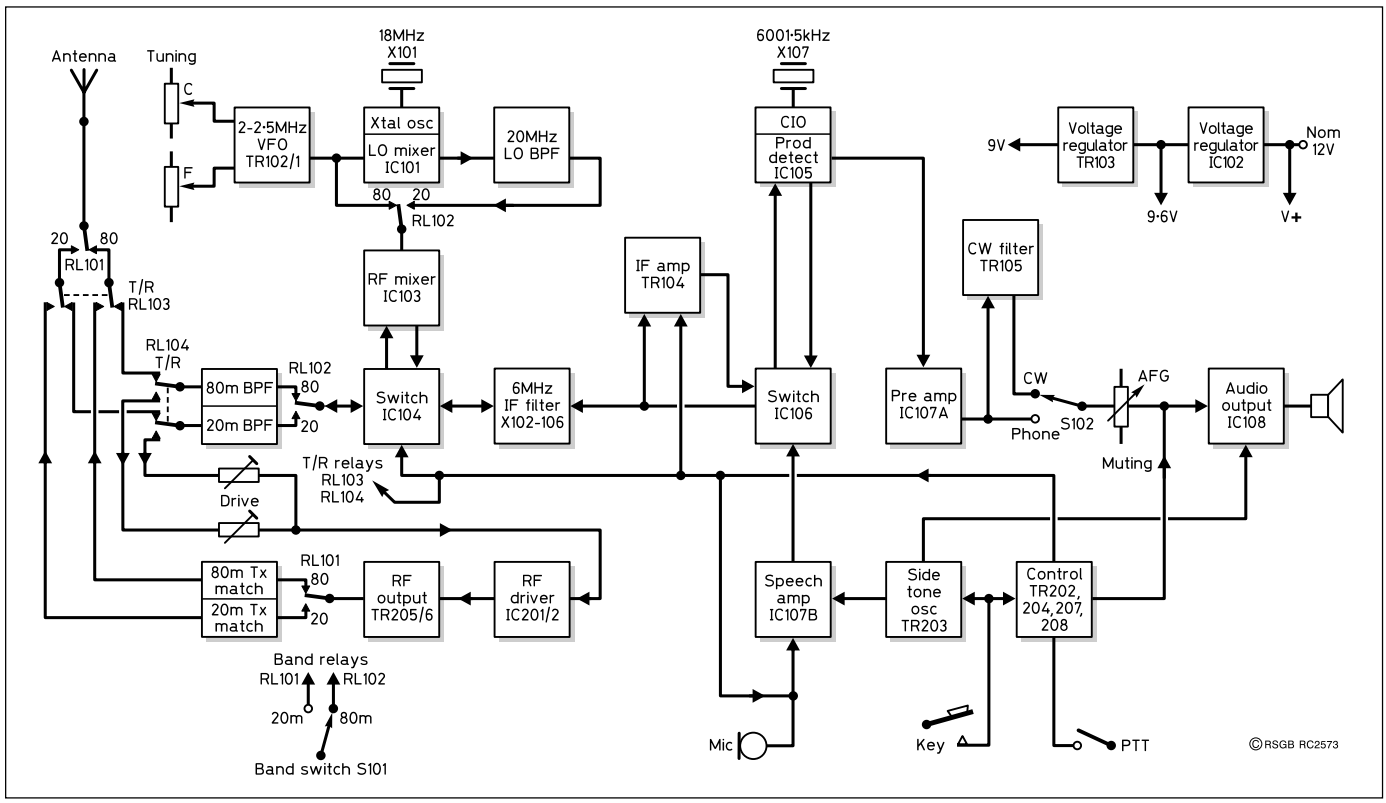



**Fig 1: Block diagram of the Langport dual-band transceiver.**

course, or in the case of myself, crystal sets, an MW receiver kit and a short wave receiver kit by MFJ) he or she would be well advised to start on a simpler radio.

## BAGS OF BITS

ON FIRST SIGHT, the kit comprises a dauntingly large collection of parts, namely:

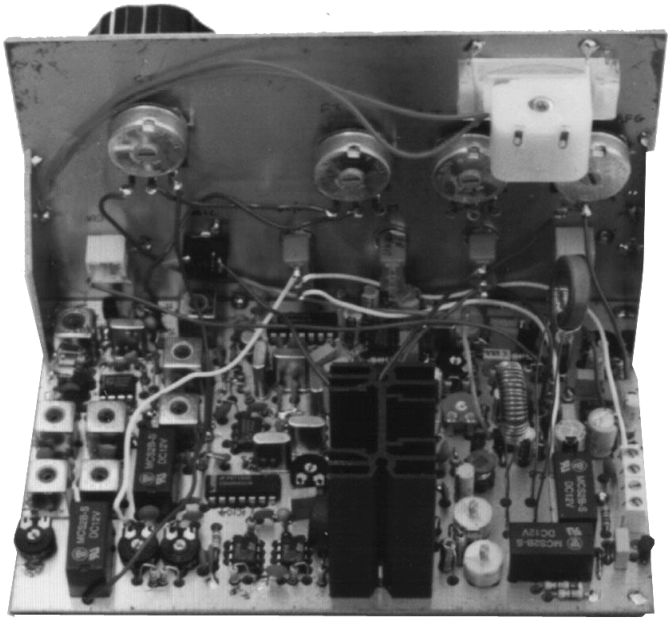
- 213 basic electronic components (relays, resistors, inductors, ICs, etc)
- the main double-sided etched printed circuit board
- a single-sided unetched PCB, which can be used as the front panel, with two small pieces of PCB for side bracing
- various switches, sockets, knobs, a connector block, rubber feet, heatsink, hook-up wire
- a detailed A4-sized construction and operation manual

The kit is therefore quite comprehensive. The only extra equipment needed to use it on air is: a 13.8V 2A power supply; a low impedance microphone with PTT (maybe a 4-pin CB type) and/or a Morse key; a loudspeaker or portable stereo headphones; and an ATU of some sort, connected to an efficient antenna (bearing in mind QRP operation). A power meter (eg a cross-needle SWR meter) is needed for transmitter set-up, together with a 50Ω dummy load. In addition, and in order to comply with the licence conditions, a means of ascertaining operating frequency is needed. A second (commercial) transceiver is a handy way to keep a check on the operating frequency from time to time. There are no surface mount components.

A good deal of construction equipment is needed to build the kit effectively. To test and set up the Langport it is useful to have (or have access to) proper bench equipment, such as an oscilloscope. However, it is possible to complete the project without this.

## APPROACH TO CONSTRUCTION

THE FIRST instruction in the manual is to read through the whole document, preferably twice. However, even following this wise guidance doesn't necessarily provide insurance against going off the rails later on! All the information is there, but as the job gets under way it pays to read both ahead and behind, continuously keeping track of what is required to be done through the various stages. The manual is quite comprehensive; in addition to the building and testing instructions there are sections describing the technical design and manner of operation of the Langport, and setting-up suitable antennas.

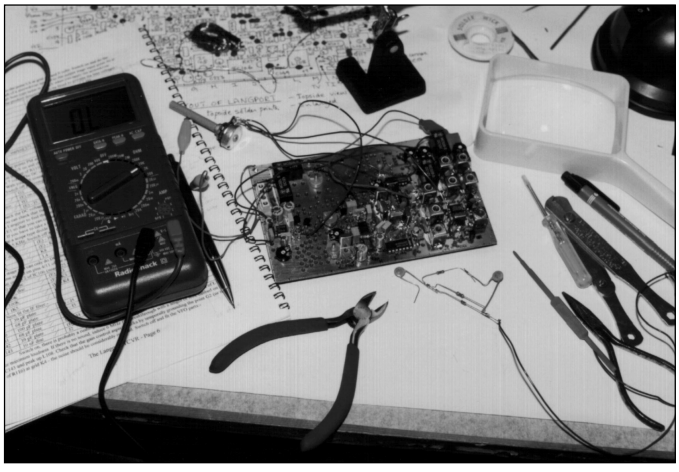


**The Langport's PCB is well-populated with components.**

Having gained some familiarity with the manual, the next action is to check, identify and sort all the components. In addition to interpreting the component markings and colour bandings, it can be useful (and reassuring) to double-check the values of some using a multi-meter, and thereby perhaps pre-empt an error later on. A large proportion of the small components can be temporarily stuck into polystyrene packaging materials and labelled to keep them organised, making it easy to retrieve them when they are needed.

The receiver section is built first, in 14 stages, many of which conclude with a test or set-up activity. All receiver components are identified as 100-series. Construction of the transmitter section follows (200-series components), in seven stages, again with stage-by-stage testing. Component positions are *not* marked on the PCB provided, but it is useful to mark some with a fine OHP pen yourself. Positions have to be established by reference to a 1cm x 1cm grid co-ordinate system and careful examination of the A3 size parts layout diagram.

As part of the construction, many components require an earth connection to the *top* 'ground plane' side of the PCB, as well as the under side. This requires allowance during installation of some components, leaving enough of the relevant wire readily accessible on the upper side of the board to connect to the copper surface. Many cylindrical components have to be installed vertically, and sometimes the exposed upper connector is required to be used as a temporary test connection point. Even non-polarised components (such as resistors) should be inserted the 'right way round', with the body of the component snug to the PCB on the side shown on the diagram. Complying with this instruction leaves the appropriate wire accessible where needed, and ensures that adjacent components can be physically fitted into the limited space available. Fortunately the manual includes a sketch plan showing such layout details.



**On the workbench, surrounded by tools and plans, the Langport's PCB.**

Care is needed with the orientation of transistors and ICs. Some of the transistors require their central leads to be bent in the opposite direction to the one used at the time of manufacture. This is described in the manual.

It is necessary to connect and disconnect the Langport from the power supply many times during construction. Repeatedly connecting to the screw connector block (or PSU terminals) provides an increased risk of accidentally connecting with reverse polarity and thus damaging the rig. It is therefore worth adding a 'one-way-round' plug in the power connector on a short, permanently connected lead, close to the PCB.

The kit is provided with a front panel (undrilled) and bracing pieces, forming a simple and traditional 'L' shaped uncased construction when these are soldered to the main (horizontal) PCB. This utilitarian style is quite adequate, but the builder is of course free to use some form of more elaborate casing.

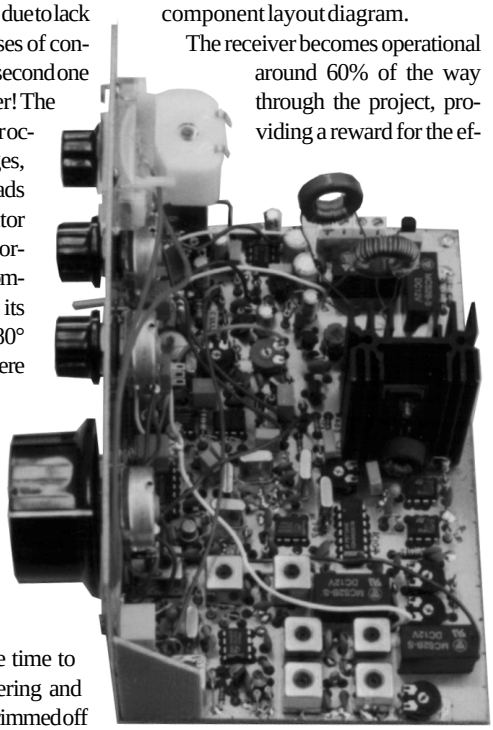
## CONSTRUCTION EXPERIENCE

ACCORDING TO Tim Walford, G3PCJ, of Walford Electronics, the kit should take about 20 hours to complete. This presupposes a certain degree of competence on the part of the builder! My experience is summarised below:

- reading manual, sorting components, planning, setting up: 4 hours
- mainstream construction and testing: 21 hours
- front panel preparation, work on various plugs and sockets: 4 hours
- troubleshooting / reworking: 9 hours

- setting-up / on air testing (say): 2 hours

While the time to carry out the main construction was close to the estimated project duration, the overall job took twice as long; around 40 hours, (or the equivalent of a working week!). About half the over-run was caused by self inflicted problems, due to lack of experience and lapses of concentration - building a second one would be much quicker! The first delay-causing error occurred in the early stages, where some of the leads on a trimmer capacitor were soldered into incorrect holes, placing the component very close to its correct location, but 180° out of position. Since there are hundreds of holes in the PCB, and components can often be inserted relative to of the locations of their neighbours, this error lead to other components nearby being placed incorrectly. This glitch took some time to identify, then unsoldering and repositioning already trimmed off components led to a 2 hour delay.



A bigger problem occurred at the stage of building the PTT / receiver muting section. On completion of this stage, and test powering-up, the relays activated straight away, causing the receive to be permanently muted. After multiple checking of component orientations, absence of solder bridges, etc, with no result, a decision was made to remove some of the PTT components progressively and find out at what point the receiver function may be regained. This was a mistake, as during this process one of the transistors blew in a miniature firework display, scorching a capacitor nearby. After a 'Mayday' e-mail to Tim Walford, and his prompt response, the decision was made to obtain and fit new transistors and diodes throughout this section (about 80 pence worth of components). This proved successful in providing proper PTT function, and it is presumed that on the first installation one of the original components was damaged, perhaps by overheating during soldering.

The PCB is 10cm x 16cm, and the components are closely packed onto it. This requires particular care during construction. It is helpful from time to time to double check component locations, by comparing the tracks on the underside of the PCB with the connections shown in the circuit diagram. This is quite tricky to do, however, and much of the time it is sufficient simply to follow the component layout diagram.

The receiver becomes operational around 60% of the way through the project, providing a reward for the effort up to that point. When tuning across a band, the lack of AGC (in the basic version) is quite noticeable: the range in audio level between strong stations and relatively weak ones is greater than in a commercial receiver. Tuning is by the varactor method, using 'coarse' and 'fine' potentiometers.

In the absence of the proper test equipment recommended in the manual, much of the testing was a bit rough and ready. An Icom IC-706 was useful to check VFO and CIO frequencies. The frequency function of a digital multimeter was less useful than had been hoped. Apart from the device not being able to identify and report the signal of interest reliably, resolution was inadequate. For example, the CIO frequency needs to be set to 6001.5kHz, which can't be checked with a display which can only come as close as 6.00MHz.

## ON THE AIR AT LAST

IN THE LATTER stages of the project, the transmitter is set up for 80m transmission, tweaking for RF output using preset resistors and coils. Having successfully achieved this using a dummy load, an end-fed antenna was tuned-up and the Langport was tried on air. As luck had it, a contest was in progress, so there were plenty of well-equipped strong stations around, keen to work anybody who popped up. Within a short time, six short G and GW contacts had been made using SSB, all with 'pinch of salt' 5-and-9 contest reports. In fact some stations clearly had problems copying the QRP signal, given the busy band conditions. However, the Langport was clearly viable, even using a rather poorly set-up antenna.

At the next session the 20m circuits were set up, enabling an immediate contact with a Swedish station and providing a new IOTA reference for the log. The Langport was fully operational on both bands.

The receive performance seems to be reasonable, but although QRP to QRP contacts have been achieved, in practice (and acknowledging antenna limitations), the Langport seems best suited to contacts with the stronger stations on the band at a given time. The frequency tends to drift slightly during QSOs longer than a few minutes, but this is not a major problem for general use. The performance of the low pass audio filter for CW reception can't be compared to a crystal narrow IF filter on a commercial rig, but it certainly makes a difference.


## OPTIONAL EXTRAS

THE NEXT STAGE will be the completion and fitting of the 'Optional extras' kit. For convenience, a rectangular hole was cut in the front panel for the optional S-meter at the same time all the other holes were formed. This meter is shown in position, but not connected, in the photographs. Similarly, the optional RIT switch and potentiometer have been located on the front panel. The remainder of the optional components will be placed on an additional small PCB (not shown). In the photographs, the two wound toroid inductances have long connector wires. These are trimmed later to fix the toroids closer to the PCB surface. If a digital frequency display were to be added on board, it would require removal and more drilling of the existing front panel. This could be the trigger to abandon the existing construction format and mount the whole rig in an enclosed case with a new front panel, some connectors at the rear, and so on.

According to the manual, there are other possibilities for developing the Langport. With modification, the supply voltage can be raised to 20V, providing a doubling of RF output power. There's a warning, however, that extra power means extra heat generation, which means more VFO drift. By assembling a version with alternative 'frequency determining parts', different band coverage could be achieved: SSB and CW operation could be obtained on 20m and 160m, or 160m CW and any other HF band up to 10m on SSB and CW.

## CONCLUSION

PERHAPS constructing your own rig is a rite of passage for a radio amateur - it's certainly character building. Fortunately, Tim Walford and other kit providers make it possible for us to maintain this hands-on experience in a world increasingly filled with 'black box' technology. The basic Langport kit costs £128.

Walford Electronics and other kit manufacturers' advertisements regularly appear in *RadCom*. ♦

# product news

## PROSISTEL ROTATORS

THE PST51 pictured left is just one of the wide range of **Prosistel aerial rotators** now being stocked by Vine Antenna Products. Inspiration for researching the Prosistel range came from keen UK moonbounce operators, who wanted something that was capable of turning large VHF EME arrays at a reasonable price. The PST51 fits the bill admirably, but Prosistel also market smaller rotators for more modest installations, and also giants, which are used for commercial HF log-periodics and for 3-element Yagis on 80 metres! All the Prosistel range have worm-gear drives, so no additional brake is needed. Digital-readout controllers give 450° rotation, and read-out to one degree. All models are fully CE and LVD approved, and options include RS-232 control and a variety of mast clamps.

Prices start at £339.

**Vine Antenna Products, The Vine, Llandrinio, Powys SY22 6SH. Tel: 01691 831111. Fax: 01691 831386. Web site: www.gw3ydx.demon.co.uk**

## DSP SPEAKER


FROM THE NCT Group comes a loudspeaker which can remove up to 95% of background noise.

Simply connect the **ClearSpeech®** speaker to a 12 volt supply and plug it into the external loudspeaker socket of your mobile or base-station receiver or transceiver, then enjoy clearer and more intelligible communication. The electronics within the speaker housing provide a continuous and adaptive reduction of white noise of up to 12dB and single-tone heterodynes of up to 50dB.

The ClearSpeech speaker measures 5.5 x 4.3 x 2.5in, has a built-in 5W audio amplifier and comes with a mounting bracket. It requires a 9-18V DC supply at a maximum of 3A.

The price is £199 including VAT and delivery.

**NCT (Europe) Ltd. Unit 3, Munro House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ. Tel: 01954 205502. Web site: www.amateurcommunications.com**

## HF-MICROWAVE?

A NEW all-mode **HF-UHF transceiver** - possibly even HF-microwave - is rumoured to be imminent from Kenwood. The TS-??? is said to be packed with facilities, including many of the datamode features of Kenwood's new TM-D700E 'data communicator', and midi-sized.

Kenwood UK Ltd deny all knowledge of this, but the word on the street is that it will be available towards the end the year.

Expect a price tag under £2000.

**Kenwood UK Ltd. Kenwood House, Dwight Road, Watford, Herts WD1 8EB. Tel: 01923 655284.**

**Web site: www.kenwood-electronics.co.uk**

Note: Product News is compiled from press releases sent in by the manufacturers and distributors concerned. Details are published in good faith, but *RadCom* cannot be held responsible for false or exaggerated claims made in the source material.

# technical feedback

## Echoes from the Leonids

*RADCOM, MARCH 2000*

AFTER READING Trevor Sanderson's interesting article about meteor echoes in the March 2000 edition of *RadCom*, I downloaded the software from the COAA site and tried it out. It took me a few days to find a suitable station for me here in Southern Germany, but today I found a Deutsche Welle station on 17760kHz, probably broadcasting from within Germany. The station was reasonably stable and around S1-2. I left the software running with the result you can see in **Fig 1**. Frequency increases from top to bottom in the picture shown, local time is shown on the top. The faint line wavering above and below the trace I interpret as aircraft. A couple of meteor echoes are on the left, but the most interesting event happens on the right. After a preliminary wobble, the signal splits in two, wavers and fades out, all within a minute or so. The aircraft signals continue, presumably because they are direct reflections of the transmitter. The signal effect is probably a small Sudden Ionospheric Disturbance, maybe pushing the ionosphere down and making a hole, or maybe the ionosphere becomes so turbulent that no reflection is possible. The signal slowly returned over a half hour period. I would be interested if a professional could perhaps put his interpretation on the effect.

Thanks for a very interesting and thought-provoking avenue of experimentation. Also many thanks to Bev Ewen-Smith at the COAA for writing the software.

***Roy Philpott, DJ0OW/G3VCH***

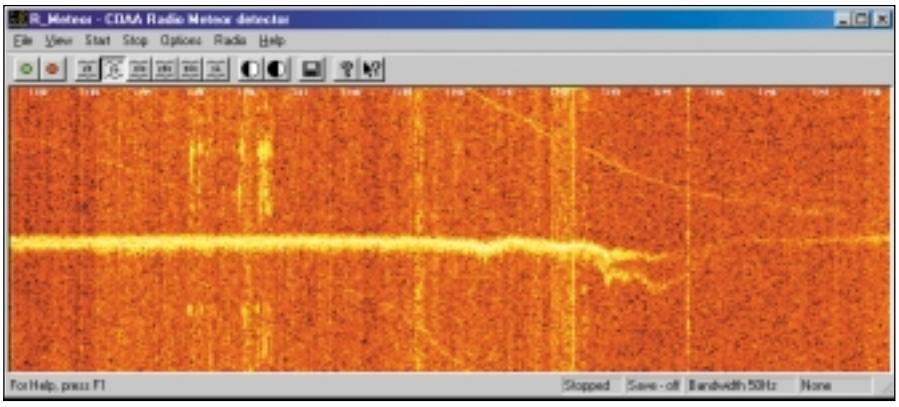



**Fig 1: If you can shed some more light on the effect on the right of the illustration, please let DJ0OW/G3VCH know. E-mail philpott@baden-online.de**

ndS.co.uk ● e-mail: sales@MLandS.co.uk

p://www.HAMRADIO.CO.UK" www.HAMRADIO.CO.UK.

returns. So there. Full UK manufacturers warranty with all items sold.

# am Radio...

ML&S

MARTIN LYNCH & SONS

140-142 NORTHFIELD AVENUE,
EALING, LONDON W13 9SB

OPEN SEVEN DAYS A WEEK.
MON - SAT 9.30 - 6.00,
SUNDAYS 10.00 - 4.00

## Kenwood TM-D700E

At last! Stock! Apologies for the delay. You know what these distributors are like. For full details of the first part of the Kenwood new range for 2000, see our web site or call for a brochure.

**RRP. £529 ML&S £469**
**AND PAY US IN SEPTEMBER, INTEREST FREE.**

## TS-870S

It started the DSP trend going and is still one of the finest HF transceivers available today. Reliability? Once again, Kenwood set the rules here.

**RRP £1999 ML&S £1499 WITH NOWT TO PAY FOR SIX WHOLE MONTHS, INTEREST FREE.**

## Kenwood TS-570DGE

If all HF transceivers were as reliable as the TS-570 then we would probably close our workshops. An excellent DSP HF Transceiver with Auto ATU.

**RRP £999 ML&S £899 WITH NOTHING TO PAY UNTIL SEPTEMBER 2000, INTEREST FREE.**

## Yaesu Corner

**YAESU FT1000MP/AC**
RRP £2499 **ML&S £1999,**
nothing until September interest free.

**YAESU FT-920AF**
RRP £1499 **ML&S £1249**

**YAESU FT-847**
RRP £1699 **ML&S £1229**

**YAESU FT-100**
RRP £1249 **ML&S CALL!**

**YAESU FT-90**
RRP £419 **ML&S £325**

**YAESU VX-5R**
RRP £359 **ML&S £299**

**STOP PRESS**
The main range of Waters & Stanton 'catalogue' items now available from stock

- MFJ
- WATSON
- CUSHCRAFT
- TONNA
- AVAIR
- DIAMOND
- RADIOWORKS
- SGC
- SSB ELECTRONICS
- SAMLEX
- ADONIS
- AMERITRON
- HIMOUND

*Call or see the web site for listings*

Martin Lynch can also offer finance terms up to 48 months with no deposit. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR: 26.9%. Payment protection is also available up to 36 months. All units are brand new and boxed and offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Switch/Delta card. No additional charges for credit cards. Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. E&OE. £10 p&p on all major items.

FINANCE EXAMPLE
**All examples do not include P&P.**

| Cash Price | Deposit | PAID IN 6 MONTHS | APR |
|---|---|---|---|
| £299 | NIL | £299 | 0% |
| OR | | | |
| **Cash Price** | **36 Payments of** | **Total Credit Price** (T.A.P.) | **APR** |
| £299 | £12.98 | £467.28 | 26.9% |

Written quotations available on request

# ...How LOW can we go?!

# CALL: 0208 566 1120

EWHERE GIVE US A CALL

# Take A Closer Look

## You get A GREAT DEAL

## When you Purchase from

# Waters & Stanton PLC

IC-756PRO In Stock

## IC-746 2-Year Warranty

**160m - 2m 100 Watts**

**SIx months FREE credit or 19.7% APR**

Plus FREE

**IC-2100H 2m Mobile**


Buy the popular IC-746 transceiver, the ideal all-mode base station, and we'll give you a **FREE IC-2100H listed at £289.** (Subject to availability)

## IC-706 2-Year Warranty

**160m -**

**SIx months FREE credit or 19.7% APR**

Plus FREE

**IC-T8E Handheld 6m, 2m & 70cm.**

Buy the latest IC-706IIG transceiver, the great little all-mode rig, and we'll give you a **FREE IC-T8E listed at £359.** (Subject to availability)

## IC-207H Price Slashed

**2m / 70cms**

**£279**

## IC-2800H Price Slashed

**2m / 70cms**

**£349**

*There's never been a better time to buy!*

**Waters & Stanton PLC**

22, Main Road, Hockley, Essex. SS5 4QS Orders: 0500 73 73 88

Tel (01702) 206835/204965 Fax 205843 e-mail: wsplc.demon.co.uk

Brought to you by wsplc.com

First in Amateur Radio

# UK Amateur Radio Band Plans

## 1.8MHz (160m)

**LICENCE NOTES:**

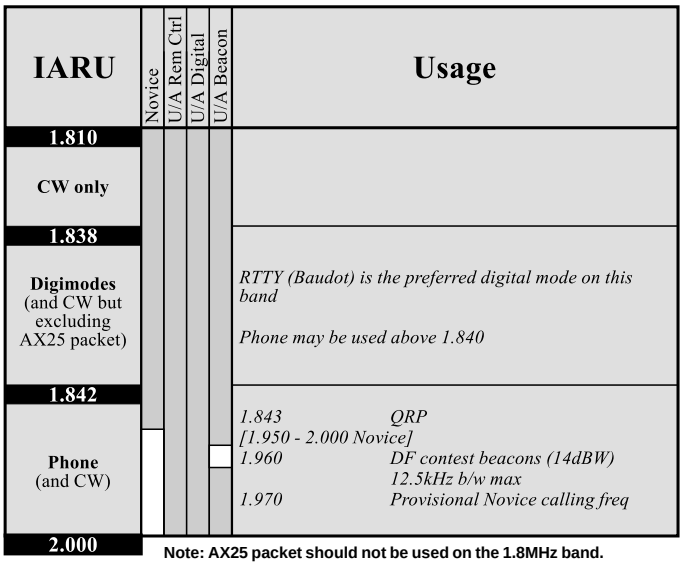
Amateur Service: 1.810 - 1.850MHz, Primary. Remainder secondary. *Available on the basis of non-interference to other services (inside or outside the UK)*

Satellite Service: No allocation

Power limit: 1.810 - 1.850MHz: 26dBW PEP. Remainder 15dBW

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1900




**Note: AX25 packet should not be used on the 1.8MHz band.**

## 3.5MHz (80m)

**LICENCE NOTES:**

Amateur Service: Primary, *Shared with other services*

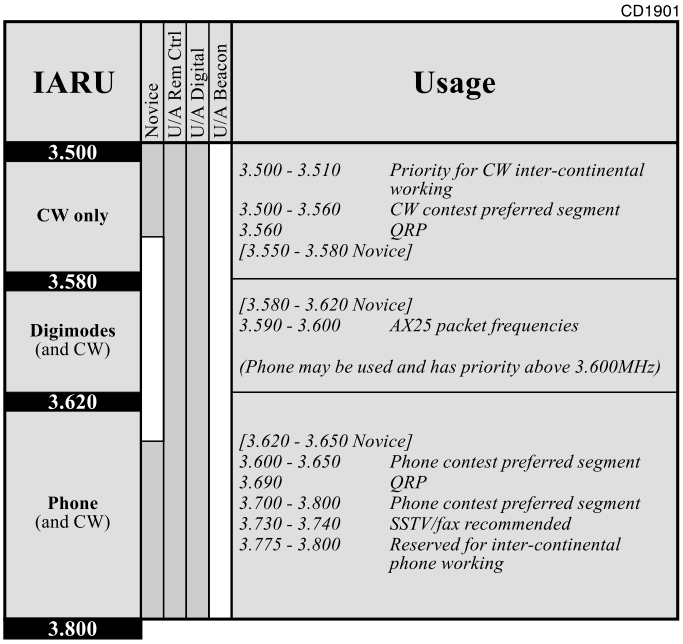
Satellite Service: No allocation

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

Unattended beacons: Only for DF contests Sat & Sun only, 14dBW ERP PEP max

CD1901




### Novice Licence: powers and modes

The power levels shown in these band plans are for the full UK licences. Novice licensees are limited to 12dBW input or 10dBW RF output. Furthermore, the Novice licence schedule makes some restrictions on the modes which are permitted *within* the bands shown in these pages as being available to Novices. Please refer to the Amateur Radio Novice Licence and its schedule for full details.

## 7MHz (40m)

**LICENCE NOTES:**

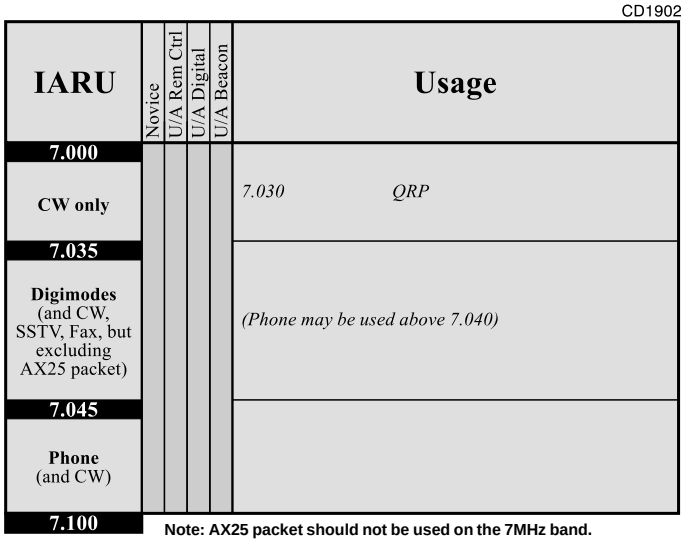
Amateur Service: Primary

Satellite Service: Primary

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1902




**Note: AX25 packet should not be used on the 7MHz band.**

## 10MHz (30m)

**LICENCE NOTES:**

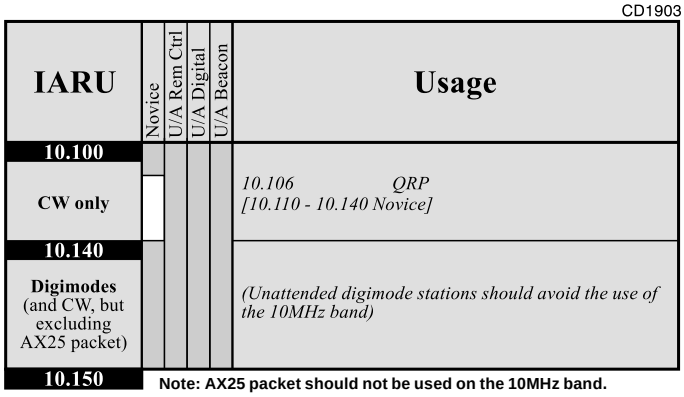
Amateur Service: Secondary

Satellite Service: No allocation

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1903




**Note: AX25 packet should not be used on the 10MHz band.**

### 10MHz Band Plan notes:

Note: The 10MHz band is allocated to the amateur service only on a secondary basis. Therefore IARU have agreed on a worldwide basis that only CW and digimodes, being narrow bandwidth modes, are to be used on this band. Likewise this band is not to be used for contests or news bulletins.

## 14MHz (20m)

**LICENCE NOTES:**

Amateur Service : Primary
Satellite Service : 14.000 - 14.250MHz: Primary
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1904

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **14.000** | | | | | |
| **CW only** | | | | | *14.000 - 14.060* *CW only contest preferred segment*<br>*14.060* *QRP* |
| **14.070** | | | | | |
| **Digimodes** (and CW) | | | | | *No digimode mailbox or forwarding*<br>*14.089 - 14.099* *AX25 packet preferred frequencies* |
| **14.099** | | | | | |
| **Beacons only** | | | | | *14.099 - 14.101* *Reserved exclusively for beacons* |
| **14.101** | | | | | |
| **Digimodes** (+ phone & CW) | | | | | *Digimode mailbox and forwarding*<br>*14.101 - 14.112* *AX25 packet preferred frequencies* |
| **14.112** | | | | | |
| **Phone** (and CW) | | | | | *14.125 - 14.300* *SSB only contest preferred segment*<br>*14.230* *SSTV/fax calling frequency*<br>*14.285* *QRP* |
| **14.350** | | | | | |

## 21MHz (15m)

**LICENCE NOTES:**

Amateur Service: Primary
Satellite Service : Primary
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1906

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **21.000** | | | | | |
| **CW only** | | | | | *21.060* *QRP*<br>*[21.050 - 21.080 Novice]* |
| **21.080** | | | | | |
| **Digimodes** (and CW) | | | | | *21.100 - 21.120* *AX25 packet preferred*<br>*[21.080 - 21.149 Novice]* |
| **21.120** | | | | | |
| **CW only** | | | | | |
| **21.149** | | | | | |
| **Beacons only** | | | | | *21.149 - 21.151* *Beacons exclusive* |
| **21.151** | | | | | |
| **Phone** (and CW) | | | | | *21.285* *QRP*<br>*21.340* *SSTV/fax calling frequency* |
| **21.450** | | | | | |

## 18MHz (17m)

**LICENCE NOTES:**

Amateur Service: Primary
Satellite Service: Primary
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1905

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **18.068** | | | | | |
| **CW only** | | | | | |
| **18.100** | | | | | |
| **Digimodes** (and CW) | | | | | |
| **18.109** | | | | | |
| **Beacons only** | | | | | *18.109 - 18.111* *Exclusively beacons* |
| **18.111** | | | | | |
| **Phone** (and CW) | | | | | |
| **18.168** | | | | | |

## 24MHz (12m)

**LICENCE NOTES:**

Amateur Service: Primary
Satellite Service: Primary
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1907

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **24.890** | | | | | |
| **CW only** | | | | | |
| **24.920** | | | | | |
| **Digimodes** (and CW) | | | | | |
| **24.929** | | | | | |
| **Beacons only** | | | | | *24.929 - 24.931* *Beacons exclusive* |
| **24.931** | | | | | |
| **Phone** (and CW) | | | | | |
| **24.990** | | | | | |

***Band Plans*** – *Simply being a good neighbour to your fellow amateur!*

## 28MHz (10m)

**LICENCE NOTES:**

Amateur Service: Primary
Satellite Service: Primary
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV
Unattended beacons: Only for DF contests (14dBW PEP max)

CD1908

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **28.000** | | | | | |
| **CW only** | | | | | |
| **28.050** | | | | | *[28.050 - 28.190 Novice]*<br>*28.060 QRP*<br>*28.120 - 28.150 AX25packet preferred* |
| **Digimodes** (and CW) | | | | | |
| **28.150** | | | | | *28.190 - 28.199 Regional time shared International Beacon Project - Exclusive* |
| **CW only** | | | | | |
| **28.199** | | | | | *28.199 - 28.201 Worldwide time shared International Beacon Project - Exclusive* |
| **Beacons only** | | | | | |
| **28.201** | | | | | *28.201 - 28.255 Continuous duty International Beacon Project - Exclusive*<br>*[28.225 - 28.500 Novice]*<br>*28.360 QRP*<br>*28.680 SSTV/fax calling frequency* |
| **Phone** (and CW) | | | | | |
| **29.200** | | | | | |
| **AX25 packet** (+ phone and CW) | | | | | |
| **29.300** | | | | | *29.300 - 29.500 Reserved exlusively for satellite downlinks* |
| **Satellite downlinks** | | | | | |
| **29.550** | | | | | *Some experimental FM repeaters may be established in IARU Region 1* |
| **Phone** (and CW) | | | | | |
| **29.700** | | | | | |

## 50MHz (6m)

**LICENCE NOTES:**

Amateur Service: 50.0 - 51.0MHz, Primary; 51.0 - 52.0MHz, Secondary. *Available on the basis of non-interference to other services (inside or outside the UK).*
Satellite Service : No allocation
Power limit: 50.0 - 51.0MHz, 26dBW PEP; 51.0 - 52.0MHz, 20dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1909

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **50.000** | | | | | |
| **CW only** | | | | | *50.020 - 50.080 Beacons*<br>*50.090 CW calling frequency* |
| **50.100** | | | | | |
| **SSB and CW only** | | | | | *50.100 - 50.130 DX window - Note 1*<br>*50.110 International calling - Note 2*<br>*50.150 SSB Centre of Activity*<br>*50.185 Cross-band activity centre*<br>*50.200 MS Reference frequency (CW & SSB)* |
| **50.500** | | | | | |
| **All modes** | | | | | *50.500 - 50.700 Digital communications*<br>*50.510 SSTV*<br>*50.550 Fax*<br>*50.600 RTTY*<br>*50.710 - 50-910 FM repeater outputs* |
| **51.000** | | | | | |
| **All modes** | | | | | *51.210 Emergency comms, priority*<br>*51.210 - 51.410 FM repeater inputs* |
| **51.410** | | | | | |
| **All modes** | | | | | *51.430 - 51.590 FM telephony - Note 3*<br>*51.510 FM calling*<br>*51.530 Note 4* |
| **51.830** | | | | | |
| **All modes** | | | | | *51.940 - 52.000 Emergency comms priority* |
| **52.000** | | | | | |

**50MHz Band Plan notes:**

1. Only to be used for QSOs between stations in different continents.
2. No QSOs on this frequency. Always QSY when working intercontinental DX.
3. 20kHz channel spacing. Channel centre frequencies start at 51.430MHz.
4. Used by GB2RS news and for slow Morse transmissions.

## Notes to the HF Band Plans

1. The expression 'phone' includes all permitted forms of telephony.
2. If transmitting very close to a band edge, take care not to radiate outside of the band.
3. Before transmitting, all operators should check that the frequency is not already occupied. The normal advice is to use the phrase "Is this frequency in use?" on SSB or "QRL?" on CW.
4. Digimodes are defined as including: AmTOR, PacTOR, Clover, ASCII, RTTY (Baudot) and AX25 packet.
5. LSB is recommended on bands below 10MHz, and USB recommended on bands above 10MHz.
6. The Region 1 IARU HF band plans are designed to enable the best utilisation of the HF spectrum space available. They achieve this objective because the vast majority of licensed amateurs observe the voluntary recommendations. In some countries (eg the USA) licence regulations require that specific modes be confined to specific sections of each band.
7. The frequencies 14.230, 21.340 and 28.680MHz should be used as calling frequencies for SSTV and fax operators. After having established contact they should move to another free frequency within the telephony section of the band.

## Notes on the VHF Band Plans

1. The beacon and satellite services must be kept free of normal communication transmissions to prevent interference with these services.
2. The use of the FM mode within the SSB/CW section and CW and SSB in the FM-only sector is not recommended.
3. Repeater stations are primarily intended as an aid for mobile working and they are not intended to be used for DX communication. FM stations wishing to work DX should use the all-modes section, taking care to avoid frequencies allocated for specific purposes.

# 70MHz (4m)

**LICENCE NOTES:**

Amateur Service: Secondary. Available on the basis of non-interference to other services (inside or outside the UK).
Satellite Service: No allocation
Power limit: 22dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

CD1910

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage | |
|---|---|---|---|---|---|---|
| **70.000** | | | | | | |
| **Beacons** | | | | | *70.030* | *Personal beacons* |
| **70.030** | | | | | | |
| **SSB and CW only** | | | | | *70.150*<br>*70.185*<br>*70.200* | *Meteor scatter calling*<br>*Cross-band activity centre*<br>*SSB/CW calling* |
| **70.250** | | | | | | |
| **All modes** | | | | | *70.260* | *AM/FM calling* |
| **70.300** | | | | | | |
| **Channelised operation using 12.5kHz channels** | | | | | *70.3000*<br>*70.3125*<br>*70.3250*<br>*70.3375*<br>*70.3500*<br>*70.3625*<br>*70.3750*<br>*70.3875*<br>*70.4000*<br>*70.4125*<br>*70.4250*<br>*70.4375*<br>*70.4500*<br>*70.4625*<br>*70.4875* | *RTTY/fax calling/working*<br>*Digital modes*<br>*Digital modes*<br>*Digital modes*<br>*Emergency comms priority*<br>*Digital modes*<br>*Emergency comms priority*<br>*Digital modes*<br>*Emergency comms priority*<br>*Digital modes*<br>*FM simplex - used by GB2RS*<br>*Digital modes*<br>*FM calling*<br>*Digital modes*<br>*Digital modes* |
| **70.500** | | | | | | |

# 144MHz (2m)

**LICENCE NOTES:**

Amateur Service: Primary
Satellite Service: Primary
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV
Unattended beacons: Only for DF Contests

CD1911

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage | |
|---|---|---|---|---|---|---|
| **144.000** | | | | | | |
| **EME (SSB/CW)** | | | | | *144.000 - 144.035* | *Moonbounce (only)* |
| **144.035** | | | | | | |
| **CW only** | | | | | *144.050*<br>*144.100*<br>*144.140 - 144.150* | *CW calling frequency*<br>*MS CW ref frequency (Note 1)*<br>*CW FAI/EME working* |
| **144.150** | | | | | | |
| **SSB and CW only** | | | | | *144.150 - 144.160*<br>*144.175*<br>*144.195 - 144.205*<br>*144.250*<br>*144.260*<br>*144.300*<br>*144.390 - 144.400* | *SSB FAI/EME working*<br>*Microwave talk-back (UK)*<br>*SSB random MS*<br>*GB2RS and slow Morse*<br>*Emergency comms priority*<br>*SSB calling frequency*<br>*SSB random MS* |
| **144.400** | | | | | | |
| **Beacons** | | | | | *144.490* | *SAREX uplink* |
| **144.490** | | | | | | |

CD1912

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage | |
|---|---|---|---|---|---|---|
| **144.490** | | | | | | |
| **Guard band** | | | | | | |
| **144.500** | | | | | | |
| **All modes non-channelised** | | | | | *144.500*<br>*144.525*<br>*144.600*<br>*144.600±*<br>*144.625 - 144.675*<br>*144.700*<br>*144.750*<br>*144.775 - 144.800* | *SSTV calling frequency*<br>*ATV talkback (SSB)*<br>*RTTY calling frequency*<br>*RTTY working (fsk)*<br>*Emergency comms priority*<br>*Fax calling frequency*<br>*ATV calling+talk-back*<br>*Emergency comms priority* |
| **144.800** | | | | | | |
| **Digital modes** | | | | | *144.800 - 144.990* | *Digital Modes (incuding unattended)* |
| **144.990** | | | | | | |
| **Guard band** | | | | | | |
| **145.000** | | | | | | |
| **FM Repeater Inputs** | | | | | *145.000 RV48*<br>*145.025 RV50*<br>*145.050 RV52*<br>*145.075 RV54*<br>*145.100 RV56*<br>*145.125 RV58*<br>*145.150 RV60*<br>*145.175 RV62* | |
| **145.200** | | | | | | |
| **FM Simplex Channels** | | | | | *145.200 V16*<br>*145.225 V18*<br>*145.250 V20*<br>*145.275 V22*<br>*145.300 V24*<br>*145.325 V26*<br>*145.350 V28*<br>*145.375 V30*<br>*145.400 V32*<br>*145.425 V34*<br>*145.450 V36*<br>*145.475 V38*<br>*145.500 V40*<br>*145.525 V42*<br>*145.550 V44*<br>*145.575 V46* | *Emergency comms priority*<br>*Emergency comms priority*<br>*Used for slow Morse transmissions*<br>*RTTY afsk*<br>*FM calling channel*<br>*Used for GB2RS*<br>*Recommended channel for rally and exhibition talk-in* |
| **145.600** | | | | | | |
| **FM Repeater Outputs** (Note 2) | | | | | *145.600 RV48*<br>*145.625 RV50*<br>*145.650 RV52*<br>*145.675 RV54*<br>*145.700 RV56*<br>*145.725 RV58*<br>*145.750 RV60*<br>*145.775 RV62* | |
| **145.800** | | | | | | |
| **Satellites** | | | | | | |
| **146.000** | | | | | | |

## 144MHz Band Plan notes:

1. Meteor scatter operation can take place up to 26kHz higher than the reference frequency.
2. Additional 12.5kHz channels will be phased in by the year 2000 (see *RadCom* March 1997 page 16).

