The Albrecht AE485S 10m Multimode Mobile Reviewed

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RadCom

Volume 77 No 1 ◆ January 2001 The Radio Society of Great Britain Members' Magazine

Build - A Broad-Banded Multiband HF Antenna

Marconi's "First Little Miracle" 100 Years On

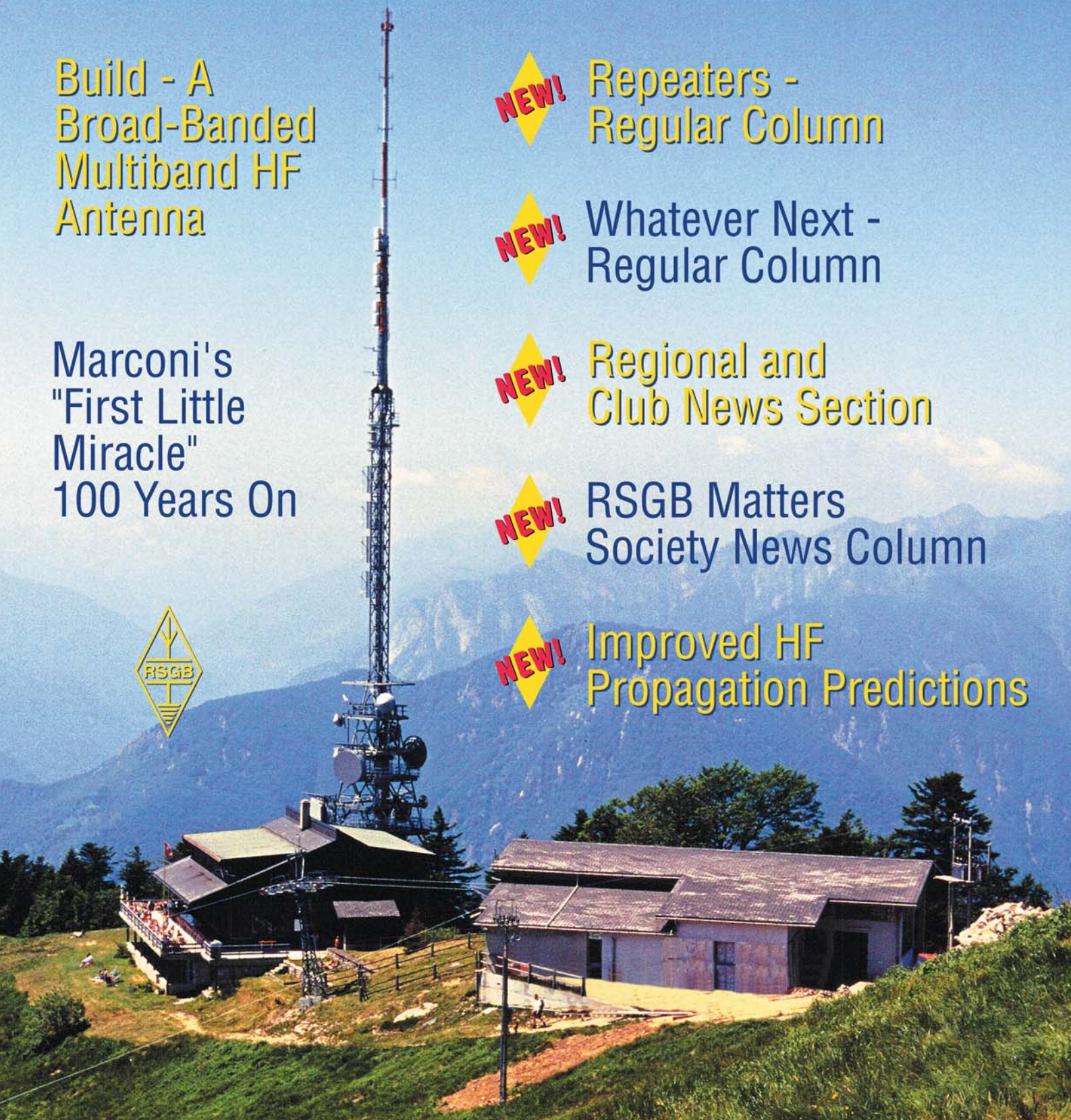
NEW! Repeaters - Regular Column

NEW! Whatever Next - Regular Column

NEW! Regional and Club News Section

NEW! RSGB Matters Society News Column

NEW! Improved HF Propagation Predictions



WATERS&STANTON

WE WILL MATCH OR BE
COMPETITIVE PRICES
GENUINE UK STOCK.

RETAIL MON-SAT 9.00-5.30pm

22 Main Rd, Ho

YAESU
Choice of the World's top DXers

The New Industry Standard .....

Would a Serious DXer accept anything else ?

FT-1000MP Mk-V (inc PSU)
200W HF All Mode Transceiver

£2799
carr. £7.50

19.4% APR: Deposit £299 and 36 months at £90.27.

'Why Buy From Waters and Stanton ?'

In choosing the FT-1000MP Mk V, you will doubtless have been impressed with the specification, reputation, product reviews and user reports; and rightly so. This radio is a class leader. But in the same way that you choose your radio, you also need to choose your dealer with equal consideration. Buying a radio of this calibre is a major investment, and as the customer you are entitled to expect a high level of technical support in return. We believe Waters & Stanton PLC is uniquely placed to provide this necessary level of competence. With almost thirty years in the business, fourteen licensed staff members, four service engineers, the largest stock holding of amateur radio equipment in the UK, an enviable reputation of fair dealing, and ISO 9002 accreditation, we take the risk our of buying. For more details of this or any other model, contact us today.

YAESU FT-840 160-10m

£599 Plus £7.50 Carr.

Look at our new low price for this 100W radio. Impossible to fault, it just goes on and on! But stocks limited at this price.

24-Month FREE Warranty on Yaesu

19.4% APR: Deposit £69 and 36 months at £19.13.

YAESU FT-1000MP AC 160 - 10m All Mode

SAVE

£1799 Plus £7.50 Carr.

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.

19.4% APR: Deposit £199 and 36 months at £57.77.

ICOM IC-746 160m - 2m All-mode

£1395 Plus £7.50 Carr.

Your chance to purchase one of the most popular "all-band, all-mode" transceivers at a very competitive price. The IC-746 offers 100 Watts output on all bands and has a receiver performance to match.Limited stock at this price.

19.4% APR: Deposit £145 and 36 months at £45.13.

ICOM IC-756PRO 1.8 - 52MHz 100W

£2199 Plus £7.50 Carr.

You've read the rave reviews, and you have seen our recommendation on the web site. This radio with its amazing receiver and digital filtering, also includes auto ATU and real-time spectrum scope. A great DX rig.

19.4% APR: Deposit £229 and 36 months at £71.13

YAESU FT- 920AF HF 160m-6m-100w

SAVE

£1099 Plus £7.50 Carr.

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.

19.4% APR: Deposit £129 and 36 months at £35.02.

ICOM IC-706IIG 160 - 70cm All Mode

£1099 Plus £7.50 Carr.

SCOOP!

Still a firm favorite with mobile operators and those who want a compact all-mode, all-band station. Phone for latest leaflet.

19.4% APR: Deposit £129 and 36 months at £35.02

YAESU FT-847 SAVE

160m - 70cm All Mode

£1329 with switch mode power supply

£1199 Plus £7.50 Carr.

SCOOP!

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!!

19.4% APR: Deposit £129 and 36 months at £38.63.

KENWOOD TS-570DG 160 - 10m All Mode

£849 Plus £7.50 Carr.

19.4% APR Available

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: Deposit £89 and 36 months at £27.43.

FIRST IN RADIO COMMUNICATION

ISO 9002 REGISTERED FIRM

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Rayleigh, Essex, SS5 9QS

VISA MasterCard

IC-910 VHF/UHF Transceiver - Coming Soon

IC-910 VHF/UHF Transceiver - Coming Soon
The new IC-910 from Icom will shortly be available. 100W on 2m and 75W on 70cms, plus the option of 1.2GHz. Well placed to take advantage of satellite operation, you can simultaneously operate 2 bands at once.

TS-2000 Multi Band/Mode Transceiver - Coming Soon!

Kenwood promise a top performance 160m - 23cms transceiver. Full details are in our latest catalogue and product release is expected fairly shortly.

£1599 APPROX. Plus £6.00 Carr.

KENWOOD TM-D700E 2m / 70cm Data Mobile

£429 Plus £7.50 Carr.

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!

WMM-3 Data Modes

£69.95 Plus £6.00 Carr.

If you want to receive data, then connect the audio output of your receiver to the WMM-3 and the output of the modem to your PC serial socket. A CD-ROM is provided with lots of software, this will get you started.

FT-817 QRP Transceiver

Demo in Stock!

£799 APPROX. Plus £6.00 Carr.

FT-817 QRP Transceiver - Demo model in our showroom
Arriving shortly, the diminutive size of this 5W 160m to 70cms radio will enable you to operate anywhere. All-modes and a very advanced specification are housed in a compact enclosure. Come and see it or send for colour leaflet.

19.4% APR: Deposit £89 and 36 months at £25.63
REPAYMENT BASED ON £799.

YAESU

FT-11R 2-Metre Handheld

SCOOP!

Another find in a warehouse! Brand new, boxed with AC chargers and ni-cad packs. 75 Alphanumeric memories, AM airband rx mod possible. Last selling price £249! Very limited stocks.

£119 Plus £6.00 Carr.

NEW

Optoelectronics
CD-100 MULTICOUNTER
Reads Frequency & Codes

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

£979.95 Plus £6.00 Carr.

KENWOOD TH-D7E

£259 Plus £6.00 Carr.

* 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

YAESU

FT-90R Can you believe the size?

2m/70cm Dual Band

SAVE

£309 Plus £7.50 Carr.

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.

C-150 144MHz (2m)FM Handheld Transceiver

Scoop Purchase!

The C-150 offers full coverage of 2m with up to 5W output when used with 13.8V supply. Supplied with a 6 x AA battery box, it can be used with dry or ni-cad cells. 20 memories and tone burst, plus extended receive coverage, make this an ideal radio to have in the car or brief case. And at our new low price it represents amazing value. Price includes carry strap and antenna plus instruction manual and 12 months warranty.

£69.95 Plus £6.00 Carr.

ICOM IC-2800H

In Full Colour!

£310 Plus £7.50 Carr.

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

Includes FREE Remote head cable.

ICOM IC-207H

£245 Plus £7.50 Carr.

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

KENWOOD TM-G707E

£259 Plus £7.50 Carr.

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

YAESU FT-8100R

£349 Plus £7.50 Carr.

* 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 Plus £7.50 Carr.

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

£269 Plus £6.00 Carr.

YAESU VX-5R

* 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

* 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

£199 Plus £6.00 Carr.

ADI AR-147

AM Airband Receive

£199 Plus £6.00 Carr.

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

WATERS&STANTON

FREE MFJ CATALOGUE-Just Phone!

BEWARE of grey imports. All MFJ products should have serial numbers and U.K Warrenty cards issued by us.

MFJ-969 300W ATU

£169.95 Plus £7.50 Carr.

160 - 6m Wire, Coax or Balanced

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

1.8 - 30MHz ATUs		
MFJ-989C	3kW roller coaster - metered	£299.95 C
MFJ-986	3kW Differential - metered	£289.95 C
MFJ-962D	1.5kW T-match - metered	£239.95 C
MFJ-949E	300W + load - metered	£139.95 B
MFJ-948	300W - metered	£119.95 B
MFJ-934	ATU + artificial ground	£139.95 B
MFJ-941E	300W compact - metered	£89.95 B
MFH-945	1.8 - 50MHz mobile	£99.95 B
MFJ-901B	300W no meters	£75.95 B
MFJ-16010	200W random wire - no meter	£44.95 B
VHF Models		
MFJ-921	144MHz 200W - metered	£69.95 B
MFJ-924	430MHz 200W - metered	£69.95 B
MFJ-903	50MHz 200W no meters	£49.95 B
MFJ-906	50MHz 200W - metered	£79.95 B

Carriage charges:
B = £6.00 C = £7.50

SGC-230 Smart Tuner

£369.95 Plus £7.50 Carr.