## UK Repeater CTCSS Tones

A number of UK 2m and 70cm repeaters now use CTCSS tones on a regional basis to help minimise unwanted access to other co-channel repeaters.

| Tone Area | CTCSS Tone (Hz) | Tone Area | CTCSS Tone (Hz) |
|---|---|---|---|
| A | 67.1 | F | 94.8 |
| B | 71.9 | G | 103.5 |
| C | 77.0 | H | 110.9 |
| D | 82.5 | J | 118.8 |
| E | 88.5 | | |

# MOONRAKER

## www.amateurantennas.com

### Tri-Bander Beam

**TBB3** 3 Element 6mts, 2mtr, 70cms, Boom Length 1.1mts, Longest Element 3mts, 5.00 dBd Gain.....**Price £65.95**

### HB9CV 2 Element Beam 3.5 dBd

**70cms** (Boom 12")....**£15.95**
**2 metre** (Boom 20")....**£19.95**
**4 metre** (Boom 23")....**£27.95**
**6 metre** (Boom 33")....**£34.95**
**10 metre** (Boom 52")....**£64.95**

### Halo Loops

**2 metre** (size 12" approx)..**£12.95**
**4 metre** (size 20" approx)..**£18.95**
**6 metre** (size 30" approx)..**£24.95**

### ½ Wave Vertical Fibre Glass (GRP) Base Antenna 3.5 dBd

*(without ground planes)*

**70 cms** (Length 26")....**£19.95**
**2 metre** (Length 52")....**£22.95**
**4 metre** (Length 92")....**£34.95**
**6 metre** (Length 126")....**£44.95**

### G5RV Wire Antenna (10-40/80 metre)

All fittings Stainless Steel

| | FULL | HALF |
|---|---|---|
| Standard | £22.95 | £19.95 |
| Hard Drawn | £24.95 | £21.95 |
| Flex Weave | £32.95 | £27.95 |
| PVC Coated Flex Weave | £37.95 | £32.95 |

### Inductors

Convert your g5rv half size into a full size with only a very small increase in size. Ideal for the small garden....**£21.95**

### Best Quality Antenna Wire

*The Following Supplied in 50 metre lengths*

Enamelled 16 gauge copper wire....**£9.95**
Hard Drawn 16 gauge copper wire....**£12.95**
Multi Stranded Equipment wire....**£9.95**
Flex Weave....**£27.95**
Clear PVC Coated Flex Weave....**£37.95**

### Antenna Rotators

AR-300XL Light duty UHF\VHF....**£49.95**
YS-130 Medium duty VHF..**£79.95**
RC5-1 Heavy duty HF....**£299.95**

### Mounting Hardware

ALL GALVANISED

**6" Stand Off Bracket** *(complete with U Bolts)*.....**£6.00**
**9" Stand off bracket** *(complete with U Bolts)*.....**£9.00**
**12" T & K Bracket** *(complete with U Bolts)*...**£10.95**
**18" T & K Bracket** *(complete with U Bolts)*...**£14.95**
**24" T & K Bracket** *(complete with U Bolts)*...**£16.95**
**1¼"x 5' Heavy Duty Aluminium Swaged Poles** *(set of 4)*....**£19.95**
**1½"x 5' Heavy Duty Aluminium Swaged Poles** *(set of 4)*....**£29.95**
3-Way Pole Spider for Guy Rope/wire....**£3.95**
4-Way Pole Spider for Guy Rope/wire....**£4.95**
1½" Mast Sleeve/Joiner....**£8.95**
2" Mast Sleeve/Joiner....**£9.95**

### Vertical Fibre Glass (GRP) Base Antennas

***SQ & BM Range VX 6 Co-linear:- Specially Designed Tubular Vertica Coils individually tuned to within 0.05pf (maximun power 100 watts)***

**BM100 Dual-Bander**....**£29.95**
(2 mts 3dBd) (70cms 6dBd) (Length39")
**SQBM100* Dual-Bander**....**£39.95**
(2 mts 3dBd) (70cms 6dBd) (Length39")
**BM200 Dual-Bander**....**£39.95**
(2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
**SQBM200* Dual-Bander**....**£49.95**
(2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
**BM500 Dual** - Bander **Super Gainer**....**£49.95**
(2 mts 6.8dBd) (70cms 9.2dBd) (Length100")
**SQBM500 Dual - Bander Super Gainer**....**£59.95**
(2 mts 6.8dBd) (70cms 9.2dBd) (Length100")
**SM1000 Tri-Bander**....**£49.95**
(2 mts 5.2dBi) (6 mts 2.6dBi) (70cms 7dBi) (Length 62")
**BM1000 Tri-Bander**....**£59.95**
(2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
**SQBM1000* Tri-Bander**....**£69.95**
(2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")

***SQBM1000/200/100/500** *are Stainless Steel, Chromed and Poly Coated. Full 2 year Warranty on these Antennas.*

### 2 METRE VERTICAL CO-LINEAR BASE ANTENNA

**BM60** 5/8 Wave, Length 62", 5.5dBd Gain....**£49.95**
**BM65** 2 X 5/8 Wave, Length 100", 8.0 dBd Gain....**£69.95**

### Traps

10 metre trap....**£21.95**
15 metre trap....**£21.95**
20 metre trap....**£21.95**
40 metre trap....**£21.95**
80 metre trap....**£21.95**

### Fibre glass mast (GRP)

1½" Diameter 2 metres long....**£16.00**
1¾" Diameter 2 metres long....**£20.00**
2" Diameter 2 metres long....**£24.00**

### Guy rope 30 metres

**MGR-3** 3mm (maximum load 15 kgs)....**£6.95**
**MGR-4** 4mm (maximum load 50 kgs)....**£14.95**
**MGR-6** 6mm (maximum load 140 kgs)....**£29.95**

### Ribbon ladder USA imported

300 Ohm Ribbon (20 Metres)....**£13.00**
450 Ohm Ribbon (20 Metres)....**£13.00**

### 70cms vertical co-linear base antennas

**BM33** 2 X 5/8 wave Length 39" 7.0 dBd Gain....**£34.95**
**BM45** 3 X 5/8 wave Length 62" 8.5 dBd Gain....**£49.95**
**BM55** 4 X 5/8 wave Length 1002 10 dBd Gain....**£69.95**

### Multi purpose antennas

**MSS-1** Freq RX 0-2000 Mhz, TX 2 mtr 2.5 dBd Gain, TX 70cms 4.0 dBd Gain, Length 39"....**£39.95**
**MSS-2** Freq RX 0-2000 Mhz, TX 2 mtr 4.0 dBd Gain, TX 70cms 6.0 dBd Gain, Length 62"....**£49.95**
**IVX-2000** Freq RX 0-2000 Mhz, TX 6 mtr 2.0 dBd Gain, 2 mtr 4dBd Gain, 70cms 6dBd Gain, Length 100"....**£89.95**

### Log Periodic

**MLP32**
TX & RX 100-1300 Mhz One Feed, S.W.R. 2:1 and Below over Whole Frequency Range. Professional Quality....**£99.95**

### Yagi Beams

All fittings Stainless Steel

**2 metre 4 Element** (Boom 48") (Gain 7dBd).....**£19.95**
**2 metre 5 Element** (Boom 63") (Gain 10dBd)...**£34.95**
**2 metre 8 Element** (Boom 125") (Gain 12dBd).**£44.95**
**2 metre 11 Element** (Boom 156") (Gain 13dBd).**£65.95**
**4 metre 3 Element** (Boom 45") (Gain 8dBd).....**£39.95**
**4 metre 5 Element** (Boom 128") (Gain 10dBd).**£54.95**
**6 metre 3 Element** (Boom 72") (Gain 7.5dBd)..**£49.95**
**6 metre 5 Element** (Boom 142") (Gain 9.5dBd)**£69.95**
**70 cms 13 Element** (Boom 76") (Gain 12.5dBd)**£39.95**
**23cms Beam, 11 Element** Boom Length 1 Metre, Gain 12.5 dBd....Price **£44.95**
**23cms Beam, 19 Element** Boom Length 1.5 Mts Gain 17 dBd....Price **£64.95**

### Crossed Yagi Beams

All fittings Stainless Steel

**2 metre 5 Element** (Boom 64") (Gain 7.5dBd)..**£64.95**
**2 metre 8 Element** (Boom 126") (Gain 11.5dBd)....**£84.95**
**70 cms 13 Element** (Boom 83") (Gain 12.5dBd)....**£54.95**

### ZL Special Yagi Beams All fittings Stainless Steel

**2 metre 5 Element** (Boom 38") (Gain 9.5dBd)..**£31.95**
**2 metre 7 Element** (Boom 60") (Gain 12dBd)...**£39.95**
**2 metre 12 Element** (Boom 126") (Gain 14dBd).**£65.95**
**70 cms 7 Element** (Boom 28") (Gain 11.5dBd)**£24.95**
**70 cms 12 Element** (Boom 48") (Gain 14dBd) **£39.95**

### BALUNS

**MB-1** 1:1 Balun....**£23.95**
**MB-4** 4:1 Balun....**£23.95**
**MB-6** 6:1 Balun....**£23.95**

### Mobile HF Whips

(with 3/8 base fitting)

**AMPRO 6** mt....**£15.95** *(Length 4.6' approx)*
**AMPRO 10** mt....**£15.95** *(Length 7' approx)*
**AMPRO 12** mt....**£15.95** *(Length 7' approx)*
**AMPRO 15** mt....**£15.95** *(Length 7' approx)*
**AMPRO 17** mt....**£15.95** *(Length 7' approx)*
**AMPRO 20** mt....**£15.95** *(Length 7' approx)*
**AMPRO 30** mt....**£15.95** *(Length 7' approx)*
**AMPRO 40** mt....**£15.95** *(Length 7' approx)*
**AMPRO 80** mt....**£18.95** *(Length 7' approx)*
**AMPRO 160** mt....**£49.95** *(Length 7' approx)*

### Mounts

**TURBO MAG MOUNT** (7") 3/8 or S0239....**£14.95**
**TRI-MAG MOUNT** (3x5") 3/8 or S0239....**£39.95**
**Stainless Steel Heavy Duty Hatch Back Mount** with 4 mts of coax and pl259 plug (3/8 or so239 fully adjustable with turn knob)....**£29.95**
**Stainless Steel Heavy Duty Gutter Mount** with 4 mts of coax and PL259 plug ( 3/8 or SO239 fully adjustable with turn knob)....**£29.95**

### Coax

**RG58 BEST QUALITY STANDARD** per mt....**35p**
**RG58 BEST QUALITY MILITARY SPEC** per mt....**60p**
**BEST QUALITY MILITARY SPEC MINI 8** per mt....**70p**
**RG213 BEST QUALITY MILITARY SPEC** per mt....**85p**
**H100 Coax Cable** per mt....**£1.10**

***PHONE FOR 100 METRE DISCOUNT PRICE.***

**All prices plus £6.00 P&P. per order**

# MOONRAKER (UK) LTD.

UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR.

TEL: (01908) 281705. FAX: (01908) 281706

SR STANDARD

## Standard C510

A full featured, pocket sized handheld that can be transformed into a powerful mobile too! The C510 and accessories provide a top performance mobile with the convenience of a high specification handheld.

£99 inc VAT

Dual band !

Dual band - 144 & 430MHz
1Watt high power 300mW low power
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
200 memories
Extensive scan functions
DTMF paging function
Cross band operation
Large backlit LCD display
Powered by 3 AA batteries
Size 58mm(w) x 104mm(H) x 27mm(D)
Extensive range of accessories including the CPB510 50Watt mobile booster

£100 inc VAT

CPB510 50 Watt booster
50 Watt booster
Size:150mm(W)x31mm(H)x170mm(D)

## C568 Tri band handheld

A high specification handheld with **23 cms** transmit and receive twin frequency display amazing performance and lots lots more...

Tri band - 144MHz, 430MHz & 1200MHz
Up to 5 Watt output (2.5Watts with CNB171 NiCad supplied)
35mW on 1200MHz
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
Receives on 2 frequencies simultaneously
Cross band repeater for RAYNET use
40 memories
Extensive scan functions
BNC antenna connector
Full duplex operation
Large backlit LCD display
Supplied with CNB171 NiCad battery & charger
Size 47mm(w) x 131mm(H) x 34mm(D)
Extensive range of accessories available

Tri band !

£239 inc VAT

## C558 Twin band handheld

A twin band VHF/UHF handheld with dual display

£169 inc VAT

Dual band !

Dual band - 144MHz & 430MHz
Up to 5 Watt output (2Watts with CNB151 NiCad supplied)
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
Receives on 2 frequencies simultaneously
Cross band repeater for RAYNET use
40 memories
Extensive scan functions
BNC antenna connector
Full duplex operation
Large backlit LCD display
Supplied with CNB151 NiCad battery, charger & mobile adapter
Size 55mm(w) x 130mm(H) x 31mm(D)
Extensive range of accessories available

STANDARD


## C156 VHF Handheld

Without doubt the best selling VHF handheld on the market. The C156 offers good performance, outstanding features & top quality construction for an unbeatable price.

£69 inc VAT

2m band!

144-145.995 MHz transmit
Wideband receiver
5 Watt output (1.8 Watt with CBT156)
CTCSS encode (decoder optional)
1750Hz tone burst
100 memories
BNC antenna connector
Extensive scan functions
DTMF paging function
Large backlit LCD dot matrix display
Size 58mm(w) x 100mm(H) x 26mm(D)
Supplied with CBT156 AA battery case
Extensive range of accessories available

## C178 VHF Handheld (low power transmit on UHF)

A remarkable radio at a remarkable price

Transmit 144-145.995MHz & 430-439.995MHz
Up to 5 Watt output (2Watts with CNB171 NiCad supplied)
50mW on 430MHz
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
40 memories
Extensive scan functions
BNC antenna connector
Large backlit LCD display
Supplied with CNB171 NiCad battery & charger
Size 56mm(w) x 125mm(H) x 31mm(D)
Extensive range of accessories available

Dual band !

£99 inc VAT

## C508 Dual band Miniature Handheld

80mm

58mm

£129 inc VAT

Dual band !

Dual band - 144MHz & 430MHz
280mW output
CTCSS encode/decode
1750Hz tone burst
Wideband receiver with AM
60 memories
Up to 45 hours battery life
Powered by 2 AA batteries
Battery saver function
BNC antenna connector
Cross band operation
Clear backlit LCD display
Size 58mm(w) x 80mm(H) x 25mm(D)
Weighs only 160g
Extensive range of accessories available

*ALL EQUIPMENT HAS A 1 YEAR PARTS AND LABOUR WARRANTY COMPLETE WITH TECHNICAL SUPPORT*

*- CLUB DISCOUNTS AVAILABLE, PHONE FOR DETAILS -*

**www.standard-comms.co.uk/amateur** **Telephone sales on:- 0181 236 0032**

# SRP TRADING

**1686 Bristol Road South, Rednal, Birmingham B45 9TZ**

****EXPORT AND TRADE ENQUIRIES WELCOME****

## AKD HF-3S SHORTWAVE RECEIVER

- 10 Programmable Memories
- 30kHz to 30MHz
- Data output socket and Data lead for connection to your PC
- Software JVFAX 7.1 & HAMCOMM 3.1
- UK power supply and Long Wire Aerial

**£159.95 + p&p**


**FREE!!** Ferrells Confidential Frequency List 11th Edition worth £19.95

**NEW!!**

## SANGEAN ATS 505


FM-STEREO/MW/LW/SW PLL SYNTHESIZED RECEIVER AM/FM/USB/LSB 45 presets, ATS (auto tuning system), 1kHz fine tune, tone control, memory recall and rotary tuning etc.

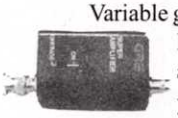
**£99.00 + p&p**

## ANTENNA ROTATOR AR300 XL

Max load 60kg (with support bearing) 360de. rotation in approx. 65 sec. (Support bearing optional £14.95)

**£29.95 + p&p**

## WIDEBAND PRE-AMP



Variable gain and bypass facility. Boosts weak signals adding clarity to let you listen with ease.

~~£49.95~~ **£39.95 + p&p**

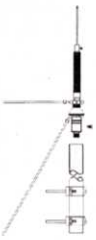
## DC-AC INVERTERS 12V DC IN 240 AC OUT

| | | p&p |
|---|---|---|
| 150W version (for notebook computers etc.) £39.99 - | **£29.95** + | **£5** |
| 300W version (for small power tools etc.) £59.99 - | **£49.95** + | **£5** |
| 600W version (for medium power tools etc.) £129.99 - | **£99.95** + | **£10** |
| 1000W version (for large power tools etc.) £159.99 - | **£129.95** + | **£10** |
| 2500W version (for most purposes etc.) £499.99 - | **£419.95** + | **£15** |

## PROFESSIONAL POLICE STYLE EARPIECE

**£8.99 + p&p**

## SILVER DIAMOND



Four band discone TX 6m, 2m, 70cm & 23cm 200W RX 25-1300 MHz stainless steel construction.

**£29.95 + p&p**

## UK SCANNING DIRECTORY


**7th Edition.** Thousands of new frequencies.

**£19.50 FREE p&p**

## SRP 3BR

Quality extension speaker with noise filter

**£12.95 + p&p**

## QS-200

In-car dashboard grill fitting hand-held mount to fit a mobile phone or hand-held scanner into your car.

**£4.99 + p&p**

## RECHARGEABLE N1-MH BATTERIES

*'No memory effect'*
*over twice the capacity of Nicads.*

AA Cell 1500mAh @ 1.2V - £2.00 each
AAA Cell 550m/Ah @ 1.2V - £2.40 each
C Cell 2220mAh @ 1.2V - £3.99 each
D Cell 2220m/Ah @ 1.2V - £3.99 each
PP3 Cell 150m/Ah @ 1.2V - £3.99 each
**CHARGERS FOR ALL SIZES AVAILABLE**

## QS-300

Desk top stand for hand-helds includes BNC to SO239 adaptor.

**£13.99 + p&p**

## SKYSCAN DX V1300 DISCONE

Vertical and horizontal elements enhance reception from 25-1300MHz. Constructed from best s/steel and aluminium. Complete with mounting pole and pole clamps.

**£49.95 + p&p**

## SRP 1 HF ATU

Quality passive antenna tuning unit will peak your receiver antenna (i.e. long wire) to maximum signal and minimum noise. 500kHz-30MHz including patach lead

**£55.00 + p&p**


## PORTABLE SHORT WAVE ANTENNA

Compact portable short wave longwire antenna on a reel

**£7.99 + p&p**

## SRP 2 PRE-SELECTOR

500kHz-30MHz. Ideal for wide band scanners yo enhance selectivity & reduce strong signal interference including patch lead

**£39.95 + p&p**


## WM918 ELECTRONIC WEATHER STATION

Allows measurement and display of weather data. Includes PC software and lead.

**£179.00 + p&p**

**Opening Times: Mon-Sat 9.30am to 5.15 pm.**

**Call Mary (M0BMH) or Dave on**

**TEL: 0121 460 1581, 0121 457 7788 - FAX: 0121 457 9009**

# 430MHz (70cm)

**LICENCE NOTES:**

| | |
|---|---|
| Amateur Service: | Secondary |
| Satellite Service: | 435 - 438MHz, Secondary |
| Exclusion: | 431 - 432 not available for use within 100 km radius of Charing Cross, London. (51° 30' 30"N, 00° 7' 24"W) |
| Power limit: | 430 - 432MHz: 16dBW ERP PEP, 432 - 440MHz: 26dBW |
| Permitted modes: | Morse, telephony, RTTY, data, fax, SSTV, FSTV |

CD1913

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **430.000** | | | | | |
| **All modes** | | | | | *430.000 - 430.810 Digital communications (Notes 6,7)*<br>*430.600 - 430.800 Note 5* |
| **430.810** | | | | | |
| **Low power repeater i/p Note 1** | | | | | *430.810 - 430.990 Low power repeaters* |
| **431.000** | | | | | |
| **All modes Note 1** | | | | | *430.990 - 431.900 Digital communications (Note 6)* |
| **432.000** | | | | | |
| **CW only** | | | | | *432.000 - 432.025 Moonbounce*<br>*432.050 CW centre of activity* |
| **432.150** | | | | | |
| **SSB and CW only** | | | | | *432.200 SSB centre of activity*<br>*432.350 Microwave talk-back calling frequency (Europe)* |
| **432.500** | | | | | |
| **All modes non-channelised** | | | | | *432.500 - 432.600 IARU Region 1 linear transponder outputs*<br>*432.600 - 432.800 IARU Region 1 linear transponder inputs*<br>*432.500 SSTV activity centre*<br>*432.600 RTTY (fsk) activity centre*<br>*432.625 Digital communications*<br>*432.650 Digital communications*<br>*432.675 Digital communications*<br>*432.700 Fax activity centre* |
| **432.800** | | | | | |
| **Beacons** | | | | | *432.800 - 432.990 Beacons* |
| **433.000** | | | | | |
| **FM repeater outputs in UK only**<br>**Note 1** | | | | | *433.000 RU240 (RB0)*<br>*433.025 RU242 (RB1)*<br>*433.050 RU244 (RB2)*<br>*433.075 RU246 (RB3)*<br>*433.100 RU248 (RB4)*<br>*433.125 RU250 (RB5)*<br>*433.150 RU252 (RB6)*<br>*433.175 RU254 (RB7)*<br>*433.200 RU256 (RB8)*<br>*433.225 RU258 (RB9)*<br>*433.250 RU260 (RB10)*<br>*433.275 RU262 (RB11)*<br>*433.300 RU264 (RB12)*<br>*433.325 RU266 (RB13)*<br>*433.350 RU268 (RB14)*<br>*433.375 RU270 (RB15)* |
| **433.400** | | | | | |

**Continued in next column**

CD1914

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **433.400** | | | | | |
| **FM simplex channels** | | | | | *433.400 U272 (SU16)*<br>*433.425 U274 (SU17)*<br>*433.450 U276 (SU18)*<br>*433.475 U278 (SU19)*<br>*433.500 U280 (SU20) FM calling channel*<br>*433.525 U282 (SU21)*<br>*433.550 U284 (SU22) Recommended channel for rally and exhibition talk-in*<br>*433.575 U286 (SU23)*<br>*433.600 U288 (SU24) RTTY afsk*<br>*433.625 Digital communications*<br>*433.650 Digital communications*<br>*433.675 Digital communications*<br>*433.700 Notes 2, 3 and 5*<br>*433.725 Notes 2 and 5*<br>*433.750 Notes 2 and 5*<br>*433.775 Notes 2 and 5*<br>*433.800 - 434.250 Digital communications (Note 8)* |
| **434.600** | | | | | |
| **FM repeater inputs (in UK only) - note 1; and fast scan television - note 4** | | | | | *434.600 RU240 (RB0)*<br>*434.625 RU242 (RB1)*<br>*434.650 RU244 (RB2)*<br>*434.675 RU246 (RB3)*<br>*434.700 RU248 (RB4)*<br>*434.725 RU250 (RB5)*<br>*434.750 RU252 (RB6)*<br>*434.775 RU254 (RB7)*<br>*434.800 RU256 (RB8)*<br>*434.825 RU258 (RB9)*<br>*434.850 RU260 (RB10)*<br>*434.875 RU262 (RB11)*<br>*434.900 RU264 (RB12)*<br>*434.925 RU266 (RB13)*<br>*434.950 RU268 (RB14)*<br>*434.975 RU270 (RB15)* |
| **435.000** | | | | | |
| **Satellites and fast scan TV - note 4** | | | | | |
| **438.000** | | | | | |
| **Fast scan TV** | | | | | *438.025 - 438.175 Note 5*<br>*438.200 - 439.425 Note 1* |
| **438.425** | | | | | |
| **Low power repeater o/p + fast scan TV** | | | | | *438.425 - 438.575 Low power repeaters* |
| **438.575** | | | | | |
| **Fast scan TV** | | | | | *438.200 - 439.425 Note 1*<br>*439.600 - 439.750 Digital communications (Note 6)* |
| **439.750** | | | | | |
| **Packet radio** | | | | | *439.750 - 440.000 Digital communications (Note 6)* |
| **440.000** | | | | | |

## 430MHz Band Plan notes:

1. In Switzerland, Germany and Austria, repeater inputs are 430.600 - 431.825MHz with 25kHz spacing, and outputs are 438.200 - 439.425MHz. In France and the Netherlands repeater outputs are 430.025 - 430.375MHz with 25kHz spacing and inputs at 431.625 - 431.975MHz. In other European countries repeater inputs are 433.000 - 433.375MHz with 25kHz spacing and outputs at 434.600 - 434.975MHz, ie the reverse of the UK allocation.
2. Emergency communications priority.
3. IARU Region 1 fax/AFSK.
4. Fast Scan Television carrier frequencies shall be chosen so as to avoid interference to other users, in particular the satellite service and repeater inputs. IARU Region 1 recommends that video carriers should be in the range 434.000 - 434.500MHz or 438.500 - 440.000MHz.
5. IARU Region 1 packet radio.
6. The DCC will recommend usage of this sub-band at a later date.
7. Users must accept interference from F/PA repeater output channels in 430.025 to 430.375MHz. Users with sites which allow propagation to other countries (notably F and PA) must survey the proposed frequency before use to ensure that they will not cause interference to users of repeaters in those countries.

# 1.3GHz (23cm)

**LICENCE NOTES:**

Amateur Service: Secondary

Satellite Service: 1260 - 1270, Secondary *Earth to space only*
1296 - 1297, Secondary *Earth to space only*

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

Unattended operation: Not permitted in Northern Ireland

CD1915

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **1,240.000** | | | | | |
| **All modes** | | | | | *1240.150 Packet radio (150kHz b/w)*<br>*1240.300 Packet radio (150kHz b/w)*<br>*1240.450 Packet radio (150kHz b/w)*<br>*1240.600 Packet radio (150kHz b/w)*<br>*1240.750 Packet radio (150kHz b/w)* |
| **1,243.250** | | | | | |
| **ATV** | | | | | *1248.000 RT1-3 FM TV input*<br>*1249.000 RT1-2 FM TV input* |
| **1,260.000** | | | | | |
| **Satellites** | | | | | |
| **1,270.000** | | | | | |
| **All modes** | | | | | |
| **1,272.000** | | | | | |
| **ATV** | | | | | *1276.500 RT1-1 AM TV input* |
| **1,291.000** | | | | | |
| **Repeater inputs** | | | | | *1291.000 RM0 (UK) 25kHz spacing*<br>*1291.375 RM15* |
| **1,291.500** | | | | | |
| **All modes** | | | | | |
| **1,296.000** | | | | | |
| **CW only** | | | | | *1296.000 - 1296.025 Moonbounce* |
| **1,296.150** | | | | | |
| **SSB and CW** | | | | | *1296.200 Narrow band centre of activity*<br>*1296.400 - 1296.600 Linear transponder input*<br>*1296.500 SSTV*<br>*1296.600 RTTY*<br>*1296.700 Fax*<br>*1296.600 - 1296.800 Linear transponder output* |
| **1,296.800** | | | | | |
| **Beacons exclusive** | | | | | *1296.800 - 1296.990 Beacons* |
| **1,297.000** | | | | | |
| **Repeater outputs - note 1** | | | | | *1297.000 RM0 (UK)25kHz spacing*<br>*1297.375 RM15* |
| **1,297.500** | | | | | |
| **FM simplex - note 1** | | | | | *1297.500 SM20*<br>*1297.750 SM30* |
| **1,298.000** | | | | | |
| **All modes** | | | | | *Remote control*<br>*Digital communications* |
| **1,299.000** | | | | | |

**Continued in next column**

CD1916

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **1,299.000** | | | | | |
| | | | | | *1299.000 Packet radio (25kHz b/w)*<br>*1299.425 Packet radio (150kHz b/w)*<br>*1299.575 Packet radio (150kHz b/w)*<br>*1299.725 Packet radio (150kHz b/w)* |
| **1,300.000** | | | | | |
| **TV repeater outputs** | | | | | *1308.000 RT1-3 FM TV output*<br>*1311.500 RT1-1 AM TV output*<br>*1316.000 RT1-2 FM TV output* |
| **1,325.000** | | | | | |

### 1.3GHz Band Plan notes:

1. Local traffic using narrow-band modes should operate between 1296.500 - 1296.800MHz during contests and band openings.
2. Stations in countries which do not have access to 1298 - 1300MHz (eg Italy) may also use the FM simplex segment for digital communications.

# 2.3GHz (13cm)

**LICENCE NOTES:**

Amateur Service: Secondary. *Users must accept interference from ISM users*

Satellite Service: 2400 - 2450, Secondary. *Users must accept interference from ISM users.*

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

ISM = Industrial Scientific and Medical

CD1917

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **2,310.000** | | | | | |
| **Sub-regional (national band plans)** | | | | | *2310.000 - 2310.500 Repeater links*<br>*2310.100 Packet radio (200kHz b/w)*<br>*2310.300 Packet radio (200kHz b/w)*<br>*2310.000 - 2310.500 Remote control* |
| **2,320.000** | | | | | |
| **CW exclusive** | | | | | *2320.000 - 2320.025 Moonbounce* |
| **2,320.150** | | | | | |
| **CW and SSB** | | | | | *2320.200 SSB centre of activity* |
| **2,320.800** | | | | | |
| **Beacons exclusive** | | | | | *2320.800 - 2320.990 Beacons* |
| **2,321.000** | | | | | |
| **Simplex & repeaters (FM) - note 1** | | | | | |
| **2,322.000** | | | | | |
| **All modes** | | | | | *2322.000 - 2355.000 ATV*<br>*2355.100 - 2364.000 Repeater links*<br>*2355.100 Packet radio (200kHz b/w)*<br>*2355.300 Packet radio (200kHz b/w)*<br>*2364.000 Packet radio (1MHz b/w)*<br>*2365.000 - 2370.000 Repeaters*<br>*2370.000 - 2390.000 ATV*<br>*2390.000 - 2392.000 Moonbounce* |
| **2,400.000** | | | | | |
| **Satellites** | | | | | |
| **2,450.000** | | | | | |

**Notes continued in next column**

### 2.3GHz Band Plan notes:

1. Stations in countries which do not have access to the All Modes section (2,322 - 2,390MHz), use the simplex and repeater segment 2,321 - 2,322MHz for data transmission
2. Stations in countries which do not have access to the narrow band segment 2,320 - 2,322 MHz, use alternative narrow band segments: 2,304 - 2,306MHz and 2,308 - 2,310MHz.

## 3.4GHz (9cm)

### LICENCE NOTES:

Amateur Service: Secondary
Satellite Service: No allocation
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

CD1918

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| 3,400.000 | | | | | |
| Narrow band CW/EME/SSB | | | | | *3400.100 Centre of activity*<br>*3400.800 - 3401.000 Beacons*<br>*3401.000 - 3402.000 Remote control* |
| 3,402.000 | | | | | |
| All modes | | | | | |
| 3,456.000 | | | | | |
| Narrow band CW/EME/SSB | | | | | *3456.000 EME to USA* |
| 3,458.000 | | | | | |
| All modes | | | | | |
| 3,475.000 | | | | | |

## 5.7GHz (6cm)

### LICENCE NOTES:

Amateur Service : 5,650 - 5,680, Secondary; 5,755 - 5,765 + 5820 - 5850: Secondary. Users must accept *interference from ISM users*
Satellite Service: 5,650 - 5,670 Secondary *Earth to Space only;* 5,830 - 5,850 Secondary *Users must accept interference from ISM users Space to Earth only*
Power limit: 26dBW PEP
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

ISM = Industrial, Scientific & Medical

CD1919

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| 5,650.000 | | | | | |
| Satellite uplinks | | | | | |
| 5,668.000 | | | | | |
| Narrow band CW/EME/SSB | | | | | *5668.200 Preferred narrow band segment** |
| 5,670.000 | | | | | |
| All modes | | | | | |
| 5,680.000 | | | | | |
| 5,755.000 | | | | | |
| All modes | | | | | |
| 5,760.000 | | | | | |
| Narrow band CW/EME/SSB | | | | | *5760.200 Current centre of activity*<br>*5760.800 - 5761.000 Beacons* |
| 5,762.000 | | | | | |
| All modes | | | | | |
| 5,765.000 | | | | | |
| 5,820.000 | | | | | |
| All modes | | | | | |
| 5,830.000 | | | | | |
| Satellite downlinks | | | | | |
| 5,850.000 | | | | | |

* IARU aim to move narrow band operation to this segment, but for the time being operation will continue in the 5760 - 5762 band.

## Unattended (U/A) Operation

Frequencies on which unattended (U/A) operation is permitted by full licensees are shown in these band plans. Novice licensees can also operate their stations unattended but the frequencies and powers are different – please see the Novice licence for the details. Remember that unattended operation requires the prior consent of the local Radio Investigation Service before operation can begin, to enable close down arrangements to be made.

Unattended beacons are limited to 14dBW ERP max. Do not confuse this type of unattended beacon operation with the normal beacon sections of the bands (these are fully site cleared, have special licences and are co-ordinated on an international basis.

Unattended low power remote control is limited to –20dBW ERP and should not radiate outside the boundary of the premises from which you are operating.

Unattended digital operation is limited to 10dBW on the 50MHz band and 14dBW on the other bands where it is permitted.

## IARU

### *International Amateur Radio Union*

As the RSGB represents the interests of radio amateurs within the UK, so the International Amateur Radio Union (IARU) represents amateur radio on an international scale. Its membership is made up of national societies rather than individuals and it has more than 140 member societies. The RSGB is the UK's IARU member society. The IARU was founded in 1925 and has its headquarters in the USA. It is divided into three regions as is the International Telecommunications Union (ITU). Region 1 comprises the UK, Europe, Africa, the CIS and the Middle East.

The aim of the IARU is to promote, preserve and protect worldwide growth in amateur radio and where necessary represent the movement's interests at the ITU. It also regulates and co-ordinates band plans, and makes recommendations for the operation of specialised activities such as meteor scatter.

Another service provided is the Monitoring System (IARUMS) which monitors unauthorised transmissions by other services within the amateur bands. Reports from the IARUMS are sent to both the ITU and national telecommunication administrations.

# 10GHz (3cm)

**LICENCE NOTES:**

Amateur Service: Secondary

Satellite Service: 10,450 - 10,500: Secondary

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

CD1920

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **10,000.000** | | | | | |
| **All modes (ATV, data FM simplex, duplex and repeaters)** | | | | | *10,002.5 - 10,027.5* WB transponders RMT 290/015 OUT<br>*10,027.5 - 10,052.5* WB transponders RMT 315/040 OUT<br>*10,052.5 - 10,077.5* WB transponders RMT 340/065 OUT<br>*10,080 - 10,090* Packet links<br>*10,090 - 10,110* Wideband Beacons & Operating<br>*10,110 - 10,120* Speech repeaters OUT |
| **10,125.000** | | | | | |
| **10,225.000** | | | | | *10,227.5 - 10,252.5* WB transponders RMT 240/425 OUT<br>*10,252.5 - 10,277.5* WB Simplex<br>*10,277.5 - 10,302.5* WB transponders RMT 290/015 IN<br>*10,302.5 - 10,327.5* WB transponders RMT 315/040 IN<br>*10,327.5 - 10,352.5* WB transponders RMT 340/065 IN<br>*10,352.5 - 10,368* Wideband modes |
| **10,368.000** | | | | | |
| **Preferred narrow band CW/EME/SSB beacons** | | | | | *10,368 - 10,370* Narrowband modes<br>*10,368.1* Centre of activity<br>*10,368.8 - 10,369* Beacons |
| **10,370.000** | | | | | |
| **All modes** | | | | | *10,370 - 10,390* Wideband modes<br>*10,390 - 10,410* WB beacons and operating<br>*10,412.5 - 10,437.5* WB transponders RMT 240/425 IN<br>*10,440 - 10,450* Speech repeaters IN<br>*[10,400 - 10,500 unattended operation]* |
| **10,450.000** | | | | | |
| **All modes + satellites** | | | | | *10,450 - 10,452* Alternate narrowband CW/EME/SSB - note 3 |
| **10,475.000** | | | | | |

### 10GHz Band Plan notes:

1. 10,400 is the preferred frequency for wideband beacons, but 10,100 is still used.
2. Wideband FM is preferred around 10,350 - 10,400 to encourage compatibility with narrowband systems; however, there is still activity around 10,050 - 10,125
3. The current NB sub-band is at 10,368, however, a sub-band at 10,450 is being considered as a possible future alternative.
4. Simplex TV operation should take place on RMT inputs which are not used by local transponders.
5. Wideband transponder pairs are designated by input/output frequency. The pairings shown are recommended but occasionally variants may be needed to suit local circumstances.
6. Note that 10475 to 10500MHz is allocated ONLY to the Amateur Satellite service and NOT to the Amateur Service.

# 24GHz (12mm)

**LICENCE NOTES:**

Amateur Service: 24,000 - 24,050 Primary. *Users must accept interference from ISM users*; 24,050 - 24,150 Secondary, *May only be used with the written consent of the Secretary of State. Users must accept interference from ISM users*; 24,150 - 24,250 Secondary. *Users must accept interference from ISM users.*

Satellite Service: 24,000 - 24,050 Primary. *Users must accept interference from ISM users*

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

ISM = Industrial, Scientific & Medical

CD1921

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **24,000.000** | | | | | |
| **Satellites** | | | | | *24,025* Preferred operating frequency wideband equipment<br>*24,048 - 24,050* Preferred narrowband operating* |
| **24,050.000** | | | | | |
| **All modes** | | | | | *24,192 - 24,194* Narrowband op (UK) |
| **24,250.000** | | | | | |

* Will eventually be used if and when allocation changes force this.

# 47GHz (6mm)

**LICENCE NOTES:**

Amateur Service: Primary

Satellite Service: Primary

Power limit: 26dBW PEP

Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

CD1922

| IARU | Novice | U/A Rem Ctrl | U/A Digital | U/A Beacon | Usage |
|---|---|---|---|---|---|
| **47,000.000** | | | | | |
| | | | | | *47,088* Centre of narrowband activity |
| **47,200.000** | | | | | |

**Changes to the 10GHz band:** From 1 February 1999, the allocation will be from 10.00 to 10.125GHz and from 10.225 to 10.475GHz for the Amateur Service. The Amateur Satellite Service allocation will remain unchanged. Changes to the band plan will be published in *RadCom* near to that date.

## *Other amateur bands allocated in the UK are:*

***71.6 - 74.4kHz (Notice of Variation only. Available until 30 June 2000 only)***
***135.7 - 137.8kHz (Permanent beacons not recommended; band planning to be discussed at IARU Region 1 conference, 1999), and 75.5 - 76.0, 142.0 - 144.0, 248.0 - 250.0GHz.***

***The Band Plans printed here have been checked by the relevant spectrum committees***

# ALINCO GIVES YOU more FOR LESS!

## DJ-G5EY
*Dual Band Handheld*

- Spectrum channel display
- Optional extended receive including Airband
  108-173.995MHz
  400-511.995MHz
  800-999.990MHz
- Full VHF/UHF Duplex
- Over air cloning
- Cross band repeat
- Up to 5W RF output
- 100 memories

**£289.00** £8 P&P

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

## DJ-V5
*With Wideband RX*

A new compact heavy duty dual band transceiver

- Full VHF+UHF amateur bands coverage
- Expandable RX range (76 - 999MHz)
- Wide FM broadcast
- Up to 5W output
  (3 output settings: 0.5W, 1W, 5W)
- 4 scan modes
- 200 memory channels + 2 call channels
- 5 programmable scan bands
- Priority Watch
- Plus many more features!

**£229.95** £8 P&P

## DJ-195
*Low Cost 2mtr Handheld*

One of the 'New Breed' Alinco handhelds using state of the art technology

- 5W output (with standard battery)
- 144MHz amateur band coverage
- CTCSS encode/decode fitted
- 40 memories
- DCS, Tone bursts and DTMF
- Many other features!

**£159.00** £8 P&P

## DX-70TH
*100W HF Transceiver plus 100W on 6 mtrs*

**£699.00** £8 P&P

***The DX70 TH packs a hefty 100W punch on all Ham bands 1.8 - 50MHz. It is backed by a superb receiver with narrow filters fitted as standard. Make no mistake - this is a real DX operators transceiver ideal for use at home, in the car, or for that portable DXpedition. General coverage receive is included and wideband transmit facilities for export customers. The detachable front panel allows remote mounting and additional security.***

- TX - all HF + 6mtr
- RX - general coverage
  150kHz - 30-MHz
  50MHz - 54MHz
- SSB, CW, AM, FM and digital modes
- 100 memories
- Detachable faceplate and remote mounting kit available
- Speech processor standard
- Narrow filters fitted as standard
- 100W output on HF & 6mtrs
- Selectable 4 stage RF gain
  -20dB to +10dB
- Superb TX audio and RX
- Excellent RX sensitivity
- Full break in on CW
- All mode squelch
- Scan facilities
- CTCSS encoder
- Noise blanker
- Quick offset for DX pile-ups
- IF shift control
- Separate HF & 6M antenna sockets

## DR-610E Twin Band Mobile

The DR-610E dual band transceiver equipped with Alinco's Advanced Channel Scope utilises a 'Real Time Monitor' on 11 different frequencies simultaneously giving you quick visual scanning capability and the potential for making numerous contacts.

- **120 memories**
- **VHF 50W/UHF 35W max**
- **Channel Scope**
- **Full duplex**
- **CTCSS encoder**
- **AM Airband RX**
- **Optional extended receive inc airband**
  - VHF 108 - 174MHz
  - UHF 420 - 470MHz

**£425.00** £8 P&P

### What PETER HART said about the DR-610E . . .

*" The Alinco also includes a DTMF decoder which permits full DTMF coded links to be set up."*

*Channel Scope - "I found this feature a real boon for quiet monitoring of band activity and in no way just a gimmick."*

*"The audio quality on receive was excellent, the best of all the radios with best overall frequency response."*

## DX-77(E)

**£599.00** £8 P&P

- Covers all HF Amateur Bands
- General coverage receive (150kHz - 30MHz)
- 100 memories
- 100W, SSB, CW & FM, 40W AM
- Built in speech compressor
- Computer control with optional ERW-4
- Full QSK in CW modes
- QRM/QRN reduction with IF shift, RF attenuator and optional CW filter
- Two VFOs + memory operation mode
- Basic model upgradeable to (T) model with
  **EJ33U** Electronic keyer.....**£29.95**
  **EJ34U** CTCSS.....**£19.95**
  **EJ35U** CW filter.....**£49.95**

Post and Packing £2.75

## DR-150E 2 Metre Mobile

**£279.95** £8 P&P

- Optional receive to cover Airband, PMR, Marine, UHF, etc 135-950MHz (with gaps)
- 100 memories
- Channel Scope
- simultaneously displays 7 channels
- 9600 BPS Interface
- CTCSS encoder
- Time Out Timer
- On air cloning

## DR-140E
2 Metre Mobile/Base

**£219.95** £8 P&P

- Optional receive to cover Airband, PMR & Marine
  118-135.995MHz (AM)
  136-173.995MHz (FM)
- 51 memories
- Time out timer
- Alpha numeric display
- 50W FM output
- Electronic squelch
- c/w DTMF mic

## DJ-491
*70cms Handheld Transceiver*

***A new slim line 70 cms transceiver that's easy to use and has an enormous clear display. A unique feature is the ability to display either frequency readout or just a channel number.***

**£189.95** £8 P&P

- Up to 5W output
  (with 9.6V NiCad pack)
- 40 memories channels
- RX expandable to 430 - 450MHz
- Programmable steps 5-50kHz
- PLUS MANY MORE FEATURES!

## DR-605E Dual Band Mobile

- 50W (2m) - 35W (70cms)
- 100 memories
- Full Duplex
- CTCSS encoder fitted

**£329.00** £8 P&P

## DR-M06TH
6mtr FM Mobile
50 - 54MHz

20W!

**£249.95** £8 P&P

***With the new 6 metre repeaters now up and running, this is the ideal radio for the Band. With an optimised receive front end, CTCSS encode and easy to use controls you will be amazed at the range achievable.***

- 100 Memories
- Programmable Repeater Shift

NEVADA®
DISTRIBUTION DIVISION

UK Distributors for Alinco products

tel: **023 9231 3090** fax: **023 9237 6565**

• Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT

• ***e-mail:*** info@nevada.co.uk • ***website:*** http://www.nevada.co.uk

# The new range of Patcomm radio's!

**PATCOMM** announces the redesigned PC 16000E. The ultimate HF Transceiver supplied with a keyboard to receive and xmit RTTY and CW readable on the standard display.

## SPEC'S PC 16000E

*Output Power: Adjustable 1 to 100 Watts Continuous (160 thru 10 meter Ham Bands) *DSP Filtering Systeem: Includes: 2.4 kHz, 1.8 kHz, 500 Hz, 250Hz and RTTY "Brick Wall" DSP Filters -DSP Autonotch Filter -DSP "Denoiser reduces Background noise". *General Coverage Dual Conversion Receiver (1.5-30 mHz) USB, LSB, CW, RTTY & AM. *FM optional. *COLLINS MECHANICAL FILTERS included (2.4 kHz and 500 HZ). *Built-In Digital Power/SWR Meter. *Built-In Iambic Keyer (5-75 WPM). *Highly Effective Noise Blanker. *90 Memories plus Scratchpad. *Selectable Tuning Speed: Fixed (10 Hz Step size) and Variable (1 Hz thru 10 kHz). * IF SHIFT. *Frontpanel selection of 3 Antenna Ports (can be configured as one for receive antenna). *RS-232 Ports for "Dumb Terminal". *Built-In Keyboard interface.

**PATCOMM** PC 9000 the "to become" standard in no nonsense operation on HF + 6 meters. The Unit is strictly Hambands from 160-6 meters with adequate power, 40 watts ( 20 watts on 6 meters ) or qrp 5 watts switchable. FM and RTTY/CW decoding on display is available as an option.

## SPEC'S RX16000E

*1.5 to 30 mHz. *AM, USB, LSB, FM Optional * Full DSP, Autonotch * Denoiser. * Noise Blanker and Manual Notch as well as *90 memories + Scratch pad.