Covers 1.6 - 30MHz and handles 3 - 200W. Designed for end fed wires, just connect to 12V and feed with RF via coax. Can be mounted outside or at top of mast.

Microset Amplifiers

All FM/SSB with GaAsFET pre-amps and RF switched. 13.8V DC powered.

R-25	2m 1-4W in / 30W max out	£84.95 B
RV-45	2m 3-15W in / 45W max out	£95.95 B
R-50	2m 1-7W in / 50W max out	£89.95 B
SR-100	2m 4-25W in / 100W out	£169.95 B
SR-200	2m 10-50w in / 200W max out	£299.95 B
VUR-30	2m/70cms 1-5W in / 20/30W out	£199.95 B
RU-20	70cms 3-15W in / 20W max out	£119.95 B
RU-46	70cms 3-15W in / 45W max out	£165.95 B
RU-432-95	70cms 6-12W in / 95W max out	£499.95 C

WCN-3 Adaptor. For all transceivers using SMA connector. Converts to BNC **£3.95 A**

Speaker Mics. QS-112

£16.95 Plus £2.00 Carr.

Including Yaesu and Icom 4-way jack.

QS-112-Y Yaesu **£16.95**
QS-112-K Kenwood **£16.95**
QS-112-V4 4-way **£16.95**

Phone if in doubt about suitable model.

Hands-Free Mobile Mics.

£42.95 Plus £2.20 Carr.

Comes complete with PTT switch box for mounting on gear lever. Head/shoulder band makes for easy wear. Models for almost every transceiver. Phone for confirmation of model number to suit your rig.

Cushcraft Ham Radio Antennas

MA5B Mini-Beam

£299 Plus £7.50 Carr.

2 El. on:	20m, 15m 10m
Gain:	3.6dB, 4.8dB, 5.3dB
F/B	10dB, 12dB, 22dB
Dipole:	17m and 12m (0dB)
Power	1.2kW (2:1VSWR)
Boom:	2.2m
Element	5.2m
Radious	2.7m

A3-S	10-15-20m 8dB 2kW 3 el. 4.27m boom	£389.95 D
A-743	10/7MHz kit	£129.95 C
A4-S	10-15-20m 9dB 2kW 4 el. 5.84m boom	£469.95 D
X7	10-15-20m 13dB 2kW 7 el 5.48m boom	£549.95 D
X9	10-15-20m 14dB 2kW 9 el 8.5m boom	£799.95 D
R-6000	6 - 20m vert.	£299.95 D
R8	6-40m vert 8.7m	£399.95 D
TEN-3	10m 3 el.	£159.95 D
D4	10-40m 10.92m 2kW rotary dipole	£259.95 D
D3	10 - 20m 7.86m 2kW rotary dipole	£189.95 D
XM240	40m 2 el	£569.95 D
XM520	5el 20m	£629.95 D
XM515	5 el 15m	£359.95 D

Phone for catalogue.

MFJ-269 Analyser

160m - 70cm On-site Antenna Analyser.

£299.95 Plus £6.00 Carr.

MFJ-259B 1.8 - 170MHz £229.95

Imagine being able to plug into your antenna or feed line and make meaningful adjustments on site. Or be creative and turn hours into minutes and ideas into antennas! Read what RadCom says and make your own mind up. One of the best investments you will ever make!

KH-WS1 "World Space digital receiver"

NEW

£99.99 Plus £6.00 Carr.

This radio has its own mini satellite dish and receives digital WorldSpace broadcast signals via the AfriStar satellite. As well as all the normal VHF FM programmes, you can switch to satellite broadcast signals from CNN, BBC, Bloomberg (multi language), World Radio networks 1 & 2, and lots more. High quality mono via the internal speaker and stereo via the headphone socket. Runs from AC, 4 x D cells (not supplied), or external 6V.

Heil Audio

Appointed by Heil as UK Distributor

Proset-4	H'phone/boom mic	£129.95
Proset-5	H'phone/boom mic	£129.95
Micro-4	Lightweight ver.	£99.95
Micro-5	Lightweight ver.	£99.95
AD-1	Cables Y. K. or I	£14.95
HM-10-4	Stick mic	£69.95
HM-10-5	Stick mic	£69.96
CC-1	Cables Y. K. or I.	£25.95
HC-4	Spare insert	£32.95
HC-5	Spare insertt	£32.95

You can convert your mic to Heil by simply purchasing HC-4 or HC-5 insert.

Avair AV-600

£59.95 Plus £6.00 Carr.

1.8 - 525MHz VSWR Meter 5/20/200W scales. Dual sensors, PEP reading. More accurate than built-in meters.

The Toughest Japanese Rotators

These are tough rotators that weigh almost twice as much as similar priced units and have great turning capacity. Made by Create of Japn, they will handle 4 element HF yagis with ease. Our own Create model has been on our roof for 12 years turning a 4-element HF beam. We wouldn't use anything else!

RC5-1 Standard control box, OK for 4-el Yagis - needs 7-core cable **£349.95C**

RC5-3 Control box features pre-set or manual control. Otherwise the same as RC5-1 above **£449.95 C**

MC-2 Lower mast clamps **£49.95 B**

NEW MFJ-Cub QRPers

The MFJ Cub **single band transceivers** are small enough to sit in the palm of the hand. They provide up to **2 Watts CW output** (variable to mWs), have **full break-in** and on-air sidetone.

Available ready **built or as a half kit.** The kit version has all the surface mounted components installed. You only need to add the larger items, knobs and case.

Kit £89.95 Built £139.95

Models available for 80m, 40m, 30m, 20m and 15m. Includes cabinet and controls.

Postage £6.00

Carolina Windoms

CW-80 Special

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

£89.95 Plus £7.50 Carr.

Other Models (all with low angle radiator stub)

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

Plus £7.50 Carr.

80-40-20m Mini Dipole

The "80 plus 2" Mini - Dipole was designed by our Director, Peter Waters, G3QJV. Just 52ft long, it uses linear loading - no tuned traps. It can be directly fed without ATU and also operates at 2.5:1 VSWR on 15m. Amazingly efficient, it handles 400 Watts and is balun fed. Erect it as an inverted V and it takes up less than 40ft of space. If you have a small garden, don't miss out on the LF bands anymore. £79.95 Carr. £6.00

Power Supplies

SEC-1223
13.8V PSU
23 Amps - 3.2lbs!

£99.95 Plus £6.00 Carr.

Back In Stock

Beware of cheap noisy supplies that have poor filtering & construction!

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

LINEAR AMP UK Amplifiers

British made Amplifiers with a Pedigree

Full Range Stocked

Challenger	HF 2 x 3CX800 AT 1.5kW out	£2095 D
Explorer	HF 2 x 3-500ZG 1.3kW out	£1595 C
Hunter	HF 1 x 3-500ZG 750W out	£1195 C
Hunter	6m 1 x 3-500ZG 800W out	£895 C
Ranger	HF 4 x 811A 800W out	£895 C
Discovery	2m 1 3CX800 400 - 1KW out	£1395 C

WATSON

UK's top selling power supplies.

£89.95 Plus £7.50 Carr.

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

W-3A	3 Amp fixed supply.	£22.95
W-5A	5 Amp fixed supply	Plus £6.00Carr. £29.95
W-10AM	10 Amp variable supply	£59.95
W-25AM	25 Amp variable supply	£89.95
W-30AM	30 Amp variable supply	Plus £7.50 Carr. £119.95

NEW **W-40SM** 40 Amp Switch Mode

£149.95 Plus £6.00 Carr.

Digital display, 3 - 15V rated at 40 Amps continuous. Fully protected and very low noise. Ideal for a wide variety of ham applications. Light weight of 3.5kg and measuring 220 x 110 x 300mm Fixed 13.8V switch.

Compact 10 Amp Switch Mode PSU

£49.95 Plus £6.00 Carr.

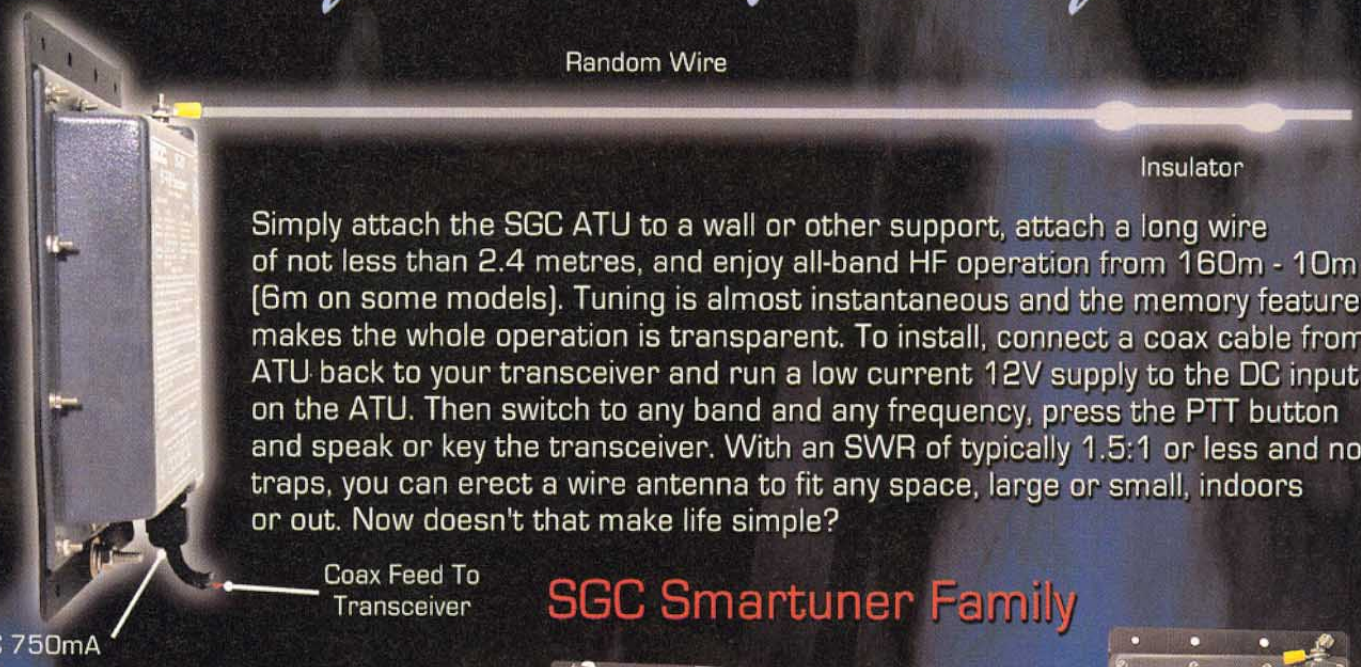
The W-10SM is small enough to fit in a brief case. Measuring just 230 x 100 x 65mm, it's ideal for 50 Watt mobile's etc. Over voltage and current protection.

Order Details on inside Front Cover

SGC
NO COMPROMISE COMMUNICATIONS

Making Life Simple

All bands from a simple end fed wire



ATU

Simply attach the SGC ATU to a wall or other support, attach a long wire of not less than 2.4 metres, and enjoy all-band HF operation from 160m - 10m (6m on some models). Tuning is almost instantaneous and the memory feature makes the whole operation is transparent. To install, connect a coax cable from the ATU back to your transceiver and run a low current 12V supply to the DC input on the ATU. Then switch to any band and any frequency, press the PTT button and speak or key the transceiver. With an SWR of typically 1.5:1 or less and no traps, you can erect a wire antenna to fit any space, large or small, indoors or out. Now doesn't that make life simple?