## SPEC'S THE FIRST

*Frequency Coverage : 136,5 kHz. *Final Class-D PA 30 or 130 Watts switchable, delayed Receiver relay-switching. *Built-in SWR current protection circuit. *Harmonics: Suppressing >40 dB thru 5 stage Filtering *Cooling: Internal blower fitted. *Noise level <-30 dbA. *Power requirement: 13.8 Volts, 13.5 Amps @ 130 Watts maximum power output. *Features High/Low output Power switch. *Antenna and Receiver connector SO 239. *Paddle/Keyer standard 6.3 mm Jack. *Power/ PTT/ Low/High indicator. *Compliance: "THE FIRST" is CE certified and approved according to standard ETS 300 684.

We reserve the right to change specifications without notice. All PATCOMM radio's have been CE certified and approved.

**PATCOMM/ROPEX** "THE FIRST" is a great way to explore this new band easily!

**PATCOMM** RX 16000E The latest design in short-wave listening for the discriminating SWL. No receiver incorporates CW and RTTY decoding on display WITHOUT the use of a separate computer.

patcomm international


Platinastraat 90, 2718 RX Zoetermeer
The Netherlands.
Phone : +31 (0)79-361 72 04
Fax. : +31 (0)79-361 71 95
E-mail : rob@patcomm.net
Website : www.qth.com/patcommradio

Patcomm Corporation
Phone : +1-516 862 6511
Fax : +1-516 862 6529
E-mail : patcomm1@aol.com
Website : www.qth.com/patcommradio

Uk dealer:
Nevada ltd.
Phone : 023-9231 3090
Fax : 023-9237 6565
Email : info@nevada.co.uk
Website : www.nevada.co.uk

# technical topics

by **Pat Hawker**, G3VA*

## PERSPECTIVES ON HOMEBREWING

FRANK MERRITT, VE7FPM, in the 'On the bench' column of *The Canadian Amateur* (March/April 1999, pp25-26) offers "some perspectives on homebrewing", devoted to some of the many 'tricks of the trade' in homebrewing amateur radio equipment: Some obvious, some not. He stresses that when a project is to be built (probably on boards) and mounted in an enclosure, care must be exercised in the packaging of the boards.

He writes: "*Before* the design of the boards is finalized, it is wise to make a cardboard model of each board and provide for adequate positioning of the boards in the cabinet, etc. In locating the boards it is imperative that sufficient 'head space' should be allowed above the component surface to be sure there will be no space conflicts. An important factor is to ensure that the later cabling can be run in such a manner that it will be possible to remove any board for future operations.

"A neat way to stack PCBs is through the use of 'U' brackets fabricated from aluminium. This ensures there is a definite separation between the boards and there is shielding to further decrease coupling between the boards. These can be fashioned with a heavy vice and a piece of 3/4-inch plywood.

"It is most important that every assembly in the unit can be made available for repair, modification or change. Every assembly, mainly boards, must be accessible. It may be necessary to remove bolts and nuts from assemblies where the nut is not really accessible. One good technique is to use epoxy cement to secure the nut to the surface that is to be secured, although it is very important that none of the epoxy cement should touch the threads of the screw or nut.

"It will sometimes be possible to insert a finger into the desired location of the nut. For this, wrap a few inches of masking tape around the finger so that sticky part of the tape is over the pressure side of the finger. The nut is then secured to the finger and can be positioned so as to receive the bolt.

"Straight and bent-nose forceps are available from medical or dental sources that make it possible to hold wires etc in remote positions. There are step locks on forceps, making it possible to hold wires in place without using your hand.

"Any and all electronic units should be protected by a fuse (usually twice the normal operating current). It is usually convenient to put a diode at the output of the fuse, such that when the input polarity is reversed the fuse will blow, protecting the unit from accidental reverse-power.

"An automatic centre-punch should always be used to establish the centre of all holes before they are drilled. Automatic punches are better than impact punches.

"For single audio or RF lines, use either BNC or RCA jacks. The RCA jack is the common shielded connector used in audio equipment and is not at all bad as an RF connector.

"Multi-pin connectors will probably be those available from suppliers. They should be purchased *before* assembly of the unit. Indeed, all critical components should be *in hand* before *any* construction is attempted.

"It may not always be necessary to purchase a new enclosure. Sometimes an old cabinet can be recycled, although old steel cabinets are more difficult to work with than aluminium. Often it is possible to fabricate a new enclosure from aluminium sheet stock, often available from flea markets, etc. The main requirements are a heavy vice, a couple of steel angle brackets and a few pieces of wood. Have an adequate supply of stock to permit re-work, since bending sheet aluminium is tricky and is a skill that must be learned.

"The only paint that will really stick to aluminium is marine enamel, manufactured by General Paint [UK equivalent? - G3VA]. The secret of using this paint on plain alumimium surfaces is to remove the surface coating with steel wool and then *immediately* paint the surface. Apply the paint with a paint brush, taking care to remove stroke marks and surface bubbles, then put aside for a minimum of two days to permit adequate drying. Ripple finish requires a spray gun. Be careful not to apply too much in one spot. This also applies to wrinkle paint. Several light coats are superior to one heavy coat that can easily become defective."

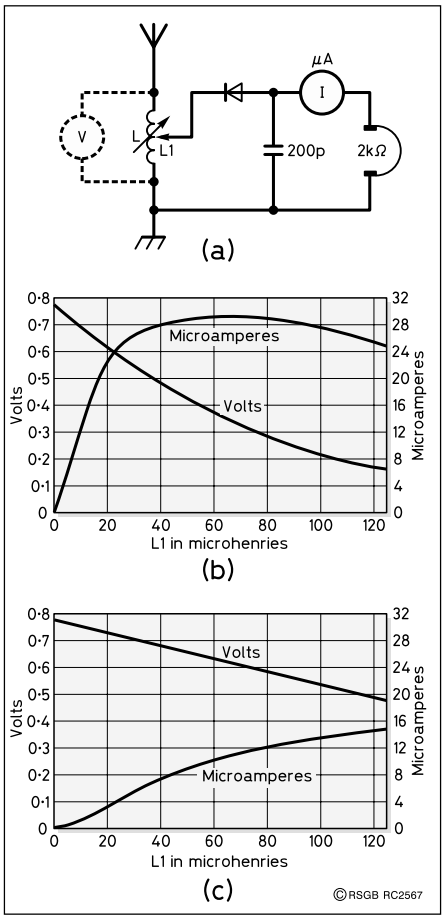



**Fig 1: The 1926 measurements by W H F Griffiths, showing the effects of varying the tapping point of galena and Perikon crystal detectors down the coil. (a) Circuit used for the curves of (b) Galena and (c) Perikon.**

## CRYSTAL SETS, HEADPHONES & PI-NETWORKS

'CRYSTAL SETS - RECRUITING OR EXPERIMENTAL AID?' (*TT*, January 2000, pp54-56) attracted a number of interesting comments, proving once again that this simplest form of radio receiver continues to interest many of those who cut their first 'radio-teeth' on these intriguing devices - which could still offer practical advantages in areas where battery costs weigh heavily and 'wind-up' clockwork radios are out of the reach of many. In the UK the main interest appears to be G3MXV's contention that they also still provide opportunities for experimental work, both on basic design and on the question of the absence of new high-resistance headphones.

David Buddery, G3OEP, recalls that *Wireless World* described in 1939 or 1940 a stand-by crystal set which used a form of full-wave push-pull (balanced) detector circuit [probably using two of the then available Westector miniature copper-oxide detectors: WX high impedance; W lower resistance; with the number indicating the number of elements in series - G3VA]. Unfortunately, he foolishly loaned his bound copy to an acquaintance and this has not been returned. I have attempted to locate the circuit diagram at the Science Museum Library but so far without success, although I have found one that uses a single WX1 detector.

Tony Harwood, G4HHZ, (taking a rest from the conjugate matching controversy, although feeling that this is to some extent relevant) has for some time been interested in finding out how to get the best out of a crystal set in terms of combined selectivity and sensitivity. He writes:

"Some three years ago I carried out quite a search of 1920s' literature, when such sets were a major means of receiving broadcasts. I found three particularly good articles, 'Complications of Crystal Reception' (two parts, *Wireless World*, February 17 and 24, 1926) and 'Further Notes on the Loading

*37 Dovercourt Road, London SE22 8SS.

Effects of Crystals' (March 3, 1926) both by W H F Griffiths. These deal with the optimum L/C ratio; the loading effects of 'low resistance' crystals such as galena (compared with the higher resistance Perikon detectors); how to determine the HF resistance of the detecor from measurements of the DC diode current and RF voltage across the inductor; the use of different resistance headphones; the effect of nearby aerials; and, last but not least, the use of frame aerials. These articles confirm the necessity to use tapped coils as a means of obtaining the best compromise between power transfer from the aerial to detector and selectivity, and showed that the best results were obtained with a low resistance detector connected to the tuned circuit by tapping it down the inductance." **Fig 1** is from the 1926 articles.

[These articles were written long before the concept of semiconductor junction barrier voltage, and I must admit to an error in the January text as giving this as 0.7V which applies to silicon junctions rather than germanium diodes such as the OA81 normally used in RF detector applications and for which the correct figure would be about 0.3V. I wonder what would have been the barrier voltage, if any, of galena and Perikon detectors? - G3VA].

G4HHZ continues: "I built a number of sets using tapped coils and the well known Denco DRRL coil. Although the selectivity and sensitivity were good, I experienced a lot of difficulty with breakthrough from HF broadcast stations, which I suspect was due to resonance of the tapped portion of the coil or the coupling coil. I actually measured a 10MHz resonance with a GDO on a set using an MF tapped coil.

"This led me to consider whether an alternative means of coupling the detector was possible, whereby the impedance of the aerial could be matched to the detector whilst eliminating the sensitivity to HF. It occurred to me that a pi-network combined impedance matching and the characteristics of a low-pass filter. The results were astounding. With the circuit arrangement shown in **Fig 2(a)** and using my G5RV as a T-aerial (feeders strapped) and the central heating pipe work for an earth, some seven MW stations are received at good headphone strength and with very good selectivity.

"I can confirm G3MXV's findings that headphones for crystal sets need not necessarily be high resistance types. Ex-military type SGB CLR (50Ω per ear piece) gave as good results as the SGB CHR 2000Ω version. I even managed quite good results with modern 16Ω 'phones. Varying Cd and retuning Ct shows that an optimum match can be achieved at a particular frequency, as indicated by maximum DC detector current on a micro-ammeter placed in series with the 'phones (the use of a shunt detector as shown rather than the conventional series circuit removes the need to provide a DC return path).

"For coils, I use the windings from a ferrite rod aerial which slide on to 4cm lengths of ferrite rod mounted vertically on the baseboard simply by drilling a hole and gluing them in; this allows for a degree of variation of inductance and reduces direct pickup. The tuning capacitor is 1000pF, using a paralleled 2 x 500pF/gang from a broadcast receiver. Because the aerial/earth system is directly across the tuning capacitor and is of relatively high capacitance, it has a great effect on the tuning. A more sophisticated long- and medium-wave version is shown in **Fig 2(b)**. The LW performance is remarkable, with some six stations available at good 'phone strength. The tap on the MW coil permits reception of the high-frequency end of the band where the aerial capacitance restricts the capacitor tuning range.

"I would thoroughly recommend the pi-network for experiments with crystal sets and also suspect it would be a good way to couple into the low base-impedance of a bipolar transistor. I have tried to find a reference to this method in modern literature but have only come up with a brief mention of its use in the front end of VHF valve television receivers in Section 15 of my 1956 2nd edition of *Radio & Television Engineers' Reference Book* edited by Molloy and Pannett." As I well remember, this reference can be found in all four editions, including those credited to "Hawker and Pannett"! Section 15 was written by D H Fisher, technical director of Regentone Radio and Television Ltd, and formerly of Pye Ltd. He described the circuit shown in **Fig 3(c)** as "particularly satisfactory for medium [impedance] ratios if a balanced input is not necessary, and fits well into some tuner arrangements. It also possesses the virtue of being a low-pass filter and provides excellent attenuation of the local oscillator EMF; although it is often necessary to provide an extra filter for the attenuation of interfering signals at low frequencies." In this application, the pi-network is used to step-up the low-impedance (70Ω) of the aerial input to match the high-impedance valve input. I seem to remember (but cannot trace) that a similar pi-network input arrangement was used in one of the American wartime communications receivers.

Mike Clift, G3UNV, spent a happy Christmas reliving his youth by building crystal sets, including an 'Electronics in Action' kit with a crystal earpiece for one of his grandchildren and then winding coils and assem-

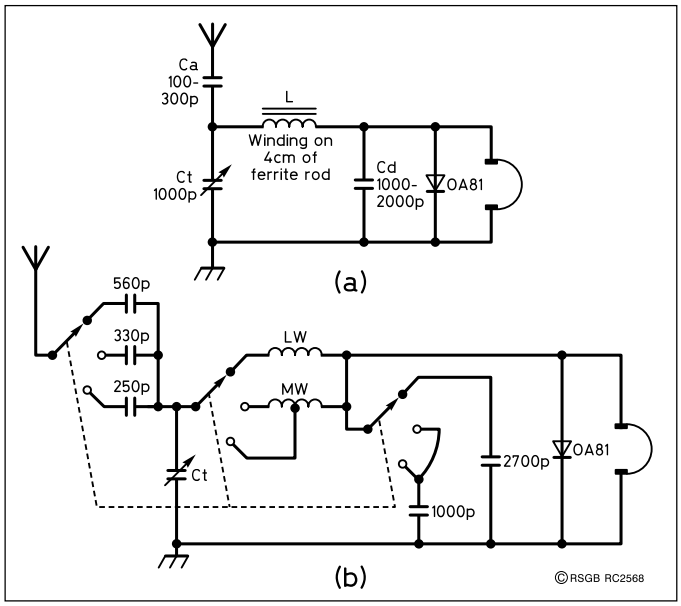



**Fig 2: G4HHZ's use of a pi-network to match the aerial input to a modern OA81 germanium diode. (a) Basic MW receiver. (b) More sophisticated MW/LW receiver with excellent results on both bands.**

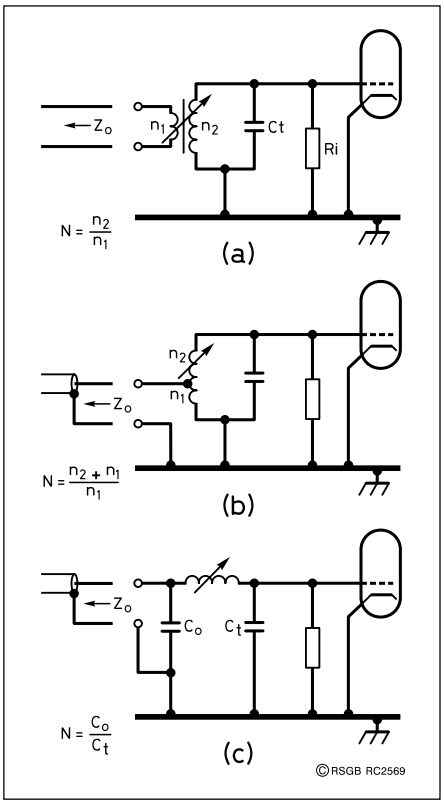



**Fig 3: The use of single-tuned input circuits used on the VHF valve tuners of 1950s TV sets as described in *Radio and Television Engineers' Reference Book*. 'N' is the impedance step-up ratio. (a) Tuned transformer. (b) Tapped coil. (c) The "particularly satisfactory" pi-filter network.**

bling bits and pieces for a second experimental unit on which he tried out various earpieces etc. In brief, he found that his Maplin crystal earpieces did not produce quite so loud a signal as the kit unit, although apparently similar to that in the kit. "Then, trying all the dynamic (moving coil) earpieces and phones which I have, one earpiece produced voices read with difficulty. I tried a 64Ω 64mm diameter mini-loudspeaker and got some promising results. As soon as Maplin opened after the holiday, I bought a couple of 64Ω 37mm diameter units. The results were disappointing, although signals were heard. . . I later wound a coil on a 3-in diameter Saxa salt drum and used by 150ft aerial. My main point in writing is to confirm that an ex-Government SGB [S G Brown] CHR (measuring 2.2kΩ) performed superbly, better than the kit crystal earpiece." G3UNV is now searching for a low-resistance CHL earpiece. He admits all this is quite elementary, but got a buzz almost equivalent to hearing signals on his first crystal set many years ago. "It still seems magical without batteries. How do we get the young to experience that buzz - I've had no luck with my grandson."

## A DISAPPOINTING SOLAR CYCLE?

THE DECEMBER 1999 *TT* item 'HF Radio - Bright future or lost glory?' drew attention *inter alia* to the unexpectedly poor performance of the DX bands last autumn as we moved towards a then expected peak of Solar Cycle 23 during 2000. The daily solar flux readings stayed stubbornly below 200 during September and most of October, after reaching a peak of 248 on August 28, but then in November only reaching 249, the highest (up to 10 March 2000) of the cycle, with relatively poor maxima in December and January. **Fig 4** shows the range of solar flux measurements between June 1999 and January 2000 and also, for comparison, corresponding measurements between July 1997 and March 1998 when we were still in the trough between Cycle 22 and Cycle 23. There have been good (even briefly excellent) openings on 28 and 50MHz in 1998-1999 and 1999-2000, but this winter the geomagnetic conditions have often been disturbed (a condition often enhanced during the immediate post-peak period), and east-west DX signals seem to have seldom been as strong as in the peak months of earlier solar cycles. Then the word was that you could easily work the world with a piece of wet string as an antenna. As the diagram shows, the monthly solar flux minima were often little better than in 1997. Unless, as suggested in the December *TT*, this proves to be a 'double hump' cycle, it looks increasingly as though, despite many predictions, we may have already during 1999 passed the peak of a disappointing Cycle 23. But the jury is still out! A good sign is that March has opened with the flux between 200-233 for at least ten days.

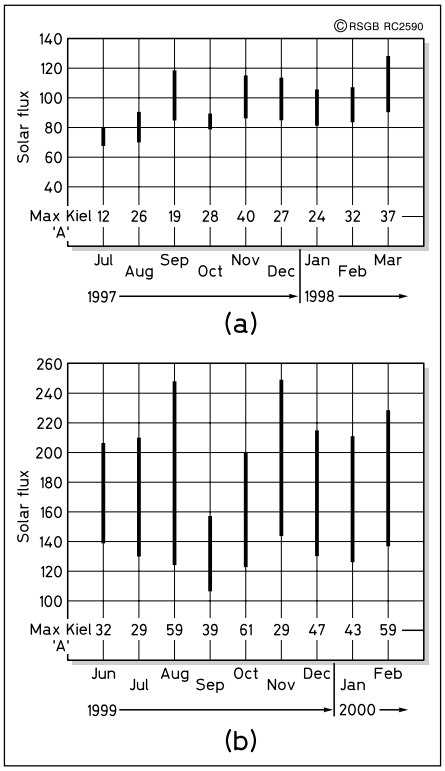



**Fig 4: Solar flux at 10cm wavelength, measured at Penticton, Canada, broadcast on DK0WCY, as received at G3VA. The monthly maximum Kiel A figures represent index A of the geomagnetic field as measured at the Kiel beacon.**

The question of how good the long-term HF propagation predictions are (including those given monthly in *RadCom*) has been raised once again by Ray Cracknell, G2AHU. In a letter which reached me after compiling the December *TT* (but before its publication) he wrote: "This question was put in my article in *RadCom*, October 1984, pp882-885, - for which I was awarded the Wortley-Talbot Trophy - but the findings obviously fell on very deaf ears. We now have a different computer program to tell us what to print and claims to have founded the predictions on practical tests.

"I therefore enclose a copy of my monthly analysis of the reception of the ZS6PW beacon (Pretoria, South Africa), operated by my old friend Fred Anderson. This beacon has a power output of 15 watts on 28,186kHz into a very old three-element Yagi a few feet above his garage. Reception here at Yarpole (nr Leominster, Herefordshire) is on a transceiver home-built in the 1970s and an even older three-element Yagi. A simple crystal-controlled timer switches on the receiver and a tape-recorder for 30-seconds every hour from 0500 to 2100UTC daily."

The north-south path is much less affected by geomagnetic disturbances than would be a east-west path and is open over much longer periods. G2AHU has compiled a series of graphs showing in detail the results achieved during 1988 and 1989 and particularly October 1999, a month when the reliability of signals from ZS6PW proved to be very high and stronger than predicted. There is space here for just three of his graphs: **Figs 5, 6** and **7**, which are self-explanatory. Note that Fig 7 compares the average observed signal strength with those predicted in *RadCom*. With a reception period of only 30 seconds each hour, G2AHU's results are conservative.

G2AHU comments: "As we all know, reception depends on the receiver and the antenna, and if these are not specified then S-meter readings are meaningless. In the case illustrated I would suggest that only a very old 1930s receiver and an odd length of wire dropped out of the window would produce results as poor as those predicted. I believe that measurements of reception are at the very centre of technical investigations and that predictions of likely signals strengths ought to be treated as scientifically as possible. I would thus repeat my 1984 question: How good are our HF propagation predictions?"

My own feeling is that long term propagation predictions have long been recognised as little more than a general guide, with professional and military HF communica-

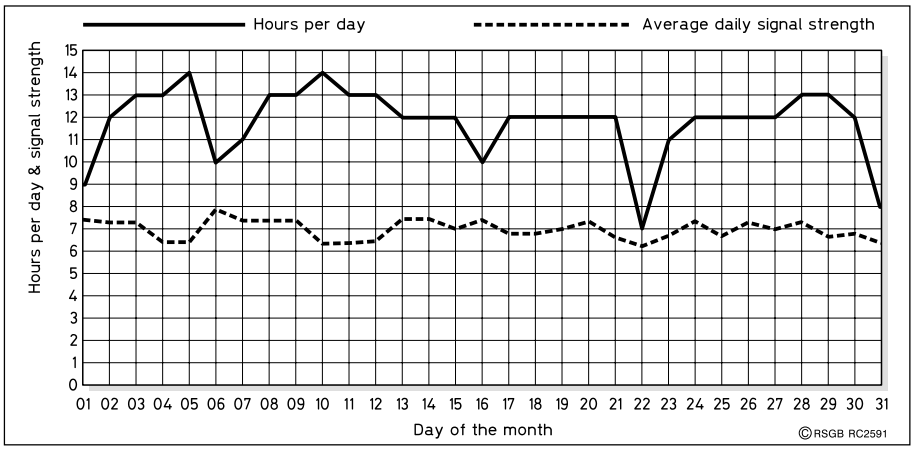



**Fig 5: Distribution of ZS6PW signals received at G2AHU during October 1999 and the distribution of average daily signal strengths.**

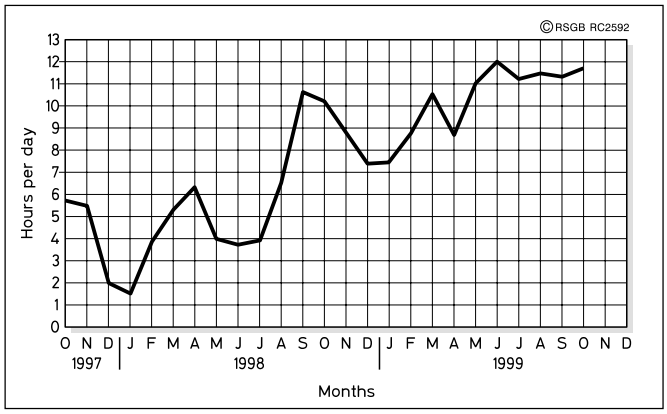



**Fig 6: Average hours per day during which ZS6PW signals were received at G2AHU between October 1997 and October 1999.**

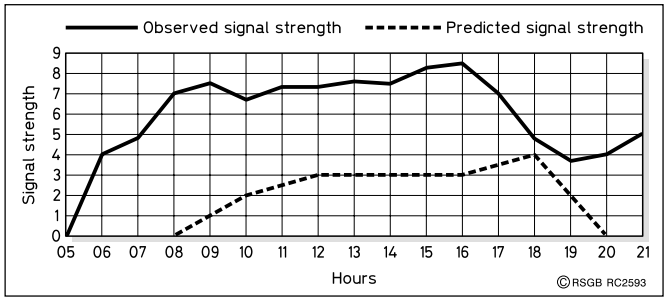



**Fig 7: Predictions and observed results for ZS6PW at G2AHU, from 0500 - 2100UTC during October 1999.**

tors increasingly turning to real-time ionograms to provide information for frequency selections, etc. I confess to seldom using the published predictions and much prefer to use the daily solar flux and magfield figures (supplemented by the three-hourly K ratings) from DARC's Kiel beacon, DK0WCY, as described last December. Similarly, I regard the weekly GB2RS propagation data as useful, but largely of historic interest. Nobody has yet discovered a reliable way of predicting solar disturbances and solar flares in advance or even, it would seem, to predict the shape and progress of the solar cycle.

## SIMPLE DIODE-MATCHING UNIT

THE CHANGING NATURE of amateur radio with virtually 95% of equipment now factory-built, resulting in a decreasing interest in home design and construction, is regretted, if only passively, by many. A good example of its effects can be seen in the growing reluctance of our major technical libraries to take and display the overseas amateur radio publications that formerly graced their shelves. Another recent example is the merging of ARRL's *QEX* with *Communications Quarterly* published by CQ Communications Ltd as the successor to the still-missed *Ham Radio*. Clearly the interest in the technology of communications other than purely practical operating techniques is decreasing at an alarming rate. Much is being left to relatively small-circulation specialist journals such as the excellent *CQ-TV* and *Sprat*. Amateur radio is essentially a hobby, but for many years it has been recognised as a *technical* hobby providing "A radiocommunication service for the purpose of self-training, intercommunication and technical investigations", to quote from the long-standing international definition. Now, it sometimes seems that it is primarily for "intercommunication" and little else. That of course is unfair to the many who, while generally using factory-designs, remain deeply interested in understanding and developing the technology, but it must be the impression given to newcomers.

J A Ewen, G3HGM, wonders if there are any constructors still about in these days of black boxes - with even simple wire antennas purchased - though he admits that may seem a rather curmudgeonly attitude brought about by increasing age. In the hope that there are still a few of what he calls "real hams" left, he offers the diode matching unit shown in **Fig 8**.

He writes: "Users of this circuit who have wondered why their home-brewed double-balanced diode ring mixers [or indeed any balanced diode mixer] have underperformed will have it revealed that diodes selected for 'balance' by simply comparing their forward resistances at a single voltage (the voltage being applied by the ohmmeter) usually differ widely at different forward voltages.

"The circuit comprises a simple bridge with the two diodes under examination forming the lower arms. The two 3k9 resistors should be selected by measurement on a digital ohmmeter. Although their exact value is unimportant, they *must* be of identical resistance. The 50µA meter shows zero reading when the two diodes are passing identical currents (ie they are matched at that applied voltage). The 5k potentiometer allows a voltage varying from zero to approximately 9V to be applied. A current flows when the bridge is unbalanced by different forward resistances of the diodes. Ideally, the meter should be of the centre-zero type, but an end-zero meter is usable though not so convenient, since it requires the diodes to be interchanged when there is a negative reading.

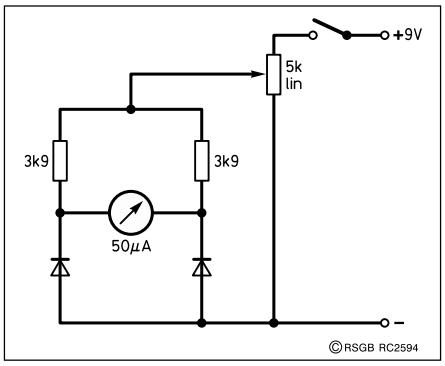



**Fig 8: G3HGM's simple but effective diode matching unit.**

"I believe that most users will be astounded by the spread of characteristics between diodes bearing the same type number, and will be driven to seek a pair of diodes where the needle virtually fails to move throughout a full sweep of the potentiometer. I have found that a meter reading of less than 1µA throughout the range indicates a match far better than that obtained by purchasing so-called 'matched diodes'. Due allowance should be made for the fact that germanium diodes do not start to conduct until approximately 0.2V is applied. The corresponding figure for silicon diodes is about 0.6V."

## FDDS 200-WATT PEDAL GENERATORS FOR AFRICA

THE USE OF pedal-power to generate electricity to operate two-way radios in the absence of mains power has a long and distinguished history. Alf Treager, an Australian engineer, is credited with its introduction over 70 years ago. He developed and manufactured both pedal generators and transmitters of around 50W output and receivers (and later transceivers) for use by the Australian Inland Mission and later the Flying Doctor Service, from the 1920s onwards. These provided a "mantle of safety" for the remote communities of Queensland and Northern Territories. For many years he travelled the Outback installing pedal sets.

Bicycle-lamp dynamos which could be strapped to the wheel of a static bicycle to charge 6V vehicle batteries were dropped in quite large numbers for clandestine radios in occupied Europe during WW2. I still have a working 'Generatimg Set AC 45W 110V hand/pedal driven No 1 Mk1' which formed part of the complete post-war SR123 (Mk123) clandestine/SAS radio, with pedals that can be attached to turn it from a hand- to a pedal-driven set (it weighs much more than the set itself and needs considerable energy to achieve the full 45W output!).

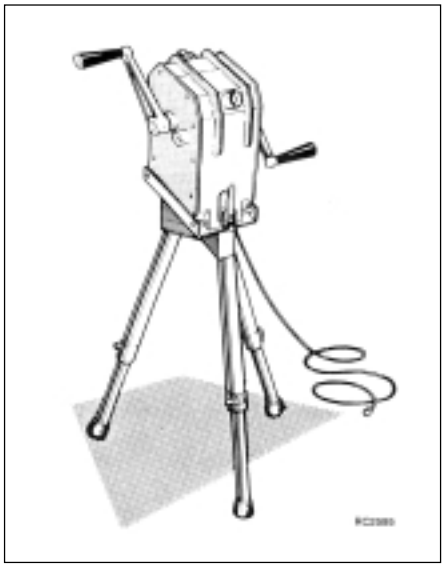
An output of about 50-60W has conventionally been considered the maximum power output of a hand or pedal generator, but *TT* May 1985 (see also *TT Scrapbook, 1985-89*,

p30) reported that Penn Cower, W1BG, had described in *Ham Radio* a "bicycle-powered station" using a regulated 110V vehicle alternator directly to power a 100W transceiver with no form of energy storage other than adding some 2kg of 'flywheel' weight to the rim of the bicycle wheel which drives the alternator. An effective and relatively sophisticated voltage regulator was also used to overcome the large swings in the load presented by an SSB transceiver and the significant variation in the power delivered by the rider during each pedal revolution. W1BG claimed that a middle-aged adult in average physical condition should be able to produce 50W continuously for an hour without undue strain. He reported that a 30-40 minute contact left him damp but by no means exhausted when using his static 10-gear bicycle, doubling as an exercise machine!

John Longhurst, G3VLH, who is Programme Co-ordinate for the Flying Doctor Development Service (FDDS) which has UK charity status and who has been involved in the design, installation and commissioning of many communications projects from HF to microwave in most parts of Africa, has read with interest the various references to solar power, fuel cells and other forms of local electrical power supply that have appeared in *TT* over the years.

He writes: "Whilst cellular phone networks are established in many African cities, most outlying villages have no access to the telephone, insufficient resources to fund satellite communications, or any public electricity supply to power a transceiver. There is a real need for low cost communications to call up medical assistance, relief supplies during flooding, and for public safety, etc. Recognising this need, FDDS has developed a pedal generator capable of powering a 100W HF transceiver. It requires no battery, fuel or solar energy, and the running costs are virtually zero. It uses no slip rings or brushes and so requires minimal maintenance. It has been designed for low-cost local manufacture to minimise unnecessary expenditure of foreign exchange and with a view to future assembly in the Diocesan workshops in Dodoma, Tanzania.

"The FDDS generator design has drawn on the ergonomic and structural development of the bicycle. Sitting on the frame, a man pedalling steadily at around 60rpm can generate in excess of 200W of energy, sufficient to power fully a 100W SSB transceiver. The pedal and chain transmission drives a high-efficiency disc alternator, which produces a three-phase AC output. Acting as a heavy flywheel, the alternator smooths the transition between receive and transmit loads. The output of the alternator is rectified and fed into an 85% efficiency switch-mode power controller, the output of which is a regulated 13.8V output at around 20A peak.



**Military hand-generator of the 1960s. This unit was intended to power the BCC30 (A14) or HF156 low-power HF pack sets in remote areas and could be either tripod-mounted or attached to a tree or a post. The complete kit weighed 7.5kg. With a hand-cranking speed of 50rpm, the alternator rotor shaft is geared to rotate at 2000rpm. The alternator was a three-phase type with a six-pole permanent magnet rotor and three pairs of stator winding. Six silicon diode rectifiers produced a low-voltage DC output at about 10-watts. The development by FDDS of a 200-watt AC pedal generator would seem a significant step.**

"The radio is bolted to the front of the frame, where the handlebars are located on a bicycle. FDDS is using the Kachina KC102 commercial 100W mobile SSB transceiver, since this is compact, low-cost and because Kachina were prepared to provide it in kit form for assembly in the UK. Initially some 14 pedal-powered radios are to be installed in villages in the Dioceses of Ruuaha and Mpwapwa in Tanzania this year, operating on the Diocese 4MHz network frequency. It is foreseen that the new pedal radios will extend the present network and will provide many more villages around Dodoma with vital two-way radio communication."

This project seems not only most laudable in its own right, but also should be of interest to anyone seeking to develop relatively high-power pedal systems for amateur radio or other remote-radio applications.

## MATTERS ARISING

LETTERS ARE STILL arriving on the 'Elusive Conjugate Match', but I really feel that it is pointless to continue this debate *ad infinitum*. It is not as though it makes any significant difference in practice to the way we load up tuned power amplifiers to provide optimum power into our antennas. At least one well-known American 'professional' amateur dismisses it all as "this ridiculous discussion, reaching the highest engineering levels in the USA." Personally, I am willing to accept the view that it is largely a matter of definition (see December *TT)*. Please, no more letters on this topic! But an hour or so after writing this item, a large envelope crammed with e-mail material arrived, courtesy of Ian White, G3SEK, from none other than Walter Maxwell, W2DU, one of the co-authors with VE2CV and W8JI of the 1997 *Communications Quarterly* article that renewed this controversy. W2DU provides the text of the revised Chapter 19 'On the Nature of the Source of Power in Class B and C RF Amplifiers' for the forthcoming 2nd Edition of his excellent book *Reflections*. This, as might be expected, provides a detailed argument in support of the conjugate match case, refuting the "negative statements" of Walter Bruene and those who argue that a conjugate match inherently cannot result in more than 50% efficiency. In view of my comments above, I can only suggest that those who wish to pursue this controversy should wait for the publication of the new edition of W2DU's excellent *Reflections*!

USEFUL COMMENTS have arrived on a number of other recent *TT* items, including the Telefunken variable bandwidth crystal filter (used in several wartime and postwar receivers), G7IXH's fast PA0KSB-type VFO stabilizer (*TT*, December 1977 with detailed article in *QEX* a year or two later), electronic tuning diodes, etc.

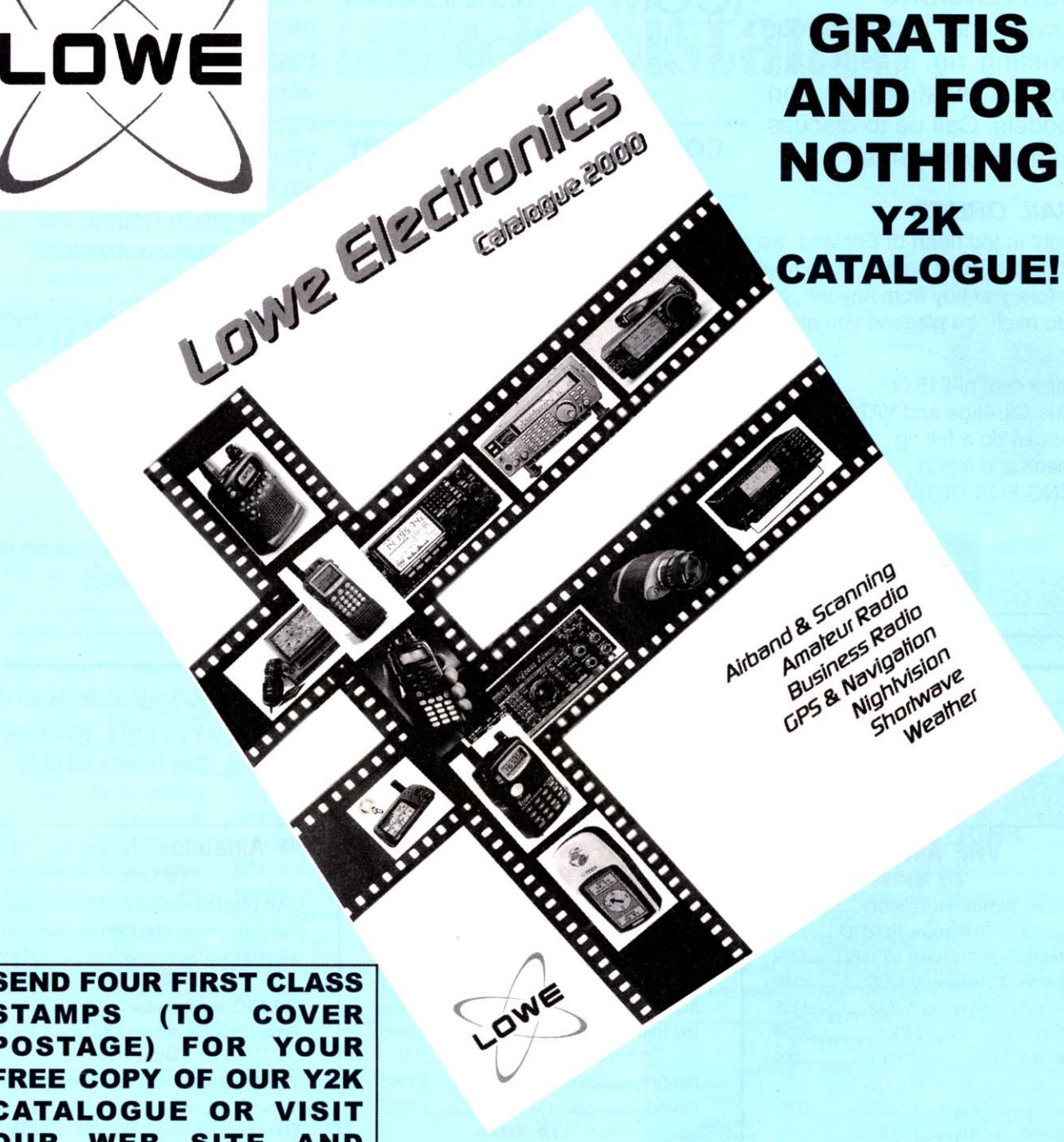
One that cannot be held over concerns the use of a simple home-made loop to help amateurs using NHS hearing aids (*TT*, November 1999). Several comments testify to the effectiveness of this technique. Dave Sergeant, G3YMC, is currently serving on a committee at Hearing Concern which is conducting a survey of induction loop installations in public places for the hard of hearing, investigating the extent and efficiency of applications. He would like any feedback from users of these systems, especially from the amateur community. Anybody who wants to contribute to this survey can obtain more information from him, QTHR, or via e-mail on sergeantd@compuserve.com He warns however against using such loops on radio or TV sets not provided with an earphone socket, since there are still significant numbers of TVs in use with non-isolated chassis. He also mentions that he is getting good results on 136kHz using a loop transmitting antenna in a very small garden, which most would think totally unsuitable for 136kHz transmission. There is further information on his web site: http://ourworld.compuserve.com/homepages/sergeantd ♦

# LOWE ELECTRONICS

LOWE

## FREE GRATIS AND FOR NOTHING

### Y2K CATALOGUE!




**SEND FOUR FIRST CLASS STAMPS (TO COVER POSTAGE) FOR YOUR FREE COPY OF OUR Y2K CATALOGUE OR VISIT OUR WEB SITE AND DOWNLOAD A COPY NOW!!**

**Lowe Electronics Ltd**
**Chesterfield Road**
**Matlock**
**Derbyshire**
**DE4 5LE**

**Tel 01629 580800**
**Fax 01629 580020**
**Email**
**info@lowe.co.uk**
**www.lowe.co.uk**

# HF

**DON FIELD, G3XTT**
*105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ*
*e-mail: hf.radcom@rsgb.org.uk*

TO MY MIND, the HF bands still don't feel as they ought so close to the peak of the cycle, but I see that the experts are now saying the peak may not happen until early next year, so maybe there is better still to come. I operated in the ARRL CW Contest, and 10m was certainly lively to all parts of the USA. However, it was also frustrating during the month to see spots from southern Europe for DX such as ZK2CA on 10 and 12m which were simply not audible here in the UK. Nevertheless, VP6BR on Pitcairn was a nice catch on 10m for many UK stations. Unfortunately, his linear developed problems early on, which meant that his low band activity was severely curtailed. Let's hope he manages to fix the problem before he has to leave the island.

Dean, M5AEM, sent me a log of his recent mobile contacts (100 watts to a mobile whip), which includes nice ones such as A45XM and 9G5ZW on 20m SSB, and 5A1A, A41LZ on 10m SSB. I also note Z21KQ as a rare one on 10m FM. It's good to see one of our new M5 licensees doing so well,

## DX NEWS

Per, LA7DFA, will operate as JX7DFA (Jan Mayen) from 7 April. He will be there for either 6 or 12 months, and will be active on all HF bands as well as VHF. Per prefers CW but will also be on SSB, digimodes, SSTV and PSK31.

Between 31 March and 2 April Willy, ON4CDP, plans to sign F/ON4CHP/P from the Normandy beaches, on 40, 20, 15 and 10m. On the Saturday he will operate from the one of the American beaches, probably Omaha, then on Sunday from Gold beach which was one of the British landing zones.

Stan, OK1JR (5N0MSV), is now stationed in Albania and has received his licence to operate. He will be there for several years and plans to be active during his afternoons and evenings, all bands. There is no ZA QSL bureau, so QSLs go to his home call.

Roger, G3SXW, has sent me some statistics on his trip to Mayotte and Seychelles with Nigel, G3TXF, earlier this year. Between 21 January and 3 February, they made a total of 26,200 CW QSOs, consisting of 21,740 from FH and 4,460 from S79. All WARC-band contacts were made by FH/G3TXF and S79TXF and all non-WARC QSOs by FH/G3SXW and S79SXW. QSL to home calls. Incidentally, these fine totals were made running barefoot with two TS-570Ds to verticals (two R-7000s and an HF2V).

Gus, 9U5D, has been back in Burundi since mid-January and now has two stations. His 'work' station, located in his UN office, has a TS-450 and Ameritron ALS-500M with a multiband dipole for 10 through 80m. He is now living in a hotel and his station there consists of an IC-706 with a 15m L antenna on a tin roof.

The Swiss team which activated St Brandon Island in 1998, using the call 3B7RF, is planning to operate over a two week period from Agalega Island (3B6) in October. An application has been made to ARRL to have Agalega counted as a separate DXCC entity (it lies 1080km from Mauritius, while St Brandon is just 400km from Mauritius). In any case, Agalega counts separately for the IOTA awards programme. The necessary permits and licence are already in hand, and further information will be available later.

Elmer Ribeyro, who operated as 7Q7DX from Malawi until October 1998, is now active from Papua New Guinea as P29DX (the call has been reissued, as it was used by Steve, G4JVG, several years ago).

After many years confined to the narrow 1907.5 to 1912.5kHz segment on 160m, Japanese amateurs may now operate between 1810 and 1825kHz. Nevertheless, I suspect there will still be advantages for European stations in working Japan split-frequency, given that signals over this path tend to be very weak.

The Associated Press reports that Taiwanese officials are eyeing Pratas Island (BV9P/BQ9P), about 432km south of Taiwan, as a possible future tourist spot. The tiny horseshoe shaped island is located in a flashpoint area of the South China Sea and has been a garrison up until now. Last November military officials announced plans to withdraw troops from Pratas and Taiping Islands. Chen Wen-hsiung, a cruise director from Kuohsiung, said "It's kind of different, but we definitely see possibilities" and "ought to make visitors feel safe". Taiwanese officials and tour groups say they can 'get by' the current infrastructure by having tourists lodge on floating hotels. The area is pristine territory for divers and possibly more for amateur radio.

**Gone fishing - one of the aerials in use on the Mayotte expedition. See 'DX News'.**

Peter, OM6TY, has been in Iraq for the last year and has finally received a licence. His new callsign is YI9OM. He works in the Slovak Embassy and will be there for another two years. So far he has been reported on 10 and 15m CW. It appears that his licence covers 10, 15, 20 and 40m only. QSL via his father, OM6TX.

Chung, BX4AF (ex BV4ME), gives news about a new callsign structure in Taiwan.

BX#?? - May operate on all bands with up to 800 watts.

BV#?? and BM#?? - May operate on all bands with up to 600 watts.

BX#??? - May operate on 21 and 28MHz only.

BM#??? and BV#??? - May operate on VHF/UHF only.

Chung says he is active on all bands from 10 to 160m on CW, SSB, RTTY, SSTV and PSK31, including 29MHz FM.

A couple of contributors have told me that Anil, VU2TRI, has asked that amateurs sending direct QSLs to India should ensure they use IRCs and not dollar bills. He further states that 3 IRCs are required, though this seems surprising given that by CEPT rules one of the current type of IRC should be sufficient for airmail postage from anywhere (see the wording on the IRC) unless, of course, the QSL card being used is of excessive weight (which some of the more elaborate cards can be).

Will, WC6DX, plans to activate Santa Barbara Island (NA-066) from 7-9 April.