SGC Smartuner Family

£369
carriage £6.00

SG-230 Auto ATU

1.6 - 30MHz
3- 200 Watts
Tune time: 10ms
Input: SO-239
Output: High voltage terminal
Supply: 12 - 14V 750mA approx.
Fully weatherproof
Size: 406 x 305 x 76mm

£389
carriage £6.00

SG-231 Auto ATU

1.0 - 60MHz
3- 100 Watts
Tune time: 10ms
Input: SO-239
Output: Terminal post
Supply: 12 - 14V 750mA approx.
Fully weatherproof
Size: 292 x 242 x 43mm

£369
carriage £6.00

SG-237 Auto ATU

1.8 - 60MHz
3- 100 Watts
Tune time: 10ms
Input: SO-239
Output: High Voltage terminal
Supply: 12 - 14V 300mA approx.
Fully weatherproof
Size: 178 x 229 x 38mm

SG-2020 Compact HF Transceiver

1.8 - 29.7MHz Transceiver
0.5 - 20W SSB & CW
Tx 3 Amps average
Rx 300mA approx.
RF clipping with VOGAD
100Hz display resolution
10Hz tuning steps
Wide selectivity range
Size: 150 x 65 x 177mm
Weight 1800gr.

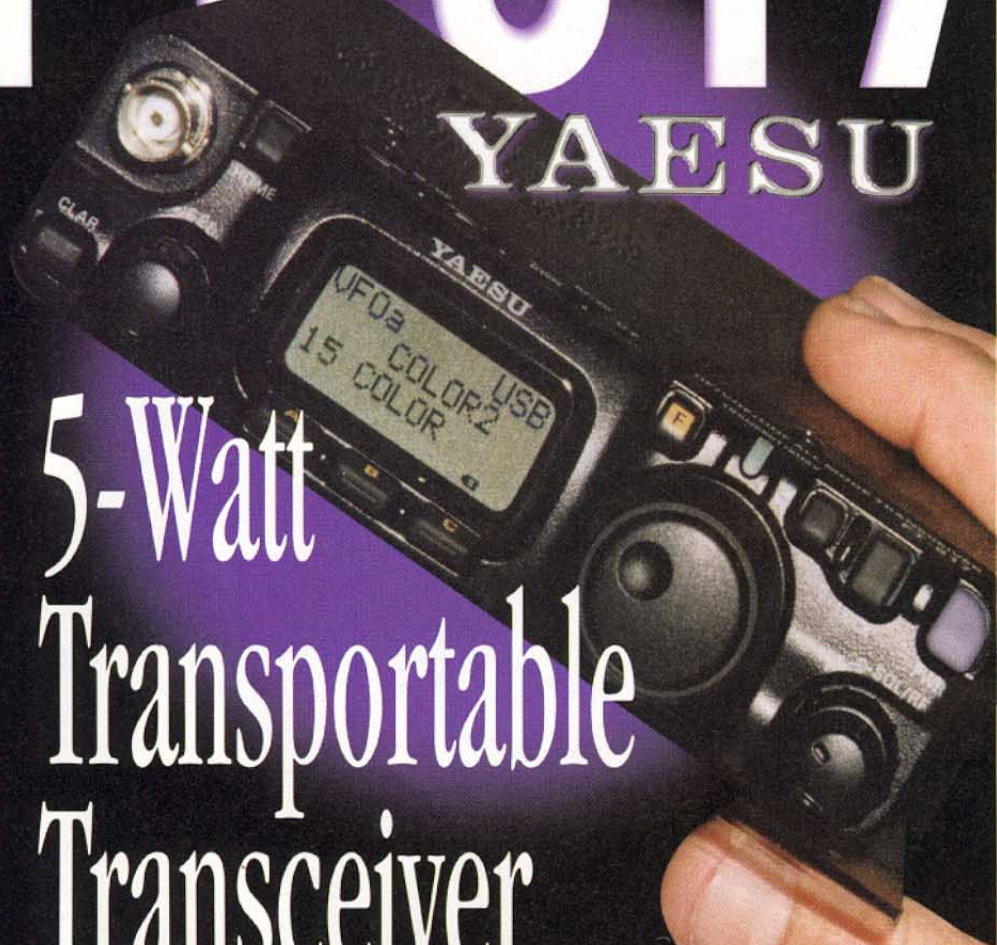
£649
carriage £6.00

U.K Distributor

Waters and Stanton PLC, Spa House, 22 Main Road, Hockley, Essex, SS5 4QS
Telephone: 01702 206835 Fax: 01702 205843 E-mail: sales@wsplc.com Web: wsplc.com

FT-817

YAESU



5-Watt Transportable Transceiver

HF ♦ 6m ♦ VHF ♦ UHF

To reserve your FT-817 call or email us today!
ML&S has reserved a large quantity from Japan and will guarantee to offer this exciting new product BEFORE any competitor!
Stock hopefully arriving end December / January

Call now on 0208 566 1120 or see our web site for more details
www.hamradio.co.uk

ML&S martin lynch & sons
Suppliers of Communications Equipment

128 & 140-142 NORTHFIELD AVENUE, EALING, LONDON W13 9SB

All this in the palm of your hand!

TX Frequency:	160-10m, 6m, 2m and 70cms
RX Frequency:	100kHz-56MHz, 76-154MHz, 420-470MHz (Exact frequency range may be slightly different)
Power Output:	5 Watts SSB/CW/FM with 13.8V External DC: 1.5W AM Carrier 2.5 watts SSB/CW/FM with 9.6V NiCad or 8 "AA" batteries (AM: 0.7W)
Operating Modes:	USB, LSB, CW, AM, FM, W-FM, Digital (AFSK), Packet (1200/9600 FM)
Digital Modes:	RTTY, PSK31-U, PSK31-L & user defined USB/LSB (SSTV, PACTOR etc).
Case Size:	5.31"x1.5"x6.5" (WHD)
Weight:	2.6lb (with alkaline batteries, aerial but without microphone).

- Two Colour LCD Multi-function Display (Blue/Amber).
- Bar-graph Metering of Power output, ALC, SWR and Modulation.
- Optional Narrow CW and SSB Filters.
- AGC Fast-Slow-Auto-Off Selection.
- RF Gain/Squelch Control.
- Built-in Noise Blanker.
- IPO (intercept point optimisation) and ATT (receiver front end attenuator)
- Dual VFOs, Split Capability, IF Shift and R.I.T. ("Clarifier").
- Wide/Narrow FM Selection.
- AM Aircraft Reception.
- Dedicated SSB-based Digital Mode for PSK31 on USB/LSB, AFSK RTTY etc.
- Built-in CW Electronic Keyer with Semi-Break-In (adjustable down to 10ms delay).
- Adjustable CW Pitch; CW Paddle Normal/Reverse Connection Selection.
- Built in VOX.
- Built in CTCSS and DCS.
- ARTS (Auto Range Transponder System).
- Smart Search (automatic memory loading system).
- Spectrum Scope.
- Front and Rear Panel Aerial Connectors (BNC on front, SO-239 on back).
- 200 Regular memories, plus Home Channels and Band Limit (PMS) Memories.
- Alpha-Numeric Labelling Memory Channels.
- Automatic Power-Off (APO) and Tx Time-Out Timer (TOT).
- Rear Panel Data, Accessory and Key jacks.
- CAT System Computer Control Capability (4800/9600/38400 bps) and Cloning Capability.

Estimated RRP:
A Staggering
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Front Cover:

A repeater site in the Dolomite mountains of Italy. A new regular Repeaters column by Roger Jones, G3YMK, starts this month on page 84. (Photo: David Cockayne, M1DGE.)

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NEW THIS MONTH:
RSGB Matters (page 8)
Whatever Next (page 45)
Regional and Club News (page 71)
Repeaters (page 84)

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RSGB AGM 2000 AT HARROGATE

I AM DELIGHTED to be able to say that the AGM at Harrogate Ladies' College on 2 December was a great success. In total 92 people attended, which is as good, if not better, than in recent years when the AGM has been in London. The Board will now be considering whether to continue to hold the AGM around the country.

Perhaps more importantly, the changes which your Council were proposing, to adopt new Memorandum & Articles of Association and new Bylaws, were overwhelmingly approved, both by those at the meeting and by the many hundreds of people who took time to vote by post. I am very grateful to everyone for their support in what is an important step for the Society. Now we need to put the new structure in place and make it work!

After the AGM (and an excellent buffet lunch provided by the College), we devoted a lot more time to discussions with those present about important topics facing the Society and amateur radio in 2001. We discussed the progress of our licensing discussions with the RA, and the practical issues of the new Society structure. Members present were also able to raise other issues of concern to them. Most people who were present seemed to feel that it was a very useful session - it was certainly one of the more open sessions I can remember.

In the evening, we enjoyed a most pleasant dinner at the College. The facilities at Harrogate were well suited to the Society's needs, and we are all very grateful to the Harrogate Ladies' College for their help, support and hospitality.

Your Society now has a great start to the New Year. I will be working with Council and the new Board, when it is finalised, to ensure that the changes we are making will materially improve the service to members and the effectiveness of the Society's operations.

Don Beattie, G3OZF
President

Above: AGM stalwart Harry Bellfield, G3SBV, giving the top table a hard time.

Above: Democracy in action. Voting at the Annual Meeting.
Right: Trevor Sanderson, PA3BOH / G4OEY, receiving the Wortley-Talbot Trophy for outstanding experimental work in amateur radio from President Don Beattie, G3OZF.

TROPHIES AND AWARDS

EACH YEAR a number of trophies and awards for service to the Society and for outstanding technical articles are presented at the Society's Annual Meeting. This year's recipients are:

The Founder's Trophy (for service to the Society): Ken Ashcroft, G3MSW.

The Calcutta Key (for outstanding service to international friendship): Bill Kennamer, K5NX.

The Bennett Award: Peter Martinez, G3PLX (for 'Chirps: a New Way to Study HF Propagation', *RadCom* Jul / Aug 2000); and Adrian Robinson, G7WFM (for his work on Internet linking as reported by Jeremy Boot, G4NJH, *Radio Today* Jun 2000).

The Raynet Trophy (for outstanding service to Raynet over the past 47 years): Len Crane, G3PED.

The Ostermayer Trophy (for best article in *RadCom* on home constructed equipment): Dave Roberts, G8KBB ('Simple Digital Power Meter', Jul 1999).

The Wortley-Talbot Trophy (for outstanding experimental work in amateur radio): Trevor Sanderson, PA3BOH / G4OEY ('Echoes of the Leonids', *RadCom* Mar 2000).

The Courtney-Price Trophy (for most outstanding published technical contribution to amateur radio): Andy Talbot, G4JNT ('Digital Voice Communications', *RadCom* Oct / Nov 1999).

Ian Kyle, GI8AYZ / MI0AYZ / MI5AYZ; and Hilary Clayton-smith, G4JKS, were made Life Vice Presidents of the Society.

REPEATER MANAGEMENT COMMITTEE VACANCIES

THERE ARE VACANCIES on the Repeater Management Committee. The first is for a Regional Representative for the Midlands (formerly RSGB Zone B). The successful applicant will be expected to represent the interests of Repeater Groups and keepers in the Midlands Region. Ideally the representative should have experience of building and operating repeaters, be resident in the Region, and it is expected that they make themselves available to groups and clubs within the Region to give talks and presentations about the work of the committee, gaining first-hand feedback. As a full committee member, attendance at committee meetings (about four a year) is expected, and they should be prepared to attend major amateur radio events in the Region as part of the RMC team. If necessary other members of the RMC team are willing to give training in any area a particular applicant might feel they need help.

The other vacancies, which could be either full or corresponding members, are open to those who would like to offer particular areas of speciality to the team. In particular, knowledge of Voice over IP techniques, microwave engineering and design of PMR networks would be particularly valuable, but knowledge of other technologies or amateur radio special interest areas would be equally welcome.

For further details about any of the above vacancies, 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, Cranborne Road, Potters Bar, Herts EN6 3JE. Applications should be addressed to G0AKI with a short résumé of relevant experience. The closing date for applications is 28 February and it is expected to announce the names of those forming the new team in March.

SATELLITE TEST CENTRE SCHEME SUCCESS

THE INTRODUCTION of the RSGB Satellite Test Centre Scheme is proving a popular move with amateur radio clubs up and down the country. With over 50 clubs now registered and more coming on stream day by day the scheme is rapidly filling in the gaps left by colleges who no longer sponsor RAE courses or allow outside students to sit the examination. At a recent club talk in Cornwall, RSGB General Manager Peter Kirby, G0TWW, was told that the scheme had been a godsend in the South West, where it was becoming increasingly difficult to find a college holding the course.

With most RAE / NRAE course commencing in September the real test of the scheme will be the numbers of candidates sitting the examinations next spring.

MAJOR NEW SPRING RSGB SHOW

THE RSGB has announced that it is organising a major new amateur radio event in the spring. The Society has decided to amalgamate its February VHF Convention and the summer Hatfield Hamfest into one new, bigger show to take place on Saturday and Sunday 7 / 8 April - the weekend before Easter. The venue is the Bletchley Leisure Centre, located very close to historic Bletchley Park. The event incorporates the VHF Convention, including lectures, and the annual convention of the 6 metre group. Guided tours of Bletchley Park will also be available. The event is to be sponsored by Kenwood, Martin Lynch & Sons and Yaesu (UK).

DELAY FOR RAE / NRAE EXAMINATION ON DEMAND

THE SOCIETY was very disappointed to hear from City & Guilds that the introduction of examinations on demand was to suffer further delays. It was hoped that both the RAE / NRAE would be available on demand by the end of 2000. Due to some operational difficulties this will not now be possible. However, the Society, with the support of the RA, will be pressing City & Guilds to introduce the service as soon as possible.

● THERE ARE two new RSGB QSL Bureau sub-managers. For all GW and MW series callsigns, the new sub-manager is Mr R J Harris, GW0MOW, 25 Twyn y Ffald Road, Blackwood, Gwent NP12 1HQ. For the G4P- series of callsigns, the new sub-manager is Mr K Hutt, G0TSH, The Railway House, Fenwick Lane, Fenwick, Doncaster DN6 0EZ.

SYLVIA CLOCKS UP 20 YEARS

RSGB STAFF MEMBER Sylvia Manco, 2E1CYL, recently celebrated 20 years of working at RSGB headquarters. Sylvia, who is well known to numerous members through her work on the RSGB stand at rallies throughout the country and overseas, started working for the RSGB at Doughty Street, London, when she was still a teenager. Sylvia says she wanted to work for the RSGB because she thought it was one of the new commercial radio stations that were coming on the air then! To mark her 20th anniversary, Sylvia was presented with a crystal vase and a certificate signed by the President.

2001 - 2003 COUNCIL ELECTION

THE RESULT of the RSGB Council Zonal Election for Zone E (Wales) is as follows:

Patrick Allely, GW3KJW	57 votes
Simon Lloyd Hughes, GW0NVN	76 votes.

Simon Lloyd Hughes, GW0NVN, has therefore been elected to represent Zone E.

'DAYS INN' CARD

A REMINDER THAT the RSGB Days Inn Hotels special deal card is still available (see page 11 of last month's *RadCom* for more details). RSGB members wishing to take advantage of this should please send a medium-size SASE (preferably DL size) to 'Days Inn Offer', RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. The offer is valid on Friday, Saturday and Sunday nights until 31 March.

LICENSING TALKS CONTINUE APACE

THE LATEST round of talks between the Society and the RA on the future of amateur radio licensing took place in late November.

The talks centred on the proposals put forward by both the RA and the Society which are featured on the websites of both organisations and on the input received both from the members of the RSGB and those directly sent to the Agency.

Although nothing was agreed on any future structure of the amateur radio licence the talks were most positive and it was agreed that both parties would meet again shortly to continue the negotiations.

HFC 2000 A POPULAR EVENT

THE RSGB International HF and IOTA Convention was held at the Beaumont Conference Centre at Old Windsor from 13 - 15 October 2000. It attracted amateurs from four continents and from all over the UK, the one travelling the furthest to attend being Cliff Gray, ZL4AS, from New Zealand, who was delighted to meet at least 25 people who had spoken to him on the HF bands.

Attendances on the Saturday were 40% up on last year. The two lecture streams and the forum stream drew capacity audiences, while the Saturday evening 'DX Dinner' was attended by over 200 people, completely filling the large dining room.

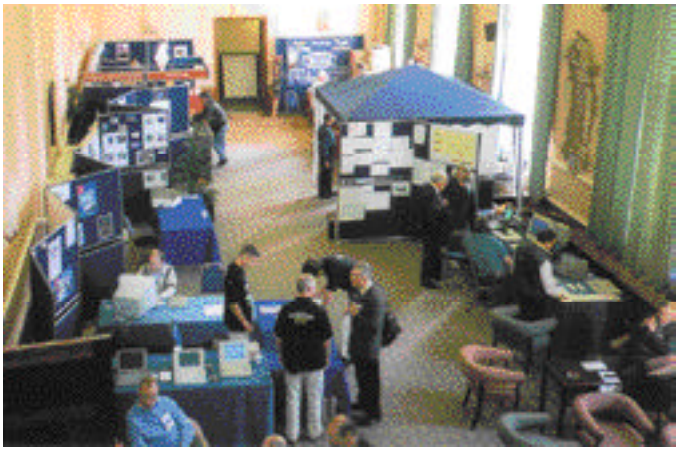
This was IOTA's main convention of the year and there was a full IOTA lecture programme in the main convention hall covering many fascinating expeditions which were very well received by the audience. Other lectures on the Saturday and Sunday covered topics such as propagation, antennas, linear amplifiers, the history of amateur radio, LF operations, DXpeditions, and special event station M2000A. One highlight was a lecture and live demonstration of new research undertaken by Prof Mike Underhill, G3LHZ, from the University of Surrey on small HF loop antennas.

This year the Convention's special event station used the prefix 'MB' for the first time. Many of those attending enjoyed making DX contacts from MB2HFC. An LF station was also of great interest, especially as its antenna was 1000ft long!

Each year at the HF Convention RSGB trophies are presented to the individuals and groups who have won RSGB HF contests during the last year. In addition, the G5RP Trophy is awarded on the recommendation of the HF Committee and the Vale of White Horse Amateur Radio Society to the amateur who has made the most progress in the field of HF DX during the year. This year it was won by 16-year old Mark Haynes, M0DXR, last year's Young Amateur of the Year and a team member of the forthcoming D68C DXpedition to the Comoros [see page 11 - *Ed*].

The Grand Raffle was a fitting event to end the weekend, with over 1300 tickets being sold and everyone hoping that they would win the star prize of an FT-100 kindly donated by Yaesu (UK). The winner, John Dunnington, G3LZQ, was presented with his prize by the Managing Director of Yaesu (UK), Bob Ives, G3MSL (see photo in December 2000 *RadCom*). All proceeds of the Raffle go to support HF DXpeditions operating during the next year.

The HF Committee would like to express its grateful thanks to all lecturers, presenters, helpers, donators of prizes for the raffle, and to the Management and Staff of the Beaumont Conference Centre who made HFC 2000 such a successful event. Last but not least, our thanks to our main sponsors, Yaesu (UK) and Martin Lynch & Sons, for making the whole event possible. If you did not manage to come to the Convention, make a note in your diary the next one will be in October 2001. For further details of HFC 2000 including overseas attendees, prizewinners etc, go to the HF Convention website at www.g3wkl.freeserve.co.uk/conv/prog.htm



AMATEUR RADIO OBSERVATION SERVICE

THE AMATEUR RADIO Observation Service (AROS), acting on behalf of RSGB Council, works closely with the Radiocommunications Agency (RA) and is responsible for observing operating practices and activities on the amateur bands. AROS helps the RA to make its case against licence abusers. Repeaters are no longer AROS responsibility - they are now under the wing of the Repeater Management Committee.

The AROS Coordinator has 15 volunteer observers with a range of skills and abilities. All observers are anonymous, in order to protect them from those who do not like what AROS is doing. The AROS Coordinator wishes to recruit more observers; volunteers (licensed amateurs or SWLs) should write to PO Box 113, Potters Bar, Herts EN6 3ZY. Applications from those with time to spare during the day are particularly welcome.

When AROS receives a complaint a 'case' is opened. Depending on the nature, location, modes etc, observers are tasked. Reports are then reviewed and if enough hard evidence is available the case is forwarded to the RA. Its course of action can range from written warnings through licence revocation to court action to secure fines and / or confiscation of station equipment. Many complaints are received by AROS but most complainants, when asked for further information, decline to pursue the matter and lose interest. AROS is unable to proceed without hard evidence and so can only take up complaints from those who wish to see the case through.

REPRIEVE FOR 73kHz

THE Radiocommunications Agency has acceded to a request from the RSGB to extend the use of the 73kHz amateur radio allocation until 2003. A press release from the RA dated 23 November announced that the RA has permitted a three-year extension to the use of the band, until 30 June 2003. The allocation was due to have been withdrawn completely on 30 June 2000. Existing holders of the 73kHz Notice of Variation (NoV) will now be allowed to continue conducting their experiments until the new date. Radio amateurs who do not already hold such an NoV, but who wish to investigate low frequency propagation within this band, are invited to write to the Amateur and CB Radio Services Section at the RA to apply for one.

The RA stresses that there will be no further extensions to this date: with no exceptions, all experimentation and operation within this band will cease at midnight on 30 June 2003. Only those amateurs holding a Class A or A/B licence are permitted to operate at frequencies below 30MHz. Therefore this NoV is only available to holders of a full Class A or A/B Amateur Radio Licence.

NEW RSGB NOVICE AWARD

THE NEW RSGB Novice award is for holders of Novice callsigns only and is designed to encourage activity in the CW, SSB and FM simplex sections of the 50, 144, 432 and 1296MHz bands. The starting date is 1 January. Points may be claimed for contacts made, with multipliers for locator squares, postal districts, countries and long-distance contacts. The full rules may be obtained by sending an SASE to the VHF / UHF Awards Manager, Tony Jarvis, G6TTL, Dovecote Farm, Patman's Lane, Friskney, Boston, Lincs PE22 8QJ.

THE PRESIDENT, THE COUNCIL, THE GENERAL MANAGER AND ALL STAFF AT RSGB HEADQUARTERS WOULD LIKE TO WISH ALL MEMBERS A VERY PEACEFUL, HEALTHY AND PROSPEROUS NEW YEAR.

Schools to Talk to Astronauts

APPLICATIONS ARE invited from amateur radio club stations at schools to make scheduled contacts with the astronauts on board 'Space Station Alpha' - the International Space Station. The Amateur Radio on the International Space Station (ARISS) programme is now sending out application forms for school stations. If your school station has suitable equipment - transceiver, power amplifier, steerable antennas, tracking programs etc - and wishes to be considered for this experiment, send a request *by e-mail only* to ar.dept@rsgb.org.uk You will be sent the application form which when completed should be e-mailed to the ARISS-Europe School Contact Co-ordinator in Germany. The application will be acknowledged, then put in a queue. The schools will be contacted when a slot has been assigned to them.

Commander William 'Shep' Shepherd, KD5GSL, made the first amateur radio contacts from the ISS on 17 November. Commander Shepherd reports that he was able to take a few minutes out of his busy schedule to engage in contacts with a few lucky hams.

● STOLEN from the shack of G3GNR nr Okehampton, Devon: TS-940SAT transceiver, S/N 9020119. Any information to PC Law, tel: 0990 777444.

The shack of Derek Ritson, G5RI, who died recently at the age of 83. Despite having a distinguished professional and academic career in electronic engineering (pioneering research and development of air-to-air radar at the Royal Radar Establishment and later becoming a Senior Lecturer at Newcastle University), Derek was happy to continue to use very old, but effective, technology for his amateur radio hobby, as can be seen here. He nevertheless used very effective antennas and had a considerable degree of success in the RSGB's BERU contest in the 1950s and 60s.

Big UK-based expedition due on air next month

D68C on Schedule for Major HF / 6m Operation

OVER 3.5 TONNES of amateur radio equipment - transceivers, amplifiers, antennas, masts, coax, computers and ancillary equipment - left the UK in a 20ft shipping container at the end of November *en route* for Moroni, Comoros. The consignment is to be used for the D68C Comoros DXpedition organised by the UK-based Five Star DXers Association.

Tony Canning, G0OPB, examining one of around 40 100m drums of low-loss coax being shipped to the Comoros for D68C. Yes, there's more than 4km of coax!