Max, IK1GPG, reports the following activity from Antarctica. Kim, JA9BOH, is active from Ongul Island (AN-015) as 8J1RL. On-line logs can be found at http://www.jarl.or.jp/English/4_Library/A-4-7_8j1rl/8j1rl_log99.htm Philippe, FT5YG, is located on King George Island (AN-017). QSL via F5LBL. KC4AAA can often be found on 14243 at 0200. This station is located at the Amundsen-Scott Base at the South Pole. QSL via K1IED. Danny, LZ2UU, is active as LZ0A on Livingston Island,

**ARRL RTTY Roundup 1999**
**UK Results**

| Call | Score | Power |
|---|---|---|
| GU0SUP | 10,320 | A |
| GI4KSH | 9,720 | A |
| MM0BYC | 6,840 | A |
| GW5NF | 98,280 | B |
| (ops: GW5NF, GW4JBQ, G4VXE) | | |
| G0LII | 73,439 | B |
| GW4KHQ | 61,824 | B |

A = low-power, B = high-power

South Shetlands. QSL via LZ0A. Russian stations R1ANB, R1ANC, R1AND, R1ANJ, R1ANK and R1ANZ are all on the Antarctica mainland. R1ANF and Polish station HF0POL are located on King George Island in the South Shetlands. QSL R1ANF via RK1PWA and HF0POL via SP3QSL. If you've ever worked an Antarctic station and didn't know where it was located, a good source can be found at http://www.avana.net/~polar/ddxclub/waba_ref.htm

Finally, there are rumours of a possible IOTA DXpedition to Helen Reef/Sonsorol Island between April 28th and May 1st. This would be a first-time operation from the only un-activated group belonging to Belau (T8).

## MOST WANTED COUNTRIES

THE *DX MAGAZINE* has published the results of its annual survey of the '100 Most Needed Countries'. The full list is available at: http://www.dxpub.com The top ten are:

1 - P5 North Korea
2 - VU4 Andaman
3 - A5 Bhutan
4 - BS7 Scarborough
5 - 7O Yemen
6 - 3Y/B Bouvet
7 - VU7 Lakshadweep
8 - VK0/M Macquarie
9 - VP8/SS S. Sandwich
10 - 3C Equatorial Guinea

All but Macquarie look likely to remain high on the list for the time being, while readers of this column will be aware that Macquarie is currently active through the efforts of VK0MM (though QSL cards are unlikely to be available for many months). As I reported in February, there is some hope that Bhutan might once again appear on the bands, but don't expect too much too soon. Spanish amateurs are continuing to look at activating Equatorial Guinea, but so far without success.

## CONTESTS

SOME RTTY CONTEST results this month. The UK scores for the 1999 ARRL RTTY Roundup are shown in the table.

In the tables you will also find the results of the 1999 CQ/RTTY Journal WPX and DX Contests. In the latter, G8G (op: G0NUP) was world 7th on 14MHz.

His Majesty The King Of Spain Contest 2000 takes place over the weekend of 8-9 April, from 1800 on the Saturday for 24 hours on 10, 15, 20, 40 and 80m, both modes (but separate logs are required for each mode – there is no mixed-mode category). Send RS(T) + serial number and receive RS(T) plus letters indicating province (provinces are multipliers). I can provide full details on request.

The Low Power Spring Sprint Contest, organised by the Slovak Amateur Radio Association, takes place on Easter Monday (24 April) from 1400 to 2000

## HF F-Layer Propagation Predictions for April 2000

| | 10.1MHz | 14.0MHz | 18.1MHz | 21.0MHz | 24.9MHz | 28.0MHz |
|---|---|---|---|---|---|---|
| Time | 000001111122 | 000001111122 | 000001111122 | 000001111122 | 000001111122 | 000001111122 |
| (UTC) | 024680246802 | 024680246802 | 024680246802 | 024680246802 | 024680246802 | 024680246802 |
| *** Europe | | | | | | |
| Moscow | 888745442788 | 888866666888 | 1..87777888. | ....888888.. | .....8888.1. | .....88... |
| *** Asia | | | | | | |
| Yakutsk | 3.....243 | 5544....1435 | .1.431123.4. | ....43...4.1 | ....444..... | ....1..... |
| Tokyo | .....1..1. | ..1.....112 | ..1.....1... | ...111.3.... | ....1..... | .......... |
| Singapore | .......... | 1.......111 | .....1...112 | ..1..1..111. | ..1...122.. | .....22.. |
| Hyderabad | 3.....3 | 42.....334 | ...1....3444 | 1..11112344. | ...13233341. | ....133334.. |
| Tel Aviv | 66641....566 | 66.544434666 | 8..65545566. | 8...555555.. | .....5551.. | .....1... |
| *** Oceania | | | | | | |
| Perth | 1..... | 1.....1 | 4.....11.2. | ....1..1.... | ....1.1..... | ...1..1.... |
| Sydney | .....1.. | .....1.2. | .....1.23. | 1..11..11... | .....11..11 | .....22.... |
| Wellington | .....1. | ....11.1.4.. | .....23.451. | ....24.455.. | .....445.... | .......... |
| Honolulu | .......... | ...1..... | .....1 | .....1..... | .......... | 11..... |
| W. Samoa | ..1.1....1.. | .....1.... | ....11.1.1.. | 1.1.211211.1 | 1.....2..... | 1.....1 |
| *** Africa | | | | | | |
| Mauritius | 21.....1..2 | 24.....2 | 3.....1212 | .....12333 | ..1.111123.1 | ....1112233. |
| Johannesburg | ..2..... | 1.....31 | ...1....333 | 3..1.11.1233 | ....1..1122. | ....13..1224 |
| Ibadan | 4442.....454 | 5464.1.1.444 | 4666331123564 | 46.654445666 | ....55555666 | ....5555566. |
| Nairobi | 442.....4 | 444.....454 | 44.4221.2454 | ...433333444 | ....4334.4.. | .....4.... |
| Canary Isles | 8876443..578 | 888.56555788 | 88.887666788 | 8...88788788 | ..1.8888888. | .1...88888.. |
| *** S. America | | | | | | |
| Buenos Aires | 2221.....2 | 3332.1....13 | 44.32.1...23 | ...3...1.133 | .....1111234 | .....212234. |
| Rio de Janeiro | 4432.....24 | 4444.....44 | 44.43....244 | 4..5.1111344 | 4....3233444 | .....3333455 |
| Lima | 2221.....1 | 2323.....12 | 3...1.....3 | ....21....13 | ..11..1.112. | .....1111.. |
| Caracas | 4444.....14 | 45552....1.4 | 55..42111245 | ....14222445 | .....444445. | .....4444.. |
| *** N. America | | | | | | |
| Guatemala | 4443.1.....1 | 44441.1..... | 45..42112234 | .....322333. | .....33444. | .....44444. |
| New Orleans | 3343.1..... | 4442..1.132 | 4.....112344 | .1..11223344 | .....331. | .......... |
| Washington | 5544.....31 | 5555321.1444 | 551.14334544 | 5.....444555 | .....44555. | .....11.51. |
| Quebec | 555421...144 | 555.41113455 | 5....4334555 | .....1444555 | .....11.5.. | .......... |
| Anchorage | 3331.....22 | 4...1...1223 | .....22 | .....1. | .....11... | |
| Vancouver | 2221...1...1 | 2...1....112 | 2...1...1121 | .....222 | .....1 | .....1. |
| San Francisco | .222..1..... | 1242.....112 | 3...1...1232 | .1.....1222 | .....32. | .......... |

Key: The numbers in the table represent S-meter reading on the average amateur rig, whilst colours represent availability. When the predictions are expected to be 67-100% certain, the numbers are blue; when 33-66% certain, red; when less than 33% certain, black.

**The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated weekly.**
**The provisional mean sunspot number for February 2000 issued by the Sunspot Data Centre, Brussels, was 112.3. The maximum daily sunspot number was 153 on 29 February and the minimum was 64 on 2 February. The predicted smoothed sunspot numbers for April, May and June are respectively: (SIDC classical method – Waldmeier's standard) 97, 96, 94 (combined method) 116, 120, 123.**

**WARC BANDS TABLE 2000**

| Call | 10 | 18 | 24 | Total |
|---|---|---|---|---|
| G4KHM | 77 | 92 | 27 | 196 |
| G0NXX | 59 | 50 | 78 | 187 |
| G4UCJ | 30 | 19 | 22 | 71 |
| 2U0ARE | 45 | 0 | 0 | 45 |
| M0CNP | 0 | 7 | 6 | 13 |
| G4FVK | 0 | 6 | 6 | 12 |

**28MHz COUNTRIES TABLE 2000**

| Call | CW | SSB | Mixed | |
|---|---|---|---|---|
| M0BZQ | | | 115 | |
| G0NXX | 82 | 0 | 82 | |
| G0VHI | | | 80 | |
| GM4CHX | | | 61 | |
| M0BIB | 0 | 60 | 60 | |
| G3MDH | 0 | 54 | 54 | |
| G4IDL | 40 | 0 | 40 | |
| G0URR | | | 31 | (RTTY) |
| G0CAS | | | 30 | |
| G4UCJ | 30 | 0 | 30 | |
| G0NCS | | | 21 | (PSK) |
| M0CNP | | | 18 | |
| M0CAL | 0 | 16 | 16 | |

**1999 CQ/RTTY Journal RTTY WPX**

| Call | Points | Class |
|---|---|---|
| GW4KHQ | 692,307 | SOAB HP |
| MI0BME | 330,378 | SOAB HP |
| G5LP | 504,288 | SOAB LP |
| GU0SUP | 159,794 | SOAB LP |
| MM0BYC | 150,500 | SOAB LP |
| GI4KSH | 91,650 | SOAB LP |
| G0MTN | 85,762 | SOAB LP |
| G0LII | 460,285 | SO 15 |
| GW4SKA | 151,076 | SO 20 |

**1998 CQ/RTTY Journal RTTY DX**

| Call | Score | Class |
|---|---|---|
| GW5KHQ | 593,928 | SOH |
| GW5NF | 24,016 | 28 |
| G8G | 237,728 | 14 |
| (Op: G0NUP) | | |
| GW4SKA | 148,336 | 14 |
| GU0SUP | 181,888 | SOL |
| MI0BME | 114,560 | SOL |
| GW3JBQ | 87,906 | SOL |
| G0PCA | 43,709 | SOL |
| G0MTN | 41,124 | SOL |
| GW3YVC | 4,046 | SOL |

**9-BAND TABLE No 33**

**CW ONLY**

| Call | 1.8 | 3.5 | 7 | 10 | 14 | 18 | 21 | 24 | 28 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| G3KMA | 237 | 272 | 319 | 303 | 329 | 312 | 327 | 284 | 311 | 2694 |
| G3XTT | 217 | 239 | 297 | 271 | 296 | 272 | 291 | 236 | 261 | 2380 |
| G3TXF | 126 | 210 | 279 | 243 | 308 | 250 | 305 | 207 | 261 | 2189 |
| G0NXX | 163 | 218 | 260 | 270 | 279 | 270 | 254 | 222 | 244 | 2180 |
| G3WGV | 106 | 183 | 250 | 267 | 295 | 272 | 283 | 247 | 253 | 2156 |
| GW3JXN | 167 | 198 | 260 | 255 | 281 | 275 | 269 | 223 | 224 | 2152 |
| G4BWP | 198 | 198 | 267 | 307 | 246 | 272 | 227 | 235 | 181 | 2131 |
| G3YVH | 122 | 141 | 239 | 266 | 298 | 278 | 264 | 228 | 237 | 2073 |
| G4OBK | 127 | 168 | 235 | 242 | 274 | 260 | 251 | 240 | 234 | 2031 |
| G3SXW | 91 | 190 | 239 | 216 | 305 | 220 | 286 | 193 | 254 | 1994 |
| G3AKU | 104 | 150 | 219 | 229 | 278 | 245 | 258 | 226 | 240 | 1949 |
| G3NOH | 48 | 123 | 202 | 249 | 292 | 274 | 274 | 231 | 235 | 1928 |
| G3VJP | 106 | 148 | 243 | 185 | 299 | 243 | 275 | 192 | 228 | 1919 |
| G3SED | 214 | 207 | 258 | 238 | 229 | 196 | 176 | 150 | 163 | 1831 |
| G3MCS | 37 | 63 | 177 | 220 | 283 | 280 | 252 | 202 | 206 | 1720 |
| G3VKW | 34 | 70 | 114 | 64 | 173 | 87 | 167 | 66 | 133 | 908 |
| M0AEF | 37 | 128 | 120 | 103 | 114 | 82 | 86 | 43 | 94 | 807 |
| GM4OBK | 30 | 76 | 111 | 53 | 126 | 73 | 121 | 73 | 122 | 785 |
| GW0VSW | 28 | 30 | 79 | 111 | 125 | 109 | 96 | 71 | 63 | 712 |
| **AVERAGE** | **115** | **159** | **219** | **215** | **254** | **225** | **235** | **188** | **208** | **1818** |

UTC. Contest exchange is RST, IARU locator (first four characters) and power category (A=1W, C=5W, Q=25W, X=50W, Y=100W). Operate one, three or all six bands. In the 1999 event, G4FDC was first in the 5 watt, 3-band category with 31,590 points, while in the 50 watt, 3-band category G4OGB was first with 33,675 points and G3RSD third with 16,434 points. There were 89 participants in all. My thanks to Alex, G4FDC (OM6SA), for passing along these results and the full rules of the 2000 contest, which I'm happy to forward to any readers in return for an SAE.

The 500th Anniversary of Brazil Discovery contest, organised by the Portuguese radio society is on 1/2 April, for the full 48 hours, SSB only on 10, 15, 20, 40 and 80m. Send RS + serial number. Receive RS + District (Portuguese stations), State (Brazilian stations) or serial number (others). I can provide full details if required.

## AWARDS

THE ARRL REPORTS the backlog of applications at the DXCC Desk continues to dwindle. As of mid-February there were 789 applications with 70,651 cards on file, and applications filed in late November were going out in the mail. The ARRL DXCC Desk has also announced a new, enhanced DXCC Card Checking program. This will allow DXCC members to have their cards checked by local card checkers, without the necessity of mailing cards to ARRL Headquarters. Under the new program, DXCC Card Checkers will be able to check all awards except 160m DXCC, and all QSLs from any current DXCC Entity. This will apply to both new awards and endorsements. QSOs made up to ten years prior to the current year will be eligible for checking in the field, while older cards and Deleted Entities may still be sent to ARRL HQ.

The UK field checking team remains as before. If you live in England (G or M prefix and GX/MX), send your cards, return postage, application form, proof of ARRL membership (if applicable) and fee to Jim Kellaway, G3RTE, 55 Ladbrooke Drive, Potters Bar, EN6 1QW.

If you live in the rest of the United Kingdom (GD, GI, GJ, GM, GU, GW, and equivalent M and club prefixes), send your cards, return postage, application form, proof of ARRL membership (if applicable) and fee to Rob Ferguson, GM3YTS, 19 Leighton Avenue, Dunblane, FK15 0EB.

The new system is already in place, with the restrictions described above. A completed application form must accompany the QSL cards sent for checking. The rear of the form listing the data from the QSL cards submitted *must* be completed.

### 2000 YEARS OF HISTORY IN THE HOLY LAND

The 4X2K award is for promoting historical sites related to the beginning of Christianity in the Holy Land. The rules are quite extensive and involve collecting points for working stations in the Holy Land, with stations at major historical sites counting for additional points, as will the special station, 4X2K. All QSOs in the Holy Land contest count double points. I am happy to supply a full set of the rules in return for an SAE.

## QSL INFORMATION

DAVE, G4MUL, recommends a Web site run by ON6DP as an excellent source of QSL information. There are over 900 pages of QSL data to download, and it can then be searched by most current word processors. The site is at: http://www.qsl.net/on6dp

## SILENT KEY

I HAVE RECEIVED news of the passing of Ron Wills, ZL2TT. Ron is particularly remembered for his part in the very successful DXpedition to Raoul Island by the Kermadec DX Group in May 1996. His wife Win, to whom sympathies are extended, is licensed as ZL2GI.

## THANKS

MY THANKS TO all who have provided information, particularly to the authors of the following for information extracted: *OPDX Bulletin* (KB8NW), *The Daily DX* (W3UR) and *425 DX News* (I1JQJ). Please send items for the **June** issue by **22 April.** ♦

**QTH Corner**

| | |
|---|---|
| A22RM | Ranye, PO Box. 41295 Gaborne, Botswana. |
| C21JH | Jack Haden, VK2GJH, P.O. Box 299, Ryde N.S.W. 1680, Australia. |
| C21/VK2QF | N.E.Mattick, VK2QF, Hargraves N.S.W. 2850, Australia. |
| CE0ZX/CE0ZY | DL bureau or direct to DK7YY, P.O.Box 700343, 10323 Berlin, Germany. |
| EA4CEN | Jose A. Rodriguez Fernandez, General Castejon 1-6-A, Alcorcon, Madrid 28924, Spain. |
| FH/TU5AX | Didier Senmartin, F5OGL BP 19, 35998 Rennes Armees, France. |
| FO0AAA | N7CQQ, P. O. Box 31553, Laughlin, Nevada, USA, 89028, USA. |
| G4ZVJ | Andy Chadwick, 5 Thorpe Chase, Ripon, HG4 1UA U.K. |
| JI3DST | Takeshi Funaki, 2-18-26 Hannan-cho Abeno-ku Osaka-city, Osaka 545-0021, Japan. |
| JX7DFA | Per-Einar Dahlen, LA7DFA, Royskattveien 4, 7670 Inderoy, Norway. |
| NN7A | Arthur M. Phillips, P.O. Box 201, Flagstaff, AZ 86002, USA. |
| OH2BOZ | Keijo Loisti, Jaalankatu 11, FIN-04430 Jarvenpaa, Finland. |
| OK1JR | Stan Matejicek, Moskevska 1464, CZ 10100 Praha 10, Czech Republic. |
| OM2LZ | Ludovit Zajicek, C.P.506, Kuchyna 90052, Slovak Rep. |
| OM6TX | Peter Kristof, Stefanikova 2618, Cadca 02201, Slovak Rep. |
| P29DX | Dr. Elmer Ribeyro, Esparza Sopas Hospital, P.O. Box 112, Wabagenga Province, Papua New Guinea or to QSL manager EA4CEN, direct or through the bureau. |
| PA3GIO | Bert v.d. Berg, Parklaan 38, NL-3931 KK Woudenberg, Netherlands. |
| TX0DX | Jarmo Jaakola, OH2BN, Kiilletie 5 C 30, Helsinki FIN-00710, Finland. |
| V73CW | Bruce Smith,P.O. Box 1436, APO, AP 96555. |
| VU2TRI | Dr.Anil Kumaragarwall, 144 New Ardash Nagar, Balkeshwar Rd, Agra-282004, India. |
| WC6DX | P.O. Box 1332, Monterey CA 93942, USA. |
| XZ0A | c/o Bob Myers, W1XT, 37875 North 10th Street, Phoenix, AZ 85086, USA. |
| ZK2CA | NW7O, Jim Frye, 4120 Oakhill Ave. Las Vegas, NV 89121-6319, USA. |
| ZK2/K7CA | as ZK2CA. |
| ZK2VF | W7TVF, Bill Dawson, P O Box 4049, Pahrump, NV 89041, USA. |
| ZK2/W7TFV | as ZK2VF. |
| ZS31ER | ZS1FJ, P.O. Box 53319, Kenilworth 7745, Cape, South Africa. |
| 5R8GL | Michel Bon, BP 342, (201) Antsiranana, Madagascar. |
| 5Z4WI | G3SWH, either direct (QTHR) or via the RSGB bureau. |
| 7Q7DX | as P29DX. |

# VHF/UHF

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

THE FIRST LINK from amateur radio to the Internet has been approved and is now operational (QRV). There were reports of some enhanced tropospheric propagation and an auroral event. On 50MHz there were a few Sporadic-E (Es) openings to continental Europe, but there were no reports of any inter-continental DX worked from Britain. In the Reports section an asterisk (*) after a call sign indicates a CW QSO. All times are UTC.

## LICENSING NEWS

AN IMPORTANT milestone was reached on 2 February when Adrian Robinson, G7WFM (NG), was issued with a Notice of Variation (NoV) by the Radiocommunications Agency, permitting him to link his amateur radio station to the Internet. This is thought to be the first such NoV. During the experimental period, which began on 8 December 1999, he operated on 437.500MHz, but from 5 February the link frequency (QRG) was changed to 431.075MHz simplex on which you will find the Internet phone 'chat rooms' under the Repeater and Ham Radio groups.

Adrian reports that the local RA inspectors were very positive and helpful. He records special thanks to David Hendon, the Chief Executive of the RA, who helped him to cut through the red tape to get his NoV. Since the system has been on the air, and up to 5 February, over 300 contacts with colleagues in Australia, Canada, Hawaii, New Zealand, the USA and elsewhere were made by amateurs in Nottingham.

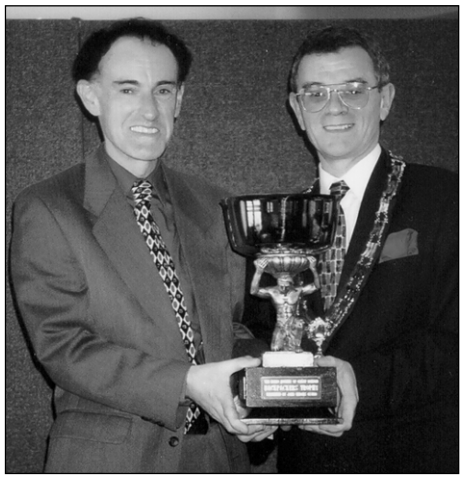
## REPEATERS

UHF REPEATER GB3HU (IO93RS near Hull) became QRV on 29 December 1999, following delays due to technical problems and adverse weather conditions. It transmits on 433.075MHz (RU246) but does *not* feature CTCSS access.

The Aylesbury Vale Repeater Group's January *Newsletter* begins with the notice of the Annual General Meeting on 22 March. The 'Repeater Reports' page gives details of the three voice repeaters. They are GB3VA on 145.700MHz (RV56) located at Brill, GB3AV on 433.050MHz (RU244) located in Aylesbury and GB3BV on 433.025MHz (RU242) near Hemel Hempstead. All have been operating without problems.

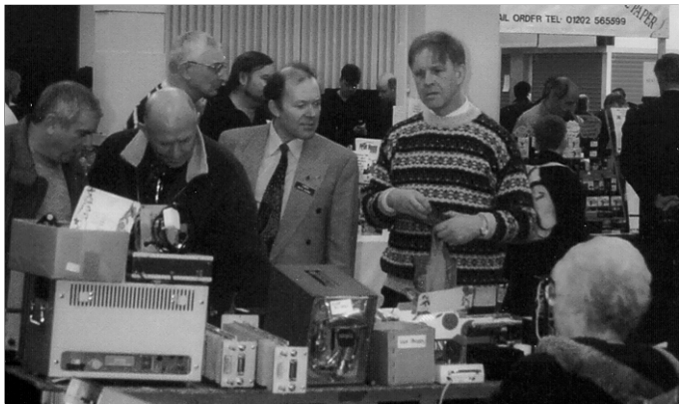
Repeater receivers are often blocked by unmodulated carriers, sometimes unintentionally by hands-free transmit systems. There is an article designed to overcome this problem by Mike Marsden, G8BQH, who describes a simple time-out circuit built around a 741 op-amp.

The AVRG had 154 members at 1 January 2000, 22 of whom are 'Loyal Members' who have been members continuously since GB3VA became QRV in 1981. If you would like to join the group, contact G8BQH whose address is in the current *RSGB Yearbook* (QTHR). There is now a website - see the panel.



**Dave Hewitt, G8ZRE, being presented with the Backpackers Trophy.**

The RSGB National VHF Convention 2000.



**All the stands were kept busy.**

## PUBLICATION

ISSUE 4/1999 OF *DUBUS Magazine* comprises 88 A5 pages. In the 'Technical Reports' section, well-known EME operator Hannes Fashching, OE5JFL, describes a Digital Position Encoder which will be of particular interest to those aiming high gain dishes. Simon Lewis, GM4PLM, describes 'A Flexible 28V Power Supply for Coaxial Relays' built around a National Semiconductor 78S40 chip requiring only ten additional discrete components for a total parts cost of less than £10.

The EME section includes the Ian White, G3SEK, Lunar Weekend Calendar for 2000 with the suggested sked weekends identified. There are reports on 6m activity, tropo, meteor scatter (MS) Es and auroral events. The UK agent for this quarterly bi-lingual publication is Roger Blackwell, G4PMK (QTHR) whose e-mail address is dubus@marsport.demon.co.uk

## ATV NEWS

*CQ-TV*, THE SUPERB quarterly publication of the British Amateur Television Club, is packed with excellent articles for the ATV enthusiast. The current edition is number 189 for February 2000. Peter Smith, G4JNU, describes a 625/30-line converter, enabling standard 625-line video to be converted into 30-line 'Baird standard'.

In his 'Chairman's Corner' column Trevor Brown, G8CJS, comments that not all members are keen to use digital transmission techniques on 70cm or any other band and writes that "...a new expression seems to have been born, 'coming down to broadcast standards. MPEG2 seems to have done for picture quality what Henry VIII did for monasteries,' was one view".

The BATC can supply members with printed circuit boards, components, accessories and literature. Members are offered free Internet dial-up accounts through the ISP Caladan Communications. Ian Pawson, G0FCT (QTHR), edits *CQ-TV* and membership information is handled by Dave Lawton, G0ANO. His e-mail address is memsec@batc.org.uk and the club has a website - see the panel. Since a new columnist has been found to write a dedicated column for *RadCom*, ATV topics will not, after all, be reported here in future.

## PROPAGATION

AS THE NAME implies, *The Six and Ten Report* covers propagation topics in the 6m and 10m bands. As with all issues of this monthly publication, the first few pages of the December 1999 edition are devoted to 10m activity. There are scores of histograms showing the reliability of beacon reception from all continents.

The 6m section begins with an analysis of reports from the UK and includes tables of Es reception from European countries, showing the days of the month when openings were recorded. Other tables deal with DX propagation to Africa and North America. The meteor scatter section records MS reception on eight days in the month, most reports being during the Geminids shower in the 12-14 period. Auroral activity was low, being reported on six days.

The table of daily solar and geomagnetic data shows that the 2.8GHz solar flux reached 217 units

on the 21st, steadily falling to a minimum of 130 by the 31st. As we approach the peak of this present sunspot cycle, there is a full-page article entitled 'Solar Cycle Comparisons' with input from several contributors. Bill Stirling, GM4DGT, suggests we should consider a solar cycle as approximately 22 years since "…the Sun flips its polarity around the middle of a cycle, inverting its magnetic field."

The *Report* is an activity of the RSGB's Propagation Studies Committee (PSC) and is edited by Dr Steve Reed, G0AEV, and Prof Martin Harrison, G3USF. Subscription inquiries should be addressed to Steve (QTHR), whose e-mail address is g0aev@explore.force9.co.uk The PSC has a website - see the panel.

## DXPEDITION

REMI VAICIUS, LY2MW, reports that he and a group of Lithuanian amateurs are planning a local expedition for the 1/2 July weekend to operate in the Baltic Nordic VHF/UHF/SHF contest. They are thinking of operating in KO23, KO34 or KO35, where they went last year, and will be seeking suitable sites. They plan to operate on 6m, 2m and 70cm and would welcome suggestions. You can e-mail Remi at r.vaicius@omnitel.net with your preferences.

## METEOR SCATTER

THE NEXT SIGNIFICANT meteor shower is the Lyrids. My OH5IY program is malfunctioning so, based on last year's data, I suggest the maximum could occur around 0930 on 22 April, but this shower exhibits a broad peak. The radiant is above a mid-UK horizon for about 20 hours between 1830 through midnight to 1430. Times when the reflection efficiency exceeds 50% in the four main directions are: NE/SW 2300-0400 and 0700-1200; E/W 0230-0630; NW/SE 2100-0130 and 0430-0930; N/S 2100-0300 and 0530-1100.

## MOONBOUNCE

THE SECOND LEG of the Annual European Worldwide EME Contest takes place on the 8/9 April weekend and is for 432MHz and 2.3GHz and above. For further details of this REF/*DUBUS*-sponsored event, see page 74 in the March *RadCom*.

From the February *432 and Above EME News*, edited by Allen Katz, K2UYH, I see that Peter Blair, G3LTF (IO91), was QRV on 23cm during the January sked weekend. On the 15th, 2200-2311, he completed with W2UHI, IK2MMB (#151), G4DZU, W1ZX (#152) and OE9ERC. Next day, 1930-2230, he completed with GW3XYW, HB9SV, ZS6AXT and K5JL. He didn't identify the modes but I presume all, except possibly K5JL, were on CW. Stations heard over the weekend were KB2AH, PA3CSG, K3HZO, SM3AKW, DF3RU and DJ5MN. (Note that '#' indicates an 'initial', ie a station worked for the first time.)

Stuart Jones, GW3XYW (IO71), was also QRV on 23cm in the same weekend and on the 15th completed with DC6UW (43/52), IK2MMB (539/439) and OE9ERC (579/559). Next day brought SM3AKW (549/559), HB9SV (569/569), DF3RU (449/539) and G3LTF (549/559). During the February sked weekend Stu's successes were KB2AH (54/52), W1QC (539/549), ZS6AXT (549/569), W2UHI (559/559) and G4DZU (449/559) on the 12th. The next day brought HB9BBD (57/56), HA5SHF (339/559), OE9ERC (57/56), OZ6OL (449/559), KD4LT (559/559), DJ5MN (549/559), K5JL (56/56) and IK2MMB (559/549), to bring his initials to 137 in 28 DXCC countries. Up to mid-February he had been QRV on 23cm for 16 months and hopes to switch to either 70cm or 13cm when the weather improves.

**LOCATOR SQUARES TABLE**
**Starting date: 1-1-1979**

| Callsign | 50MHz | 70MHz | 144MHz | 430MHz | 1.3GHz | Total |
|---|---|---|---|---|---|---|
| G3IMV | 600 | 15 | 610 | 125 | 53 | 403 |
| G4YTL | - | 50 | 444 | 72 | - | 566 |
| G0EVT | 416 | 14 | 292 | 77 | 16 | 815 |
| GJ4ICD | 753 | 1 | 267 | 121 | 79 | 1221 |
| G4DEZ | 435 | 17 | 256 | 81 | 67 | 856 |
| G0FYD | 468 | 1 | 255 | 7 | - | 731 |
| G3XDY | - | 33 | 246 | 170 | 120 | 569 |
| G3FPK | - | - | 246 | - | - | 246 |
| G4ZHI | 19 | - | 225 | 32 | - | 276 |
| G1SWH | 338 | 42 | 222 | 81 | 30 | 713 |
| G7CLY | 238 | - | 221 | 13 | - | 472 |
| G0XDI | 196 | - | 213 | 59 | - | 468 |
| GW7SMV | 392 | - | 150 | - | - | 542 |
| GW6VZW | 488 | - | 146 | 6 | - | 640 |
| G8XTJ | 247 | - | 137 | - | - | 384 |
| G6TTL | 182 | - | 133 | 89 | 27 | 431 |
| G8TOK | 293 | 31 | 132 | 55 | 29 | 540 |
| G1UGH | 265 | - | 130 | 14 | - | 409 |
| G4OUT | - | 23 | 107 | - | - | 130 |
| G3FIJ | 222 | 29 | 104 | 50 | 23 | 428 |
| G0GCI | 279 | 19 | 99 | 39 | - | 436 |
| G0ISW | 162 | - | 80 | 22 | - | 264 |
| MM1BUO | 296 | - | 76 | 31 | - | 403 |
| EA7IT | - | - | 71 | - | - | 71 |
| G1EFL | 207 | - | 64 | - | - | 271 |
| G7LRQ | 212 | - | 60 | 36 | 34 | 342 |
| G4OBK | 279 | - | 58 | - | - | 337 |
| G0JHC | 718 | 20 | 48 | 4 | - | 790 |
| G4APJ | 111 | - | 38 | 19 | - | 168 |
| G8GNI | 113 | 13 | 36 | 18 | - | 180 |
| M0CNP | - | 1 | 29 | 10 | - | 40 |
| G4UCJ | 141 | - | 26 | - | - | 167 |
| 2U0ARE | 238 | - | 18 | 12 | 2 | 270 |
| G4FUJ | 57 | 17 | 18 | 4 | 3 | 99 |
| G3NKS | 5 | 52 | 12 | 4 | - | 73 |
| GU7DHI | 415 | - | - | - | - | 415 |
| GW3EJR | 233 | - | - | - | - | 233 |
| GM1ZVJ | 224 | - | - | - | - | 224 |
| GU6AJE | 214 | - | - | - | - | 214 |

No satellite, repeater or packet radio QSOs.
If no updates are received for a year, entries will be deleted.
Next deadline is 20 April. Band of the month 144MHz.

## BAND REPORTS

### 50MHz

First some news from Ted Collins, G4UPS (EX) who reports that Alain, TR8CA, was going to S9 (Sao Tome) for a short period of work. Ron, 7Q7RM, hoped to be QRV again in March, provided he could find a place for his 6m antenna. Pierre, 8Q7QQ, had only contacted six Europeans up to 17 February, in spite of many hours of operation.

For the last decade, Matt, OZ6OM, has edited his *OZ 50MHz DX Bulletin*, which was originally released on packet radio. Since the spring of 1998, it has been available on the Internet on Saturdays and includes updated beacon listings split into continental order. The *Bulletin* can be found on his website - see the panel.

Peter Taylor, G8BCG (PL), hopes to be QRV again from the Solomon Islands in the Pacific from 28 March under his H44PT call sign. He will be on the 10m liaison QRG, 28.885MHz as well. Further details from his website - see the panel.

From the other side of the world, Mike Foubister, ZL3TIC (RE66), reported an excellent opening to the W6 and 7 districts from 2045 on 13 February. ZL4AAA worked EH8BPX on 50.110MHz at 2130, a distance (QRB) of 18,900km. In addition, the XE1KK beacon (EK09) on 50.023MHz was copied at S9+, as was TV up to 55.260MHz. Keen Oceania DXers might like to try the Oceania cluster - see the panel.

Michael Wright, G0GCI (TN), reports a brief Es opening to NE Italy, Slovenia and Yugoslavia on 28 Jan, 1430-1530, and worked S52LC (JN76). On 7 February he contacted EHJ7AH (IM67). G4UPS reports little DX till the evening of 6 February when Ted worked into DL, S5, 9A3, EH7, EH4 until fade-out at 2020.

Paul Baker, GW6VZW (NP), made auroral QSOs with three GMs on 11 January, 1900-1930, and on the 31st he had Es QSOs with 9A8A and I6PQE. Jamie Ashford, GW7SMV (NP), enjoyed Es contacts with S5, 9A, DL and OE stations on 21 January, 1135-1144, and on the 28th with YT, S5 and 9A folk, 1454-1527. An interesting QSO on the 31st was with T92000 (JN93) at 1010, with 9A and I6 also worked.

### 70MHz

The only report was from G0GCI, who was QRV in the first three legs of the Cumulatives. In average conditions on 16 January, Michael made 22 contacts. On the 30th conditions were slightly better, resulting in 23 QSOs, the best DX (ODX) being GD4GNH (IO74 at 474km) and GM4AFF (IO87 at 657km). On 13 Feb GD4GNH was ODX out of 22tacts in average conditions.

### 144MHz

G0GCI's only QSOs were on 17 January with F4THE (JN18) and HB9RDE (JN37). Conditions were up again on 5/6 February. Graham Daubney, F/G8MBI (JN04), reports a lift on the 4th, with GB3VHF peaking 20dB above normal. GW7SMV also enjoyed the tropo on the 4th, working Fs in IN93, 94, 96 and 97 and JN06, 2157-2317. Next day, using just 1W, Jamie contacted EA1CRK (IN73), plus F, PA, ON and DL stations.

Gordon Wyatt, GW8ASA (CF), found several continental beacons at 0700 on 4 February, but repeated CQ calls only yielded G8CBU (LU). The following morning some EAs were copied and he contacted EA1CRK and a couple of Fs.

**USEFUL WORLDWIDE WEB SITES**

| | |
|---|---|
| Aylesbury Vale RG | http://www.avrg.org.uk |
| British Amateur TV Club | http://www.batc.org.uk |
| Prop Studies Committee | http://www.keele.ac.uk/depts/por/psc.htm |
| OZ6OM 50MHz bulletin | http://www.qsl.net/oz6om/ |
| H44PT News | http://www.qsl.net/g8bcg/ |
| Oceania Cluster | http://www.big.or.jp/~ham/pubhtml/dxcl50.html |

### 430MHz

G0GCI found the first weekend in February to have been particularly good for 70cm. On the 5th, 1030-1215, he made eight contacts with DL, F, ON and PA stations, ODX being DL2VB (JO31 at 459km). On the 6th, in the Affiliated Societies Contest, conditions to the continent were good for the first hour resulting in 13 QSOs, ODX being DL8OBU at 673km. Michael made 50 contacts in this event.

GW8ASA reports that the Severn Estuary SSB Activity Nights are going well. These are from 2000 local on Mondays, Wednesdays and Fridays. Regulars are G0PHZ, GW3HWR, GW3SSK, GW6TYO and G4FHN/P (BS) and Michael, who operate on 432.200MHz up. They would welcome callers from afar.

## VHF CONVENTION

I TOOK A FEW hours off keyboard-bashing to visit the RSGB's National VHF Convention at Sandown Park on 20 February. It was a glorious day, which was just as well as many people had to queue longer than is acceptable to get in. There was more space to circulate around the stands this year and by midday trade seemed brisk. I had to leave before the opening ceremony and the lectures, in order to finish this column. However, I met several contributors and many old friends.

## STOP PRESS

PETER TAYLOR, G8BCG, has forwarded details of his forthcoming operation from H44PT on 50MHz - see also the Band Reports section. This should commence on 28 March around 0100. He suggests the 2000-2200 period for the best chance for long path QSOs to Northern Europe. For the short path, try 0800-1100. He will be running 375W into a 5-ele Yagi. He hopes to have telephone, e-mail and web access to be able to keep in touch, send logs, sound files, etc.

## SIGN OFF

WE WOULD LIKE more photographs in *VHF/UHF*, so if you have any please send them to me by snail mail or as an e-mail attachment if possible. The copy deadline for June is **20 April** and for July the date is **18 May**. My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ISP address is g3fpk. ♦

# IARU

**TIM HUGHES, G3GVV**
*10 Farm Lane, Tonbridge TN10 3DG*

FROM TIME TO time it is useful to remember why, when and how the International Amateur Radio Union was founded, how it has developed and how it functions. This retrospection formed the basis of a presentation at the 1999 Conference in Lillehammer, Norway; some of the topics are summarised in the following paragraphs.

## IN RETROSPECT

IN 1924, THE PRESIDENT of the American Radio Relay League, Hiram P Maxim, realised that amateur radio had become international in scope, and that there ought to be an international organisation to take advantage of its growth and to solve the problems that would accompany that growth. During March of that year, he met in Paris with an international group of amateurs, and made preliminary plans for an international organisation to be known as the International Amateur Radio Union (IARU). Present were representatives from France, Great Britain, Belgium, Switzerland, Italy, Spain, Luxembourg, Canada and the USA.

A year later, the amateur radio representatives of 23 countries met again in Paris to create the IARU officially and to adopt a constitution, one which differed slightly from our present constitution, but with similar goals:

to encourage friendship;

to promote and coordinate amateur radio worldwide;

to represent amateur radio at the International Telecommunication Union's conferences.

In addition to the 23 countries previously present, there were now delegates from North and South America and from Japan.

The history of the IARU has been one of gradually-increasing effectiveness. There are clear signs that the effectiveness is still increasing. The Union has developed from one whose emphasis was largely on the production of operating achievement awards and the reporting of DX successes, to one whose primary emphasis is on the preparation for international telecommunication conferences.

Yet, back in 1925, in the earliest days of international radio regulations, when international long-distance communication was a rare occurrence, those men of vision who compiled the first IARU constitution realised that preparation for telecommunication conferences was an important goal for IARU. It was the continued emphasis on that goal of conference preparation that led to the restructuring of the IARU subsequent to WARC-79, a restructuring that has made that organisation more truly international, not only in scope, but also in administration and leadership.

## STRUCTURE OF IARU

THERE ARE similarities between the structure of IARU and that of the ITU. In the majority of the world's countries, there are national amateur radio societies, groups of radio amateurs banded together for mutual support and cooperation. In each country, a single national society represents its members in IARU. Each member society has responsibility and authority within the framework of IARU. Basically, each member society has the responsibility of representing amateur radio within its own country or territory. This means establishing strong and effective liaison with its own telecommunications organisation and with the officials of that organisation. Only by such effective liaison can the needs of radio amateurs be adequately addressed, and the goals of IARU world-wide be shared with each administration. For example, IARU encourages administrations to have regulations which will support the growth of amateur radio, and it lobbies for the adoption of standards for entry into the amateur service which are uniform throughout the world.

A further responsibility of each member society is to attend triennial conferences of its own regional organisation; there are three of the these - Region 1 comprising Europe, Africa, the Middle East, and the area covered by the former Soviet Union; Region 2 comprising North, Central and South America, and the Caribbean area; and Region 3 comprising Asia and Australasia. These three Regions coincide with the three regions of the ITU. One of these IARU Regions holds a conference each year, at which its member societies gather to discuss mutual problems and to seek mutual solutions. The conference might, for example, discuss a problem caused by other services operating outside their allocated bands, or the most efficient use of the frequency allocations to the amateur service, and adopt a band plan which would recommend the modes of transmission to be used in various portions of the amateur allocations. Each triennial conference of the IARU examines ways to encourage the growth of amateur radio, particularly among young people; it will also consider its budget for the following three years and assess its member societies accordingly.

**Karl Vogele, DK9HU, member of Region 1 IARU Executive Committee, in expansive mood.**

In addition to the member societies and their regional organisations, IARU has an Administrative Council, which consists of a President, Vice President, and Secretary, plus two representatives of each of the three regions, all of whom meet at least once a year. The policy and management of the IARU are carried out by the Administrative Council. Its primary functions are to coordinate the representation of the interests of amateur radio at international or regional telecommunication conferences, under the direction of the President, to establish long term planning to preserve and promote the basic purposes of IARU, and to adopt such recommendations and resolutions as will facilitate the functioning of the IARU. ♦

# RADIOWORLD

## (WEST MIDLANDS)


42 BROOK LANE
GREAT WYRLEY, WALSALL
WEST MIDLANDS WS6 6BQ

TEL SALES & SERVICE: 01922 414796
FAX: 01922 417829
MOBILE TEL: 0850 099244


WE ARE 5 MINS AWAY FROM J11 M6

## Main dealers for Alinco, Icom, Yaesu & Kenwood

***Manufacturers warranty on all new equipment***

**TELEPHONE SALES ON: 01 922 41 47 96**

Ask for Dave (G1LBE)

***Open Mon-Fri 9.30 - 6.00pm. Sat 9.30 - 4.00pm***


**WEB SITE**
http://freespace.virgin.net/radio.world
**E-mail**
radio.world@virgin.net


VISA · DELTA · MasterCard · SWITCH

There is NO CHARGE for using credit cards

**WANTED USED EQUIPMENT**

**PX WELCOME**

**BEST PRICES PAID!**

### ICOM

Most of the Icom range will carry unbelievable discounts. Ring for details

**IC-706G**
HF 6m, 2m, 70cm
**£999**

**IC-746**
HF, 6m, 2m 100W, 100W, 100W with tuner built in.
**£1395**

**NEW IC-756 PRO**
Needs no introduction. Simply fabulous.
**£2099**

**PCR 1000**
Computer driven receiver.

**ICOM IC-R75**
Latest Icom receiver. 0-30 + 6m. Outstanding receive with DSP. **£629**

### YAESU

**FT-920AF**
HF & 6m built-in tuner with FM & FREE AM/FM Filter. ~~£1199~~

**FT-1000MP AC**
Dual Receiver. Digital 100W Competition radio.
~~£2199~~

**FT-VX 1R**
VHF/UHF Handie. Micro small.
**£POA**

**FT-847**
The new mobile-base. DSP HF 2m-70cm 50MHz.
~~£1499~~

**FT-100**
HF 6m/2m/70cm extra small mobile. Information to follow.

### KENWOOD

**TS-870**
Still the only true DSP radio with TX,EQ N/R.
**£1499**

**TS-570DG**
Dedicated HF mobile-base DSP with built-in tuner. **£899**

**TH-G71E**
Full 5 Watts power. Wide band receive.
**£239**

**TM-G707**
The new mobile package with features: High visability display, 5-in-1 programme memory, memory name function, multiscan facility & built-in CTCSS. **£299**

### ALINCO

**DX-70TH**
HF +6M **£599**

**DR-MO6**
6M MOBILE 20W
**£215**

**DR-140**
2M mobile 50W
**£220**

**DR-430**
Mobile 70cm
**£220**

**DJ-G5**
2M/70CM handie
**£237**

**PRICE MATCH**
Up to 5% extra discount may be available on selected items.

## WE STOCK ALL ACCESSORIES FOR THE MAIN BRANDS DISCOUNTED BY 10%

### Microphones - Icom

SM6 ohm, 8 pin, desk mic ..... £59
SM8 1.3/600 ohm selectable, 8 pin desk mic ..... £100
SM20 600ohm, 8 pin, deluxe desk mic ..... £108

### Speakers - Icom

SP20 base station loudspeaker with audio filter ..... £125
SP21 base station loudspeaker ..... £65

### Microphones - Kenwood

C-60A dual impedance desk mic internal pre-amp ..... £106
MC-80 electret desk mic with pre-amp ..... £65
MC-85 electret desk mic with pre-amp & compressor ..... £125
MC-90 desk mic for DSP transceivers ..... £169

### Speakers - Kenwood

SP-23 station loudspeaker for TS-450/690S/570D ..... £62
SP-31 station loudspeaker for TS-850/870S ..... £74.50
SP-950 station loudspeaker for TS-950SDX ..... £96

### Yaesu FT-847 options

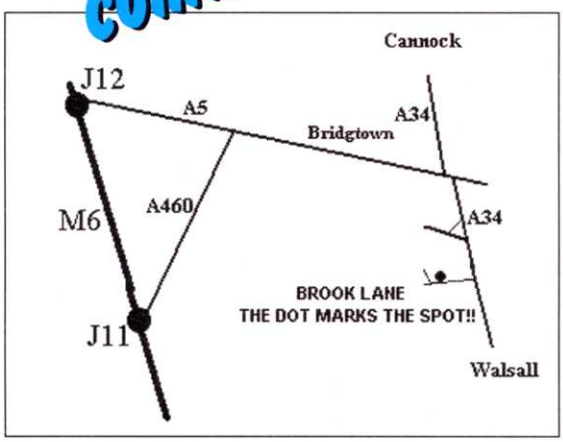
ATAS-100 active tuning ant system ..... £224
FC-20 automatic ant tuner ..... £197
MD-100 A8X desk top mic ..... £99
YF-115C 455kHz/500Hz Collins Mechanical filter ..... £89
YF-1158 02 2.7kHZ SSB filter Collins Mechanical ..... £89

***We also stock all makes of antennas:- Cushcraft, Diamond, Sirio, Watson, Pro-Am, etc.***

# RADIOWORLD

your 1-stop communication shop

42 BROOK LANE, GREAT WYRLEY,
WALSALL, WEST MIDLANDS WS6 6BQ
SALES & SERVICE
TEL: 01922 414796
FAX: 01922 417829
WE ARE 5 MINS AWAY FROM J11 M6




*Remember, if you don't need it, we wont sell it to you phone or visit us for friendly, impartial advice on ALL of your communications needs.*

**MAIL ORDER IS AVAILABLE ON ANY ITEMS FROM THE BELOW LIST; NEXT-DAY DELIVERY IS USUAL.**

ADI, Adonis, AKD, Alinco, Albrecht, Ameritron, AOR, Baygen, Barker & amp; Williamson, Comet, Creative Design, Cushcraft, Datong, DCI, Diamond, Diawi, Fairhaven, & G.B., Garmin GPS, Grundig, Hari, Heil, Hi-Mound, Hora, Howes kits, Icom, JPS, JRC, Kachina, Kantronics, Kent, Kenwood, Kuranishi, Lake, Linear Amp, Lowes, Maspro, Maxon, MFJ, Microset, Mirage, Mizuho, Motorola, Optoelectronics, Oregon Scientific, PRO-AM, Radio Works, Ramsey, Revex, Roberts, Sagant, SGC, Siskin, Sony, SSB, Steepletone, Tasco, 'Ten-Tec' kits, Tonna, Uniden-Bearcat, Vectronics, Watson, Welz, Yaesu, Yupiteru

**AND THEN SOME MORE!!**

## FINANCE NOW AVAILABLE. PHONE DAVE FOR DETAILS!

# USED EQUIPMENT PRICE LIST

| MAKE | MODEL | PRICE |
|---|---|---|
| ALINCO | DJ-X10 RECEIVER | £220.00 |
| ALINCO | DR-112 2M FM | £110.00 |
| ALINCO | DR-510E DUAL BANDER | £195.00 |
| ALINCO | DR-605 DUAL BANDER | £250.00 |
| ALINCO | DX-70T 6M HF | £499.00 |
| AMERITRON | AL-811E BOXED | £450.00 |
| AOR | AR 2002 SCANNER | £199.00 |
| AOR | AR-3000 BASE SCANNER | £395.00 |
| AOR | AR-3000A MINT! | £495.00 |
| AOR | AR-5000 TOP RECEIVER | £999.00 |
| AOR | AR-7030 Inc REMOTE 0-30MHz | £550.00 |
| AOR | AR-8000 SCANNER | £199.00 |
| AOR | AR-8100 SCANNER | £280.00 |
| DRAKE | R8E RECEIVER | £575.00 |
| HI MOUND | KEY HK-702 NICE! | £40.00 |
| ICOM | AT-150 AUTO ATU FOR THE IC-735 | £175.00 |
| ICOM | AT-500 ATU | £295.00 |
| ICOM | AT-500 ATU 500w | £295.00 |
| ICOM | IC 706 Mk1 | £599.00 |
| ICOM | IC-229H 2M FM | £165.00 |
| ICOM | IC-706MK 11 DSP TRANSCEIVER | £650.00 |
| ICOM | IC-706MK11 SUPER TRANSCEIVER! | £599.00 |
| ICOM | IC-706MK11G LATEST! | £850.00 |
| ICOM | IC-720A ALL MODE + FM 100 Watts | £350.00 |
| ICOM | IC-725 TRANSCEIVER PLUS FM | £450.00 |
| ICOM | IC-730 100w SOLID STATE | £250.00 |
| ICOM | IC735 General Coverage | £425.00 |
| ICOM | IC-735 TRANSCEIVER | £450.00 |
| ICOM | IC-737 BASE TRANS, INC TUNER 0-30MHz | £600.00 |
| ICOM | IC-745 0-30MHz | £500.00 |
| ICOM | IC-746 HF/VHF | £999.00 |
| ICOM | IC-751A 0-30MHz | £595.00 |
| ICOM | IC-821H DUAL BAND BASE | £895.00 |
| ICOM | IC-8500 TOP RECEIVER! | £1,199.00 |
| ICOM | IC-970H 2m 70cm BASE TOP RADIO! | £1,299.00 |
| ICOM | IC-970H P/S WIDE RECEIVE 900MHZ | £1,495.00 |
| ICOM | IC-R10 HAND RECEIVER | £225.00 |
| ICOM | IC-T8E 2 m 70m & 6m HANDIE | £230.00 |
| ICOM | P21ET HANDY 2M SMALL | £100.00 |
| ICOM | PCR-1000 PLUS DSP | £285.00 |
| ICOM | PS-15 PSU 20 amp | £120.00 |
| KENWOOD | D7E DUAL BANDER | £225.00 |
| KENWOOD | MC-60A DESK MIC | £70.00 |
| KENWOOD | MC-85 DESK MIC | £90.00 |
| KENWOOD | PS-20 SUITS 9130 etc | £50.00 |
| KENWOOD | PS-33 MATCHES 450 etc | £130.00 |
| KENWOOD | PS-50 HEAVY DUTY | £150.00 |
| KENWOOD | R-5000 0-30MHz | £500.00 |
| KENWOOD | R-5000 0-30MHz + CONVERTER | £650.00 |
| KENWOOD | THE-79E DUAL BANDER | £195.00 |
| KENWOOD | TH-G71 LATEST DUAL BAND HANDIE | £200.00 |
| KENWOOD | TM-221E 25w FM | £125.00 |
| KENWOOD | TM-441E 70cm MOBILE | £120.00 |
| KENWOOD | TS-140S HF/0-30MHz TRANSCEIVER | £400.00 |
| KENWOOD | TS-180S SOLID STATE BASE STATION | £295.00 |
| KENWOOD | TS-450 SAT 100w | £595.00 |
| KENWOOD | TS-530S HF | £200.00 |
| KENWOOD | TS-570DG SPECIFICATION | £695.00 |
| KENWOOD | TS-711E 2M Multimode BASE | £400.00 |
| KENWOOD | TS-850 TRANSCEIVER 0-30MHz | £695.00 |
| KENWOOD | TS-850SAT TRANSCEIVER 0-30MHz | £895.00 |
| KENWOOD | TS-870 SAT 0-30 DSP | £1,200.00 |
| KENWOOD | TS-950SD 150 Watt BASE STATION | £1,395.00 |
| KENWOOD | TS-950SDX 150 Watt BASE STATION | £1,799.00 |
| KENWOOD | VC-H1 VISUAL COMMANDER | £225.00 |
| KW | 1000 AMP | £400.00 |
| LOWE | HF-125 0-30 MHz RECEIVER | £195.00 |
| MFJ | 986D 3KW ATU | £190.00 |
| MFJ | 989C 3KW ATU | £250.00 |
| SEM | TRANSMATCH | £80.00 |
| TENTEC | PSU | £85.00 |
| TOKYO | HL-60U 70cm | £85.00 |
| TRIO | TL-911 AMP NEW VALVES | £400.00 |
| UNIDEN | XLT 860 BEARCAT AS NEW! | £99.00 |
| YAESU | FC-757 AUTO ATU | £175.00 |
| YAESU | FRG-100 FM KEY PAD | £350.00 |
| YAESU | FT 290R 2m Multi Mode | £195.00 |
| YAESU | FT 290R MK11 INC AMPLIFIER 25WATTS | £325.00 |
| YAESU | FT 890 HF Gen "as new" | £600.00 |
| YAESU | FT-10 HANDIE 2M | £100.00 |
| YAESU | FT-11 HANDIE 2M | £100.00 |
| YAESU | FT-3000M 2 METER 70W | £200.00 |
| YAESU | FT-730R 70cm 10w | £120.00 |
| YAESU | FT-736 2/70 AC TRANSCEIVER | £695.00 |
| YAESU | FT-747 TRANSCEIVER | £350.00 |
| YAESU | FT-757GXMK11 TRANSCEIVER | £450.00 |
| YAESU | FT-790R 70CM TRANSCEIVER | £200.00 |
| YAESU | FT-8100 USED | £275.00 |
| YAESU | FT-840 0-30MHz TRANSCEIVER | £495.00 |
| YAESU | FT-920 AF TRANSCEIVER | £999.00 |
| YAESU | FT-990AC | £895.00 |
| YAESU | MD-1 DESK MIC | £60.00 |
| YAESU | FC-102 IN ANT SWITCH | £175.00 |
| YAESU | FC-902 | £140.00 |
| YAESU | FL-110 100w ALL BAND AMP HF | £150.00 |
| YAESU | FP-707 PSU | £100.00 |
| YAESU | FP-757 GX PSU HEAVY DUTY | £150.00 |
| YAESU | FT ONE BASE 0-30MHz | £495.00 |
| YAESU | FT-1000MP AC TOP RADIO! | £1,599.00 |
| YAESU | FT-107m 100w BASE HF | £325.00 |
| YAESU | FT-2500M 50w | £225.00 |
| YAESU | FT-480R 2m Multimode | £225.00 |
| YAESU | FT-650 100w 6m Multimode | £595.00 |
| YAESU | FT-726 2/70/6M/ SAT | £599.00 |
| YAESU | FT-757GXMK1 TRANSCEIVER | £400.00 |
| YAESU | FT-790 MULTIMODE 70cm | £175.00 |
| YAESU | FT-890 0-30MHz | £575.00 |
| YAESU | FT-990 AC | £895.00 |
| YAESU | FT-990 DC | £795.00 |
| YAESU | SP-901 | £30.00 |
| YAESU | YO 100 SCOPE 101 SERIES | £70.00 |
| YUPITERU | MTV-9000 AM/FM/USB/LSB/CW SCANNER | £245.00 |
| YUPITERU | MVT-7100 | £150.00 |

# CONTEST

**TIM KIRBY, G4VXE**
*11a Vansittart Road, Windsor SL4 5BZ*
*E-mail: tim@ukgateway.net*

AN INTERESTING postbag from you this month! Many thanks for taking the trouble to get in touch. My comments and those of David, G3VFP, about adherence to band plans during the larger contests drew plenty of response. The majority of correspondents felt that those who strayed outside recognised contest segments during a contest should be penalised – probably by disqualification. Godfrey, G4GLM, put the case very eruditely by suggesting behaviour on the air as being a microcosmic example of wider social activity. With too many people crowded into too small a space, disrespectful competition ensues. And that was the bit that I was trying to get over. The competition is great. The lack of respect, however, is not. I am starting to tire of the larger contests, with constant battles to keep a frequency. The increasing tendency to jump onto a frequency and call CQ without listening and then refusing to move is a perfect example of this. I don't need those stresses in a 'fun' activity!

Lee, G0MTN, agrees that CQ WW brings out the worst in many contesters, but feels that, happily, this is an exception. He mentions that contests such as the UBA and REF saw plenty of contest activity, but 'normal' contacts going on in between – and all entrants seemed to be in the right parts of the band. Excellent news indeed.

Lee tells a more positive side to the story, by saying how much he enjoys contesting and the sense of community that exists between regular entrants. As he says, "although during contests we only speak to stations for a few seconds each time, there's normally time for a quick 'Hello' as exchanges are sent. It's always nice when your callsign is recognised when you're pulled from the noise, or to get a quick 'Hi Lee' on CW". Absolutely! As I wrote somewhere once before, you can make someone realise you are pleased to work them without telling them so. That really counts!

The comments from Alan, M0AVN, about high speed CW drew some interesting reaction, too. Several people said that there were plenty of CW contests for newcomers to 'get their feet wet'.

Last weekend I was tuning around and working a few stations during the ARRL CW contest, a favourite of mine for many years. Something that seemed new this year was that when I worked some of the big multi-multis I was asked if I'd QSY to another band and gave the frequency. On a Sunday afternoon, when the QSO rate had come down, this struck me as a really sensible thing to do. From my perspective, I was happy to oblige! Those of you who operate from multi-operator stations might like to think about this very direct means of passing stations.

## 21/28 MHz CW Contest 1999

FOR THE CW contest, Chris, G3VHB, was the Open Section leader and claims the silverware; his new C31XR at 100 feet was working well. Dave, G3NKC, just a few miles away in Lichfield, was QRT for an hour with antenna damage, but was still not too far behind in second place!

**One of the contributors to the mailbag this month. Walt, G3NYY, seen operating PSK31 as SV9/G3NYY at the QTH of SV9ANJ.**

**21/28 MHz CW 1999**

**UK Section**

| Pos | Callsign | Overall | Section | 21MHz | | 28MHz | |
|---|---|---|---|---|---|---|---|
| | | | | Q | M | Q | M |
| 1 | G3VHB* | 140823 | O | 292 | 61 | 175 | 41 |
| 2 | G3NKC* | 115602 | O | 314 | 61 | 104 | 32 |
| 3 | GM3POI* | 115116 | O | 193 | 56 | 186 | 46 |
| 4 | G3TBK | 104295 | O | 230 | 55 | 145 | 38 |
| 5 | G3WGV | 83670 | O | 236 | 55 | 115 | 25 |
| 6 | G3UFY | 68493 | O | 164 | 47 | 125 | 32 |
| 7 | G2QT | 62694 | O | 166 | 52 | 92 | 29 |
| 8 | G3CWI* | 44100 | R | 147 | 48 | 63 | 22 |
| 9 | G3LHJ | 39000 | O | 123 | 38 | 81 | 27 |
| 10 | G4IIY* | 38760 | R | 151 | 46 | 39 | 22 |
| 11 | GM3JKS | 33930 | O | 139 | 46 | 35 | 19 |
| 12 | GW3NJW* | 33489 | R | 135 | 40 | 53 | 21 |
| 13 | G3SXW | 24168 | O | 78 | 32 | 74 | 21 |
| 14 | G3LIK | 14949 | O | 67 | 26 | 45 | 19 |
| 15 | GM4SID | 14832 | O | 86 | 34 | 17 | 14 |
| 16 | G0TSM* | 13269 | Q | 81 | 32 | 18 | 13 |
| 17 | GM3CFS | 12843 | R | 88 | 39 | 8 | 6 |
| 18 | G4CZB | 12015 | R | 66 | 29 | 23 | 16 |
| 19 | GW3WWN | 11880 | O | 94 | 30 | 11 | 8 |
| 20 | GW4PXQ | 11772 | R | 101 | 30 | 8 | 6 |
| 21 | G3VYI | 10488 | R | 50 | 21 | 42 | 17 |
| 22 | G3RSD | 9540 | R | 82 | 21 | 24 | 9 |
| 23 | G0MTN | 8928 | O | 91 | 30 | 2 | 2 |
| 24 | G2HLU* | 8436 | Q | 64 | 27 | 12 | 10 |
| 25 | G2AFV | 5859 | R | 54 | 24 | 9 | 7 |
| 26 | G4DDL | 5280 | Q | 38 | 20 | 17 | 12 |
| 27 | G3MPB | 5175 | R | 56 | 24 | 6 | 5 |
| 28 | G3GMM | 4488 | O | 34 | 20 | 14 | 12 |
| 29 | G6QQ | 4425 | R | 48 | 19 | 11 | 6 |
| 30 | G0IGP | 3525 | R | 38 | 17 | 9 | 8 |
| 31 | G3GMS | 2760 | Q | 33 | 17 | 7 | 6 |
| 32 | G0VQR* | 1776 | O | 35 | 14 | 2 | 2 |
| 33 | GM4HQF | 792 | Q | 19 | 9 | 3 | 3 |
| 34 | M0AEK | 792 | R | 21 | 11 | 1 | 1 |
| 35 | MM0BQI | 765 | R | 14 | 12 | 3 | 3 |
| 36 | G4XPE | 687 | R | 19 | 11 | 1 | 1 |
| | | | **SWL Section** | | | | |
| 1 | UA3-170-847* | 810 | S | 18 | 15 | 0 | 0 |

* Certificate winner
Sections: O = Open; R = Restricted; Q = QRP; S = SWL
Check logs: DK3RED, PY2YU, GW3SB, LZ1UQ, G4ZME.

Richard, G3CWI, from Loughborough, was the UK Restricted Section leader, using a pair of dipoles at 10m, with Darren, G0TSM, this time entering and winning the QRP section.

In the Overseas Open Section, Bob, N4BP, was the clear leader, beating Brian, 9J2BO, into second place. Brian noted a lack of G0 and M0 callsigns active in this contest. The Restricted Section was won by Andy, EA8CN, from Tenerife, who enjoyed the best of the 10m propagation to the UK. For the fourth year running, Rumen, LZ2RS/QRP, is the QRP winner – is there no stopping him?

The poor conditions did pick up a little for those who stuck it out. Despite this, DX calls such as R1AND, 3B8CF and HP1AC were welcome appearances in several logs, as well as large numbers of JA and W stations. Thanks to all entrants for their comments and ideas.

***Lee Volante, G0MTN***

## 21/28 MHz SSB Contest 1999

DESPITE BEING NEAR the peak of the sunspot cycle, some entrants were disappointed with conditions for the 1999 contest. Most people still found 10m a struggle. The big exception to the rule was Overseas Open Section winner Brian, 9J2BO, who worked a massive 380 UK stations on 10m – which also shows that UK activity was much higher than you might think, especially from M0, M5 and Novice stations. Please let's have a few more logs next year! Henry, N4UH, worked more stations than Brian on 15m, but could not compete on 10m and had to settle for second place.

The UK Open Section was closely fought, with just a few QSOs and multipliers separating the leaders. Andy, G4PIQ/P, operating from the Martlesham RS shack was the winner. Andy used two FT-1000MPs to move multipliers swiftly between bands, edging out Keith, G3NAS, into second place. Andy was also the leading station on 28MHz and so wins both trophies.

In the Restricted Section Darren, G0TSM, in Hampshire, used just 100W

**21/28 MHz CW 1999**
**Overseas Section**

| Pos | Callsign | Overall | Section | 21MHz | | 28MHz | |
|---|---|---|---|---|---|---|---|
| | | | | Q | M | Q | M |
| 1 | N4BP* | 75276 | O | 100 | 63 | 104 | 60 |
| 2 | 9J2BO* | 46136 | O | 62 | 43 | 92 | 59 |
| 3 | US9QA* | 30132 | O | 117 | 74 | 7 | 7 |
| 4 | K3ZO | 20025 | O | 35 | 32 | 54 | 43 |
| 5 | UT1IA* | 16653 | R | 91 | 61 | 0 | 0 |
| 6 | EA6ZY | 16104 | O | 73 | 49 | 15 | 12 |
| 7 | EA8CN* | 14457 | R | 43 | 33 | 36 | 28 |
| 8 | RX9FB* | 13776 | R | 82 | 56 | 0 | 0 |
| 9 | UA4LU | 11970 | O | 58 | 47 | 12 | 10 |
| 10 | LZ1QZ | 11658 | O | 68 | 58 | 0 | 0 |
| 11 | LZ2RS* | 10302 | Q | 70 | 49 | 2 | 2 |
| 12 | HP1AC | 10065 | O | 34 | 31 | 27 | 24 |
| 13 | UA4PT | 8673 | R | 59 | 49 | 0 | 0 |
| 14 | VK2AYD | 7568 | O | 57 | 43 | 1 | 1 |
| 15 | EA7EZQ | 7425 | R | 48 | 37 | 8 | 8 |
| 16 | RA9AN | 7224 | R | 56 | 43 | 0 | 0 |
| 17 | N7DR | 7152 | O | 24 | 19 | 20 | 17 |
| 18 | VE2AWR | 6774 | O | 42 | 37 | 9 | 8 |
| 19 | JH3AIU | 6708 | O | 52 | 43 | 0 | 0 |
| 20 | LZ1BJ | 6360 | O | 53 | 40 | 0 | 0 |
| 21 | UA9OW | 6027 | O | 51 | 41 | 0 | 0 |
| 22 | VK2KM | 5328 | O | 48 | 37 | 0 | 0 |
| 23 | AA1CA* | 5040 | Q | 22 | 21 | 20 | 19 |
| 24 | UA4QK | 4968 | R | 46 | 36 | 0 | 0 |
| 25 | LZ2NB | 3648 | R | 38 | 32 | 0 | 0 |
| 26 | EA4BWR | 3360 | O | 33 | 30 | 2 | 2 |
| 27 | UY5TE | 2958 | R | 34 | 29 | 0 | 0 |
| 28 | VK8AV | 2697 | O | 29 | 27 | 2 | 2 |
| 29 | RV9WB | 2652 | O | 34 | 26 | 0 | 0 |
| 30 | VE3ST | 2550 | O | 34 | 25 | 0 | 0 |
| 31 | YO8MI | 2430 | O | 30 | 27 | 0 | 0 |
| 32 | UR9MM* | 2355 | Q | 31 | 26 | 0 | 0 |
| 33 | N6ZZ | 2250 | O | 15 | 12 | 15 | 13 |
| 34 | YO4AAC | 2250 | Q | 30 | 25 | 0 | 0 |
| 35 | W2EZ | 2175 | O | 14 | 11 | 15 | 14 |
| 36 | LZ3DP | 1716 | R | 26 | 22 | 0 | 0 |
| 37 | LZ1ABC | 1260 | Q | 25 | 21 | 0 | 0 |
| 38 | JH4JNG | 1254 | O | 23 | 19 | 0 | 0 |
| 39 | RV3DAK | 969 | R | 19 | 17 | 0 | 0 |
| 40 | VA3UZ | 918 | R | 8 | 8 | 10 | 9 |
| 41 | VK4XW | 870 | R | 20 | 15 | 0 | 0 |
| 42 | YO6BMC | 816 | R | 17 | 16 | 0 | 0 |
| 43 | YZ1ZI | 720 | R | 24 | 10 | 0 | 0 |
| 44 | JF2FIU | 630 | O | 15 | 14 | 0 | 0 |
| 45 | JH6TYD | 624 | O | 16 | 13 | 0 | 0 |
| 46 | PY2NY | 507 | R | 5 | 5 | 8 | 8 |
| 47 | JH5OXF | 360 | O | 12 | 10 | 0 | 0 |
| 48 | RA3XO | 300 | O | 10 | 10 | 0 | 0 |
| 49 | N4MM | 297 | O | 0 | 0 | 11 | 11 |
| 50 | W4NTI | 297 | O | 9 | 7 | 2 | 2 |
| 51 | JA1AB | 216 | O | 9 | 8 | 0 | 0 |
| 52 | RX3AP | 192 | O | 8 | 8 | 0 | 0 |
| 53 | UA3XEV | 108 | Q | 6 | 6 | 0 | 0 |
| 54 | JA2DHL | 90 | O | 6 | 5 | 0 | 0 |
| 55 | N4RP | 75 | R | 5 | 5 | 0 | 0 |
| 56 | JA7KM | 60 | O | 5 | 4 | 0 | 0 |
| 57 | JA1AAT | 48 | O | 4 | 4 | 0 | 0 |
| 58 | ER1LW | 48 | O | 4 | 4 | 0 | 0 |
| 59 | YU7SF | 48 | R | 4 | 4 | 0 | 0 |
| 60 | JJ3TBB | 27 | R | 3 | 3 | 0 | 0 |
| 61 | JA6QDU | 18 | O | 3 | 2 | 0 | 0 |

and a CB vertical on 10m to good effect. The UK QRP section was won by Phil, G4RVW, using a 40ft dipole.

The Overseas Restricted Section was won by Boyidar, LZ1HB, using a DX-70 and a trap dipole, and the QRP section by YO4AAC, running a home-made 3W transceiver.

***Lee Volante, G0MTN***

## 2nd RSGB Top Band CW Contest 1999

THE SECOND PART of the bi-annual RSGB Top-Band CW Contest was up on the previous year's similar event by some six entries. However, most scores were slightly lower. 23 stations had perfect logs and overall log-keeping was good, making adjudication fairly straightforward. There was still some slight confusion about the now correct use of contestants' 'post code' report suffixes, rather than the 'county codes' of years past. Again Clive Penna, GM3POI, was the outright overall winner of both 1999 events, with an excellent and perfect score. Chris Burbanks, G3SJJ, missed in recent Top-Band events, came strongly in second place, whilst Jan Fisher, G0IVZ, always near the top, managed a close third place.

A certain amount of score adjustment was undertaken to help contestants who were sometimes unaware that UA2 (Kaliningrad), counts for an extra country, and unfortunately, one or two entrants had to be down-graded slightly for adding the various USA area callsign-numbers to their bonus

**21/28MHz SSB 1999**
**UK Section**

| Pos | Callsign | Overall | Section | 21MHz | | 28MHz | |
|---|---|---|---|---|---|---|---|
| | | | | Q | M | Q | M |
| 1 | G4PIQ/P* | 327234 | O | 518 | 92 | 179 | 70 |
| 2 | G3NAS* | 282580 | O | 546 | 92 | 134 | 48 |
| 3 | GM3WOJ* | 266196 | O | 609 | 92 | 66 | 40 |
| 4 | G3VHB | 214272 | O | 462 | 72 | 148 | 48 |
| 5 | GW4BLE | 171183 | O | 415 | 76 | 96 | 37 |
| 6 | G4NOK* | 163173 | O | 323 | 76 | 128 | 47 |
| 7 | G0KXL | 155886 | O | 500 | 74 | 68 | 21 |
| 8 | G4IRC/P | 150324 | O | 451 | 74 | 56 | 26 |
| 9 | M5ACC | 100035 | O | 294 | 63 | 57 | 32 |
| 10 | G0WPX/P | 96366 | O | 290 | 69 | 45 | 28 |
| 11 | G0TSM* | 66963 | R | 183 | 53 | 72 | 37 |
| 12 | G0DLR | 56112 | O | 249 | 67 | 11 | 7 |
| 13 | GM0NTL | 32979 | O | 154 | 39 | 45 | 17 |
| 14 | G0AEV* | 32886 | R | 126 | 38 | 49 | 25 |
| 15 | G4DUW | 32208 | O | 0 | 0 | 176 | 61 |
| 16 | G4PQL/P* | 29970 | R | 155 | 42 | 31 | 12 |
| 17 | GW4HAT | 26526 | O | 118 | 45 | 36 | 13 |
| 18 | G4AES | 20433 | R | 118 | 37 | 21 | 12 |
| 19 | MM0BQI | 16464 | R | 87 | 34 | 25 | 15 |
| 20 | G2QT | 15498 | O | 98 | 30 | 25 | 12 |
| 21 | G4DDL | 11196 | R | 79 | 24 | 26 | 12 |
| 22 | G4RVW* | 9222 | Q | 87 | 28 | 7 | 5 |
| 23 | M0BAO/P | 7704 | R | 101 | 20 | 22 | 4 |
| 24 | GU4YBW | 5481 | Q | 58 | 25 | 5 | 4 |
| 25 | G4CZB | 5229 | R | 51 | 21 | 12 | 7 |
| 26 | M0COK | 5118 | O | 70 | 19 | 5 | 4 |
| 27 | G3FNM | 2376 | Q | 21 | 16 | 12 | 8 |
| 28 | G4EDR | 1260 | R | 28 | 12 | 2 | 2 |
| 29 | G6QQ | 792 | R | 21 | 11 | 1 | 1 |
| 30 | G4XPE | 648 | R | 19 | 6 | 5 | 3 |

scores! The magic word to look for is 'multipliers' in the annually-published RSGB specific scoring rules for the contest in question.

Overseas entries were the same as in November 1998, but well down on the 31 entries of the February 1999 contest.

LY3CI achieved first place, with EU6EU in second place and SP2FAV in third place. Thanks to all overseas entrants for clean, English-language logs, making score-checking much easier.

***Derek Stanners, G3HEJ***

**2nd RSGB Top Band CW 1999**

**UK Section**

| Pos | Callsign | Pts | |
|---|---|---|---|
| 1 | GM3POI | 1057 | *#++ |
| 2 | G3SJJ | 956 | * |
| 3 | G0IVZ | 947 | *# |
| 4 | G4RCG | 766 | |
| 5 | G3VYI | 735 | |
| 6 | G4CXT | 707 | # |
| 7 | G0JQN | 648 | # |
| 8 | GM3CFS | 645 | |
| 9 | G4OGB | 643 | # |
| 10 | G0LII | 639 | |
| 11 | G4CZB | 635 | |
| 12 | G3NCN | 621 | |
| 13 | G3KKQ | 605 | # |
| 14 | GM4SID | 593 | # |
| 15 | G2HLU | 592 | |
| 16 | G4TSH/P | 591 | # |
| 17 | GM3JKS | 587 | |
| 18 | G3YEC | 566 | |
| 19 | G3THE | 562 | |
| 20 | G4IIY | 543 | |
| 21 | G2AFV | 532 | |
| 22 | G4EBK | 529 | # |
| 23 | G3ZGC | 475 | |
| 24 | G0VFV | 469 | # |
| 25 | G3HZL | 466 | |
| 26 | GW3NJW | 463 | # |
| 27 | M0AJT | 454 | # |
| 28 | G3IZD | 445 | # |
| 29 | G0VQR | 415 | # |
| 30 | G3UFY | 386 | # |
| 31 | G4BJM | 371 | # |
| 32 | G3AWR | 369 | # |
| 33 | G3ZDD | 364 | |
| 34 | G3GMS | 361 | # |
| 35 | G3GMM | 360 | |
| 36 | G3LIK | 329 | # |
| 37 | G3VQO | 189 | # |
| 38 | G3WZR | 75 | # |

**Overseas Section**

| | | | |
|---|---|---|---|
| 1 | LY3CI | 384 | * |
| 2 | EU6EU | 277 | *# |
| 3 | SP2FAV | 251 | * |
| 4 | EU6DX | 185 | # |
| 5 | LA8WG | 130 | |
| 6 | EW8DX | 124 | |

* Certificate Winners
\+ Victor Desmond & Maitland Trophies
\# No Errors
Check log: GW0KZW

# CONTEST CALENDAR

### HF Contests

| Date | Time | Mode | Contest |
|---|---|---|---|
| *1-2 April* | *1500-1500z* | *CW/SSB* | *SP DX Contest* |
| *1-2 April* | *1600-1600z* | *RTTY* | *EA RTTY Contest* |
| 2 April | 0700-0900z | CW | RSGB RoPoco I |
| 4 April | 1900-2030z | CW | RSGB Slow Speed Cumulative |
| *9 April* | *0700-0900z* | *SSB* | *UBA Spring Contest* |
| 12 April | 1900-2030z | CW | RSGB Slow Speed Cumulative |
| 20 April | 1900-2030z | CW | RSGB Slow Speed Cumulative |
| *22-23 April* | *1200-1200z* | *RTTY* | *SP DX RTTY Contest* |
| 28 April | 1900-2030z | CW | RSGB Slow Speed Cumulative |

### VHF Contests

| Date | Time | Mode | Contest |
|---|---|---|---|
| 2 April | 0900-1300z | CW/SSB | RSGB 1st 70MHz |
| 5 April | 1900-2100z | CW/SSB | RSGB 144MHz Cumulative |
| 9 April | 1700-2100z | CW/SSB | RSGB 1.3/2.3GHz |
| 13 April | 1900-2100z | CW/SSB | RSGB 144MHz Cumulative |
| 16 April | 0900-1300 | CW/SSB | RSGB 50MHz |

**The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 1999 *RadCom*. Brief rules for non-RSGB contests, which are listed in italics above, can often be found in the *HF* and *VHF/UHF* columns.**

## 21/28MHz SSB 1999
### Overseas Section

| Pos | Callsign | Overall | Section | 21MHz | | 28MHz | |
|---|---|---|---|---|---|---|---|
| | | | | Q | M | Q | M |
| 1 | 9J2BO* | 289602 | O | 173 | 77 | 380 | 101 |
| 2 | N4UH* | 119112 | O | 204 | 89 | 85 | 49 |
| 3 | 9H1DE* | 102609 | O | 169 | 75 | 109 | 51 |
| 4 | LZ3YY | 59607 | O | 87 | 56 | 92 | 55 |
| 5 | LZ1HB* | 59496 | R | 79 | 58 | 92 | 59 |
| 6 | K3ZO | 56430 | O | 184 | 83 | 14 | 12 |
| 7 | VE3KZ | 51744 | O | 161 | 85 | 15 | 13 |
| 8 | UR8QR | 45529 | O | 144 | 81 | 71 | 49 |
| 9 | UA9CBO | 35250 | O | 66 | 50 | 59 | 44 |
| 10 | US5MJF | 25875 | O | 125 | 69 | 0 | 0 |
| 11 | 4N1DX* | 22848 | R | 112 | 68 | 0 | 0 |
| 12 | EX0Y | 20424 | O | 108 | 61 | 2 | 2 |
| 13 | LZ2A* | 19851 | R | 93 | 61 | 7 | 7 |
| 14 | UA3LHL | 19656 | R | 105 | 63 | 0 | 0 |
| 15 | UA4LU | 19206 | O | 18 | 16 | 79 | 50 |
| 16 | RA3XO | 18939 | O | 108 | 59 | 0 | 0 |
| 17 | RU3DVR | 16920 | O | 94 | 60 | 0 | 0 |
| 18 | RA3OU | 16296 | O | 81 | 56 | 7 | 7 |
| 19 | RN1AO | 14877 | R | 91 | 57 | 0 | 0 |
| 20 | UA3ADK | 13695 | R | 83 | 55 | 0 | 0 |
| 21 | RK9JXQ | 12759 | O | 82 | 52 | 12 | 11 |
| 22 | RW3QF | 10638 | R | 58 | 42 | 37 | 30 |
| 23 | YO5CRQ | 10098 | R | 66 | 51 | 0 | 0 |
| 24 | LZ1BJ | 9555 | R | 65 | 49 | 0 | 0 |
| 25 | N7DR | 7353 | O | 58 | 43 | 0 | 0 |
| 26 | UR3QCW | 7290 | O | 42 | 34 | 12 | 11 |
| 27 | UA4CJJ | 7137 | O | 33 | 25 | 42 | 37 |
| 28 | OH8JSZ | 7011 | O | 57 | 41 | 0 | 0 |
| 29 | UY5TE | 6987 | R | 51 | 41 | 17 | 14 |
| 30 | RA3DNC | 6000 | O | 50 | 40 | 0 | 0 |
| 31 | N4ZDL | 3627 | R | 26 | 22 | 13 | 9 |
| 32 | UT5EFV | 3534 | R | 35 | 28 | 3 | 3 |
| 33 | UT1IA | 3360 | R | 20 | 18 | 15 | 14 |
| 34 | YO4AAC* | 3348 | Q | 36 | 31 | 0 | 0 |
| 35 | JH4JNG | 3306 | O | 38 | 29 | 0 | 0 |
| 36 | EU6DX | 3240 | R | 37 | 30 | 0 | 0 |
| 37 | UA9ACJ | 2883 | O | 29 | 24 | 18 | 17 |
| 38 | YO6BMC | 2772 | R | 35 | 28 | 0 | 0 |
| 39 | N6ZZ | 2673 | O | 23 | 19 | 10 | 8 |
| 40 | YU1KN* | 2430 | Q | 31 | 27 | 0 | 0 |
| 41 | RU3WR | 2418 | O | 27 | 22 | 4 | 4 |
| 42 | YL3BZ | 2340 | R | 33 | 26 | 0 | 0 |
| 43 | RA3DGH* | 1782 | Q | 27 | 22 | 0 | 0 |
| 44 | RV9WB | 1719 | O | 15 | 13 | 21 | 18 |
| 45 | OM4KK | 1716 | O | 26 | 22 | 0 | 0 |
| 46 | LZ2NB | 1443 | O | 24 | 19 | 1 | 1 |
| 47 | LW7EGO | 1320 | O | 0 | 0 | 23 | 20 |
| 48 | YU7SF | 1260 | R | 23 | 20 | 0 | 0 |
| 49 | JA5EO | 1197 | Q | 22 | 19 | 0 | 0 |
| 50 | YL3FW | 1188 | O | 22 | 18 | 0 | 0 |
| 51 | JA7KM | 1071 | O | 21 | 17 | 0 | 0 |
| 52 | JF2FIU | 1071 | O | 21 | 17 | 0 | 0 |
| 53 | JA6QDU | 1071 | O | 21 | 17 | 0 | 0 |
| 54 | 4M3Y | 987 | O | 19 | 17 | 14 | 12 |
| 55 | PY2NY | 969 | R | 13 | 11 | 6 | 6 |
| 56 | UN9PQ | 768 | R | 17 | 16 | 0 | 0 |
| 57 | JF1JLW | 765 | Q | 17 | 15 | 0 | 0 |
| 58 | JH1EVD | 714 | O | 17 | 14 | 0 | 0 |
| 59 | VK8AV | 660 | O | 11 | 10 | 12 | 10 |
| 60 | JG2REJ | 360 | O | 12 | 10 | 0 | 0 |
| 61 | JA8GTO | 300 | O | 10 | 10 | 0 | 0 |
| 62 | JH5OXF | 297 | O | 11 | 9 | 0 | 0 |
| 63 | JR7LVK | 297 | O | 11 | 9 | 0 | 0 |
| 64 | IZ0BXT | 270 | R | 10 | 9 | 0 | 0 |
| 65 | RA9AN | 168 | R | 8 | 7 | 0 | 0 |
| 66 | LZ5QZ | 102 | O | 20 | 17 | 0 | 0 |
| 67 | OK2BHE | 90 | R | 6 | 6 | 0 | 0 |
| 68 | JI8GZS | 75 | Q | 6 | 5 | 0 | 0 |
| 69 | JA9SCB | 75 | Q | 5 | 5 | 0 | 0 |
| 70 | VK4PJ | 48 | O | 4 | 4 | 0 | 0 |
| 71 | JA1STY | 48 | R | 4 | 4 | 0 | 0 |
| 72 | JA1XPU | 48 | R | 4 | 4 | 0 | 0 |
| 73 | JL3RDC | 27 | Q | 3 | 3 | 0 | 0 |
| 74 | JJ3TBB | 27 | R | 3 | 3 | 0 | 0 |
| 75 | JA1AB | 18 | O | 3 | 3 | 0 | 0 |
| 76 | 7N2UQC | 18 | O | 3 | 2 | 0 | 0 |
| 77 | JH2WHS | 12 | Q | 2 | 2 | 0 | 0 |
| 78 | JK1XMP | 12 | R | 2 | 2 | 0 | 0 |

### SWL Section

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | BRS32525* | 28968 | S | 113 | 51 | 23 | 20 |
| 2 | UA3-170-847* | 10614 | S | 68 | 43 | 28 | 25 |
| 3 | BRS28198 | 8241 | S | 54 | 30 | 13 | 11 |
| 4 | F11676 | 867 | S | 14 | 14 | 3 | 3 |
| 5 | ONL383 | 270 | S | 6 | 5 | 4 | 4 |

Check logs: UA4RC, G0FYX, and LZ1UQ

# RSGB VHF National Field Day 2000 Rules

**General Rules Apply**
See *RadCom*, October 1999, p48 and p53.

**1 Date and time of contest**
1400 Saturday 1 July 2000 until 1400 Sunday 2 July 2000.

**2 Site Notification**
Each Group intending to compete must supply the following details:
(a) Name of Club/Group
(b) Contact name and address/telephone number in case of query
(c) Section entered
(d) Choice of bands (see section 7)
(e) Call sign for each band
(f) NGR of site
(g) Site access information (maps are not required)

A suitable form is available in the *RSGB Yearbook*, from the VHFCC web site www.blacksheep.org/vhfcc or from G4XUM (VHFCC Chairman). Post the details to: VHF Contests Committee, PO Box 2399, Reading, RG7 4FB or e-mail to vhf.entry@rsgb.org.uk The postmark of the letter or the date of the e-mail must not be later than 27 June 2000. Late changes to site may be made by telephoning or e-mailing G4XUM (telephone number and e-mail address are given below). Each group may only register one site, although changes can be made provided G4XUM is informed before the contest by telephoning 0870 740 7909 evenings and weekends, or by e-mail to g4xum@blacksheep.org

**3 Bands**
The chosen bands must be stated on the site registration form. See individual section rules (section 7 of these rules) for the choice of bands during the contest. Late changes to chosen bands may be made by telephoning or e-mailing G4XUM as above.

**4 Operators**
Any RSGB member or group of members operating from the British Isles (excluding the Irish Republic) may enter. Also, affiliated RSGB societies may enter (operators *must* be members of the Affiliated Society (AFS), but not necessarily members of RSGB themselves). In this case, a declaration signed by an officer of the AFS to which the member belongs is required with the entry. RSGB members are allowed to operate in AFS groups, whether or not they are actually members of that AFS group.

**5 Stations**
All equipment including antennas and accommodation must be installed on site not more than 24 hours before the contest. Only portable accommodation can be used to house the stations. Power for all equipment must be derived from an on-site generator, battery, the wind or the sun.

**6 Contest exchanges**
(a) On each band, report, serial number and 6-character locator (eg IO91OJ) must be exchanged.
(b) Additionally, on 70MHz only, QTH information must be exchanged (Special rule S2).

**7 Sections**

**7.1 Open section (O):**
(i) Maximum output power as permitted by standard licence conditions.
(ii) General rules apply.
(iii) Operate on up to 4 bands from the table.
(iv) Single-band entries for any band are also acceptable.

**7.2 Restricted section (R):**
(i) The power output of any band must not exceed 100W PEP at the transmitter.
(ii) The height of the antenna's driven element must not exceed 10 metres above ground level.
(iii) Only one antenna per band may be used (ie no stacked, bayed or colinear arrays, or switching between two or more antennas). A slot-fed Yagi or Quad antenna is permitted. Dish or Backfire antennas must not exceed 2m diameter.
(iv) Operate on up to 4 bands from the table.
(v) Single-band entries for any band are also acceptable.

**7.3 Low Power section (L):**
(i) The power output of any band must not exceed 25W PEP at the transmitter.
(ii) The height of any part of the antenna's driven element must not exceed 10 metres above ground level.
(iii) Only one antenna per band may be used (ie no stacked, bayed or colinear arrays, or switching between two or more antennas). A slot-fed Yagi or Quad antenna is permitted. Dish or Backfire antennas must not exceed 2m diameter.
(iv) Operate on up to 3 bands from the table.
(v) Single-band entries for any band are also acceptable.
(vi) Each band may be operated for no more than 16 hours (except for 6m and 4m, see 7.3 (iv) above) during the contest period. Each rest period must last at least 1 hour.

**7.4 Mix &Match (M) section:**
(i) A group can elect to place different bands into Restricted, Low-Power or Open sections, eg 4m in Restricted, 2m and 70cm in Open, and 23cm in Low Power. This decision must be made at registration time and the details shown on the site registration form. At least one station must be in a different section from the other stations (eg 6m, 4m and 2m in the Open section, 70cm in the Restricted section).
(ii) Individual band entry will be tabulated in the appropriate main section, and a normalised score for the band produced on this basis.
(iii) The sum of the normalised scores will appear in a separate Mix & Match section table.
(iv) Operate on up to 4 bands from the table.
(v) Note that 2m, 70cm or 23cm stations entered in the Low Power section may be operated for no more than 16 hours during the contest period. Each rest period must last at least 1 hour.

**7.5 SWL section (S):** as per general rules.

**8 Inspections**
All stations are subject to inspection by members of the VHF Contests Committee or nominated representatives. Should the inspector be unable to locate the site due to inadequate or incorrect information, the entry may be disallowed. In the event of a last-minute site change, it is the responsibility of the group to make suitable arrangements for the inspector to find the site. The inspector must be given immediate access to all parts of the site with the right to stay as long as desired, and the ability to return at any time during the contest.

**9 Entries**
(a) All entries must be postmarked no later than 31 July 2000.
(b) Entries must be addressed to VHF Contests Committee, PO Box 2399, Reading, RG7 4FB or via e-mail to vhf.entry@rsgb.org.uk
(c) A Form 427 cover sheet or near facsimile is required for each band.

**10 Awards**
The Surrey, Martlesham, Arthur Watts and G5BY Trophies will be awarded to the overall winners of the Open, Restricted, Low Power and Mix & Match sections respectively. The Tartan Trophy will be awarded to the leading resident Scottish entry in the Open section, and the Scottish Trophy to the leading Scottish entry in the Low power section. Certificates will be awarded to the winners and runners-up on all bands in each section, and to the leading stations in each country. ♦

**Bands and Times for the RSGB VHF National Field Day 2000**

| | | |
|---|---|---|
| 50 MHz | (6m) | 1400 to 2200 Saturday (all-modes) |
| 70 MHz | (4m) | 0800 to 1400 Sunday (all-modes) |
| 144 MHz | (2m) | 1400 Saturday to 1400 Sunday (all-modes) |
| 432 MHz | (70cm) | 1400 Saturday to 1400 Sunday (all-modes) |
| 1300 MHz | (23cm) | 1400 Saturday to 1400 Sunday (all-modes) |

# EMC

**DAVID LAUDER, G0SNO**
*20 Sutherland Close, Barnet, Herts EN5 2JL*
*E-mail: D.M.Lauder@herts.ac.uk*

SOME OF THIS month's items may seem improbable, but if anyone is wondering which one is the April Fool, the answer is none of them!