Nearly 30 operators from 10 countries will be active between 8 and 28 February on all bands from 6 to 160 metres, using brand-new Yaesu FT-1000MP Mark-V transceivers and VL-1000 linear amplifiers to monoband beam antennas on all bands other than 160m, where an 82ft Titanex V160S vertical will be used. Six HF stations will be on the air 24 hours a day, while at peak propagation times up to 11 stations will be operating simultaneously. One of the objectives of the operation is to provide the possibility for every amateur in the world - even those running QRP or very simple antennas - to make at least one contact with the station. To this end, next month *RadCom* will be publishing an article explaining exactly how a beginner to DXing could go about attempting to make a contact with D68C.

Above: The 20ft container being loaded. The Force 12 monoband Yagis are lashed to the top and sides, while the transceivers are packed securely in the wooden crates.

Ministerial Statement on ADSL

THE MINISTER FOR Small Business and E-commerce, Patricia Hewitt, has made a statement to the House of Commons on the deployment of broadband technology on telecommunications systems. The statement dealt primarily with ADSL (Asymmetric Digital Subscriber Line) which involves using frequencies up to 1.1MHz on the ordinary 'twisted-pair' telephone lines.

The Minister said that radio interference from such systems would be controlled by a Regulatory Standard prepared by the Radiocommunications Agency. Some time ago interested parties were invited to submit comments on this Standard, and in particular, which of two proposed emission limits should be adopted. The RSGB put in a submission on behalf of radio amateurs and short wave listeners supporting the more stringent limit. According to the Minister's statement, the higher of the two limits will be adopted, but on the other hand the Minister specifically mentioned possible radio interference and the obligation of service providers to take reasonable steps to remedy any interference caused.

The full text of the Minister's statement can be found on the RA web site at www.radio.gov.uk More information on the background, and the text of the RSGB submission can be found on the News Page of the EMC Committee web site which is accessible from the main RSGB site at www.rsgb.org or directly at http://www.qsl.net/rsgb_emc/emcnews.html

The only amateur band directly affected by ADSL would be the 136kHz band, but SWLs who enjoy medium or long wave DXing may experience interference.

Phase 3-D Renamed AO-40

THE PHASE 3-D satellite, which was successfully launched on 16 November, has been renamed AMSAT Oscar 40, or AO-40 for short. After launch, the satellite was put into a temporary holding orbit while tests were carried out.

The first planned orbit change, resulting in a 50,000km apogee, was scheduled to take place as we were going to press. This attitude would allow a thorough study of the 70cm transmitter problem using the high-gain antenna.

The new AMSAT-NA President, Robin Haighton, VE3FRH, says plans are in place to make AO-40 available for a *limited* period of general amateur use within a few weeks. The provisional operation would involve one or two bands at a time. Since the satellite's solar panels will not be deployed until AO-40 is in its final orbit, full power will not be available. It is stressed that it is likely to be around nine months before the satellite becomes available for *full* amateur radio use.

GW4ZAG Honoured in Romania

GEORGE WOODWORTH, GW4ZAG, has received the Star of Romania, that country's highest civil honour, from the President of Romania, Emil Constantinescu. George received the honour at a ceremony at the Presidential Palace in Bucharest on 19 October. The award was made in recognition of the work of the Ellesmere Port and Neston Romania Appeal, a registered charity of which George is a founder. The appeal began in 1990 in response to the problems facing the Romanian people following the collapse of the communist government. Since then, two convoys per year, carrying around 60 tonnes of food, clothing, furniture and Christmas presents have left Ellesmere Port for Romania. Radio communications played an important role in ensuring the convoys negotiated their way through the borders.

President Emil Constantinescu of Romania and George Woodworth, GW4ZAG, at the Presidential Palace in Bucharest.

Raynet Receives Grant for Comms Trailer

THE NORTH WEST Durham Raynet Group has received a grant of £4030 from the National Lottery Charities Board which will enable it to buy a mobile communications trailer. The trailer will be used during outdoor events and exercises as the 'Communications Control' for passing third-party messages for the User Services.

RA Open Forum in Edinburgh

UNFORTUNATELY JUST too late for inclusion in last month's *RadCom* came news that the RA was to hold an amateur radio Open Forum meeting in Edinburgh on 7 December. Representatives from the RA's licensing and enforcement sections will be at the Open Forum, as will representatives from the RSGB and the Post Office Radio Licensing Centre. The RA has said that it will be making available a cassette recording of the events at the meeting. The cassettes will be available from January 2001 and anyone wishing to receive one should send a request to Des Daily at the RA on tel: 020 7211 0160, or by e-mail to amcb@ra.gsi.gov.uk

● AROUND 15,000 contacts were made by the Millecom M2000Y special event stations active during the whole of last year. The stations were operated by and on behalf of the three Cadet organisations, ATC, ACF and SCC.

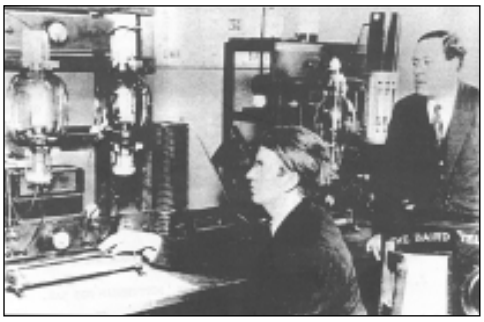
● ROB Micklewright, G3MYM, has been asked by the Somerset County Council Library Service to give a public talk on the history of the Yeovil Amateur Radio Society. The talk will be held at Yeovil Library on **16 January.**

● STAFF OF Yaesu (UK) would like to thank everyone who attended the Leicester Amateur Radio Show in September last year and who helped them to raise £144.33 for the Wessex Children's Hospice Trust, in aid of Naomi House, the hospice for children and their families.

● JACK PLATT, G3FEV, was installed as the Worshipful Master of the Radio Millennium Lodge number 9709 at a ceremony in Urmston, West Lancashire, on 4 November last year. He sends greetings to both Masonic and Non Masonic members of the RSGB and would be pleased to hear from them QTHR, tel: 01706 211339 or fax: 01706 222587.

Baird and 75 Years of TV

TO COMMEMORATE the 75th anniversary of Baird's demonstration of television to members of the Royal Institution and the press, Ralph Barrett, G2FQS, will show 30-line pictures on an original Baird Televisor during his presentation, 'Baird and 75 Years of Television'. The presentation will take place at the Royal Institution, 21 Albemarle Street, London (Green Park underground) at 6.00pm on Tuesday 30 January. Admission is free and no tickets are required - just turn up.



J L Baird (left) and Ben Clapp, 2KZ, sending 30-line pictures across the Atlantic in February 1928.

Kilve Court Courses

TWO COURSES are being offered at the Kilve Court residential college, near Bridgwater in Somerset. 'A Scientific Approach To Global Communications' (16 - 20 April) is intended for adults and students in academic year 9. It is suitable for anyone with an interest in radio or physics. 'Around the World in 48 Hours' is a two-day course (20 - 22 April) intended for students in years 7 / 8. The courses provide the opportunity to use communications receivers, test equipment and to transmit using special event station GB2KRC. Further information from Adrian Dening, G4JBH, tel: 01288 331113 (evenings) or e-mail: g4jbh@compuserve.com

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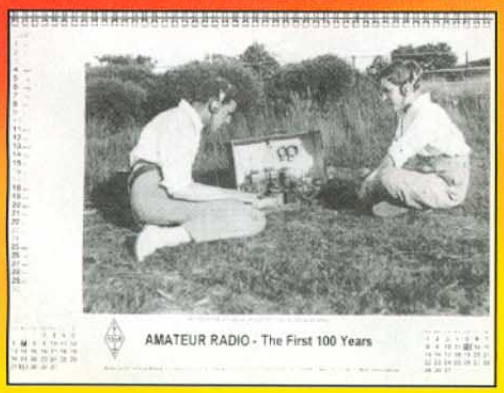

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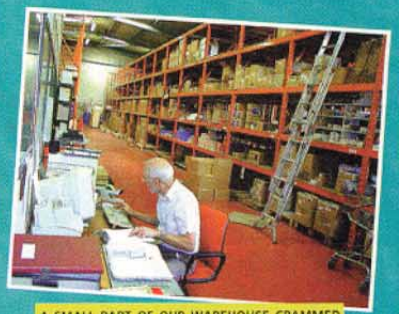

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KENWOOD

The Glen Forrest Marconi

a 'fat' trapless semi-vertical antenna for 3.5, 10, 18 and 24MHz

by Steve Ireland, VK6VZ / G3ZZD *

WHEN IS BEING FAT a good thing? Probably never, if you are trying to be a champion athlete or keeping yourself free from heart disease, but for an amateur radio enthusiast - fat is good.

Before you take this as an excuse to reach for a large block of chocolate, I am talking about antennas here. 'Fat' antennas - made from several parallel pieces of wire and giving both broad bandwidth *and* high efficiency - can really help radio amateurs throw their weight about in a DX pile-up.

Most radio amateurs specialising in HF spend a lot of time putting up extremely thin pieces of wire to work or hear DX. When the amateur band we want to use is narrow - such as the UK 7MHz band - this is fine, but in the case of most of the upper HF amateur bands something a bit thicker than a single strand of 16 or 18SWG copper is a good idea.

Those who doubt this statement should take a look at a professional HF radio installation. Normally, there are no single wire dipoles there, but large arrays of 'fat' dipoles, constructed like skeletal tubes or cages.

What the cage of wires does - compared with a single wire - is to make the resulting antenna thicker, closer to a wavelength in diameter, thus increasing its bandwidth and causing the feed impedance to remain virtually the same over a wider range of frequencies.

Making a dipole fatter in this way will have a drastic effect on its bandwidth, increasing it from several tens of kilohertz to several hundreds of kilohertz. What this means practically for a radio amateur is that it is possible to have an antenna that is a good match to its feeder over an entire amateur band, rather than just part of one.

No more messing about with expensive antenna tuning units (ATUs) or worrying about whether the SWR is low enough for the transceiver's power amplifier stage - why not consider an almost-perfectly-matched antenna that is going to make a big impression anywhere on the band you choose?

The VK6VZ Glen Forrest Marconi just after sunrise. The feedline choke and radial system can just be seen on the left hand side of the photo.

Conventional cage antennas are widely regarded as difficult to construct and unwieldy. Yes they are, but all that is needed to make an effective 'cage antenna' are two separate thin wires, spaced well apart and joined at their feedpoint. Now, that sounds easy, doesn't it?

FAT ANTENNAS AND ME

MY INTEREST IN fat antennas with a wide bandwidth was stimulated last winter when trying to work rare Pacific, Caribbean and Central American DX on 1.8MHz from my home in Perth, Western Australia. This meant that I would frequently want to try to bring stations down to topband from the 80m band.

Sometimes these stations would be in the CW DX section of the band, which was fine for my quarter-wave 'inverted-L' antenna made of very thin wire and cut for 3.510MHz. But sometimes these stations would be operating on 3.798MHz on SSB - far too high in the band for my inverted-L, whose SWR at this frequency was too great to allow my solid state transceiver to transmit. Modern HF transceivers are designed so that their power output is drastically reduced if their SWR is greater than 2:1. At 3.798MHz, the SWR on my inverted-L quarter-wave antenna was *way* above 2:1.

The usual solution to this problem is to use an ATU (between the transmitter and the antenna) but, if the antenna is fed with coaxial cable, the ATU will simply make the antenna 'look' as though it is matched. Unfortunately, although the SWR may be 1:1 at the transmitter, the mis-match between the actual antenna and the feeder still remains - along with the consequent loss of signal.

Having a broadband antenna with a good match to its feeder right across the band of frequencies used is a much better solution.

BROADBAND METHODS

WHEN I LOOKED through my large collection of antenna books and journals, there were plenty of ideas for broadbanding wire antennas, but most looked rather expensive or difficult to implement.

There was the traditional cage wire technique - see **Fig 1(a)** - but this looked both awkward to construct and very heavy. Half a dozen strands of copper wire around a circular or square spacer was going to require the skills of a skilled basket weaver to put together - and require a couple of supporting masts with the strength of Xena the Warrior Princess to keep the resulting antenna in the air.