On a more serious note, the EMC Committee has had several responses to the request for volunteers in the 'News' section of the February 2000 issue of *RadCom*. Last year was a very busy one for the EMC Committee, with one of our members (G4JKS) as RSGB President, and much important campaigning work to be done on PLT and xDSL, all done by volunteers. This means that we have had insufficient time and resources for some other matters, so there are things 'in the pipeline'!

## THANKS TO G4JKS

AS REPORTED IN the 'News' section of the same *RadCom*, Hilary Claytonsmith, G4JKS, has stepped down from her many RSGB activities after her year as RSGB President. Hilary was Vice-Chairman of the EMC Committee, having been a member for 17 years and did much useful work including:

- The campaign against PLT in summer 1999, which resulted in questions being asked in the House of Lords.
- Forging international links via IARU with radio amateurs involved in EMC in other countries.
- Dealing with automotive EMC and setting up the RAKE (Radio Activated Key Entry) working group, after problems with 433MHz vehicle keys hit the headlines.
- Setting up the EMC Co-ordinator scheme in 1989.
- Initiating the first 'EMC' Column in *RadCom* in 1989 and writing this column for a number of years.

## MICROWAVE PLT?

DAVID, G4RMC, AND others have sent information about a new idea for high-speed Internet access via electricity power lines. G4RMC asks whether this could be PLT under a new name.

The March 2000 issue of *PCPro* magazine included an article entitled, 'Electrically charged?', about a US start-up company called Media Fusion. The company has developed technology which it says will allow users access to the Internet using standard electricity lines.

It is claimed that the technology uses 'the naturally-occurring magnetic waves surrounding electrical power lines and writes Internet and satellite data within these waves using proprietary hardware and software'. Ed Blair, president of Media Fusion is reported to have said, "The speed [of data transfer] is 186,000 miles per second, almost as much as the speed of light. Hundreds of times faster than what is currently available".

There seems to be some confusion here, between propagation velocity and data rate. In the Media Fusion proposal, the signal propagates in free space at the velocity of light, which is about 1.5 times faster than the typical propagation velocity in a cable. Whether the signal takes 3.3µs to travel each kilometre in free space or 5µs in the same length of cable is largely irrelevant to the response times seen by the user, however.

A US patent, which has been granted to Media Fusion, describes how a microwave signal is generated using a MASER. This is like a LASER (but was invented first), and generates microwave energy instead of light. The signal is launched onto an overhead electricity transmission cable and propagates along the line. The magnetic field surrounding the cable due to the 60Hz current is claimed to act as some sort of waveguide. This may be similar to the surface wave transmission line described in the older 5th edition of the RSGB *Radio Communication Handbook* (page 13.5).

In the Media Fusion proposal, microwave signals propagate down the street on the overhead mains cables and skip over the pole-mounted transformers that are used in the US electricity distribution network. They then run along the overhead cables leading to each house and travel around the 120-volt house wiring, appearing at mains sockets where they are received by a controller.

The patent is vague about transmitted power and frequencies but mentions 30 - 300GHz as an example. It appears unlikely that this idea would be used in the UK however, as most of our 240V mains distribution wiring is underground.

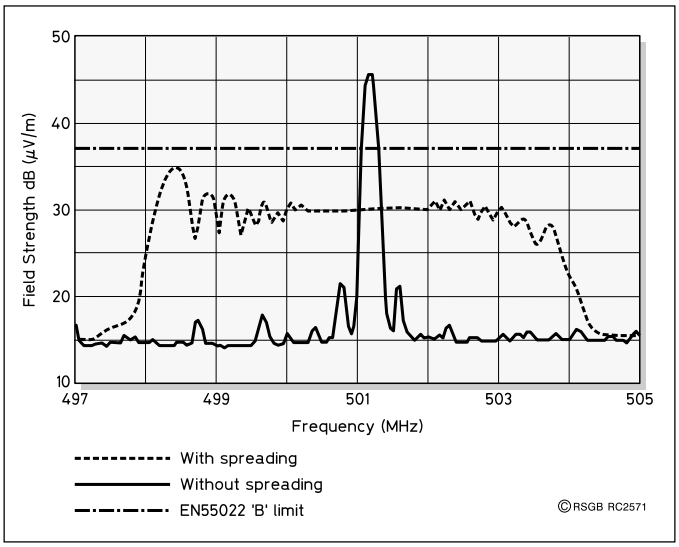



**Fig 1: The effect of spreading the clock oscillator in digital electronic equipment such as a PC.**

## DON'T SPREAD IT

THERE WAS AN ITEM in the April 1998 'EMC' column about spread-spectrum clock generators (SSGs) for PCs and other microprocessor applications. The purpose of these devices is to allow products to pass EMC emission tests which they would fail without clock spreading.

Emission standards such as BSEN 55022 for information technology equipment (ITE) allow interference to be radiated on an unlimited number of frequencies, provided the level does not exceed a specified limit at any frequency. SSGs take advantage of this by spreading a narrow-band emission from the harmonic of a clock oscillator into a broad-band emission occupying several MHz or more.

This may sound like a good idea from the ITE manufacturers' point of view, but how could it affect the RF spectrum? The RA decided to find out and issued an invitation to tender for a contract to do some investigations. The University of Hertfordshire submitted the successful tender and the work was done by your EMC columnist and James Moritz, M0BMU. We tested the radiated emissions from two pieces of digital equipment where clock spreading could be turned on or off. **Fig 1**, which is derived from the report mentioned below, shows the 5th harmonic of one of the 100MHz clock oscillators. The measurement was made at 10m distance with 120kHz receiver bandwidth and a quasi-peak detector. The solid line shows that without spreading, the 5th harmonic is 9dB above the EN 55022 'B' limit, but with spreading it is 2dB below, a reduction of 11dB.

This has important implications for digital terrestrial television broadcasting (DVB-T) or other services. The multi-carrier modulation technique used in DVB-T is quite tolerant of narrowband interfering signals that only interfere with a few sub-carriers. If, however, an interfering signal has noise-like characteristics and a bandwidth of several MHz, it can cause the loss of many sub-carriers if it exceeds a certain level. This causes complete loss of picture and sound on all channels carried by the DVB-T multiplex. If someone had set out to design a jammer for digital TV, this would be quite a good way to do it! A report on this project can be found at http://www.radio.gov.uk/busunit/research/extramen.htm

The results of this work have important implications for EMC standards in general. Digital Au-

dio Broadcasting (DAB) is already in operation around 220MHz and a different service called Digital Radio Mondiale (DRM) is planned for digital sound broadcasting in the LF, MF and HF broadcast bands. DRM, DAB and DVB-T are all multi-carrier COFDM systems that need protection from broadband noise-like interfering signals.

This has also focused attention on the LF, MF and HF broadcast bands, where noise-like emissions from ADSL could affect DRM. It is to be hoped that emissions of broad band interference will be more tightly controlled, which would also benefit the HF amateur bands.

## ULTRA-WIDE BAND

A NEW IDEA for radio communications is the so-called 'pulse radio' or Ultra-Wide Band (UWB) radio (see also the Ultra-Wideband Working Group web site http://www.uwb.org). Instead of modulating a carrier, UWB uses narrow pulses that are fed directly to the transmitting antenna. The only bandpass filtering is provided by the antenna itself. The receiver is similarly wide-band and looks for the received pulses at precisely determined time intervals. This technique becomes attractive only at UHF and above. Because it is fundamentally a broad-band system, it goes right across bands used by other services, which could include UHF television broadcasting, the 1296MHz amateur band and possibly 432MHz. The idea is that the amount of power in the bandwidth used by any conventional radio service is relatively small, so the overall effect is to increase the apparent noise level on the band.

In the US, the FCC has granted three waiver requests for ultra-wideband products, including one to Time Domain Corporation (www.time-domain.com). On this web site is a technology overview of their TM-UWB system that says, "Think of it as super high-speed Morse code with 40 million dots and dashes per second".

As shown above, if UWB is permitted to operate across the UHF TV bands, this could be bad news for digital terrestrial TV.

## RADIO LANS

RADIO LOCAL AREA Networks (RLANs) for linking computers in an office have been available for some years, but their use has mainly been confined to commercial and industrial premises. Now that prices have fallen, these products are on sale in stores like PC World and are becoming affordable for home use. Several members have asked about compatibility between RLANs and amateur radio. Most RLANs use a licence-exempt allocation at 2.45GHz. This is within the 13cm amateur band and is also shared with microwave ovens and microwave inturder sensors for some cars such as the MGF. Most RLANs use frequency-hopping spread-spectrum (FHSS) techniques which may offer reasonable immunity to CW interference from microwave ovens or 13cm amateur transmissions.

## NOISY TV SETS

SOME LARGE-screen TV sets sold in the past few years radiate significant levels of RF noise on the HF bands. This may occur only when the TV set is in use, but with some models it also occurs in standby mode. The same applies to some set-top boxes for digital terrestrial TV, satellite TV or cable TV. Most of these are bristling with digital electronics and although they do not use much power, most have switch-mode power supplies that run all the time.

Most of the complaints we have received recently are about one leading TV manufacturer. The company told one member that they would not accept a complaint from him as the TV set belonged to his neighbour who would have to make the complaint. Not surprisingly, the neighbour didn't complain. They told another member that the problem was probably due to his amateur radio transceiver not being CE marked!

The EMC Committee is in contact with this manufacturer and we are also doing our own tests on their TV sets. In the meantime, we would like to receive reports from members about any TV sets or set-top boxes that generate excessive RF noise and also about any that are particularly quiet.

## UNLOCKED SYNTHESISER

MANY REPORTED problems of interference to amateur reception, particularly on 144MHz, relate to what appears to be interference from other radio services. Radio paging transmitters cause a few problems and while such transmitters may occasionally develop a fault that results in spurious transmissions in the 2m or 70cm amateur bands, the most common cause is poor performance of the amateur receiver. Some 144MHz hand-held and mobile transceivers with extended receive coverage can be rather susceptible to overloading by nearby radio paging transmitters. You wanted extended receive coverage? Well you got it!

When a G3 member reported a problem on 144MHz recently, our first question was, "Are you sure the signal really exists in the amateur band and isn't a shortcoming of the receiver?". He was sure and he had checked it with his own spectrum analyser. The symptoms were bursts of noise lasting 2 - 3 seconds that affected the whole 2m band. Sometimes these occurred about once every 10 minutes, and at other times it was several times per minute. It was so strong that it rendered the 2m band virtually unusable, and even interfered with his 2m QSOs with a friend two streets away.

My first thought was that it was a faulty radio paging transmitter. The spectrum analyser showed broadband VHF interference covering a bandwidth of 20MHz or more. There were several broad peaks but it was not possible to determine the exact carrier frequency. It was also very difficult to DF (direction find) bursts of noise, as there is insufficient time to swing a beam. Ring Doppler or time difference-of-arrival DF techniques do not work either, as these need a coherent carrier.

We enlisted the help of a G4 amateur station about a mile away, who had a 13-element 144MHz beam. The interference signal was very weak at the G4 station and the beam heading indicated that the source was in the same direction as the G3. I suggested to the G3 that the source was probably within a few minutes' walk of his QTH and that he should wait until the interference was occurring frequently and then go for a walk with a portable receiver and find where the signal was strongest. He did this and found it was strongest in the town centre where there were two taxi companies. It was then a simple matter to find out which taxi company's transmissions coincided with the interference. It turned out that the interference was only present for a few seconds at the start of each transmission. It appears that the frequency synthesiser was taking a long time to lock and was transmitting while out of lock.

We arranged for someone with access to some EMC test equipment to go to the town centre with the G3 and make some measurements (see photo). The spectrum analyser plots were then e-mailed to the RA, pointing out that the interference was also going right across bands used by other services including the police and that the source was close to the police station. The interference then disappeared in double quick time and has never been heard again. ♦

**Two radio amateurs measuring spurious emissions in the 144 - 146MHz band from a taxi company's faulty transmitter somewhere in the UK.**

# DATA

**ANDY TALBOT, G4JNT**
*15 Noble Road, Hedge End, Southampton, SO30 0PH.*
*E-mail: data.radcom@rsgb.org.uk*

THE DEADLINE for this issue followed so closely on the heels of the appearance of the February column that very little feedback has come in about the new content or direction I intend to follow. What comments I have received have been very encouraging.

## MICROWAVE HIGH-SPEED LINKS

VERY LITTLE USE has been made of the microwave bands for amateur data communications in the UK. All microwavers are aware of how little our allocations up there are actually being used, and are pondering on the absence of all the high-speed data links that could be using the bands. What we believe has happened is that the data users, mainly those building-up the packet network, have little interest in the higher frequencies and that those who use microwaves regularly don't have much interest in data, the result being that nothing happens. If anyone reading this column has an interest or need for high-speed data comms – tens to hundreds of KB/s or higher - get in touch with me and I will try to find someone in the microwave field with whom to co-operate.

The Tucson Amateur Packet Radio group (TAPR) has a number of modem designs and kits available. See their web site at *www.tapr.org* There are frequencies set aside in all the microwave bands for packet linking which, to my knowledge, are not in use in the UK. The Microwave Subsystem published in the September 1999 issue of *RadCom* is a good starting point for experimenting with even higher rates and, with a suitable power amplifier, could be useful for digital repeater linking over many tens of kilometres. I also know of one individual who took the KISS approach and successfully networked two computers using no more than Ethernet connections to simple 10 GHz wideband FM heads.

## AUTOMATIC LINK ESTABLISHMENT

AT HF, A FEW amateurs have been experimenting with Automatic Link Establishment (ALE) using standard protocols now widely available. The idea is that a net of users establishes a number of common frequencies (channels) on a range of bands. Each user then 'probes' the channels from time to time, typically transmitting every 15 - 60 minutes, with a digital signalling waveform designed to measure the path capability and quality. All users in the net keep track of the probe signals from all the others and by measuring error rate can automatically build up a list of frequencies in which communication will be possible with each of the other stations. When one station wants to call another, a call request is transmitted, with the software choosing the optimum frequency based on the recent probing history. Once connected, communication can then go ahead using whatever mode is appropriate, such as voice or high speed data. As the signalling protocol also includes the capability for short messages with different levels of error correction, this is often all that is needed.

The standard employed is known as FS-1045A or MIL STD 188-141A. This was originally a military standard, but is now in the public domain. G4GUO has implemented a version for use with a PC running Windows® 95 or 98. Since the software has to control the transceiver completely, it is suitable only for those rigs with computer control capability. Currently the IC-706 and IC-746 are included, but other rigs could be added at a later date. Full data is available from Charles's web site at www.users.dircon.co.uk/~chbrain

The waveform employed with this standard uses an eight-tone FSK signal with each symbol 8ms long, the tones being spaced at 250Hz intervals, giving a signal bandwidth around 2kHz. With the symbol rate at 125Hz, eight tones allows three bits of data to be transmitted simultaneously, allowing 375 bits per second. However, the very heavy error correction and redundancy, essential to the channel measuring capability, means that the messages are sent more reliably at a lower effective data rate.

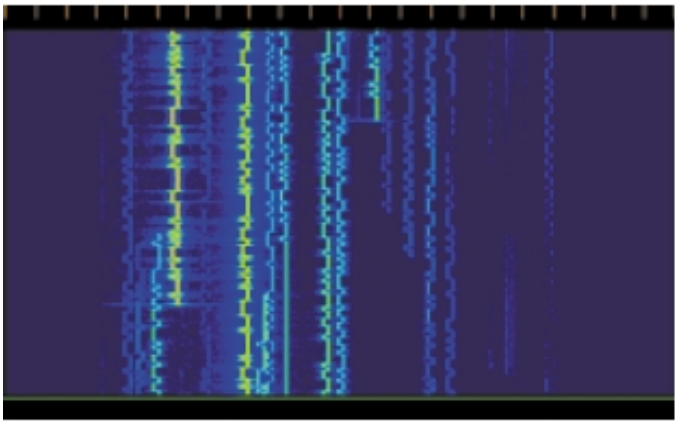
## VERY SLOW DATA ON LF

ONE OF THE REASONS for my interest in data communication being rekindled was the 73kHz band and the opportunities this offered for exciting new modes. Unfortunately, there has not been a significant take up so far, with only two or three stations on 137kHz using PSK31. The main reason for this is probably the need for linear class B power amplifiers, which many users do not have for purely CW operation. What has become popular is a mode known as SlowCW (see the article by G3PLX in *RadCom* November 1997). This is not strictly a data mode as such, as it relies on human eye interpretation of a spectrogram, but it has at least brought the computer into the shacks of LF operators! A public domain spectral analysis programme called *GRAM* is usually used for this mode.

However, the real advantage of LF, that of a very frequency-stable link, has not yet been exploited. The 'Holy Grail' of a trans-Atlantic QSO will almost certainly not be made using conventional CW, or even SlowCW. For this challenge, more efficient data modes employing lower data rates will be required. PSK31 has been shown to be around 3 - 6 dB more effective than normal speed CW when received by an experienced operator, and there is no reason why a lower-speed version of this mode could not be used. I modified the PSK31 software for the 56002 EVM module to reduce the data rate to one-quarter, ie PSK08, and also a breadboard version of PSK01 (actually 0.98 bits/s), but these have yet to be tested on air. PSK08 is now available for the 56002EVM from http://leden.tref.nl/~nl9222tv/software.htm Apart from needing linear transmitters, frequency has to be set to within 2Hz and 0.25Hz respectively, or a half these figures if the QPSK mode is used. It is, therefore, not for the faint-hearted, but well worth trying if the result could be a trans-Atlantic first! (There are a lot more EVM users in the US than here).

## DATA COMMS FUNDAMENTALS

LAST MONTH WE discussed how data could be sent by on-off keying of a carrier and the disadvantages of this method. One solution is to use two tones and switch them alternately - one tone for a logic *one*, the other tone for a logic *zero*. Demodulation is then performed by looking at each tone separately and comparing the relative amplitudes of the signals, which will include added noise, to decide which element was sent. This particular technique is know as Frequency Exchange Keying, or wide-shift Frequency-Shift keying (W-FSK) and relies on the two tones being independent and widely-spaced in frequency. This is only the case if the data rate is significantly less than the difference between the two tones, as the spectral spreading from each tone being switched causes the sidebands from each to merge as data rate rises. ♦



**A few seconds of a spectrogram plot during a RTTY contest with a number of wide-shift FSK signals present in a 22kHz-wide segment. Note the spectral spreading at the frequency changeover points on some of the transmissions. This trace was made using GRAM running on a PC via the sound card.**

# SWL

**BOB TREACHER, BRS 32525**
*93 Elibank Road, Eltham, SE9 1QJ*
*E-Mail: brs32525@compuserve.com*

THE M2000A experience will be but a fond memory when this column appears. When the idea was first aired in mid 1998, I had no idea what an enormous animal would be born. It was everything I hoped - and much, much more - and I hope that SWLs, not just in the British Isles, but all around the world had the opportunity to log and QSL a special event station that was truly something special. I already have over 50 direct QSL cards; the first batch from the bureau arrived on 23 February, and came from people who heard the station either on the first day of operation or on five different bands, to claim the very attractive awards.

Organising the special event seriously affected a great many things, but it was an opportunity which could not be missed. The joy and pleasure involved in running arguably the most successful special event station ever was a once-in-a-lifetime experience. Now it is all over I can look forward to all that spare time in which I can check all those contest logs!

## SWL LOGGING PROGRAMS

QUESTIONS APPEARED on the Internet SWL Reflector about logging programs that also print QSL labels. Two SWLs suggested *EasiSWL* by Don, G0MDO, and *Profilog* by DL1HJS (but this is written in German). I believe that *SDL* by EI5DI and *Shacklog* by Alan, G3PMR, also include such a facility. Let's try to compile a really helpful list for SWLs for a future column. Have you any further suggestions or any helpful comments?

## SET LISTENING PERIODS

THESE USED TO BE quite popular, but they have all but disappeared from the SWL Calendar now. However, Dutch SWL Lambert Wijshake, NL10175, devised a short series of events to provide some interest for SWLs, and the results of his first SLP are now available. The idea of SLPs is to log as much as you can during a set listening period - usually on a set band. It is like a contest, but it normally takes place when there are no transmitting contests. Participation was not all that Lambert had hoped for, but he received 9 entries. The results from Part 1 of his 2000 competition were:

| Pos | Callsign | Score |
|---|---|---|
| 1 | NL-7280 | 14758 |
| 2 | GW-5218 | 8284 |
| 3 | NL-7403 | 8208 |
| 4 | NL-12089 | 5610 |
| 5 | NL-290 | 3710 |
| 6 | F-11734 | 2258 |
| 7 | NL-11099 | 1974 |
| 8 | OE1-0140 | 1496 |
| 9 | NL-9723 | 250 |

If any SWL wants to try his hand at an SLP, send Lambert an e-mail (lambert.wijshake@wxs.nl) or write to him (Lambert Wijshake, NL-10175, Kattedoorn. 6, 8265 MJ Kampen, Netherlands) with your name and address and he will send you the rules. The next contest is on the weekend of 25/26 March 2000. SLPs usually fall on the same weekends as major transmitting contests.


**An attractive QSL card sent to M2000A.**

## HF DX

WE HAVEN'T HAD the benefit of a report from Robert Small, BRS8841, of late. The following redresses the balance. Robert felt that the beginning of February saw band conditions beginning to pick up after a very poor mid-winter, but even though we are now getting Solar Flux figures above 170 and even into the 200s, band conditions are not what you would expect given such high SFI numbers. At the start of January things were so bad that Robert only heard the CE0Z DXpedition once, and that was with a 3x3 signal on 10m.

However, a better situation existed with the XZ0A DXpedition as he had heard that one on all bands, including 160m, but only needed them on 12m CW for a new band country. He had not listened much on the low bands. Apart from the XZ, the only logging of interest was JI3DST/6 from AS-049 on 40m. 20m tended to close quite early, but he was pleased it did stay open long enough one evening to log XQ5BIB/8 from Wellington Island. Other highlights were R1ANP, TF1MM/9, KL7JM, WL7EM, FT5YG Antarctica, FK8HW and VP6BR from Pitcairn Island. Conditions were a little better on 15m, especially to the Far East. Stations finding their way into Robert's log included EK1700DX, XV5JP, AP2MIZ, BG5QAD, 6K2K, A71EF, D2BF, HS5AYO and BV4SF. The only new countries this time were to be found on 12m, where 5U7X and 5U7Z were new on CW and SSB, and XZ0A was new on CW. 10m had opened up really well on a number of occasions and Robert had heard a great many stations from the West Coast of the USA and Canada. He was also happy to log 5R8FH, 3E2K, 8Q7PA and A22RM.

## WPX CONTEST

ALTHOUGH THE preparations for, and the organising of M2000A has seriously delayed the 1999 WPX contest results, there will be WPX SWL contests this year. The SSB contest is on 25/26 March and the rules are given in the panel. ♦

### CQ WORLDWIDE WPX SWL CONTEST 2000 RULES

Short Wave Listeners around the world are invited to take part in the Year 2000 CQ World-Wide WPX SWL Contest. The objective is to log as many stations and prefixes as possible on the 28, 21, 14, 7, 3.5 and 1.8MHz bands.

PLEASE READ THESE RULES CAREFULLY.

**When**: SSB: 0000Z 25 March to 2359z 26 March 2000.
CW: 0000Z 27 May to 2359z on 28 May 2000.
**Sections**: Single and multi-operator sections. Only 36 hours logging is permitted in the single operator section. Single band logs can be submitted. SWLs who use Packet Cluster or the Internet 'DX Summit' *must* enter the multi-operator section.
**Scoring**: (a) Stations heard from different continents from the listener are worth 3 points on 28, 21 and 14MHz, and 6 points on 7, 3.5 and 1.8MHz. (b) Stations heard from the same continent as the listener are worth 1 point on 28, 21 and 14MHz, and 2 points on 7, 3.5 and 1.8MHz. (c) Stations heardfrom the same country as the listener are permitted for multiplier credit but are worth zero points.
**Multiplier**: A prefix is counted only once, regardless of the number of times the prefix is heard. A prefix is the letter/numeral combination which forms the first part of an amateur callsign - M6, W5, OT7, LZ5, WB8 and HG19. In cases of portable operation, the portable designator becomes the prefix - KH9/W1XXX or NH9/W1XXX. KH6XXX operating from Ohio would be W8/KH6XXX. Portable designators without numbers will be assigned a zero (0) after the portable designator to form the prefix - PA/W1XXX would become PA0/W1XXX. /MM, /AM, /A, /P, etc suffixes do not count as prefixes.
**Final Score**: Total points (from each band) multiplied by the number of different prefixes (prefixes are counted only once).
**Penalties**: Any unmarked duplicate will lose 10 times the logging value.
**Awards**: Certificates of merit will be sent to the winner, runner-up and third placed SWL in each section and the leading listener in each DXCC country, provided the listener has at least 25% of the overall winner's score.
**Logs**: Logs *must* show Date, Time (UTC), station heard, RS(T) report and serial number given by station heard, RS(T) report at SWL's QTH [no report shall be less than 33(9)], station worked, prefix multiplier, points. An alpha/numeric check list of claimed prefixes and a Cover Sheet showing the points, multipliers and score claimed *must* be submitted.
**ENTRIES NOT COMPLYING WITH THESE RULES WILL BE SUBJECT TO DISQUALIFICATION.**
**Entries**: All entries must be postmarked no later than 8 May 2000 for the SSB section, and 10 July 2000 for the CW section. Please enclose 2 IRCs or $1 for a copy of the Results. Entries should go to WPX SWL Contest Director, Bob Treacher BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, England.

# AT THESE PRICES - ONCE THEY'RE GONE, THEY'RE GONE!

## This Stock is new boxed and fully guaranteed — Limited Stocks

| | |
|---|---|
| FT920, HF/50MHz 100w | £1150 |
| FT847 "Better HF receiver than an IC756PRO" | Just £1199 |
| FT90R Mini dual bander 50w/35w with FREE mobile antenna and external speaker | Package £299 |
| VX1R Dual bander | £149 |
| T81E Quad-band handy | £299 |
| ICPCR100's PC Radio, were £249 | now £169 ea. |
| IC706MK2G HF/50/144/433 Multi-mode with FREE mobile antenna and speaker package. | £925 |
| IC746 HF/50/144 100w internal tuner | £1399 |
| MVT7100 dc to light scanner, were £229 | Last few £179 |
| MVT9000 dc to light scanner, were £499 | Last few £150 |
| IC756PRO HF/50MHz DSP | Last few £1899 |

## Clearance Items — Limited Stocks

| | |
|---|---|
| Daiwa DX10N 144/432MHz Duplexers were £24 | now £10 |
| Brand New Yaesu MH1 E8 Speaker mics, 600 ohm mic, 8 ohm speaker 1 watt, | only £3 |
| SP2 Mobile speakers, were £12, | now £5 |
| VX5R speaker/mic's, your last chance at | £10 ea. |
| New SMC545L1 UHF PMR Mobiles | £25 |
| New SMC1045L2 UHF PMR Mobiles | £25 |
| Power supplies for above to slot the radio in | £25 |
| New SMC2546L8: 8 Channel 25w UHF PMR (Yaesu) radio's set up for the national packet channels | £40 |
| With Mic' and set up for 8 simplex channels | £50 |
| With Mic/dc lead/mobile bracket and set up for 435MHz attached channels (Quantity discounts available) | £70 |
| New Yaesu PMR VX1000 70MHz Mobiles, 25w, 4 channel set up for simplex use, with Mic/dc lead, last 20only | £50 ea. |
| SMC (Yaesu FT23 look-alikes) 70MHz 15channel synth' handhelds, with Raynet/Packet/Simplex limited quantity, Brand New boxed with nicadCost over£300! | £Call Now |
| SMC33A (FT23/43/FT73/SMC545L14 style) 6 way base chargers cost £300 plus | £50 ea. |
| Midland UHF mobiles, NEW 16 channel, no info but boxed | £25 |
| VX2000 tri-band verticals | only £32 |
| UHF Mobile antenna's | £25 ea. |
| Triplexers and duplexers at half price | £call for details! |

## The Bargain Bucket

| | |
|---|---|
| "Bags of plugs/sockets" a mixture of RF/Mic/Audio plugs | £5 |
| TNC leads for most radio's just | £5 |
| AR303 Medium duty rotators to clear, new, tested | £30 ea. |

**SMC's commercial business is expanding and more room is needed immediately.**

# All amateur stock must go!

SMC

# FAIRHAVEN


£899 inc.VAT

## RD500

- Frequency 0-1700MHz
- Switchable Pre-Amp
- Remote Control
- 26 VFO's
- 54,000 Data text Entries
- PC data Editing
- Built in Decoder SSTV,FAX
- Digital Recorder
- Stereo Output
- Video Output for TV
- World Clock

Includes FREE Datong active antena AD-270 and FREE delivery (UK Mainland)

## HF-150

Rugged and Dependaple
30KHz - 30MHz
60 Memories
LSB, USB, AM,AM Sync
12v DC input option + £20
*Full range of accessories available including:-*

*Preselector*
*Audio Processor*
*Computer interface*
*Keypad*


£389 inc.VAT

The New HF-150 Marine have yours converted today

# South Midlands Communications Ltd

**HQ. SM House . School Close . Chandlers Ford Ind Est . Eastleigh . Hants . SO53 4BY**
**HQ Opening: Monday - Friday 9am - 5pm and 9am - 1pm Saturday**

**Reg Ward & Co . 1 Westminster House . West Street . Axminster . Devon . EX13 5NX**
**Reg Ward Opening: Tuesday - Saturday 9:30am - 5:30pm**

## Southampton
## 023 8024 6222
email us at: amateur@smc-comms.com

## Axminster
## 01297 34918
email us at: regward@dialin.co.uk

Website: http://www.smc-comms.com

# Members' Advertisements

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

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

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

## FOR SALE

**COBBWEBS**, pair with all connections for 2-ele beam, £130. 020 8845 9384 (S. Ruislip).

**EDDYSTONE** 750 rcvr, gwo, with homebrew plinth speaker, £80. Prefer buyer inspects collects or R.V. by arrangement or postage at cost. Also spare cabinet for Eddystone 990R rcvr with front panel, £10. Jim McGowan, M1CUC. 01708 340 304 (Romford).

**GOING QRT**. JRC JST-135 HF tcvr, 150W output with fitted bandwidth control board, plus fitted 500Hz CW filter. Plus gen cov receive (all modes). Matching JRC 30A PSU. MFJ 1.5 kW ATU (built in SWR/Power Meter). AEA program keyer (the Morse Machine). Vibroplex racer paddle key (Brass). Datong FL-3 outboard filter. Shure 444 desk mic. Adonis high quality desk mic. Combination headset/boom mic (Heil insert). Daiwa 1.5kW SWR/PWR meter. 600W dummy load. Optoelctronics freq counter. Altai grid dip meter. Jaybeam triband 2-ele beam antenna. Daiwa rotator plus controller. Tri-band dipole of delight. All the above in near mint cond with mans (bought new by me). £1400 cash, no offers, and no splits. A good quality complete HF stn at a knock down price. Prefer buyer inspects (as a working stn) and collects. G4WNG. 01670 822 172. (Northumberland).

**KENWOOD** service man for model TS-180 HF, SSB tcvr. Hallicrafters instruction man for super Skyrider rcvr SX-28. Technical man for printer NCR EM-T3/T4. RCA man for communication rcvr AR-88. RCA man for communications rcvr model AR-77/AR-77E. All original mans, £20 each, post paid. AOR, communication rcvr model AR-3030, 30kHz-30MHz, boxed, as new, £395 plus carriage. Peter, G8WYT. 01444 450 265 (Haywards Heath).

**KENWOOD** TS-950SD, mint, boxed, mans, £1000. Kenwood TS-790E, all bands, mint, boxed, manuals, £1000. Trio TL-922, mint, £850. 01625 829 297 (Macclesfield).

**KW-2000A** with matching PSU/spkr, 150W CW/SSB, professionally rebuilt 1997 using new components, high-stability VFO, 600Hz CW filter mods, full mans and spare set new boxed valves (cost £80+), exc working order and appearance, £150 plus carriage or collect. GM3OFT, QTHR. 01683 221 219 (Moffat). E-mail: gm3oft@btinternet.com

**TH3** Mk4, as new, £250. 2m Ringo Ranger, £30. 70cm Ringo Ranger, £20. Yaesu FC-902 ATU, £120. Jim, G0BGY. 020 8949 5549 after 1700 (New Malden).

**UNIDEN** 2020 HF tcvr, 10-80m, 100W, PSU, accepts battery or mains, includes mic, power leads, etc, £100. Buyer collects. G6QI, QTHR. 01326 240 546 (Helston). E-mail: g6qi@cury.swinternet.co.uk

**UPGRADE** your computer facility with my FIC PA-2017 ATX motherboard and AMD K6-2 300MHz CPU, 96MB RAM, AGP and USB, all for £85. Also Creative DVD drive package, £75. CD-ROM drive, £20. Creative Soundblaster card, £15 and Diamond internal V90 56K modem, £15. All in exc cond with software h/books and original boxes. Buyer pays carriage. 01986 798 524 (Woodbridge).

**WESTERN** 60ft heavy-duty mast with man. Winches in three sections, plus base, frame mounting, buyer to dismantle and remove, £275. Jaybeam 2m 10-ele antennas, 2 off, £10 each. Jaybeam 70cm 12-ele antennas, 2 off, £10 each. Peter, G8WYT, QTHR. 01444 450 265 (Haywards Heath).

**YAESU** FT-726R, £225. 6m module for FT-726, £185. Sat board, £75. SP-102 spkr, £15; or £475 complete. Also FT-901DM, £185. FTV-901R, 2m/6m/70cm, £175. FC-901 ATU, £100. SP-901, £25; or £450 complete. G3SOA, QTHR. 01743 709 639 (Shrewsbury). E-mail: allanmccartney@allsar.freeserve.co.uk

**AEA** PK-900 TNC, mint, boxed, man, leads, very little use – bargain, £150 ono. G3OUQ, QTHR. 01827 880 719 (Atherstone).

**ALTRON** 2 x 4.5m sections tilt tower, ground post, winches & cables, gc. Ready for collection. GM4BOA, QTHR. 01355 224087 (E Kilbride).

**ALTRON** SM-30 tilting telescopic mast, complete with base post, winch & head unit, Yaesu G-400 rotator & 3-ele 6m beam, £200. Buyer collects. G8AVX, QTHR. 0121 778 5848 (Birmingham).

**AOR** 3000A rcvr, virtually unused, with original packing, £425. GM3WRN, QTHR. E-mail: colmcrae@netscapeonline.co.uk

**AOR** spectrum display unit, £320. Dymar 1525 HF/UHF sig gen, £75. Ten-Tec 540 HF tcvr, £115. PacCom EB-9600 standalone packet modem, £80. Commercial 1GHz (1.3GHz) frequency counter, £65. JPS DSP audio filter, £55. MFJ mic/TNC switch, £10. MFJ 35A DC distribution board, £25. Commercial 2kW HF LPF, £25. Andrews 44AN connector, £5. Unused 10A solar panel regulator, £20. RS 5A switched mode PSU, £12. Farnell 2.5A switched mode PSU, £6. Astron (USA) 13.8V/35A PSU, £105. h-books/cct diagrams with all equipment. Buyer collects/pays carriage. 01935 813 097 (Sherborne).

**BARGAIN** sale. Icom IC-751 tcvr, Icom IC-2KL solid-state linear amplifier, Icom IC-AT500 full auto ATU with PSU (insured at £4,600). Buyer collects, GM3ZVF. 01592 260 477 (Kirkaldy, Fife).

**BUTTERNUT** V2 (80/40) vert ant, unused, still in box, £125. Trio TS-930S with 500Hz 8.8MHz filter – a great tcvr, £395. MFJ-949E ATU & dummy load, £75. Daiwa cross-needle SWR & power meter, 1500W, £40. KW Electronics 50-ohm SWR bridge, £35. Air Dux 10in long by 3in dia 6tpi of 16SWG – new, £35. Emoto rotator (7000kg brake torque) & controller, £150. Balun 4:1 – waterproof, £15. 4-way 50-ohm co-ax switch, 1500W, £25. Home-brew 250V AC GDO, 1.7 to 90MHz, £20. All items in vgc. G3EIW, QTHR. 01392 876 606 (Exeter). E-mail: g3iew@cwcom.net

**COLLECTORS'** items: KW Decca 202 rcvr, £70. KW-107 Supermatch, £107. KW-103 power meter, £30. Vibroplex champion, ex Royal Signals, £40. Kenwood SP-230 speaker, £35. Yaesu CW filter for 840, £25. Buyer collects or carriage at cost. Phone after 7pm. 01343 835 635 (Burghead).

**COLLINS** 302C3 D/Watt meter, 180S1 ATU, 312B3 speaker, DL1 dummy load, MM-1 h/mic, round, exc cond. Drake TR4 MS4, h/book, perfect cond, £200. LG-300 AM/CW tcvr, 150W modulator, p/supply, good working cond, £100. Panda Cub, £40. AR-88D rebuilt Marconi S meter, matching speaker, original h/book, exc cond, £125. Wobbulator kit, £10. CDR AR-44 rotator, new, never used, £60. Electro voice mic 423A, £30. 01273 454 108 (Brighton).

**CT** Morse devices: GU-74B (4CX800A), other tubes, J80 inc s & h, other tubes. http://www.qsl/net/ut7ct

**EX-**GW8GT, KT-34XA ant, £400. KT-34 ant, £250. Strumech 80ft tower with base plate, £175. Strumech heavy duty 80ft tower, no ground post, £350. Two Create RCB3 rotators, £350 each. Ham IV rotator, £150. GW3KYA, QTHR. 01495 225 825 (Blackwood).

**FOR** sale: FT-290R 2m multimode, £150. TS-700 2m multimode, £200. TONO 550 comms terminal, £25. Burns crystal calibrator CC-10 and wavemeter TC-101, £10 each. Mike Roach, G3TWJ. 020 8668 3408 (Purley).

**FT-1000MP**, 250Hz filter, DVS-2 digital voice recorder, FH1 keypad, £1150. SSB Electronics 100W 70cm linear amplifier, 12V DC, £110. 01403 864 222 (Horsham).

**FT-102**, CW filter, SP-102 speaker, £250. FT-200, good PA, £90. Marconi TF-2008 sig gen with counter, £160. RA-1772 in cabinet, £325. 01502 715 419 (Beccles).

**FT-102**, FV-102, SP-102 tcvr, rcvr side needs some attention, £250 the lot, inc spare set of valves. G4PRI, QTHR. 01895 270 772 (Uxbridge).

**FT-221R,** faultless, superb cond, Mutek f/e, £150. Winch motors with cable drums 240V AC (4 off) £30ea. KW-2000A + PSU, renovate or spares, £35. Xtal filters, Heathkit 3395kHz SEI 5.2MHz. Full set GRP tubing for quad arms. PL509s (22 off), also bases. Massive 1000pF wide-spaced variable. Valves 4-125 (1), plus many others. RSGB h/book (6th edn), VHF h/book, Antennas For All locations (2), Data Book. Collect heavy items, others plus p&p. 01332 735 896 (Derby).

**FT-8100R**, £180. Diamond GSV-3000 PSU, £75. Avair 2/70 AV-400 SWR/PWR meter, £25. DJ-580, needs charger, £80. All plus p&p. 01522 808 072 (Lincoln).

**FT-847** 2.7kHz SSB Collins filter, boxed, new, cost £99, accept £50. FT-736R workshop man, £20 inc p&p. Ian. 07932 694 685 (Sunderland).

**FT-847** HF to 70cm, 20mth old, boxed, £995. TS-680S HF+6m, £345. Collect or carriage extra. G0GUL, John. 024 7645 0476 (Coventry). E-mail: pjsolman4@ic24.net

**FT-901** with FTV901, 70MHz, 70cm, 6m, full kit for WARC bands, man conversion chart, £350. HF vertical also mobile capability, 40-6m, £55. W-570 Revex HF to 13GHz power and SWR meter, dummy load, £110. 01473 425 798 (Ipswich).

**ICOM** 728 HF tcvr, AM/FM unit fitted, original mic, man, makers packing, speech processor, vgc, £350. G0IXC, QTHR. 01423 872 997 (Harrogate).

**ICOM** 751 100W tcvr, 1.8-30MHz, with gen cov rcvr, c/w PS-35 built-in power supply, also service man, £400. Heathkit HW-32A 20m tcvr with HP23 and HP13A power supplies, £100. AP-12 airband monitor rcvr, £20. Eddystone 640 rcvr - offers. 01978 751 177 (Wrexham).

**ICOM** IC-2KL + AT-500, £1000. FT-757GX, £250. FT-290R, £120. FT-230R, £75. Strumech Versatower, 85ft 2-section tiltover (Dorset), offers. G4KWL, QTHR. 0118 987 1330 (Reading).

**ICOM** IC-746 HF/6m/2m tcvr with UT-102, PS-8S matching PSU, £895. Kenwood TM-G707 2/70 mobile tcvr, extras, £135. Yaesu FT-41R 70cm h/held, £60. Outbacker 'Outreach' mobile HF aerial, £90. Alpha-Delta matched tripod, £75. All unused, boxed, mans. Kenwood AT-230, £90. Kenwood SP-940, £45. MC-80 base mic, £45. TH-G71 2/70 h/held, case, SMC-33 spkr/mic, £160. All as new. 01582 670 592 (Dunstable).

**ICOM** IC-746 HF-6-2m 100W tcvr, immac cond, boxed, £850. Yaesu MD-1 desk mic, as new, boxed, £45. 01474 823 797 (Gravesend). E-mail: zipwax@talk21.com

**ICOM** IC-756 HF + 6m + Heathkit SB-200 linear amplifier, both in gc and gwo. Prefer no split, £1000. G0EHQ, QTHR. 01527 879 636 (Bromsgrove).

**ICOM** IC-820H VHF/UHF all-mode tcvr, mic, mans, little used, pristine cond, checked by Icom, boxed, sales data available, £575 ono. 01279 731 070 (nr Harrow).

**ICOM** IC-T22A 2m h/h, 9.6V battery, case, etc, boxed, £125 ono. Andrews LDF4-50, N-plugs, unused, £10 each. G4DJC, QTHR. 01245 256 416 (Chelmsford).

**ICOM** R-72 gc rcvr 1-30MHz, SSB-AM-CW-FM, £265. IC-7100 scanning rcvr, 25MHz-2000MHz, SSB-AM-FM/W, new, boxed, £575. IC-735 HF mobile, fitted electronic keyer, CW/N filter, FM board, man, vgc, £400. PX. Want IC-970 multiband, IC-9000 rcvr. G4AFY. 01562 747 480 (Kidderminster).

**K2R1W** 70cm amplifier with 2 Eimac 4CX250B and hefty power supply, £100. FT-101E, £100, Yaesu FRG-7700, £150, Liner 2, £25. 01202 511 267 (Poole).

**KENWOOD** TM-231E 2m 50W FM mobile, gc, £140. G7PPV. 01677 423 349 (N Yorks).

**KENWOOD** Trio HF tcvr TS-830S, £350. Yaesu FL-2100Z linear, 1200W PEP, £395. Kenwood TS-7700E VHF 2m/70cm FM/SSB/CW base station tcvr, £225. MFJ-962C Versatuner Mk3, 10-160m, £125. KR-400 azimuth indicator, £50. Tono Theta-9000E CW/RTTY terminal and monitor, £70. Jason kit oscilloscope, AVO signal generator, universal AVO meter, £50 each. Most items with schematic, instructions. All items immaculate. Buyer collects or pays p&p. 01737 373 373 (after 6pm and weekends).

**KENWOOD** TS-140 HF all-band tcvr, complete with mic, h/book, leads, £350. Kenwood PSU PS-430, £50. Both exc cond. 01723 862 169 (Scarborough).

**KENWOOD** TS-430S HF tcvr with matching AT-250 ATU, PS-430, MC-60 mic, LF-30A filter, boxed, mans, £550. Kenwood TS-711E 2m tcvr with MC-80 mic, Daiwa CNW-727 ATU, boxed, man, £200. Kenwood TH-28E h/held, s/mic, £160, all vgc. 0191 237 6115 (Whitley Bay). E-mail: george@g0lns.freeserve.co.uk

**KENWOOD** TS-50S HF mobile, exc cond, hardly used, boxed, £400 ono. Quantity of Tait T-500 VHF mobiles, ideal for 2m conversion (programmable), £40 each. Gary, G0FWX. 01527 872 777 (work) or 01527 574 401 (home) (Kidderminster). E-mail: gary@twoway-radio.co.uk

**KENWOOD** TS-570DGE, CW filter, extended comprehensive warranty, mint, £650. Index QRP plus CW/SSB, man, gc, £350 ono. Carriage extra. 01482 650 410 (Hull).

**KENWOOD** TS-850SAT, exc cond, CW filter, PC interface and software, boxed, with mic and mans, £730. 01908 609 284 (Milton Keynes).

**KENWOOD** TS-940S, £600. CN-620A SWR and power meter, £50. Icom IC-W21ET with battery charger BNC-03-UK, £150. MC-425 Trio mic, £20. All in gc in original boxes with instruction mans. Offers invited. Carol-Ann Williams, 01695 723 601 (OH) or 01254 831 581 (eve).

**KW-1000** linear amplifier with two new 572B valves and instructions, £275, buyer collects. G4NEW, Roland. 01702 710 000 (Leigh-On-Sea).

**KW-2000A** + PSU, KW-107 ATU, KW-500 lin amp 200W o/p + 6 spare 813s, external RF switching box, Shure 444D desk mic wired for KW-2000A, all cables, all mans (except KW-107), extra paperwork for KW-2000A. £400. No split. Buyer to collect – heavy! Peter, G0WID, QTHR. 01872 242 311 (Truro).