There were other ideas, using complicated arrangements of sections of coaxial cable, and what are known as quarter-wave shunt stubs (**Fig 1(b)**). Although this had promise, it meant the antenna was going to be both relatively heavy, expensive, *and* require a matching unit [1]. Then, I finally found the technique I wanted in an old *ARRL Antenna Compendium* [2] - see **Fig 1(c)**.

* *PO Box 55, Glen Forrest, Western Australia 6071*

The fat antenna idea described in the compendium by Robert Wilson is a brilliant variation on the old cage dipole principle which has been around since the early days of radio. It is basically a kind of minimalist or skeleton cage antenna - in it, the cage has literally two 'bars' or walls.

What a traditional cage dipole does is to use a large number of pieces of wire that are joined together at the antenna feedpoint, but open circuit at the antenna ends. All these pieces of wire are the same length, fed in parallel and are roughly cut to the middle of the frequency band you wish to cover. Wilson's article is a practical illustration of how reducing the number of cage wires to just two can still produce excellent antenna broadbanding.

Using this simple technique, it is possible to make a two-wire dipole antenna that will cover an entire amateur band - even the almost-2MHz-wide 10m band. Using two equal-length wires spaced by only 12cm, a dipole antenna can be created that will give an SWR of less than 2:1 right from 28 to 29.7MHz, enabling easy operation in the CW, SSB and FM segments of the band. Perhaps the best thing about this is that the resulting 28MHz fat antenna is barely wider than the width of your hand.

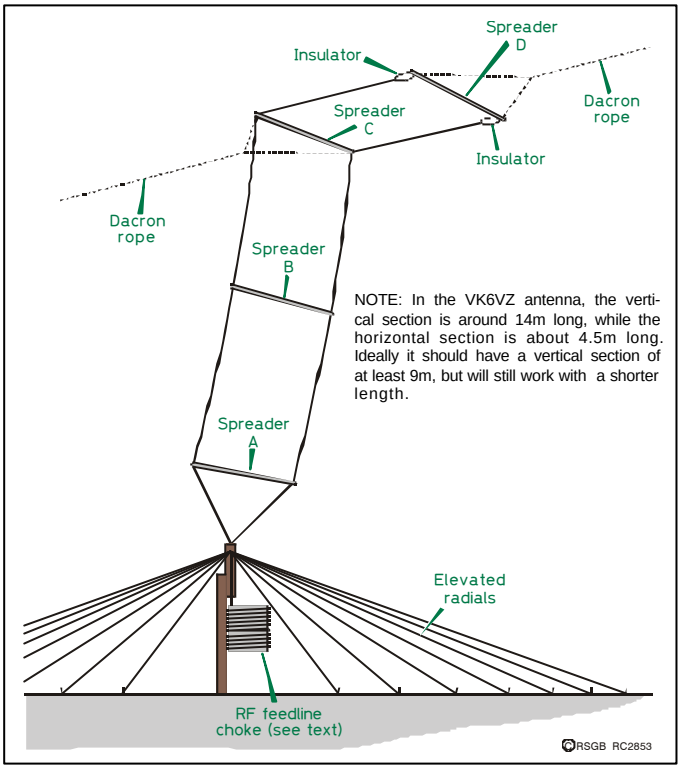


Fig 2: The Glen Forrest Marconi used at VK6VZ.

For those interested in the 3.5MHz band like myself, a two-wire dipole antenna can be made for 3.5MHz that is relatively light, but will cover both the SSB DX window and the CW section of the band and have equal performances in both. All that is needed is to cut the antenna for a centre frequency of 3.65MHz and space the two equal length wires about around one metre apart.

In my case, I was interested in adapting the Wilson technique for a quarter wave 'inverted-L' antenna. After doing some calculations, I also realised that the wideband properties of the resulting 3.5/3.8MHz antenna - around 0.5MHz with a 1.8:1 or better SWR - could be used to produce an antenna that should provide excellent performance and a low SWR as well on all three WARC bands without an ATU.

FAT HARMONICS

THE USE OF a half-wave dipole or quarter-wave Marconi-type antenna on odd harmonically-related frequencies is a time-honoured broadcasting and amateur radio technique. This is most popularly used in amateur radio in the form of a 7MHz dipole being used on its third harmonic frequency of 21MHz.

However, a dipole or Marconi antenna will also work well on its fifth, seventh and ninth (etc) harmonics, often offering a match at the antenna's feedpoint that is almost as good as that on its fundamental frequency.

Now the so-called WARC bands at 10, 18 and 24MHz are reasonably closely harmonically related to the 3.5 - 3.8MHz band, being roughly the third, fifth and seventh harmonics. With the narrowness in bandwidth of conventional single wire dipole and Marconi 3.5MHz antennas, their harmonic relationships to the WARC bands are a somewhat 'hit and miss' affair, with the antenna's SWR at the WARC frequencies often poor.

However, with the wide bandwidth of the fat Wilson-type antenna at its fundamental frequency, the performance/SWR bandwidth of the antenna at harmonic frequencies is much more useful than a conventional one. The third-harmonic bandwidth of a 3.5 - 3.8MHz Wilson dipole is at least 0.9MHz, whilst the fifth harmonic bandwidth is around 1.5MHz and the seventh harmonic is about 2.1MHz!

In practical terms, this means that the 18MHz (18.068 - 18.168) and 24MHz (24.890 - 24.990) bands lie well within the fifth (17.5 - 19MHz) and seventh (24.5 - 26.6MHz) harmonic antenna bandwidths.

If the wires of the 80m Wilson-type antenna are spaced about one metre apart and are cut for a centre frequency of around 3.65MHz, the antenna should have a (better than) 2:1 SWR bandwidth of around 0.5MHz. This brings the lower operating limit of the antenna to down to at least 3.4MHz - and into a relatively close harmonic relationship with the 10MHz (10.1 - 10.15MHz) band.

CONSTRUCTION

THE ANTENNA I built is of the classic inverted-L shape and should work effectively with a vertical section as small as eight metres in length. The longer the vertical section, the better the antenna will work on the 3.5MHz band. My antenna has a vertical section of around 14 metres, making it the best 80m DX antenna ever used at this QTH.

As with all Marconi-type antennas, a good earth and radial system is important for the antenna to work at maximum efficiency. The soil conductivity is very poor at my particular QTH, and I used an existing earth system of around 50 radials made of 0.8mm soft-drawn copper wire, ranging from about 6m to 22m in length and elevated about three metres above the ground.

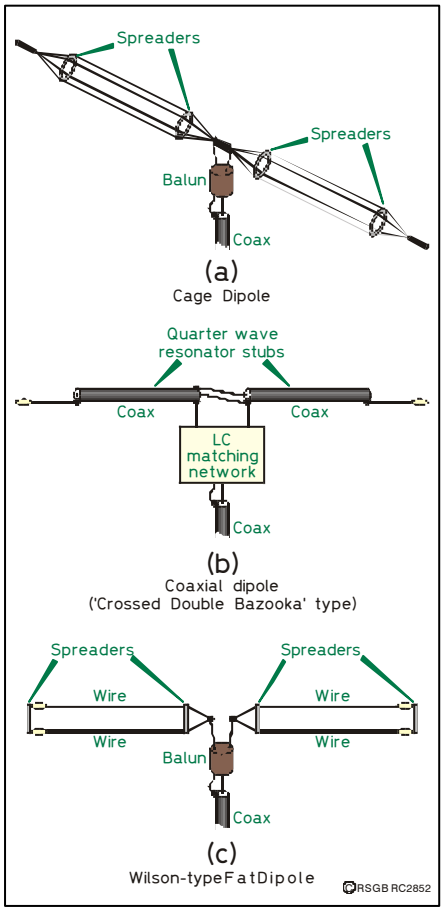


Fig 1: Different methods of broadbanding dipole antennas.

In the past, in the UK where the soil conductivity is generally relatively good in comparison to Australia, I have found that a buried (or preferably elevated) radial system consisting of a minimum of 16 radials of 7m to 10m in length has been an effective 'earth' system for vertical antennas covering the 3.5MHz to 28MHz amateur bands. The greater the number of radials, the lower are the ground losses from the antenna.

In order for the inverted-L antenna to be as robust and light as possible, it is best to construct at least the top part of the inverted-L from 14 or 16SWG hard-drawn copper wire. Hard-drawn copper wire - made from steel wire coated with copper - is springy and will not stretch when it is taut.

My 'Glen Forrest Marconi' (see **Fig 2** and the photograph) has a top section made from two pieces of 16SWG hard-drawn copper and a vertical section made from two pieces of a single conductor of plastic-covered 'figure-of-eight' copper wire (24/0.2mm or 24 strands of 0.2mm wire), available from hardware stores. If plastic-covered wire is used for any antenna, don't forget that using this type of wire will make the antenna three to five per cent shorter (electrically) than if it was made from bare wire [3]. In Australia, you can buy figure-of-eight cable in grey and brown colours, which is much less visible than the more readily available white type.

If the antenna is made of bare copper wire, the two pieces of wire making it should each be around 18.5 metres long, for a centre frequency of 3.65MHz. Adding or subtracting around half a metre of wire will lower or raise the centre frequency of the antenna by about 100kHz. My advice would be to start with both pieces of wire around 19 metres long and shorten them so the lowest antenna SWR (at the transmitter end of the feeder) occurs at 3.65MHz.

Four 1m-long pieces of 12mm-diameter wooden dowel are used to space the two parallel wires that make up the antenna - one close to the feedpoint, the second in the centre of the vertical section, the third at the top of the vertical section and the fourth close to the antenna's far end.

Over each end of the first three spacers are slid 10cm lengths of 'split' 10mm diameter PVC reticulation tubing, which serve as insulators. The fourth spacer has a plastic/nylon egg insulator attached at each end using a 5mm-thick cable tie, which serves to insulate the far ends of the antenna.

The dowel spacers should be varnished with marine-grade varnish in order to weatherproof them, before attaching the antenna 'insulators'. The antenna wires

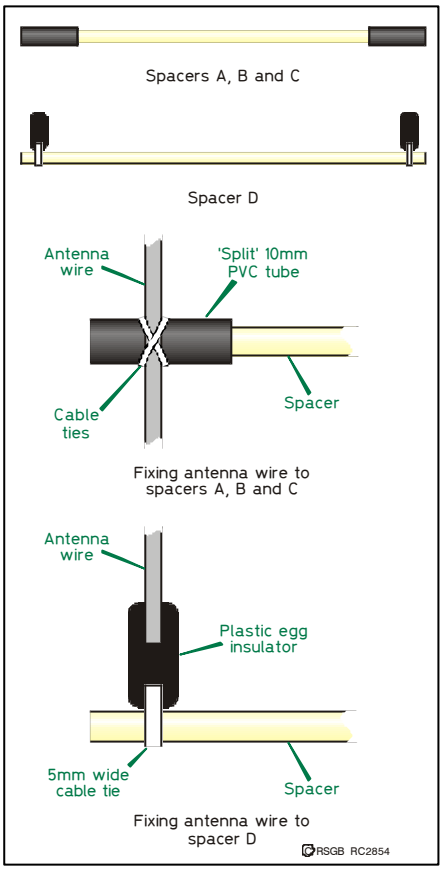


Fig 3: Constructing the spacers.

are attached to the spacers using cable ties in a cross configuration - see **Fig 3**.

A 2.5-metre length of 1cm-diameter Dacron rope is attached to the ends of the far end antenna spacer (Spacer D), and the far-end antenna halyard is attached to the centre of the piece of Dacron rope.

The antenna is fed with a length of RG-213 50-ohm coaxial cable, via an RF feedline choke consisting of 20 turns of RG-213 cable wound on a 20cm diameter plastic former (made from an empty chlorine bucket). This choke helps to prevent feedline radiation, in particular on the 3.5MHz band. A more expensive alternative would be the use of ferrite beads at the feedpoint; however, no trace of series resonance has been found on the four bands.