**MFJ-1786** loop antenna, as new, little used, with PS tuner, etc, man, £200. Buyer collects. G4KDB. 01635 349 71 (Newbury).

**MFJ-1798** 10-band (80-2m) vertical an-

tenna, unused, in original packing, £180. Lowe SRX-30 0.1-30MHz rcvr, with man, £50. ZX-81 computer plus mans – tomorrow's antique, £10. Buyer collects or pays carriage. GW4KYZ, QTHR. 01766 590 341 (Porthmadog).

**MFJ-969** ATU, £95. MFJ-1026 noise phaser, £90. Mutek 2m pre-amp, £20. SEM RF noise bridge, £25. Grundig stenorette outfit, spare unused tapes, headset, etc, £35. Reasonable offers accepted. G3INU, QTHR. 01438 369 128 (Stevenage).

**MOSLEY** PRO-57B 7-ele large HF beam, covers 10-12-15-17-20m bands, £575. Mast, 40ft, lattice, two-section, £275 ovno. 01623 484 950 (Mansfield).

**QRT** sale. IC-746, nearly new, still boxed. FT-8500 dual-band with full separation kit and hands-free system. 40ft tilt-over tower, medium duty rotator. 4-ele 6m, 9+10 ele 2m beams. Gap Titan 80-10 HF vertical. Jaybeam tri-band HF vertical. Tri-band 6-2-70 colinear. IBM Pentium laptop, 24MB RAM, CD-ROM, 56K modem, case and cables. Ring or e-mail for details and prices. 01993 212 956 (Carterton). E-mail: dave@firststep32.freeserve.co.uk

**QRT** sale. Kenwood TS-570DG, as new, boxed, man, £400. Magnetic loop antenna MFJ-1788, 7-22MHz, exc results, complete with tuner/PSU, £100 (this must be collected). Bencher keys: single lever paddle, iambic twin paddle, both black finish, £25 each. GM3HBT. 01698 888 618 (Larkhill). E-mail: thall@talk21.com

**RACAL** 1792 rcvr, exc cond, original mans, £800. Swap for Astro telescope, binoculars. RA-1771 rcvr, clean cond, needs attention but working, £95. Icom 2m h/h, case, accessories, £50. Alinco DJ-X1D scanner, vgc, accessories, £65. Russian TAL1 telescope, £140. Julian, GW0FPY, QTHR. 01248 681 782 (Llanfairfechan).

**SHACK** clearance. Ten-Tec OMNI-D, £160. TR-2300, boxed, £80. VB-2200GX 10W PA, £20. Slim Jim, £10. Send SAE for list. G4ILA, QTHR. 0161 477 6702 (Stockport).

**SILENT** key sale G4PZD. FT-990 with hand & desk mics, £750. IC-229 2m FM mobile, mag mount, £120. FT-26 h/held, £65. Tiny-2 TNC, £60. Daiwa 2.5kW auto ATU, £110. Kenwood SW-200 power meter, £25. Mosley TA-33 jr, £95. Altron 3-section 45ft tower with winches, £150, buyer collects. Yaesu G-600 rotator, £80. All good, mostly boxed, with info. 01524 381 381 (Lancaster).

**SILENT** key sale: Great quantity of radio spares – valves, resistors, chassis, magazines and other bits & pieces, all in fair condition. Mrs Phillips. 01588 638 871 (day), 01588 638 235 (eve) (Shropshire).

**TB3** c/w stub and header bearing. Also Emotator 502CXX heavy-duty rotator, £350. Will split. 01204 451 319 (Bolton).

**TENNAMAST** telescopic mast, approx 30ft extended, buyer must remove from present garden location. Reasonable offers please. 01502 715 537 (Beccles).

**TRIO** TS-130S HF tcvr, 80-10m inc WARC, 100W o/p, exc cond, boxed with man, £225. 0114 296 0411 (Sheffield).

**TRIO** TS-530S with man, CW filter fitted, £225. Buyer collects. Laurie, G0GZK. 01932 345 174 (nr Woking).

**TRIO** TS-930S, auto ATU, narrow CW filter, FM board, £495. RN Electronics 10m-6m transverter, £65. 27ft telescopic tiltover mast with rotator cage, Yaesu GC-400 rotator and bearing, £200. Mast sold complete only, buyers to inspect and collect with all items. 01254 706 181 (Darwen). E-mail: paul@g0kao.freeserve.co.uk

**TS-440S,** ATU fitted, boxed, c/w Zurich type DPS-2512M 30A PSU. 01908 542 119 (Milton Keynes).

**VHF/HF** station sale. Icom IC-271E, boxed, mans, £325. TS-680S, £425, boxed, mans. Datong S/processor, £45. G-400RC rotator, £75. BMS 11m pivoting alloy mast, telescopic, gable-end mounted, ideal for restricted space, plus groundpost, £200. 2 x 4CX250B amplifier, plumber special, £100. 2 x QY-3 HF amplifier, £75. Yaesu SP-102 speaker, £25. Welz SP-300 1kW SWR/power meter, 1.8-500MHz, £50. H/B power supply, 13.8V 40A+, £45. Vac variable U500/10/40, new, £50. Lots more. Ring for list. 01664 850 398 (Melton Mowbray, Leics).

**YAESU** FC-102 VFO, boxed, 1200W, £150. AVO Model 8, with leather case, £45. Shure 444 mic, £30. G4SKX, QTHR. 01642 895 890 (Stockton).

# CONGRATULATIONS

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

***50 years***
Mr G G Kenyon G3HMF
Mr M B Greenberg RS20443

***60 years***
Mr S B Jagger GM3BGB

Correntions to the RSGB Old Timers' Honour Roll, published in February: Mr A Ellis, GW2HFR, joined the Society in February 1941.

**YAESU** FT-100, new last April, two year warranty, boxed, man, all bands to 70cm, £750. EP-925 25A PSU, £40. G3PNF, QTHR. 01278 458 579 (Bridgwater).

**YAESU** FT-1000MP with MD-100 Yaesu base mic, boxed with mans, all as new, any trial, £1225 ono. 01473 658 99.

**YAESU** FT-101Z Mk3 HF tcvr, 9 bands, SSB-FM-CW, base mic, man, mint cond, £200. Welz 8-band HF ATU, £20. American mobile CB tcvr, £20. 01945 589 707 (Wisbech).

**YAESU** FT-290R multimode, mic, charger, case, antenna, boxed, vgc, inspection welcome, £150. 01689 850 383 (Orpington).

**YAESU** FT-290R, £130. 144MHz 30W linear, £30. Star Masterkey + Kent keyer, £50. EP-925 25A PSU, £70. 6A PSU, £10. All gc. Buyer collects or pays carriage. G0GCM, QTHR. 0151 200 5152 (Ellesmere Port).

**YAESU** FT-50R dual band h/held tcvr, wide band receive, boxed, as new, little use, £150. G0KDR, QTHR. 01728 663 476 (Saxmundham). E-mail: g0kdr@btinternet.com

**YAESU** FT-707, FV-707, boxed with mans, exc cond, owned 15 years, £375. G0GQZ, QTHR. 01234 708 301 (Bedford). E-mail; koenraad@powinv.com

**YAESU** FT-736, 70cm/2m/6m, boxed, £800. Microwave 100W linear amplifier, 423MHz, boxed, £100. Icom IC-27E 2m mobile, boxed, £80. 01205 354 596 (Boston, Lincs). E-mail: bill.stennet@ukgateway.net

**YAESU** FT-747, CW filter, £200. 01621 868 347 (Colchester).

**YAESU** FT-75 HF SSB/CW mobile tcvr, with 240V PSU, £75 ono. G4JQX, QTHR. 01249 701 697 (Corsham).

**YAESU** FT-757 HF all-mode tcvr, tech & service mans, exc cond, £295. KW-101 HF/SWR meter, forward/reflected switch, £25. AEC-50A 2m power/SWR meter, 100W, £20. Icom IC-7000 all-mode scanner, £550. Yaesu FP-757 HD PSU, £125. Cushcraft R-7000, spare set traps (3), £60. Dummy load, HF, 100W, £20. Lartraps 7MHz, info sheet, £25. Icom IC-60 commercial marine-grade PSU, 40A, £145. Jaybeam 70cm 4-stacked dipoles, as new, info sheet, ideal repeater etc, £150 ono. Mosley Mustang 3-ele tribander, £125. 01328 710 641 (N Norfolk).

**YAESU** FT-757GX, c/w auto tuning unit, mans, boxed, gc, £500. 01724 764 018 (Scotter, Lincs). E-mail: dennis.wilson@talk21.com

**YAESU** FT-840 compact high performance HF tcvr with CW filter, only 2yrs old, immaculate, boxed, £425. G0CGV, QTHR. 01253 736850 (Lytham St. Annes).

**YAESU** FT-920AF HF/6, AM/FM, mint, with man, box, etc, £825 ono. 01929 405 531 (Wool). E-mail: eric_g0cgl@lineone.net

**YAESU** line up, £400!!! Or separate. FT-101ZD, new valves, £250. FTV-901R transverter, 2m and 70cm fitted, £65. FC-902 500W WARC ATU, £90. SP-901, £15. Worked VK or want to work satellite. I challenge you to find better value! G0UZJ, QTHR. 01724 735394 (Scunthorpe).

# WANTED

**ALL** early wireless equipment wanted. Rcvrs, crystal sets, early transmitters, horn speakers, valves, Morse keys, spy sets, pre-war television. Any cond considered. Jim Taylor, G4ERU, 5 Luther Road, Winton, Bournemouth, BH9 1LH. Tel/fax 01202 510 400 (Bournemouth).

**SPY**/clandestine radio sets from WWII and since, wanted by private collector. Accessories and incomplete units also required. Bill, G8PUJ. 020 8505 0838 (E London).

**BANDWIDTH** control unit CFL-243W for NRD135/535. Also interested in EC-55 and RTTY units for above. 01502 715 537 (Beccles).

**CR-300** rcvr, DST-100 rcvr, CT-82, class D wavemeter model 2, American CQ magazines, complete run 1944 to 1979 or smaller lots, Eddystone 358 coils or complete rcvr, HRO bandspread coils, converter CV253 or complete R444 APR4Y rcvr. Keith. 020 8554 6631. (London).

**EDDYSTONE** 880 rcvr required. 01484 654 650 (Huddersfield).

**FT-208** and FT-408 h/helds, must be gc, preferably with carrying cases. 021 604 8056 (W Midlands).

**GLASS** for British Rail Morse key. 01621 868 347 (Colchester).

**HISTORY** of Wireless Telegraphy and Telephony by G G Blake, 1926, Radio Press Ltd. 01691 830 277 (Oswestry). E-mail: stan@idlew.freeserve.co.uk

**JRC** optional boards: CMH-741 RS-232 interface. CFL-243 BWC unit for JST-135. CMH-532 RS-232 interface for NRD-525. Also continuously-adjustable multiband mobile aerial, prefer auto such as SWAN 742 but others considered, including man, eg Webster Band Spanner. WHY? G3VYE, QTHR. 01772 459 275 (Leyland).

**KENWOOD** TR-9000 for spares. CPU board must be in working order. Keith, MW0AZH. 029 2061 4641 (Cardiff). E-mail: zs5os@btinternet.com

**KENWOOD** TS-850S. I require auto ATU urgently. Has anyone got one spare? Good price paid. 01582 725 519 (Luton).

**OPTOELECTRONICS** R20 near field rcvr. Bill. 01260 275 547 (Congleton).

**RACAL** RA-63 SSB adaptor and Racal RA-137 LF converter. Happy to collect within an hour or two's drive from Huddersfield, West Yorkshire. Pete Tovey, G0KXA. 01484 603 410 (Huddersfield). E-mail: petetovey@aol.com

**WANTED** Heathkit HW-8 with man if possible. Non-working model considered. Will collect within reasonable distance. Peter. 01775 720 170 (Spalding).

**WANTED** heavy-duty 3-section lattice tower, must be complete and tilt over + exc cond. Cash waiting, urgent. 020 8459 5392 (London). Mobile: 0956 230 130.

**WANTED** Yaesu FRT-7700 ATU in exc cond. Guy, 01539 726 594 (Kendal).

## 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; 70 = 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.

| | |
|---|---|
| **3 Apr** | GB2LOW: Low Power Operation. Yeovil, Somerset. (G3GC) |
| **10 Apr** | GB2BYL: British Young Ladies. Port Talbot, W. Glamorgan. LH2 (GW0KPD) |
| **16 Apr** | GB2LOW: Low Power Operation. Sherbourne, Dorset. (G3CQR) |
| **28 Apr** | GB4CSR: Chase Steam Rally. Bordon, Hants. TLHV2 (G0WYF) |
| **29 Apr** | GB4MD: Marconi Day. Waunfawr, Nr Caernarfon. LH2 (GW3VVC) |
| **30 Apr** | GB2BAH: British Aviation Heritage. Lutterworth, Leics. LH2 (G3KYF) |
| | GB4RRR: Rainham Radio Rally. Rainham, Kent. 2 (M0AAK) |

## CLUB NEWS

DEADLINE – 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. For example, 26 January for the March Issue. News items should be sent in writing (fax or letter) and be signed by the club secretary or the person responsible for publicity. Post cards for this purpose are available from RSGB HQ.

Note: This is a service for clubs affiliated to the RSGB. The announcements are intended to notify non-members and potential members of your club of specific events. Therefore, 'committee meeting', 'natter night' and 'ragchew evening' etc will not be included. Basic, unchanged details about RSGB-affiliated clubs are published annually in the *RSGB Yearbook*.

**ABERDEEN ARS** – 7, JS; 14, OTA; 28, Visit to Ocean Routes. Robert, 01224 896142.

**AYLESBURY VALE RS** – 5, OTA. Roger, G3MEH, 01442 826651.

**BANGOR & DARS** – 5, Backpacking & CC. Mike, GI4XSF, 028 42772383.

**BARRY ARS** – 4, OTA & MP; 11, OTA & MP; 18, Club Dinner; 25, OTA & MP. Rich, GW4BVJ, 01656 658830.

**BASINGSTOKE ARC** – 3, Demonstration Evening. Bob, M0CJJ, 01256 461306.

**BRACKNELL ARC** – 12, T 'Disabled Skiing', by Alan Petigrew, G0FPT (see G6XSY). Baugh @compuserve.com

**BRAINTREE & DARS** – 3, CC; 17, T 'NiCad Batteries', by Tony, G8LTY. Keith, M0CLO, 01376 347736.

**BROMSGROVE ARS** – 11, Discussion on propagation and your latest contacts; 25, DF Hunt – mobile. B Taylor, G0TPG, 01527 542266.

**CAMBRIDGE & DARC** – 7, T 'Fascination of Amateur Television' and demo, by Sid, G6FKS; 14, T 'Turning that old low noise block into a 10GHz transmitter', by Mike, G8VCN; 21, T 'Like Morse then build your own key' & CON, by John, G0GKP; 28, T 'Build a 10GHz tx from the LNB - go on, try it', & CON, by Mike, M0BLP. Bob, G0GVZ, 01223 413401.

**CHELMSFORD ARS** – 4, T 'High-Altitude Platforms and Other Topics', by Les Barclay, G3HTF. Charles, G0GJS, 01245 256654.

**CHELTENHAM ARA** – 7, T 'From Gaskets to EMC Analysers', by G4BZU. John, G4PDQ, 01242 242336.

**CHESHAM & DARS** – 12, OTA; 19, DSP talk; 26, OTA. P Blakeney, G8BLB, 01494 784811.

**COLCHESTER RA** – 13, T 'Packet Radio in Essex', by Clive, G1EUC. Frank, G3FIJ, 01206 851189.

**CORNISH RAC** – 6, AGM. Robin, G0MYR, 01209 820118.

**CRAY VALLEY RS** – 6, AGM. Tony, G4WIF, 020 7 739 5057 (OH).

**CRYSTAL PALACE & DRC** – 5, CON (6m transverter), MP, Rigs, CAD, Internet etc; 22, ES, St John's Church Hall, Sylvan Rd, London 1030 – 1300. Vic, G1PKS, 0208 653 2946.

**DENBY DALE RS** – 5, T 'That's Entertainment', by Graham Barraclough, (Mr G-Wiz); 19, Practical, MP. Tony, G4LLZ, 01484 664360.

**DERBY & DARS** – 5, JS. Martin, G3SZJ, 01332 556875.

**DORKING & DISTRICT RS** – 25, T 'Tuned Loop Antennas', by Mike

Underhill, G3LHZ. John, G3AEZ, 01306 631236.
**DUNDEE ARC** – 26, T 'The British Antarctic Survey', by Mike Gloistein, GM0HCQ, at the Melrose Terrace Lecture Theatre. M Black, GM0PIV, 01382 455771.
**ECHELFORD ARS** – 13, AGM; 27, T 'GPS for the Lighthouse Service', by Duncan Hawksbee. Robin, G3TDR, 01784 456513.
**EDGWARE & DARS** – 13, QRP HF OTA; 27, T 'Control Systems', by Ian, G4IUZ. David, G5HY, 01923 655284.
**EXETER ARS** – 10, Inter-Club Q. D I Smith, G0WHJ, 01392 434078.
**EXMOUTH ARC** – 5, T 'Marine Radio Systems', by Geoff, M0AGI; 19, Introduction to Computers II. John, G1UAN, 01395 264872.
**FAREHAM & DARS** – 5, T 'Teleprinters', by G0AMS; 19 VID; 26, Circuit Diagrams & Components, Part 4. G0AMS, 01329 235397 or G7HEP, 01329 663673.
**FARNBOROUGH & DARS** – 12, T 'Trials & Joys of a GB2RS News Reader', by Roy, G8CKN; 26, T 'Yaesu Products', with demo by Paul Bigwood, G3WYW. Norman, G0VYR, 01483 835320.
**FELIXSTOWE & DARS** - 3, AGM; 17, T 'Hubble - an Eye on the Universe', by Paul, G4YQC. Paul, G4YQC, 01394 273507.
**GLOUCESTER AR & ES** – 3, CC; 10, OTA; 17, MP; 24, VHF/P from escarpment site. Tony, 01452 618930, OH.
**GOOLE RES** – 7, Fund Raising; 14, OTA; 21, Contest Planning; 28, CC. Ken, G6YYN, 01757 638539.
**GRIMSBY ARS** – 6, Peter, G4EJP, RSGB Rep giving us a visit. Brian, G4DXB.
**GUERNSEY ARS** – 13, Visit by Don Beattie, G3OZF (RSGB President). Gloria Gardner, 01481 722188.
**GUILDFORD & DRS** – 14, T '5-Band Vertical for Picnics', by Brian, G3GJX; 28, AGM. Tim, G7JYQ, 0208 3995125.
**HALIFAX & DARS** – 18, Component Sale with Martin Stokes, G3ZXZ. Ray, 01274 600297.
**HARWICH ARIG** – 12, T and slides 'Underwater photography from around the world', by Lydia Vulliamy. Eugene, G4FTP, 01206 826633.
**HASTINGS ELECTRONICS & RC** – 19, The first auction of the new year/Millennium. Doug, G4ERA, 01424 812350.
**HODDESDON RC** – 11, T 'Valves Revisited', by Don, G3JNJ. Don, G3JNJ, 020 82923678.
**HORNDEAN & DARC** – 4, Club Social Evening; 25, T 'The IARU', by Colin Thomas, G3PSM. Stuart, G0FYX, 01705 472846.
**HORNSEA ARS** – 5, Activity, Logging; 12, Antenna farm preparation; 19, Antenna farm; 26, Activity, antenna farm, PM. John, G0TPS, 01964 562258.
**HORSHAM ARC** – 6, T 'ONdigital', by Chris Hibbert. David, G4JHI, 01403 750228.
**HULL & DARS** – 7, T 'The Cobbweb Antenna', by G3TWP; 21, Household Wiring, by G3VHM. John, G0TPS, 01964 562258.
**IPSWICH RC** – 5, AGM; 19, Test Equipment Evening with G0OZS; 26, MP. Keith, G7CIY, 01394 420226.
**KIDDERMINSTER & DARS** – 4, Metal Bashing. Geoff, G0RJP, 01299 888826.
**LEICESTER RS** – 3, OTA; 17, Quarterly Open Meeting; 24, OTA. A T Wann, G0TNI, 0116 2630947.
**LINCOLN SHORT WAVE CLUB** – 19, T 'DSP and Other Modes', by Mike, G0TTD. John, G1TSL, 01522 793751.
**LIVERPOOL & DARS** – 4, Q&A night; 11, OTA; 18, T 'The Big Bang Update', by Dr Mike Holden; 25, ES. Ian, G4WWX, 0151 7221178.
**LOTHIAN RS** – 12, VID & Photograph evening of Expeditions & Contests, with GM4DTH; 26, DF Set-Up - Rig Check Evening. Brian, GM4DIJ, 0131 3342247.
**LOUGHTON & EPPING FOREST ARS** – 7, AGM. Marc, G0TOC, 07803 023501.
**MAIDSTONE YMCA ARS** – 7, JS; 14, RAE pre-examination night; 21, Antenna Workshop; 28, RAE pre-examination night. John, G0RHO, 01622 832259.
**MAXPAK** – 10, AGM. Ron Taylor, G6LRD, 01922 684496.
**MID-CHESHIRE ARS** – 5, HF OTA; 12, Chairman's Selection of Bring a Piece of Equipment; 19, VHF OTA. Peter, G8HAV, 01606 553401.
**MID-WARWICKSHIRE ARS** – 11, ES & book sale; 25, Q&A evening. Bernard, M1AUK, 01926 420913.
**MORECAMBE BAY ARS** – 25, BBC World Service, Skelton. Brian, G0RDH, 01524 424522.
**MORSE ENTHUSIASTS GROUP SCOTLAND** – 30, Annual SES for Samuel Morse's Birthday, courtesy Stirling & DARS, Bandheath Shack & Clubrooms, Nr Stirling. Donald, GM0PIV, 01382 455771.
**NEWBURY & DARS** – 26, Talk by Geoff Brown of SMC. Ian, G3RVM, 01635 826019.
**NORFOLK ARC** – 5, AGM. Please make the effort and attend; 12, Q with Peter, G3ASQ. John, G0VZD, 01953 604769.
**NORTH BRISTOL ARC** – 14, Amplifiers, with Ross Clare, GW3NWS. Dick, G0XAY, 01454 218362.
**NORTH KENT RS** – 4, AGM. Pete, G0GIR, e-mail: Silversands@aol.com
**NUNSFIELD HOUSE ARG** – 7, QSL Card Contest by Geoff Pendrick, G6BEI; 14, T 'RSGB Matters', by Geoff Dover, G4AFJ; 21, OTA; 28, T 'Brush up Your Operating', by Peter Walker & Ken Frankcom. Also Presentation of NRAE Certificates. Ann, 2E1GMP, 01332 752997.
**OXFORD & DARS** – 27, Introducing the Internet, by Ray Geoff, G4FON. Dave, G3BLS, 01865 247311.
**PAISLEY (YMCA) ARC** – 5, Contest Operating; 19, Test Gear for the Radio Amateur. Jim, GM3UWX, 01505 862817.
**POOLE ARS** – 14, AGM. Colin Redwood, G6MXL.
**QRZ AR GROUP OF SUSSEX** – 14, T 'Doing Time', by Tony Seabrook. Stuart, M0CHW, 01435 863020.
**RADIO SOCIETY OF HARROW** – 14, B&B. If you require a pitch let Linda know; 15, GB2DHH OTA from London Colney. Jim Ballard, G0AOT, 01895 476933 or 020 72786421.
**READING & DARC** – 13, T 'An Introduction to Yaesu Products', by Paul Bigwood, G3WYW. Pete, G8FRC, 0118 9695697.
**SALOP ARS** – 13, CC; 27, T 'Fire Service', by Jim, G8UGL. Fred, G3NSY, 01743 790457.
**SHEFFORD & DARS** – 6, JS. Mike, G8BEG, 01462 816738.
**SILVERTHORN RC** – 14, Robot Wars Briefing; 28, OTA in the Shack. David, G0KHC, 020 85051871.
**SOLIHULL ARS** – 20, T 'Railway Signalling', by Peter, G4EQV. Mr Gaskin, G8AYY, 0121 7832996.
**SOUTH BRISTOL ARC** – 5, Amateur radio software demonstration, by Len, G4RZY; 12, Wine & Cheese tasting, Muriel, G4YZR; 19, T 'Oscilloscopes Are Fun', by Len, G4RZY; 26, Computer Parts – B&B, with Bob, M1BOB. Len, G4RZY, 01275 834282.
**SOUTH MANCHESTER RC** – 7, Technical Topics; 14, T 'A Flying Update', by G3SMM; 25, T 'Computer Buses', by G4HON; 28, African Report, by G3SVW. G E Spark, G7FQY, 0161 9691964.
**SOUTH NORMANTON & DARC** – 3, T 'Radio and Aviation in Russia', by Mike Hewitt, G4AYO (Hall); 10, CW Activity Night (Shack); 17, JS (Hall). Russell, G0OKD, 01773 783394.
**SOUTH NOTTS ARC** – 12, OTA HF & VHF. 01509 672846.
**SPEN VALLEY ARS** – 6 AD. D Russell, G0FOI, 01274 875038.
**ST AUSTELL (G0ECC) ARC** – 3, AGM. Reg, G4TRV, 01726 72951.
**STOCKPORT RADIO SOCIETY** – 12, Club Project Night 2; 26, Slides from around the world, by Gerry, G0WGJ. David, M1ANT, 0161 2850017.
**STRATFORD UPON AVON & DRS** – 10, Dr Bamford on Propagation; 24, AGM & Film Night. Ron, G0MRH, 01789 267430.
**SWINDON & DARC** – 6, T 'Radio on the high seas', highlights of his recent Miami-UK trans-Atlantic crossing, by Bob, G0LTP; 13, T 'Practical Wireless - its origins, past, present & future', by Rob, G3XFD, Editor. Den, M0ACM, 01793 822705.
**THORNTON CLEVELEYS ARS** – 3, T 'Multimeters', by Mike, G4EZM; 10, Auction; 17, Preparation for Mill Sunday. Jack, G4BFH, jack@duddingt.u-net.com
**TORBAY ARS** – 14, 90/10 Sale. Peter, G4VTO, 01803 864528.
**TROWBRIDGE & DARC** – 5, Inter-Club Q; 19, Bring a Rig OTA. Ian, G0GRI, 01225 864698, EW.
**WAKEFIELD & DARS** – 4, JS; 11, Q and sandwiches; 18, AGM; 25, OTA. John, G7JTH, 01924 251822.
**WARRINGTON ARC** – 18, Talk by Mark Francis of Waters & Stanton PLC. John, G0RPG, 01925 762722.
**WEST SOMERSET ARC** – 4, AGM & CON. Alan, M0AOJ, 01643 707207.
**WESTON-SUPER-MARE RS** – 3, T '2m Test Oscillator MkII', by Walter Titmuss; 17, Workshop. Graham, G8WAR, 01934 415700.
**WIDNES & RUNCORN ARC** – 5, DF Night - time to get lost again; 19, VHF/UHF DX Night. Martin, G4LUQ, 01928 714843.
**WIMBLEDON & DARS** – 14, ES. 01737 356745.
**WIRRAL & DARC** – 12, T 'Packet Software Options', with demonstrations of various programs, by Tom, G4BKF, Phil, G6IIM, Neil, G4OAR & Andy, G7HUD; 26, Bring & Tell Evening. (Bring an unusual or distinctive item & tell your friends about it. Andy, G7HUD, 0151 6774448 (eves).
**WOLVERHAMPTON ARS** – 13, CON. J Smith, 01902 751936.
**WORTHING & DARC** – 5, Discussion Evening; 12, ES; 19, Lecture by G4XRU; 26, Discussion Evening. Roy, G4GPX, 01903 753893.
**YARMOUTH RC** – 12, Q at Norwich Club (Wednesday); 14, T 'Digital Broadcasting'; 28, OTA. Tony, G3NHU, 01493 721173.
**YORK RADIO CLUB (AMATEUR)** – 6, MP by G4XIV & G0WUY; 13, MP by G4XIV & G0WUY; 20, T 'Member's Shack', by M0BDV; 27, MP by G4XIV & G0WUY. Gareth, G1DRG, 01904 421392.

## RALLIES AND EVENTS

This is a list of all rallies, hamfests, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

**9 APRIL 2000**
**WEST MANCHESTER RADIO CLUB Red Rose Rally** – Horwich Leisure Centre, Horwich, Bolton, Lancs, of Jcn 6 M61. OT 10.30am/11.00am, £1.50 (OAPs £1), C, TS, B&B. Don, G3BSA, 09142 871 620 or e-mail don@g3bsa.freeserve.co.uk

**16 APRIL 2000**
**CAMBRIDGESHIRE REPEATER GROUP Annual Rally** – Bottisham Village College, Bottisham, 6 miles east of Cambridge, access via A14 and A1303. OT 10.30am, £1.50, TS, B&B, A, CBS, CP, TI on S22. 01462 683 574.
**SWANSEA ARS Amateur Radio & Computer Show** – Swansea Leisure Centre, on the A4067 Swansea to Mumbles coast road. OT 10.30am, £1 (children 50p), TS, B&B, SIG, LB, C. Roger, GW4HSH, 01792 404 422.
**YEOVIL QRP Convention** – Digby Hall, Hound Street, Sherborne, Dorset. OT 10.00am, £2, TS, B&B, LEC. Peter, 01935 813 054.

**22 APRIL 2000**
**CRYSTAL PALACE & DARC Spring Sale** – St John's Hall, Sylvan Road, London SE19. OT 10.30am £1. Bob, G3OUU, 01737 552 170.

**29 APRIL 2000**
**INTERNATIONAL MARCONI DAY**

**30 APRIL 2000**
**BREDHURST RECEIVING & TRANSMITTING SOCIETY, Rainham Radio Rally** – Rainham School for Girls, Derwent Way, Rainham, Kent. M2 Jcn 4 or A2 – follow RRR arrows. TI on S22, OT 9.30am/10am, £2 (under-14 free), TS, SIG, C, B&B, SIG. Martin, 01634 365 980.
**DUNDEE ARC and STIRLING & DARS**

## SILENT KEYS

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

| | | |
|---|---|---|
| G2PU | Mr SRR Kharbanda | 02/01/00 |
| G3KAS | Mr F H Sturdy | 04/01/00 |
| G3OEM | Mr R A McCarty | 25/12/99 |
| GM0TKM | Mr W M McDonald | 22/11/99 |
| G3LDT | Mr L Bond | 11/12/99 |
| G4GQW | Canon W Beswick | 29/10/99 |
| G1JIY | Mr D W Batham | |
| G5XV | Mr R Y Parry | 02/01/00 |
| G4GLX | Mr LCH Glenister | |
| RS27541 | Mr A H Blunn | |
| G6HD | Mr T L Herdman | 13/12/99 |
| G3FYR | Mr W E Gardner | 27/12/99 |
| G4KAQ | Mr R Matthews | 29/12/99 |
| GW0OLN | Mr G A Clement | 16/12/99 |
| G3SCE | Mr KGA Gair | 02/01/00 |
| GM3EXS | Mr F Clark | 04/01/00 |
| RS87307 | Mr R Stoddart | 05/10/99 |
| GW3WLN | Dr A H Pritchard | /12/99 |
| G3IMK | Mr S C Walters | 16/01/00 |
| G3DTG | Mr E Clary | 07/12/99 |
| G4BLG | Mr A E Head | 04/11/99 |
| G8GZZ | Mr N P Rew | /01/00 |
| G4TJZ | Mr W L Stacey | 07/01/00 |
| G0JVG | Mr M A Woodford | 05/01/00 |
| G2AKY | Mr E J Williams | 10/01/00 |
| GM0UEQ | Mr W G Brown | 19/12/99 |
| G3KVH | Mr J B Barnes | |
| G1LZM | Mr F J Ormett | 07/01/00 |
| G3KAA | Mr L S Cutting | 25/01/00 |
| G6HM | Mr E R Henman | 07/01/00 |
| G0DEW | Mrs HMS Dew | |
| G3SXL | Mr R G Anderson | 20/01/00 |
| G3AAK | Mr K W Bunston | |
| GW0CDG | Mr R T Williams | 08/02/99 |
| G3OLZ | Mr A Caley | 12/09/99 |
| G0LFJ | Mrs G M Pearce | 10/01/00 |
| GM3EXS | Mr A W Clark | 04/01/00 |
| G0SWT | Mr L Tandy | 08/01/00 |
| G4BCJ | Mr J S Wilson | 24/12/99 |
| GW4RGL | Mr I Purnell | 20/01/00 |
| EI5AG | Mr J V Paul | 13/01/00 |
| G8SJR | Mr B J Vincent | |
| GM8SQ | Mr G Proctor | 29/01/00 |
| G4ZDO | Mr L G Newman | |
| G7GQJ | Mr F Stewart | 03/02/00 |
| G4EHZ | Mr D G Worley | 10/12/99 |
| G1NQT | Mr G Knowles | 12/02/00 |
| G7DYU | Mr C N Gilbert | /09/99 |
| G6MUV | Mr R C Kent | 13/02/00 |
| RS17973 | Mr J A Lake | 04/02/00 |
| G4PZD | Mr W H Agnew | 08/02/00 |
| G3XBE | Mr A F Walton | 27/01/00 |
| G0OAF | Mr J F Hackett | 17/01/00 |
| G7TDJ | Mr L A Coalston | 09/02/00 |
| M1EGQ | Mr P M Cleaver | 27/01/00 |
| G2AMQ | Mr F G Cockerill | 25/01/00 |

**KEY**

***Club News***
**AD** - Annual Dinner; **AGM** - Annual General Meeting; **ARDF** - Amateur Radio Direction Finding; **B&B** - Bring and Buy; **CON** - CONstruction; **CC** - Construction Competition; **D** - Details; **ES** - Equipment Sale; **EW** - Evenings/Weekends; **JS** - Junk Sale; **MP** - Morse Practice; **OH** - Office Hours; **OTA** - On The Air; **Q** - Quiz; **RP** - Rally Preparations; **T** - Talk; **VID** - VIDeo;

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

**with Morse Enthusiasts Group Scotland, Annual Get-Together** – Throsk, nr Stirling. GM0PIV, 37 Clepington Road, Dundee DD4 7EL.
**LOUGH ERINE ARS 19th Mobile Rally** – Killyhevlin Hotel, Enniskillen. OT 12 noon, B&B, WIN. Keiran, GI7NET, 01365 348 063 (day), 01365 327 133(eve).

**1 MAY 2000**
**DARTMOOR Radio Club Rally** – Pannier Market, Tavistock, Devon. OT 10.30am, TI, CP, TS, B&B. Ron, G7LLG, 01822 852 586.
**MID CHESHIRE ARS Rally** – Civic Hall, Winsford. OT 11.00am/10.30am, CP, C. David, G4XUV, 01606 77787.

**7 MAY 2000**
**BRITISH AMATEUR TELEVISION CLUB Annual Convention and Rally** – Bletchley Park. OT 10am, £1 (under 16 free). TS.
**DRAYTON MANOR Radio & Computer Rally** – Drayton Manor Park, Tamworth, Staffs, on the A4091. TS, FM, B&B, SIG. Peter, 0121 422 9787 or 0121 443 1189.

**14 MAY 2000**
**DUNSTABLE DOWNS RADIO CLUB 17th Annual National Radio Car Boot Sale** – Stockwood Country Park, Luton, Beds. Leave M1 Jcn 10a – follow signs for 'The Mossman Collection'. OT 9am, TI on S22. DDRC, PO Box 4053, Dunstable, Beds LU5 5ZJ with an SAE. Information www.ddrcbootsale.freeserve.co.uk. Fax 01525 383 898, or e-mail DRC@magstripe.demon.co.uk

**21 MAY 2000**
**MID-ULSTER ARC Rally** – Silverwood Hotel, Lurgan, Co Armagh. OT 12 noon, TS, B&B, TI on S22. Jim, GI0OND, 028 3885 1179.
**RIPON & DISTRICT ARS Northern Mobile Rally**, Harrogate. Gerald, G0UFI, 01765 640 229, or g0ufi@email.com
**THREE COUNTIES Radio & Computer Rally** – Perdiswell Leisure Centre, Bilford Road, Worcester. OT 10.00am, £2, (OAP & disabled £1.50), TS, SIG, LB, C, CP. Eddie, 01905 773 181.

**28 MAY 2000**
**BURY RADIO SOCIETY Rally** – Mosses Centre, Cecil Street, Bury, Lancs. TI, CP, TS, B&B, LB, DF. 07946 090 773 or e-mail buryrally@hotmail.com
**IPSWICH RADIO CLUB East Suffolk Radio Rally (Wireless Revival)** – 'The Hollies', Straight Road, Foxhall, Ipswich. OT 9.30am (buyers), 8am (traders), TI S22, CBS, SIG, TS. G4DDK, 01394 448 495.

**4 JUNE 2000**
**MANSFIELD ARS Annual Rally & Electronics Car Boot Sale** – Debdale Lane Sports and Social Club, Debdale Lane, Mansfiled Woodhouse. OT 10am, LB, C CP. Angela, 01623 429 218 or e-mail andange@netscapeonline.co.uk
**SPALDING & DARS Rally** – Springfields Exhibition Centre, Spalding, Lincolnshire. OT 10am, CBS, CP, C, CS. Ray, G8ELV, 01775 711 953 or Mick, 07976 271 796.
**WEST MANCHESTER RC 4th Red Rose QRP Festival** – Formby Hall, Alder Street (off High Street), Atherton, Manchester. OT 11am, £1, TS, SIG, CP, DF, R, LB, B&B. Les, G4HZJ, 1 Belvedere Avenue, Atherton, M46 9LQ, 01942 870 634.

**6 JUNE 2000**
**BENTLEY RADIO CLUB Mid-Hampshire Radio Rally** – Medstead Hall, Medstead, Alton, Hants. OT 10.30am, £1.50, TI, CP, TS, FM, SIG, C, WIN. Chris, 09790 577 945 or e-mail chris@g0wyf.freeserve.co.uk

**11 JUNE 2000**
**NUNSFIELD HOUSE ARG Elvaston National Radio Rally** – Elvaston Castle Country Park, Elvaston, Derby. Located on B5010, which runs between A6 and A52, 5 miles SW of Derby. TS, FM, B&B, C, MT, etc. Les, G4CWD 01332 559 965 or les@g4cwd.demon.co.uk

**18 JUNE 2000**
**NEWBURY & DARS Boot Sale** – Acland Hall and Recreation Field, Cold Ash. OT 9am, free but donation appreciated, CP, TI on S22. George, 01488 682 814.

**22 / 24 JUNE 2000**
**HAMRADIO 2000** – Friedrichshafen, Germany

**25 JUNE 2000**
**BANGOR & DARS Radio and Computer Rally** – Clandeboye Lodge Hotel, Bangor. OT 12 noon, £2. Mark, MI1DRU, 028 9058 6515, or e-mail mi1dru@amrad.net
**LONGLEAT RALLY** – Longleat House, Warminster, Wilts.

**2 JULY 2000**
**HARLOW & DARS Radio and Hobbies Rally** – Len, G7UFF, 01279 832 700 or e-mail g6ut@qsl.net

**8 JULY 2000**
**CORNISH RADIO Rally & Computer Fair** – Robin, 01209 820 118.

**9 JULY 2000**
**SUSSEX Amateur Radio & Computer Fair** – Ron, G8VEH, 01903 763 978 or 01273 417 756.
**YORK RADIO CLUB (Amateur) Radio Rally** – Pat Trask, G0DRF, 01904 628 036.

**16 JULY 2000**
**Humber Bridge Rally** – Bob, G0VVP, 01482 834 240 or John, G0TPS, 01964 562 258.

**23 JULY 2000**
**COLCHESTER Radio Rally & Computer Fair** – Frank, G3FIJ, 01206 851 189.
**RUGBY AMATEUR TRANSMITTING SOCIETY Radio & Computer Fair** – Arthur, M0ASD, 01788 550 778 or m0asd@tesco.net

**30 JULY 2000**
**RSGB RADIO HOBBY DAY** – RSGB, 01707 659 015.

**11 AUGUST 2000**
**COCKENZIE & PORT SETON ARC 7th Annual Radio Junk Night** – Bob, GM4UYZ, 01875 811 723, e-mail bob.gm4uyz@btinternet.com or GM4UYZ @ GB7EDN.

**13 AUGUST 2000**
**BRIDGEND & DARC Millennium Rally** – Maurice, GW0JZN, 01656 864 579 or e-mail gw0jzn@yahoo.com
**KING'S LYNN ARC 11th Great Eastern Rally** – Derek, G0MQL, 01553 841 189, Fred, 01760 440 570 or www.qsl.net/g3xyz

**20 AUGUST 2000**
**TELFORD & DARS Telford Radio Rally** – Bob, 01952 770 922 or bob@somrob.u-net.com or Jim, 01952 684 173.

**3 SEPTEMBER 2000**
**SOUTH BRISTOL AMATEUR RADIO CLUB Radio & Computer Rally** – Muriel, 01275 834 181.

**10 SEPTEMBER 2000**
**LINCOLN SHORT WAVE CLUB Rally** – John, G8VGF, 01522 525 760.
**VINTAGE Technology 2000** – Blackpool. Brian 01253 508 232.

**22 / 23 SEPTEMBER 2000**
**LEICESTER Amateur Radio Show** – Geoff, 01455 823 344, fax 01455 828 273, or e-mail g4afj@argonet.co.uk

**1 OCTOBER 2000**
**GREAT LUMLEY AMATEUR RADIO & ELECTRONICS SOCIETY Rally** – 0191 384 2803 or 030 8937 2772.

**8 OCTOBER 2000**
**NORTH WAKEFIELD RC 17th Radio Rally** – http:/www.nwrc.mcmail.com or 01924 824 451.

**15 OCTOBER 2000**
**BLACKWOOD & DISTRICT ARS Radio, Computer & Electronics Rally** – Stuart, 01495 243 824 or 07970 777 756, fax 01495 240 260 or e-mail fireham@aol.com

**29 OCTOBER 2000**
**GALASHIELS & DARS Annual Radio and Computer Rally** – Jim, 01896 850 245 or e-mail jimk@gm7lun.freeserve.co.uk

**12 NOVEMBER 2000**
**GREAT NORTHERN HAMFEST** – Ernie, G8LUE, 01226 716 339. Mobile 07787 546 515.
**MIDLAND ARS 12th Radio & Computer Rally** – Peter, 0121 443 1189.