ADJUSTMENT

ONCE THE Glen Forrest Marconi has been erected, it is easy to adjust if necessary. Using a few watts of RF and with the transceiver tuned to the 80m band, plot the SWR curve of the antenna, to find the lowest SWR. If the antenna shows a SWR curve with a lowest SWR at around 3.65MHz, no adjustments should be necessary. In these circumstances, if the antenna has similar vertical/horizontal dimensions to the one used at VK6VZ, it should show an SWR of around 1.8:1 at 3.8MHz and an SWR of around 1.6:1 at 3.5MHz - the results obtained at this station.

If the antenna needs trimming, remember that adding or subtracting about half a metre from each wire will lower or raise its resonant frequency by around 100kHz. Take care to add or subtract equal amounts from each wire when making adjustments - unequal amounts will change/distort the broadband qualities of the antenna.

With regard to the 10, 18 and 24 MHz amateur bands, as expected the SWR curves are very flat. The VK6VZ antenna shows an SWR of around 1.5 to 1.6:1 across the 10MHz band, 1.3 to 1.4:1 across the 18MHz band and 1.1:1 across the 24MHz band.

CONCLUSIONS

THE GLEN FORREST Marconi gives a no-compromise performance on the four amateur bands 3.5/10/18/24MHz, with an SWR of 1.8:1 or better across them all.

The performance of the VK6VZ version of the antenna seems in practice to be virtually omni-directional on all four bands, although no antenna radiation pattern plots have been made. If more of the antenna is horizontal than vertical, the antenna will tend to become directional in the direction of the horizontal part of it, in particular on 18 and 24MHz.

On 3.5 and 10.1MHz, contacts have been made by VK6VZ with stations all over Europe, Asia and North America, while its DX performance on 18 and 24MHz is as good as any single-element type of antenna I have used on these bands. 24.8 MHz produced a QSO with the TO0DX DXpedition on the St Pierre et Miquelon Islands (a very difficult area to contact from VK6) for an all-time new country - through an enormous pile-up of Europeans.

The total cost of the antenna (less the RG-213 feeder/feedline choke) is estimated at around £25 sterling.

The antenna has been up now for around 12 months and deals well with the strong winds that can be experienced at this location at Glen Forrest, near Perth in Western Australia. ♦

REFERENCES

[1] *ARRL Antenna Handbook*, ARRL 1988, 15th edition, p9-5.
[2] 'Fat Dipoles' by Robert C. Wilson, *ARRL Antenna Compendium Vol 2*, p106, ARRL 1992, available from RSGB Books.
[3] 'A Compact Supergain Beam Antenna' by Dick Bird, G4ZU/F6IDC, *Amateur Radio Action Antenna Book No 5*, published in Australia.

PicATUne - the Intelligent ATU

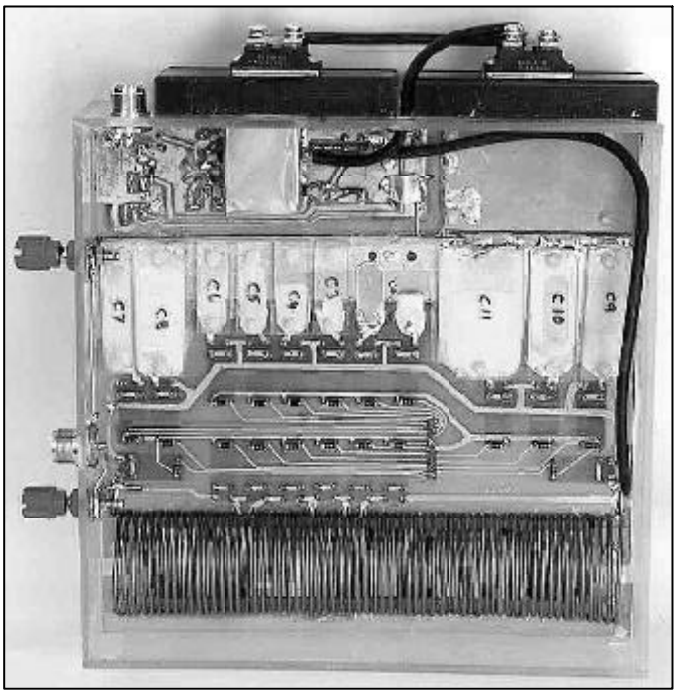
*Concluding part, by Peter Rhodes, BSc, G3XJP **

IN THIS LAST part, the architectural considerations behind PicATUne's design are covered, culminating in specific detail of the operator interface and some ideas on installation.

ARCHITECTURAL DESIGN

THE SYSTEM hardware and software thinking that went into PicATUne are briefly discussed here since, if you understand some of the background thinking, the operator instructions which follow will make more sense in that context.

Also, it is a relatively simple task to design different ATU hardware to use with my software - or your own software with my hardware - or you could be inspired to design your own tuner from scratch for your specific operational needs. Or, if you are thinking of buying a commercial offering, this may inspire some aspects to look out for.



The completed PicATUne prototype, viewed from underneath.

SYSTEM CONSIDERATIONS

There are several gross options in conceiving how to automate an ATU.

QST published a basic design [8] which is representative of the KISS approach. It is billed as "easy to build" - which certainly looks likely - and "makes time-consuming knob-twisting and roller-cranking a page in your station's history book". It uses low-voltage capacitors and only has a coax output socket, which makes me somewhat suspicious. What it certainly does *not* do is remember the matching solutions. It has to re-discover them from scratch each time you change frequency. This seems a pity, because even we humans write down the settings of a manual ATU on a piece of paper. However, that does remove a lot of systems complexity - such as the need to measure frequency - and it may represent a good compromise for some. But to pick another tune, "A KISS is just a KISS"...

From the outset, I decided that committing solutions to memory for later use was money well spent - but I did expend a lot of effort trying to keep the memory size (and cost) down.

The issue is this. If you want to cover the *entire* HF spectrum, then a lot of memory is needed to retain the full detail of unique solutions at sufficiently small frequency intervals. So much so, that there are architectural implications. It may be easier to settle for storing a limited number of solutions, or partial solutions, but then refining them in real time - every time - during the first few seconds of operation on a given frequency. Since this latter has to be done quickly to be effective, you probably need phase detection to tell you instantly which way to go; certainly full VSWR measurement is also needed since you cannot rely on a steady carrier to match on. Maybe the bigger memory works out cheaper?

If, however, you are designing exclusively for the amateur, the total HF allocation only adds up to some 5MHz (if you are generous) which immediately divides memory needs by six. But more significantly, it does allow retention of the full exact matching solution at frequent intervals - with no topping up required - at an acceptable price.

Having spent weeks trying various data compression techniques - and encoding 11 bits of capacitor settings into an 8-bit byte (by sacrificing resolution at higher capacitances), you can imagine my language when the latest catalogue from a well known UK distributor arrived showing the price of 32k EEPROM to be less than that for 16k the year before. That's progress! What I had actually saved was about 20% of my software from being devoted to the memory interface alone.

HARDWARE ASPECTS

The great debate was whether to put the intelligence (ie PIC) at the shack end - or out there in the remote ATU.

The former has the great virtue of making the operator interface easy to implement since switches and LEDs are readily to hand. The difficult aspect is the need for a data link - probably serial in practice - for the relay switching commands; and the need for some decoding at the far end. A two-PIC solution was implemented (one at each end of the link) to handle the communications as well as the ATU application. It worked well until any serious level of RF was applied - and then it collapsed in a heap of tangled '0's and '1's on the link.

The philosophical issue was that if it were necessary to run even one extra wire up to the ATU (for power or data) then one might as well run many extra cores. But I badly wanted to get to a simple and convenient installation (ie only a coax link) and without all the inherent hazards of adjacent logic and RF signals. So I built a version with no user interface at all (and no incremental features). It relied on detection of a carrier running for five seconds as the cue to go and find a match - which works fine unless you want to use a data mode - and you were never quite sure when it had finished the matching process.

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Then serendipity struck. By chance I miscoded the transmitter frequency-measuring software which left it still running on receive - and noted a broad band spectrum of tones on my receiver as the counting gate opened and closed.

Twenty minutes later, the remote PIC was sending CW - simultaneously on all frequencies in the HF spectrum. Complete flexibility to send any messages back down the coax - and with licensed HF operators as the target audience, well, no problems there. Much thanks to Keith, G3OHN, for explaining the Fourier maths needed to get the required spectral distribution.

Multiplexing the DC power up the coax presented few problems. The remaining issue was how to get operator commands up to the remote ATU.

I briefly toyed with the idea of asking you to send CW to it. I think I could have made it work, but whereas it is fair to expect anyone to copy slow machine-sent CW with a restricted set of possible short messages, expecting people to send it might well have limited the appeal. And without a lot of software (for which there is no space) a PIC is very unforgiving of scruffy CW - especially when it also has to ignore real CW QSOs. Anyway, it was all very clumsy and unfriendly.

The idea of interrupting the power to the PIC was inspired immediately after one of the frequent power failures round here. This provides exactly one command - no more, no less - so it soon developed to the concept of using that one command to pick choices from a PIC-driven menu.

I was now only short of one signal back from the ATU to denote completion of the matching process - which can't be CW since the transceiver is on transmit at the critical moment. I first implemented it by pulsing on and off a small mismatch - which could be observed on the shack SWR bridge, but eventually settled for continuously toggling all the relays and detecting the resultant regular current pulses in the shack.

At the end of the day, this flexible user interface allowed the project to proceed to fruition, since I was able to exploit it for software development. One of the issues with PIC development on the cheap is that, unless the application has a means of communicating with you, it is difficult to make much progress. Trying to peer at some LEDs through a pair of binoculars at night - and climbing on the roof to upload the latest software from my laptop by day - is not an easy development environment!

SOFTWARE ASPECTS

It would be nice to think that the software development proceeded classically. That is, understand the problem, develop a solution, code and test. Nice theory!

In real life I started off developing some chunks of code to perform utilities I just knew I would need. The ability to measure frequency, VSWR, detect phase, to read and write from memory - and above all, a fast matching algorithm. Then I struggled to integrate these into a working system at the same time as coping with radical shifts in ideas on hardware architecture. The software, the hardware and I were going round in endless loops for weeks.

As with all software development, coding is a pretty mechanistic task. It is understanding exactly how you want the system to behave in *all* circumstances that is the real issue.

Ironically, it was my wife (who has never written a line of code in her life) who sorted it out. By the simple expedient of sitting me in front of a manual ATU and saying "... show me exactly how a human does it. Why do you turn that knob first? Why do you overshoot the minimum reflected power when using that knob?" And, tellingly, "... how did you manage without a phase detector thingy?" Ah well, a lesson learned! The moral is, you don't have to understand 'software'. You don't even have to understand the solution. But you do have to understand the problem.

It also goes to illustrate that, even if you have never written software for a living and you are not being paid by the hour, you can still get there if you are persistent and enjoy the challenge.

For your interest - and especially if you want to write your own - **Table 2** shows how much code it finally took to implement the functionality.

22	PIC general overheads
19	General timing
93	Memory & bus management
66	CW send routines
55	Frequency measurement
48	Frequency to memory mapping
20	Reflected power measurement
63	'Restore from Before'
260	'Match from Scratch'
69	Menu management
107	Mode U utilities (QED)
120	Status reporting
71	Optional Bits (A-E)
1013	Total

Table 2: Number of lines of code for each function. Divide by 10 to give percentage.

MATCHING ALGORITHMS

A few words about the process of finding a match are in order. Although once the installation is stable this may never be needed again, it is certainly critical in getting to that point.

Any matching algorithm is some trade-off of speed versus the certainty of finding the best solution. There are exactly 526,400 relay combinations to try. The software could get round these in a few milliseconds each were it not for the need to allow for a relay settling time of about 15ms. So the 'try everything' approach would, by simple multiplication, take about three hours to find the solution. But it would definitely find the best one!

It might be thought that a quick coarse pass through each of the four impedance options - looking for any sort of SWR dip - would then determine which was the best impedance, thus quartering the size of the problem. In practice, this does not work because you can find some sort of SWR dip - especially for an already near-50Ω load - for all four impedance options. Some of these dips are due to spurious resonances and some are down to the fact that the solution is truly on the borderline. Some are wide, shallow dips; some are narrow, deep and easy to miss. In fact they come in all shapes and sizes. But the only way to find which is the right impedance is to pursue its dip in detail to the best match.