**26 NOVEMBER 2000**
**BISHOP AUCKLAND RADIO AMATEURS' CLUB Rally** – Mark, G0GFG, 01388 745 353.

**21 JANUARY 2001**
**OLDHAM ARC Rally** – Geoff, 01706 846 143.

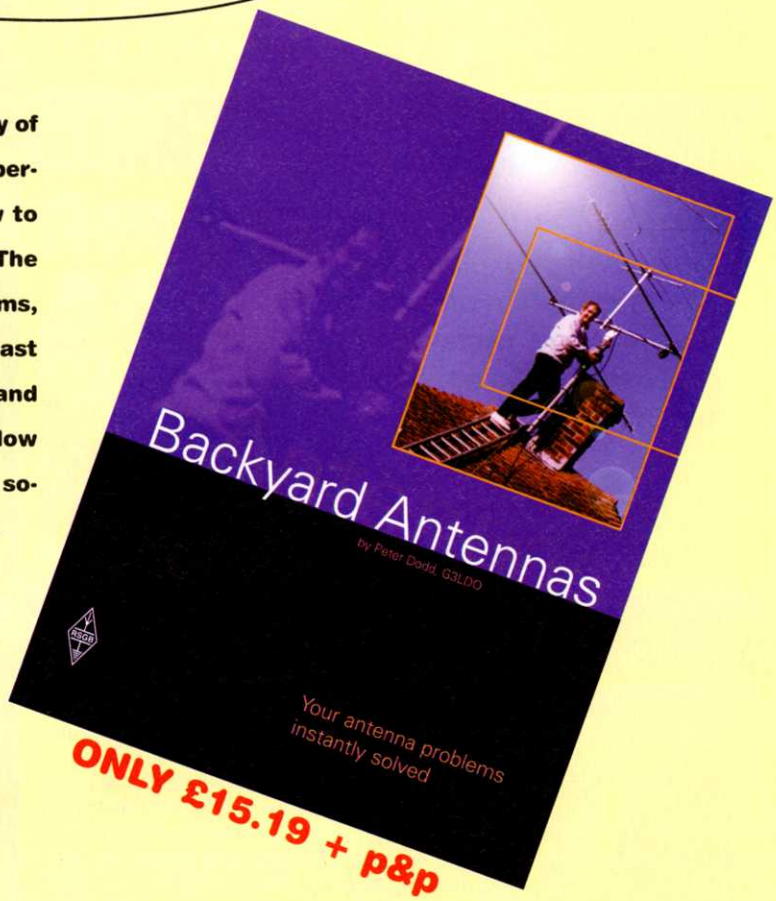
# NEW NEW

## 20% OFF OPENING OFFER FOR OUR MEMBERS

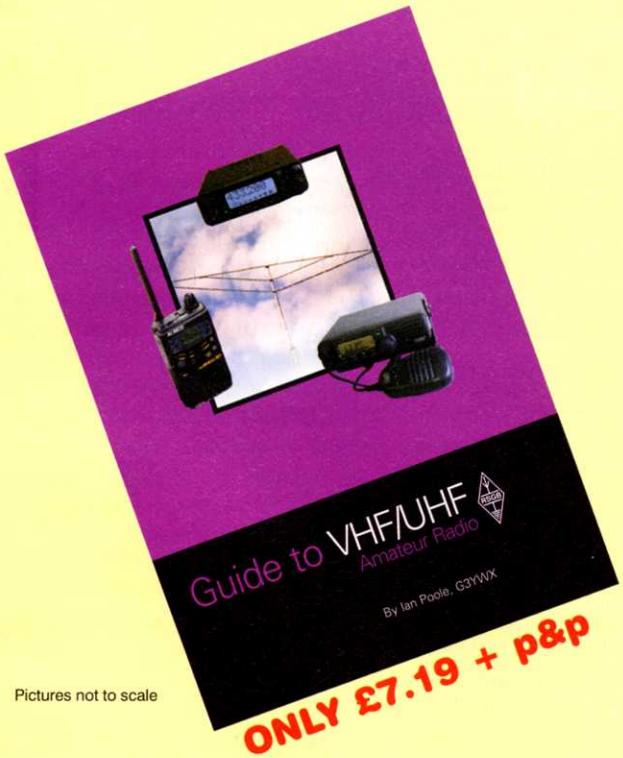
### Backyard Antennas

By Peter Dodd, G3LDO

**Antenna guru Peter Dodd explains how, by using a variety of simple techniques, it is possible to achieve very high performance from a compact antenna. Also detailed is how to make an antenna efficient on several bands at once. The book covers end-fed and centre-fed antennas, rotary beams, loops, tuning units, VHF/UHF antennas, antenna and mast construction, transmissions lines, and how to estimate and measure performance. Whether you have a house, bungalow or apartment, *Backyard Antennas* will help you find the solution to radiating a good signal on your favourite band.**




**ONLY £15.19 + p&p**




Pictures not to scale

**ONLY £7.19 + p&p**

### The RSGB Guide to VHF/UHF Amateur Radio

By Ian Poole, G3YWX

**The handy new guide to operating on the bands between 30MHz and 3GHz. Ian Poole describes in an easy-to-read style how to get the most from your VHF/UHF station. Covers propagation, bandplans, receivers & transmitters, antennas, mobile and repeaters, DXing, data comms and commonly used abbreviations.**

## CALL OUR ONE STOP SHOP ON

RSGB

**Tel: 01707 659015**
**Email: sales@rsgb.org.uk**
**Fax: 01707 645105**

RSGB

# RSGB BOOKSHOP


**To commemorate the first 100 years of amateur radio the Radio Society of Great Britain has commissioned a fine photographic history of this time.**

**This book is:**

- **Individually Hand Numbered**
- **Limited Edition of 1000 Copies**
- **A Substantial 10.5in. Hard Covered Book**
- **Beautifully Bound with Gold Blocking**
- **Over 200 selected full page Photographs**
- **256 High Gloss pages**

**MEMBERS ONLY PRICE £42.49**

FOHY

**Complete UK & Eire callsigns listing, plus a 144 page information directory - Every page updated. A must for all radio amateurs and SWLs.**

**MEMBERS ONLY PRICE £12.74**

CB2000



**The Radio Communications Handbook is one of the world's largest and most comprehensive guides to the theory and practiceof radio communication. This new edition incorporates the lastest technical innovations and techniques of practical radio, from LF to the GHz bands, for professionals and students alike. An invaluable reference for RF engineers and enthusiasts.**

**MEMBERS ONLY PRICE £24.49**

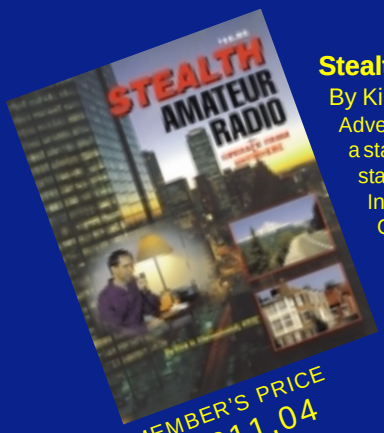
RHPB

**Post & Packing:** Please add £1.25 for 1 item, £2.50 for 2 or more items Payments can be made by Cheque/Postal Order made payable to **'Radio Society of Great Britain'**. We also accept Visa/Amex/Access. Please send orders to:


**Radio Society of Great Britain**
**Lambda House, Cranborne Road,**
**Potters Bar, Herts EN6 3JE**
**Tel: 01707 660888**
**Fax: 01707 645105**
**E-mail: sales@rsgb.org.uk Web: www.rsgb.org**


| Code | Description | Retail Price | Members Price |
|---|---|---|---|
| | **ANTENNA** | | |
| NACO | HF Antenna Collection - 2nd Ed | £9.99 | £8.49 |
| HFAL | HF Antennas for all Locations - 2nd | £7.99 | £6.79 |
| PAFN | Practical Antennas for Novices - 1st Ed | £7.99 | £6.79 |
| PWAS | Practical Wire Antennas - 4th Ed | £9.99 | £8.49 |
| TAEG | The Antenna Experimenters Guide - 2nd Ed | £17.99 | £15.29 |
| | **BACK ISSUES & BINDERS** | | |
| RC8690 | RadCom 1986-90 Triple CD-ROMs | £29.99 | £25.49 |
| RC9195 | RadCom 1991-95 Triple CD-ROMs | £29.99 | £25.49 |
| RC96 | RadCom 1996 CD-ROM | £19.99 | £16.99 |
| BV97 | RadCom 1997 Bound Volume | £39.99 | £33.99 |
| RC97 | RadCom 1997 CD-ROM | £19.99 | £16.99 |
| RC98 | RadCom 1998 CD-ROM | £19.99 | £16.99 |
| QRCB | RadCom Back Issue | £3.95 | £3.95 |
| EAZI | RadCom Easibinder | | £7.99 |
| | **CALL BOOKS** | | |
| CS2000 | RSGB CallSeeker 2000 CD-ROM | £12.99 | £11.04 |
| CB2000 | RSGB Yearbook 2000 | £14.99 | £12.74 |
| SET | RSGB Yearbook 2000 & Callseeker 2000 Set | | £19.50 |
| | **CENTENARY & MILLENNIUM (LIMITED EDITION)** | | |
| FOHY | Amateur Radio ~ the first 100 years | £49.99 | £42.49 |
| CMUG | Centenary Mug | £21.50 | £18.28 |
| MMKP | Millennium Morse Key - Add £3.65 p+p - ins. | £99.95 | £89.95 |
| | **EMC** | | |
| RAGE | Guide to EMC | £19.99 | £16.99 |
| | **GENERAL TECHNICAL** | | |
| RHPB | Radio Communication Handbook - 7th Ed - *New* | £29.99 | £25.49 |
| LFSB | LF Experimenter's Source Book - 2nd Ed | £8.99 | £7.64 |
| PMRC | PMR Conversion Handbook - 1st Ed | £16.99 | £14.44 |
| PRFB | Practical Receivers for Beginners - 1st Ed | £14.99 | £12.74 |
| PTNO | Practical Transmitters for Novices - 1st Ed | £16.99 | £14.44 |
| RDRB | Radio Data Reference Book - 6th Ed | £14.99 | £12.74 |
| TTSB | Technical Topics Scrapbook 1985-89 | £9.99 | £8.49 |
| TTSB2 | Technical Topics Scrapbook 1990-94 | £13.99 | £11.89 |
| TERA | Test Equipment for the Radio Amateur - 3rd Ed | £12.99 | £11.04 |
| RIGG | The RSGB Rig Guide | £4.99 | £4.24 |
| | **HISTORY** | | |
| WATF | World at their Fingertips - 1st Ed | £9.99 | £8.49 |
| | **LOG BOOKS & LOG SHEETS** | | |
| LOGH | HF Log Sheets | £9.99 | £8.49 |
| COVL | Log Book Cover | £6.50 | £5.53 |
| LBRX | Log Book Receiving | £4.99 | £4.24 |
| LBAR | Log Book Transmitting | £4.99 | £4.24 |
| LOGV | VHF Log Sheets | £9.99 | £8.49 |
| | **MAPS** | | |
| GTCD | Great Circle DX Map (A4 card for desk) | £1.99 | £1.69 |
| GTCM | Great Circle DX Map - Wall (folded) | £3.99 | £3.39 |
| LOCE | Locator Map of Europe - Wall (folded) | £1.99 | £1.69 |
| LOCD | Locator of Europe (A4 card for desk) | £2.99 | £2.54 |
| | **MICROWAVES, VHF & UHF** | | |
| SET | Microwave Handbook Set - Volume 1, 2 & 3 | £36.00 | £30.60 |
| MHB1 | Microwave Handbook Volume 1 - 3rd Ed | £11.99 | £10.19 |
| MHB2 | Microwave Handbook Volume 2 - 2nd Ed | £18.99 | £16.14 |
| MHB3 | Microwave Handbook Volume 3 - 2nd Ed | £18.99 | £16.14 |
| MLOP | Microwave Lectures & Other Papers | £13.99 | £11.89 |
| | Microwave Newsletter - inc postage | £11.15 | £9.50 |
| AURA | Radio Auroras | £4.99 | £4.24 |
| VHFH | VHF Contesting Handbook | | £4.25 |
| VHFM | VHF/UHF Handbook - 1st Ed | £19.99 | £16.99 |
| | **MORSE CODE** | | |
| IMCD | Instant Morse CD-ROM | £14.99 | £12.74 |
| MCRA | Morse Code for Radio Amateurs - 8th Ed | £4.99 | £4.24 |
| | **OPERATING AIDS** | | |
| PREG | Prefix Guide | £8.99 | £7.64 |
| YFAS | Your First Amateur Station - 1st Ed | £7.99 | £6.79 |
| YGTP | Your Guide to Propagation - 1st Ed | £9.99 | £8.49 |
| | **QRP (LOW POWER)** | | |
| GQRP | G-QRP Club Circuit Handbook - 1st Ed | £9.99 | £8.49 |
| | **SPECIAL MODES** | | |
| PRPR | Packet Radio Primer - 2nd Ed | £9.99 | £8.49 |
| SRHB | Space Radio Handbook | £2.99 | £2.54 |
| YFPS | Your First Packet Station - 1st Ed | £7.99 | £6.79 |
| | **SUNDRIES** | | |
| DLLB | Callsign Lapel Badge - Deluxe | | £4.50 |
| CSLB | Callsign Lapel Badge - Standard | | £4.00 |
| CSIL | Car Sticker - I Love Amateur Radio | £1.50 | £1.28 |
| CSIO | Car Sticker - I'm on the Air with Amateur Radio | £1.50 | £1.28 |
| CSRS | Car Sticker - RSGB Emblem | | £1.00 |
| RUBB | IOTA Rubber Stamp | £7.50 | £6.38 |
| MINI | RSGB Lapel Badge - Mini | | £1.25 |
| RSGB | RSGB Lapel Badge - Standard | | £2.00 |
| BTIE | RSGB Tie - Blue | | £11.00 |
| RTIE | RSGB Tie - Red | | £11.00 |
| DI2000 | RSGB Amateur Radio & SWL 2000 Diary | £2.99 | £2.54 |
| | **TRAINING** | | |
| ARBG | Amateur Radio for Beginners | £1.50 | £1.28 |
| STN3 | Novice Licence Student's Notebook - 2nd Ed | £4.99 | £4.24 |
| RAE2 | Radio Amateurs' Examination Manual - 16th Ed | £14.99 | £12.74 |
| REVN | RAE Revision Notes - 2nd Ed | £5.00 | £4.25 |
| NOVQ | Revision Questions for the Novice RAE - 1st Ed | £5.99 | £5.09 |
| TFNL | Training for the Novice Licence Instructor's Manual - 2nd Ed | £9.99 | £8.49 |

# NEW ARRL PRODUCTS
# NEW LOWER PRICES

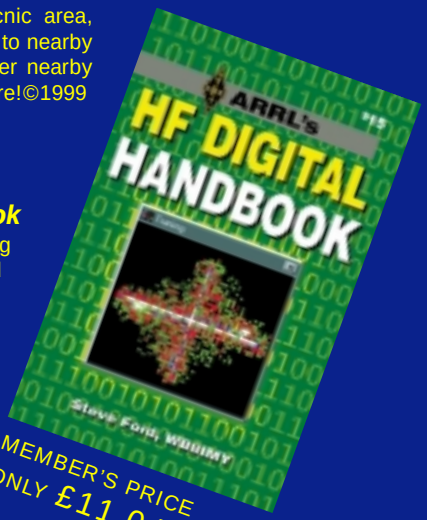



MEMBER'S PRICE ONLY £11.04

**Stealth Amateur Radio—Operate from Anywhere**

By Kirk A. Kleinschmidt, NT0Z

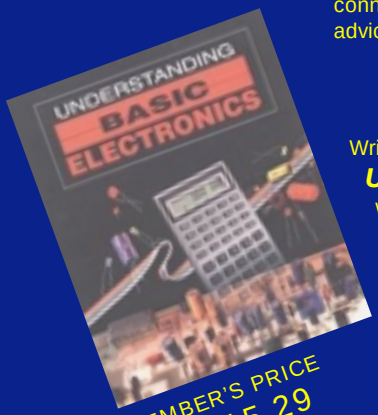
Adventure into the world of hidden stations and invisible antennas! Set up and operate a station without calling attention to yourself. Successfully operate a low power (QRP) station. Install safe antennas, including indoor antennas. Build invisible antennas. Install and operate a mobile station, to "get away" from radio-forbidden locations. Operate a portable station from a campground, motel room, picnic area, mountaintop or other location. Handle interference *from* your station to nearby consumer electronics devices as well as *to* your station from other nearby devices. Use this book and enjoy operating from just about anywhere!©1999




MEMBER'S PRICE ONLY £11.04

***ARRL's HF Digital Handbook***

The personal computer revolution has introduced many new digital operating modes. Inexpensive software and hardware make it easy to get started, and this book helps amateurs of all skill levels make sense of this alphabet soup of choices. Chapters cover building an HF digital station, digital modes such as PSK31 (the hot new HF digital mode!), PACTOR and PACTOR II, Clover, G-TOR, Hellschreiber (the "visual" digital mode), the HF/Internet email connection, and digital contesting. Includes loads of practical operating advice and valuable reference information!




MEMBER'S PRICE ONLY £15.29

Written in an easy-to-understand style for electronics beginners, ***Understanding Basic Electronics*** is also for those who want to brush up on electronics principles. Loaded with illustrations, the book starts with math skills and progresses to dc and ac electronics principles. It concludes with clear, simple explanations of how components like diodes, transistors and integrated circuits work.1st edition, ©1992, 448 pages.


***Amateur Radio Map of the USA***

full-color (26 × 34.5 inches).

MEMBER'S PRICE ONLY £5.94

## OTHER ARRL PRODUCTS:

| Code | Description | Retail Price | Members Price |
|---|---|---|---|
| | **ANTENNA** | | |
| ACV1 | Antenna Compendium Volume 1 | £10.99 | £9.34 |
| ACV2 | Antenna Compendium Volume 2 | £12.99 | £11.04 |
| ACV3 | Antenna Compendium Volume 3 | £12.99 | £11.04 |
| ACV4 | Antenna Compendium Volume 4 | £17.99 | £15.29 |
| ACV5 | Antenna Compendium Volume 5 | £17.99 | £15.29 |
| ACV6 | Antenna Compendium Volume 6 - *New* | £19.99 | £16.99 |
| SET | Antenna Compendium Set - Volume 1, 2, 3, 4 & 5 | £69.99 | £59.49 |
| ANIM | Antenna Impedance Matching | £12.99 | £11.04 |
| ANTB | Antenna Book - 18th Ed | £27.99 | £23.79 |
| YAGI | Physical Design of Yagi Antennas | £12.99 | £11.04 |
| SLWA | Simple Low-Cost Wire Antennas | £9.99 | £8.49 |
| VACS | Vertical Antenna Classics | £12.99 | £11.04 |
| WACS | Wire Antenna Classics - *New Edition* | £12.99 | £11.04 |
| | **EMC** | | |
| RFIB | Radio Frequency Interference Book | £17.99 | £15.29 |
| | **GENERAL TECHNICAL** | | |
| AH2000 | Handbook 2000 - *New* | £27.99 | £23.79 |
| AHCD | Handbook 2000 CD ROM - *New* | £27.99 | £23.79 |
| IRFD | Introduction to RF Design | £29.99 | £25.49 |
| LPCM | Low Power Communications | £12.99 | £11.04 |
| SSDD | Solid State Design | £12.99 | £11.04 |
| DENK | W1FB's Design Notebook | £18.99 | £16.14 |
| | **MAPS** | | |
| GRAS | Grid Locator Atlas | £6.99 | £5.94 |
| | **MICROWAVES, VHF &UHF** | | |
| UMEM | UHF/Microwave Experimenter's Manual | £17.99 | £15.29 |
| MWPM | UHF/Microwave Project Manual Volume 1 | £17.99 | £15.29 |
| MWP2 | UHF/Microwave Project Manual Volume 2 | £12.99 | £11.04 |

| Code | Description | Retail Price | Members Price |
|---|---|---|---|
| | **MORSE CODE** | | |
| MCEL | Morse Code The Essential Language | £8.99 | £7.64 |
| MCC1 | Morse Instruction Tapes 10-15 wpm (2 tapes) | £9.99 | £8.49 |
| MCC2 | Morse Instruction Tapes 15-22 wpm (2 tapes) | £9.99 | £8.49 |
| MCC3 | Morse Instruction Tapes 5-10 wpm (2 tapes) | £9.99 | £8.49 |
| IMTC | Your Introduction to Morse Code (2 tapes) | £9.99 | £8.49 |
| | **OPERATING AIDS** | | |
| DXCC | DXCC Countries List | £3.99 | £3.39 |
| DOTE | DXing on the Edge | £27.99 | £23.79 |
| HIKI | Hints & Kinks for the Radio Amateur | £10.99 | £9.34 |
| LDXG | ON4UN's Low Band Dx-ing ~ New Edition | £26.99 | £22.94 |
| PCHC | Personal Computers in the Ham Shack | £12.99 | £11.04 |
| | **QRP (LOW POWER)** | | |
| QRPP | QRP Power | £12.99 | £11.04 |
| QRPN | W1FB's QRP Notebook - 2nd Edition | £8.99 | £7.64 |
| | **QST MAGAZINE** | | |
| QSTA | QST 1 Year Sub - Airmail | £95.50 | £81.00 |
| QST1 | QST 1 Year Sub - Surface Mail | £40.50 | £34.25 |
| QST2 | QST 2 Years Sub - Surface Mail | £77.00 | £65.25 |
| QST3 | QST 3 Years Sub - Surface Mail | £109.00 | £92.45 |
| | **SATELLITE** | | |
| ANTH | Satellite Anthology -5th Edn - *New* | £6.99 | £5.94 |
| SATH | Satellite Handbook | £18.99 | £16.14 |
| WSHB | The Weather Satellite Handbook | £17.99 | £15.29 |
| | **SPECIAL MODES** | | |
| PSMS | Packet, Speed & More Speed - 2nd Ed | £11.99 | £10.19 |
| SSSB | Spread Spectrum Source Book | £17.99 | £15.29 |

# the last Word

## Inappropriate Remarks

I am one of those people who read 'The Last Word' with interest, and read all topics and opinions aired with the thought 'everyone is allowed an opinion', but I am beginning to ask myself the question, 'Why does it seem to me that almost everyone in the hobby is looking for a excuse to have a dig at someone else'?

May I illustrate with the letter of Mr Lindsay, G0KDS ('The Last Word', February 2000) who replies to M0ATN's comments on the *RadCom* HF column with the opening comments 'By his call sign, he has not yet dried out behind the ears'. I wonder if Mr Lindsay treats all recently licensed calls with that attitude on the band? I am just starting my third decade of involvement with the hobby, for almost two as an SWL. But, as you can see by my call, I must be absolutely saturated behind the ears. I think not! Answer topics by all means, Mr Lindsay, but what good does an opening comment like yours do for the hobby?

***Robert Walker, M0BPT***

## Missing The Point

I feel that Gerald Mack ('The Wrong Image' The Last Word, March 2000) has missed the point of the RAE and the licence. The RAE has a technical content because the licence is not just an operating licence, it is an experimenting licence. Hence, the RAE must cover transmitters, receivers, antennas, test equipment and measurements in addition to safety, EMC and regulations.

Take out the technical content of the RAE and we are left with operating 'black boxes', probably with restricted antennas, power and modes. Isn't that CB?

One of the strengths of amateur radio is that it caters for diverse interests. The RAE and licence must by necessity encompass all these interests, so that licence holders have the freedom to pursue all aspects of the hobby.

***Gary Aylward, G0XAN***

## Apostrophes

Am I alone in fighting the war against unwanted and unnecessary apostrophes? One constantly comes across plurals to which an apostrophe has been added, and even *RadCom* is not immune. Consider such words as reciever's, antenna's, transceiver's, keyer's, speaker's, etc – YUK! To all those guilty of such crimes, may I recommend the following ditty?

Apostrophes are an obsession,
But *plurals* are *not* in this lesson.
Please let it be heeded,
That they're only needed,
To show *what's left out*
and *possession*.

***DJ Simpson, GM3LVA***

## Happiness is a Place Called Scunthorpe

Having read some letters in *RadCom* recently about new members joining clubs and getting frosty receptions, I felt I had to write to you and put another point of view across.

I joined my club a couple of years ago, took my 'Novice', and have not looked back since. I may be lucky in my choice of club, but in all honesty my friends in the club can't do enough for me. They have a wealth of knowledge spanning a good few years and have probably forgotten more than I will ever learn. That, however, does not stop them helping the 'new kid on the block'.

The club is very active in most areas, with a full programme of events in any one year and, yes, the Novice is catered for. I feel with any club though, you only get out what you put in, so if one is not prepared to take part in the club activities, the club itself will flounder.

Our membership is booming, so they must be doing something right! I also know the friendship extends outside the club, and I've had some help in directions I would never have thought of. I honestly don't understand how people can have problems at other clubs, don't they talk to each other? I thought that was what our hobby was all about!

So here's one Novice who's happy with his lot, his club, his hobby.

***Pete Batty, 2E1GXY***

## Technical Interests

As a novice instructor since 1993 and a licensed amateur since 1966, I have seen a great number of changes in our hobby over the years. Within amateur radio over the last few years I have noticed the following:

1. At our local club, when the 'black boxes' are set up during a club on-the-air night, they are generally ignored by the vast majority of the members.
2. When a soldering bench is set up it is often difficult to get people away from it at the end of the session.
3. Although the overall number of amateurs is falling - and has been for some years - the membership of special interest groups concerned with such topics as microwave, experimentation, kiss technology, QRP, construction, restoration of vintage equipment etc is increasing by leaps and bounds.

For example, in the Liverpool area there is now much interest in ATV and microwave construction. Only a very few years ago this interest hardly existed. This increasing interest in the technical side of the hobby is happening in spite of the relentless drive by vested interests to push 'black boxes' at all and sundry.

Is there not a lesson to be learned from the above? If we wish to save amateur radio should we not encourage the technical side of our hobby more, whilst resisting the siren song of greedy commercialism?

One of the best things the RSGB has done in recent years was the introduction of the Novice licence scheme with its excellent practical component. Can we not build on this for the future by introducing a similar practical element to the qualifications required for the full RAE?

***Ian Mant, G4WWX***

## SSB on 10MHz

I read with interest the letter from John Teague about the possible introduction of SSB on 10MHz. Neither the RSGB nor the UK A-licence forbid SSB on 10MHz. My understanding is that the RSGB, in common with most other national societies, recognises that 10MHz is a rather narrow band (50kHz) and so seeks to recommend the use of narrow-band modes such as CW. The RSGB has no power to forbid SSB or indeed any other mode. Mr Teague's letter might be rather misleading for anyone who has not listened on 10MHz. The band is shared by amateurs on a secondary basis. There are many commercial data transmissions, some quite broadband. These leave a usable bandwidth that is sometimes as little as 10kHz, even with narrow CW filters. The widespread use of SSB for inter-Europe contacts would render the band useless for DX working.

In one respect I agree with Mr Teague. 10MHz is very under-utilised by CW operators. The band is a great leveller, as few DXers have beams and so anyone with a dipole or vertical can compete on equal terms with most of the band's users. It can support DX contacts at any time of the day or night. I am currently only active on 10MHz and regularly work into the USA at midday. VK0MM has been at good signal at 1100Z on several days recently. Indeed, just today I have just worked a K6 and 9V1 at 1500Z with a simple vertical aerial. When the band seems quiet it is well worth trying a CQ call, whatever the time.

***Richard Newstead, G3CWI***

## Essential Skills

In'The Last Word', March 2000, Gerald Mack, G7LDA, poses the question, 'will knowing the difference between a PLL and an oscillator make you a better operator'? Probably not, but surely, technical knowledge is an essential ingredient in qualifying for a licence which permits the holder to experiment with radio communication. The purpose of the RAE is to determine that an individual has sufficient knowledge to set up and operate a radio station without causing undue interference to other spectrum users, not to see how good an operator they are. After all, what is a good operator anyway? Does it matter how good an operator we are? Of course it doesn't, operating skills can be learned within the hobby. The essential skills are that we operate within the amateur bands and not interfere with other stations.

***M J Grierson, G3TSO***

## Vanity Callsigns

Whilst I can see the attraction of vanity call signs for some people, I cannot help but think that as a general idea it offers more chances for unlicensed operators to cause a nuisance. With the current system of issuing call signs in order it is fairly easy to see what has been issued and therefore to quickly decide if a call is valid. Issuing any call sign will make this far more difficult to determine. To combat this maybe we should have an online callbook that can be checked instantly and perhaps no longer allow people to withhold their details.

***Iain Taylor, M1DSR***

[A number of points here. From 1 April it will be possible for new licensees to pick any available suffix, the Data Protection Act gives any licensee the right to be 'details withheld', and there are a variety of online callbooks on the Internet – *Ed*]

Please note that the views expressed in *The Last Word* are not necessarily those of the RSGB. All letters received by the Editor are considered for *The Last Word*, unless marked 'not for publication'. Letters may be passed to the relevant person, department or committee.

# CLASSIFIED ADVERTISEMENTS

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.70. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st month prior to publication.

**Cheques should be made payable to RSGB.**

Copy and payment to:

**Jan Forde,** Lambda House, Cranborne Rd, Potters Bar, Herts EN6 3JE.

**Tel: 01707 851199**

**Fax: 01707 851206**

## FOR SALE

**ALUMINIUM TUBE.** Heavy-duty (scaffold) tube approx. dimensions 20' long 2" dia. $^{11}/_{64}$" (4.5mm) wall thickness, 20' and 10' lengths available @ £1.80 + VAT per ft. C.W.O. Rusper Hire (Crawley) 01293 87 1621 office hours only.

**E-TYPE TRAP DIPOLE** 10-160m fits 28ft garden. Full sized anti-TV1 models, traps,baluns, info SAE. Aerial Guide £2.00. R. Holman G2DYM, Uplowman, Devon EX16 7PH. 01398 361215 anytime.

**FULL COLOUR QSL CARDS** now available, plus our low cost, superior designed, conventional QSL cards, personal designs our speciality. LSAE for samples:- The Standfast Press, 5 South Drive, Inskip, Preston PR4 0UT.

**G4TJB QSL CARDS** printed to your specification, send large SAE for samples and full product list. Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare BS22 0BX. Tel/Fax: (01934) 512757

**HAM STATION KENWOOD TS930 IC28H,** two meter rig Emtron Beam and other items for sale contact 01665 576 925 for details

**ICOM "IC - PCR1000",** complete with leads and software. £150.00 Tel:01732 459358

**LANDWEHR VHF/UHF MASTHEAD PREAMPLIFIERS,** 2 metre 145MAS £150 and 70cm 435MA £155 plus £4.50 p&p. Write, phone, fax or email for leaflet.Qualitas Radio, 23 Dark Lane, Hollywood, Birmingham B47 5BS. Note new telephone numbers: 0121 246 7267. Fax: 0121 246 7268.
Email chris@g0eyo.freeserve.co.uk

**LIMITED SPACE ANTENNA** 160-10 metres 84' overall with 76' of balanced feedline £59.95 plus £5.00 P&P. Choke Baluns Std model £36.85, Yagi Model £37.45 (state boom size) G5RV £28.50 all inc. P&P. Amidon Cores, limited stocks available. Send SAE for full details of all the above. Ferromagnetics, P.O. Box 577, Mold, Flintshire CH7 1AH

**PORTABLE TELESCOPIC PNEUMATIC Hilomast Model NK6.** Five section, extending to 6m above ground with quadripod field stand, lifts loads of 25kg. Operates from car-type tyre inflator. New cost over £1200. Offers over £375. Hands, 5 Amersham Road, Chesham Bois, Bucks HP6 5PB. Tel: 01494 725337.

**POWABEAM ANTENNAS -** Superior VHF/UHF yagis from G4CQM. http://welcome.to/powabeam. Leaflets 01288 381289

**PROMS AND EPROMS FOR PMR EQUIPMENT,** Details, S.A.E.: Atlanta Communications (RC), PO Box 5, Chatteris, Cambridgeshire PE16 6JT

**QSL CARDS** - High Quality but low prices. Personal deigns including SWL. Fast service. SAE for samples: Adur Village Press (G4BUE), Highcroft Farmhouse, Gay Street, Pulborough, West Sussex RH20 2HJ.
Telephone: 01798 815711.

**QSL CARDS,** Gloss or Tinted cards. SAE for samples to Twrog Press, Penybont, Gellilydan, Blaenau Ffestiniog, Gwynedd LL41 4EP

**QSL CARDS OF QUALITY**
Best quality, keen prices & professional, helpful service. Specialising in personalised designs to include photographs. Large SAE for samples to: Admiral Printers, 12 Faraday Court, Park Farm North, Wellingborough, Northants. NN8 6XY Tel: 01933 400883 Fax: 01933 678344

**QUALITY PRE-USED EQUIPMENT.** The UK's largest stock. Special Service and consideration for purchase of deceased amateur equipment. Essex Amateur Radio Services.
Telephone 01268 752522

**TECHNICAL MANUALS,** for WWII Radio & Radar. Hundreds in stock. RAF, Army, Navy, Luftwaffe, Wehrmacht, US Forces.
Tel: 0151 722 1178 or SAE with requirements to VINTAGE TECHNICAL SERVICES,
28 Welbourne Rd, LIVERPOOL L16 6AJ

**TEN-TEC HF ARGONAUT II MODEL 535 MULTIMODE TRANSCIEVER,** good condition £285 ono. plus p&p Banstead, Surrey, 01737 360045

**THE RF KIT CATALOGUE.** Send 2 x 2nd class stamps or browse www.rf-kits.demon.co.uk. Hands Electronics, Tegryn, Llanfryrnach, Dyfed SA35 0BL Tel: 01239 698427

## MISCELLANEOUS

**LOOKING FOR SECOND-HAND VERSATOWERS.** Please email pierre.besson@vsea.com or call 0033 6 0804 5335

**CALL IN ON THE 'GOOD NEWS' CHRISTIAN NETS!** Every Sunday at 8am and 2pm around 3747kHz and 144.205MHz at 2pm sharing Christian fellowship over the air. Info from WACRAL, 51 Alms Road, Brixham, South Devon TQ5 8QR - Tel: 01803 854504

**VIDEO TAPE CONVERSIONS** to and from all modes NTSC : SECAM: PALN : PALM Digital processing. Fast and economic service. Also 'cine' conversions. Phone G4WMP 01932 846139

## BRING & BUY

**ADVERTISE YOUR SURPLUS EQUIPMENT** on our new internet site, including photos. www.bringandbuy.cjb.net

## COMPUTER SOFTWARE & HARDWARE

**SD - EI5DI's CONTEST LOGGERS.** HF £25.00, VHF £25.00, both £39.00. Paul O'Kane, 36 Coolkill, Dublin 18. (00353 1295 3668) www.ei5di.com

**LEARN MORSE BY COMPUTER,** DOS programs with fully variable speed, tone, method, groups, figures, text, punctuation, instructions. Disk £10 for all including useful conversion program. Sidney Bartlett RS35981, 11 Ennerdale Avenue, Gloucester, GL2 0EE.
Tel: 01452 531983 E-mail: sidart@aol.com

**SHACKLOG 5.1** - 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

## HOLIDAY ACCOMMODATION

**BED & BREAKFAST/FOOD.** Scotland, north coast GM0EXN, Cliff Top HF & Internet. Tel: 01847 851774
Email: accommodation@btinternet.com.
Web address: http://www.btinternet.com/~bandb.farnorth/index.html

**NORTH WALES, CARAVAN, BUNK HOUSE, CAMPING.** Elevated site. Use of shack and beam antenna. Open all year. Rural setting. "Tynrhos", Mynytho, Pwllheli LL53 7PS (01758 740712).

## RSGB AMATEUR RADIO INSURANCE SCHEME

**"ALL RISKS" INSURANCE** for portable/mobile/base station amateur radio and ancillary equipment. A service for RSGB members only. Also public liability and equipment for affiliated clubs and societies. Details and leaflets from Amateur Radio Insurance Services Ltd. Freepost, 10 Philpot Lane, London EC3B 3PA Tel: 0171 335 1647 - Fax 0171 338 0031.
Email: aris@stuartalexander.co.uk

## WANTED

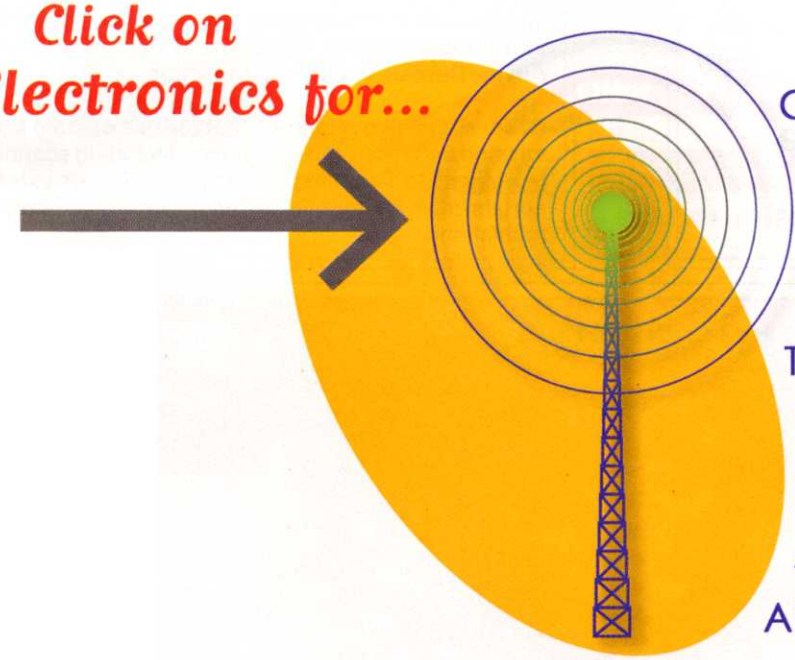
**VALVES WANTED OLD AND BOXED.**
KT66 GEC £35. KT88 GEC £60. EL34 Mullard £20. EL84 Mullard £4. EL37 Mullard £18. DA30, DO30, PX25, all at £110 each. PX4 Globe Shape £50. DA100 GEC £150. ECC83 Mullard £4. GZ32 and GZ34 Mullard £8. ECC32 and ECC33 Mullard £8. B65 Metal Base £8. 53KU Bulhous £8. Other types wanted. Please send a SAE for free list. Old valved radio and test equipment also wanted. COLOMOR (ELECTRONICS) LIMITED, Unit 5, Huffwood Trading Estate, Brookers Road, Billingshurst, West Sussex RH14 9RZ.
Tel: 01403 786 559
Fax: 01403 786 560

**I BUY, SELL EXCHANGE AMATEUR RADIOS OLD OR NEW.** Cash waiting 9am-8pm daily. Phone Dave G3RCQ 01708 374043 or E-mail g3rcq@easynet.co.uk for further information, or write G3RCQ, 9 Troopers Drive, Harold Hill, Romford, Essex RM3 9DE

# Find what you've been looking for - online!

eBay™

Click on
Electronics for...



CB
MASTS
FILTERS
RECEIVERS
TRANSMITTERS
TRANSCEIVERS
VHF & HF EQUIPMENT
ANTENNAE
AND MUCH MORE...

**What is eBay?**

*eBay is your gateway to buying and selling online!*
*eBay hosts hundreds of thousands of online auctions every day.*
*eBay has over 7 million users - people just like you!*

**How do I get started?**

*It only takes three simple steps: 1. Go to www.ebay.co.uk 2. Register on the site - it's easy and free and all you need is an email address 3. Start bidding and selling!*

*Still have a question? ukenquiries@ebay.com*

find us at **http://www.ebay.co.uk**

## NOTICE TO READERS

Although the staff of *RadCom* take reasonable precautions to protect the interests of readers by ensuring as far as practicable that advertisements in our pages are bona fide, the magazine and its publisher, The Radio Society of Great Britain, cannot accept any undertaking in respect of claims made by advertisers whether these advertisements are printed as part of the magazine, or are in the form of inserts.

The publishers make no representation, express or implied, that equipment advertised conforms with any legal requirements of the Electro Magnetic Compatiblility Regulations 1992.

Readers should note that prices advertised may not be accurate due to currency exchange rate fluctuations, or tax changes.

While the publishers will give whatever assistance they can to readers having complaints, under no circumstances will the magazine accept liability for non-receipt of goods ordered , late delivery, or faults in manufacture. Legal remedies are available in respect of some of these circumstances, and readers who have complaints should address them to the advertiser or should consult a local Trading Standards Office, or a Citizens Advice Bureau, or their own solicitor.

Readers are also reminded that the use of radio transmission and reception equipment (including scanning) is subject to licencing and the erection of external aerials may be subject to local authority planning regulations.

# Advertisement Index



Next Advertisement Copy Date:
Display advertisement copy date for June 2000 is

# WiNRADiO™

## TAKiNG THE EUROPEAN RADiO MARKET BY STORM

FREEPHONE 0800 0746263 TO PLACE A CREDiT CARD ORDER

FREE *Recieve a FREE Mini-Cone Antenna With Every WR-3100 order!** FREE

### JOiN THE TRUNKED RADIO REVOLUTION WITH YOUR WiNRADiO RECEiVER!

1. Enjoy multiple, major trunk tracking modes
2. Automatic traffic following & sophisticated control panel
3. Take comfort in the automatic volume control
4. Single & dual receiver modes
5. Convenient inbuilt electronic logger and database
6. Come complete with an inbuilt traffic recorder
7. Full XRS™ - compliant technology

**The WiNRADiO Trunking Option**
Trunking systems are used by public safety, transportation, business, law enforcement, government, military and other organisations. This software include major trunking modes: Motorola SmartNet® and MPT1327.

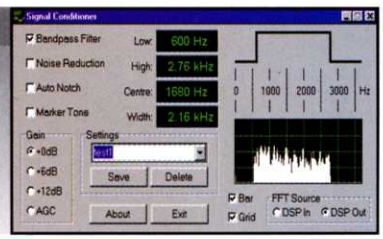
**ONLY £69.00 inc vat**

### TAKE A LOOK AT WiNRADiO's DiGiTAL SUiTE (AWARDED 5 STARS BY WRTH)

1. WEFAX / HF Fax
2. Packet Radio for HF and VHF
3. Aircraft Addressing and Reporting System (ACARS)
4. Audio Oscilloscope, real time Spectrum Analyzer with calibration cursors
5. Squelch-controlled AF Recorder
6. DTMF, CTSS decode and analyse

**The DSP applet provided with the WR3100i spectrum monitor ISA card (£995+VAT) allows continuous control of audio bandwidth and other signal conditioning functions.**

**ONLY £81.07 inc vat**
(requires SoundBlaster 16 compatible sound card)




## WiNADiO™ PC RECEIVERS

Available as either an internal ISA card that slips inside your PC, or as an external (portable) unit. WiNRADiO combines the power of your PC with the very latest, and greatest, synthesised receivers.

**YOU CAN USE WiNRADiO™ SCANNiNG PC COMMUNiCATION RECEiVERS FOR:**
Broadcast, media monitoring, professional & amateur radio communications, scanning, spot frequency, whole spectrum monitoring, instrumentation surveillance and recording.

If you're after the ultimate receiver-in-a-PC with full DSP then smile and say, "Hello" to the new **WR31000i-DSP** with its hardware for real-time recording, signal conditioning and decoding applications. It's all you need.

## NEW EXTERNAL MODEL

**EXTERNAL WiNRADiO™**
We are now able to offer you a complete range of stand-alone WiNRADiO comms systems:

- **WR1000e - £359 INC VAT**
- **WR1500e - £429 INC VAT**
- **WR3100e - £1169 INC VAT**

Each stand-alone unit connects to your PC through either the basic RS232, or through an optional PCMCIA adapter (for high speed control).
The units are powered through either your existing 12v supply, or through an (entirely optional) NiMH rechargeable 12v battery pack.

"It's software is excellent.. more versatile and less idiosyncratic than that of the Icom IC-PCR1000"
**WRTH 1999 Review**

"Five stars for its mechanical design"
**WRTH 1999 Review**

"Most Innovative Receiver"
**WRTH 1998 Awards**


| Model Name/Number | WR-1000 | WR-1500 | WR-3100 |
|---|---|---|---|
| Construction of internals | WR-1000i/WR-1500i-3100iDSP- Internal full length ISA cards | | |
| Construction of externals | WR-1000e/WR-1500e - 3100e - external RS232/PCMCIA (optional) | | |
| Frequency range | 0.5-1300 MHz | 0.15-1500 MHz | 0.15-1500 MHz |
| Modes | AM,SSB/CW,FM-N,FM-W | AM,LSB,USB,CW,FM-N,FM-W | AM,LSB,USB,CW,FM-N,FM-W |
| Tuning step size | 100 Hz (5 Hz BFO) | 100 Hz (1 Hz for SSB and CW) | 100 Hz (1 Hz for SSB and CW) |
| IF bandwidths | 6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W) | 2.5 kHz(SSB/CW), 9 kHz (AM) 17 kHz (FM-N), 230 kHz (W) | 2.5 kHz(SSB/CW), 9 kHz (AM) 17 kHz (FM-N), 230 kHz (W) |
| Receiver type | PLL-based triple-conv. superhet | | |
| Scanning speed | 10 ch/sec (AM), 50 ch/sec (FM) | | |
| Audio output on card | 200mW | 200mW | 200mW |
| Max on one motherboard | 8 cards | 8 cards | 3-8 cards (pse ask) |
| Dynamic range | 65 dB | 65 dB | 85dB |
| IF shift (passband tuning) | no | ±2 kHz | ±2 kHz |
| DSP in hardware | no - use optional DS software | YES (ISA card ONLY) | |
| IRQ required | no | no | yes (for ISA card) |
| Spectrum Scope | yes | yes | yes |
| Visitune | yes | yes | yes |
| Published software API | yes | yes | yes (also DSP) |
| Internal ISA cards | £299 inc vat | £369 inc vat | £1169.13 inc |
| External units | £359 inc vat | £429 inc vat | £1169.13 inc (hardware DSP only internal) |

**PCMCIA Adapter (external):** £69.00 inc when bought with 'e' series unit (otherwise: £99 inc)
**PPS NiMH 12v Battery Pack and Charger:** £99 inc when purchased with 'e' series unit (otherwise: £139 inc)
**The WiNRADiO Digital Suite:** £74.99 inc when purchased with a WiNRADiO receiver (otherwise: £81.05 inc)

**To receive your completely free (no obligation) info pack and WiNRADiO software emulation demo disk all you have to do is get on the internet and go to our website at http://www.broadercasting.com. If you don't yet have easy access to the internet then by all means feel free to telephone us or send a fax.**

**Please send all your enquiries to: info@broadercasting.com or Telephone: 0800 0746 263 or +44 (0)1245 348000 - Fax: +44 (0)1245 287057**
**Broadercasting Communication Systems, Unit B, Chelford Court, Robjohns Road, Chelmsford, Essex, CM1 3AG, United Kingdom**

# INTRODUCING THE MOST DURABLE HT EVER!

US MILITARY APPROVED MIL-SPEC 810

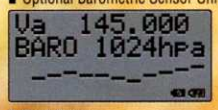
# VX-5R

**50/144/430 MHz TRIPLE-BAND HEAVY DUTY FM TRANSCEIVER**


Actual Size 5 W Version

## Features

- Frequency Coverage
  Wide Band Receive
  RX : 0.5-15.995 MHz 48-728.990 MHz
  800-998.990 MHz
  TX : 50-52 MHz 144-146 MHz
  430-440 MHz
- 5 W Power Output (430 MHz: 4.5 W)
- AM/Shortwave Receive
- AM Aircraft Receive
- Ultra Compact: 2.4" x 4.1" x 1.3"
- Aluminum Diecast Case
- MIL-STD 810 Rating
- High-Capacity Lithium-Ion Battery: 7.2 V @ 1100 mAh!
- CTCSS and DCS Built In
- Dot Matrix LCD
- Optional Barometric Sensor Unit




- Dual Watch
- Spectra-Scope™ Graphical Display
- 220 Memories plus "Home" Channels
- Ten Pairs of "Band Limit" Memories
- Ten Auto-Scan Weather Channels (North American version)
- 8-Digit Alphanumeric Memory Tags
- Convenient Icon Display Mode
- Smart Search™ Automatic Memory Loading
- Automatic Repeater Shift
- Auto-Range Transponder System (ARTS™)
- Multiple Battery Savers
- Time-Out Timer (TOT)
- Busy Channel Lock Out (BCLO)
- Versatile High-Speed Scanning
- 16-Digit 9-Memory DTMF Autodialer
- One-Touch Emergency Channel
- ADMS Windows™ PC Programmable
- Innovative Multi-Section Antenna
- Full Line of Accessories

# YAESU

*...leading the way.SM*

**FT-50R**
**5 W Heavy Duty**
**Dual Band Handheld**

**VX-1R**
**Ultra Compact**
**Dual Band Handheld**

For the latest Yaesu news, hottest products:
Visit us on the Internet! http://www.yaesu.co.uk

Specifications subject to change without notice. Specifications guaranteed only within Amateur bands.Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

YAESU UK LTD. Unit 12, Sun Valley Business Park, Winnall Trading Estate Winchester, Hampshire, SO23 0LB, U.K. 01962-866667