My final algorithm of many does just that. It finds the best match for each impedance by using first coarse steps to find any dips. Picking the best one, it then alternately dithers the L and C values up and down to find the required direction to produce a better match. If the match starts to get worse, that direction is quickly abandoned. If there is no change (which is what happens most of the time) that direction is pursued - since you never know when a dip is just around the corner. But little settling time is allowed for the relays, relying on the hardware to smooth the resultant DC reflected power level. However, as soon as any hint of improvement is noted, the algorithm slows down to allow full relay settling. Once the bottom of the dip is passed, it's all over!

There are other subtleties, but the result of all of this is the best solution for each of the four impedance options - and the best one of all is the winner. The time to do this varies with the load, but is typically somewhere about 20 seconds.

This is a necessary improvement on three hours, but must carry some inescapable risk. The risk occurs early on; that, in

going for the best dip after the coarse pass, the wrong one is picked. This risk is minimised by keeping the coarse steps small - which, of course, in the limit takes you back up towards three hours again.

I have tested the algorithm against a wide range of reactive dummy loads - and real antennas - at different frequencies. The algorithm does not always produce the same result (there are often two or more genuinely good answers), but it has never got it truly wrong yet. If it should happen to you, my suggestion would be to let it try again, perhaps at a slightly different (and preferably higher) power level. By its nature I can't anticipate the problem; if I could I would code it out.

But for sure, if your transmitter contains any significant spurii (harmonic or otherwise) then, although it will always indicate unity SWR into a dummy load, it will play havoc with any reflected power measurement into a real antenna.

Peter Hart reviewed the SGC SG-231 Smartuner [9] using a 100W light bulb as a dummy load. As he points out, this varies in impedance between 50Ω and 500Ω with increasing applied power. The SG-231 passed the test of matching it, but I suspect PicATUne would not - except by luck. My algorithm does not anticipate the antenna changing impedance with applied power - on the contrary, it assumes that the antenna impedance remains constant at any given frequency.

The same load was used to judge internal heat dissipation and hence efficiency. Without any implication that the SGC is less than efficient (I have never tested one), it is worth pointing out that any ATU will be efficient into this sort of load. As the graphs in Part 1 show, the real stress areas into real antennas do not lie around the 500Ω region for an L-match. Nor do they for any other configuration.

OPERATIONAL USE

PicATUne HAS ONE normal default mode of operation (and eight other modes used variously for training and maintenance). Each mode is named for the CW character sent when first switching to it - and that letter is also a prompt for its function.

NORMAL USE - MODE K

Entered at power on, this is the default mode for operational use. Whenever you hear a **K**, it means - unsurprisingly - over to you. All other modes revert to K on completion. Once you have a stable installation, you need never leave this mode.

In Mode K, PicATUne constantly monitors the frequency of your transmission - and repeatedly fetches the pre-stored solution from memory for that frequency - and applies it immediately on a break in transmission. A Morse dot or a snatch of SSB speech is sufficient; merely pressing the PTT switch is often enough. This process is called 'Restore from Before'.

In practice, a 'break in transmission' occurs when the SSB waveform takes a dip at normal speech frequencies, ie roughly every 10ms. An actual pause in speech is not needed. On CW, the gap between Morse elements is used.

During each such brief burst, the software measures the frequency - twice normally, but four times if a change is detected - and only if it gets the same result each time, looks up the matching solution in memory for that frequency. If none is found, it searches both up and down from that centre frequency till it finds the nearest solution - or the band edge(s). This entire process is essentially instantaneous in human time frames - and of course, if you haven't actually changed frequency there is no net effect.

The software contains a zero-crossing detector which minimises relay switching under load. It waits for the brief break - and was implemented purely as a means of making the relays affordable. So, if you are using a constant carrier mode, eg a data mode or FM, you absolutely must send a quick burst after you change frequency to allow switching.

Following any change in band you will hear **R K**. Thereafter no further status is reported while you remain on that band - but a different solution will be applied as necessary should you change frequency within the same band.

Note that PicATUne makes no judgement about the quality of the solution. As a matter of design philosophy, you are in total control, and it is up to you to decide if the SWR is too high - and to train PicATUne to a better solution for that frequency (assuming one exists).

If - very unusually - there is no stored solution for any frequency in the band then PicATUne will send a constant and annoying **XK** sequence. This sequence ceases on pressing the Command Switch.

USER-SELECTABLE MODES

THESE MODES ARE made available by pressing the Command Switch while in Mode K. PicATUne responds by sending the user-selectable mode letters **M U S I C** - an easily remembered acronym. If none of these characters is selected, operation continues in Mode K.

To summarise what follows, the modes and their initials are:-

Match from Scratch

Utilities

QRS or **Q**RQ

Erase solutions

Dummy load

Status

Inhibit

Configure

Mode M

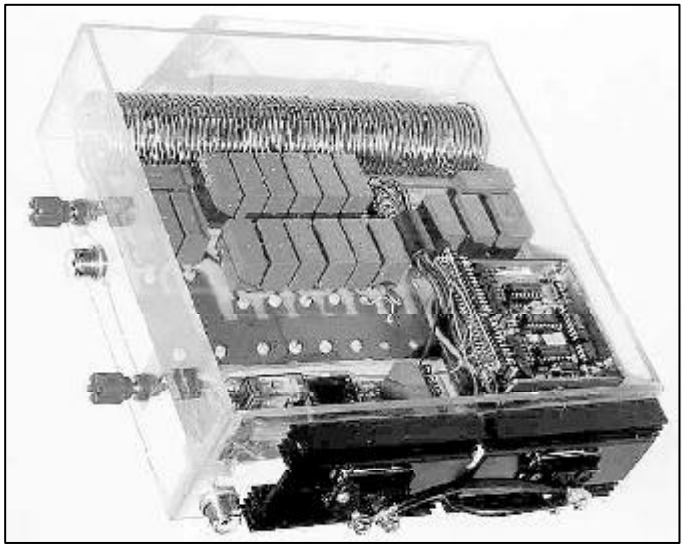
'**Match from Scratch**'. This is the mode you use to command PicATUne to find and remember a new matching solution.

On entering Mode M, PicATUne sends **R** to acknowledge your command followed by **M** continuously repeated.

You then supply a steady carrier for about 20 seconds. The time varies depending on the nature of the load. As for power level, 10W is ideal. 5W is acceptable and 2W will often produce a result. Anything over 40W risks saturating the detector, especially on the low bands - which will merely have the effect of prolonging the matching time. PicATUne is in 'quiet tune' during matching so for 10W in, you will be radiating 40mW. This is not much, but it is not nothing!

Whatever power level you use, *do not alter it during the matching process*. If you should get the power level badly wrong, immediately stop transmitting - which aborts the process - and start again. (You can do this deliberately while setting the power level in the first place.)

After detection of the carrier, PicATUne finds the best match and stores the resultant solution against the frequency in use. Throughout the matching process you will note that your SWR bridge reads close to unity



- and the intensity of the Command Unit LED varies. When it starts to flash at about 1Hz, you know matching is complete and you can stop transmitting.

PicATUne then reverts to Mode K with the matching solution applied - and you will hear **R K**. If you have not held the key down long enough, you will hear **M** continuously repeated. You need either to re-apply carrier for long enough to find the solution - or you can press the Command Switch to abort and return to Mode K.

Up to 1000 different solutions may be stored, sufficient for a potentially-different solution every 5kHz throughout the nine bands 160m to 10m - (slightly larger band allocations than the present USA allocations are assumed). If you use PicATUne outside these allocations, the results are not predictable.

Mode U

Utilities mode brings up **R U** followed by **QED**, the initials of the three utility modes.

Mode Q (QRS or QRQ) allows you to toggle CW speed between about 12WPM and about 20WPM. On first use, PicATUne is set to the slower speed. Even if your CW is truly appalling, this will soon seem very slow. When you select Q, the speed will immediately change and operation reverts to Mode K. Your speed selection is remembered even after powering off.

Mode E (Erase memory contents) erases all stored matching solutions. Use it if you change your antenna installation, thus invalidating the solutions.

Before erasing, you will be asked to confirm - **CFM** - by pressing the Command Switch. If you do, you will hear four **E**s, at about one second intervals, one for the successful erasure of each 8k memory block. There is no way back!

Mode D (Dummy load) is for your general convenience - and that of other operators. It switches in the dummy load with the L-match and antenna grounded to give vanishingly-small radiation.

The character **D** is sent continuously while Mode D is activated - and is exited to Mode K by pressing the Command Switch.

Mode S

Status mode reports the current PicATUne settings. It uses binary values, with a dit representing a '0' and a dah representing a '1'. The most significant bit is sent first.

Besides obvious value in commissioning, the L, C and Z information is useful in determining if PicATUne is matching in a 'risky' region. More about that later.

L 6 bits which L1 turns in use
C 11 bits which capacitors in use
Z HI LO ONLY L ONLY C
FREQ 13 bits frequency ÷5
BITS
BIT A ON or **OFF**
BIT B ON or **OFF**
BIT C ON or **OFF**
BIT D ON or **OFF**
BIT E ON or **OFF**

Fig 23 allows you to perform an approximate conversion of L1 turns to inductance. The frequency bits have the normal binary weighting, but need multiplying by five to give the answer in kHz. Some examples are:-

3.7MHz	00010	11100100
14.2MHz	01011	00011000
28.5MHz	10110	01000100

Note that this is not a frequency standard in any real sense. Its sole purpose is to let you check that PicATUne is getting the frequency about right. Pressing the Command Switch at any time aborts Mode S and PicATUne reverts to Mode K with **ARK**.

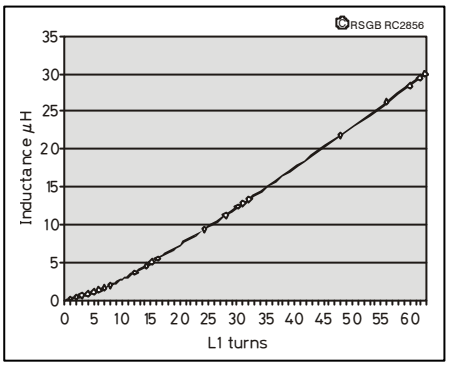


Fig 23: Measured inductance of my coil. Yours may vary from this, but the difference is unlikely to be significant when plotting your operating point on the graphs in Part 1.

Mode I

Inhibit mode. This mode inhibits all activity and explicitly prevents PicATUne from changing the matching solution. In this mode the PIC chip itself goes to SLEEP and ceases all activity including its 4MHz clock, thus preventing the possibility of any internally-generated noise finding its way into your receiver. Since all the serious PIC activity occurs while you are transmitting, this latter is not a realistic risk - but better safe than sorry.

This mode is particularly useful if other strong transmitters are in the immediate vicinity, since there can be enough pick-up on your antenna to cause PicATUne to react to a strong inbound received signal. Pressing the Command Switch gets you back to Mode K.

Mode C

Configure mode allows you to specify the behaviour of the five optional output bits. Why you might want to is covered in a moment.

Of these, Bit A is a simple on/off toggle switch. Firstly, you will hear **BIT A** followed by **ON** or **OFF**. If you select it, the switch immediately toggles and PicATUne reverts to Mode K. The switch setting is remembered during power off.

If you make no selection against Bit A, PicATUne will then play out four bits (B-E) against each of nine bands, in the sequence 160m-10m. A typical 'line' is:-

20m N Y N N

This example states that if you were to operate on 20m, Bit C would be set.

To alter a given setting, simply select it as it goes past and PicATUne will toggle it Y/N and then replay the entire line for confirmation before continuing. Thus, to change all four settings (in any order) you would make four passes through the line.

There are a total of 36 settings (9x4) to provide maximum flexibility for your application. The net result of altering any of these 36 configuration settings is first applied after the next burst of transmission. They are all remembered during power off.

SWR PROTECTION

An inherent problem with any auto-ATU is that of presenting your transmitter with SWR spikes when changing bands. For example, if you are operating on 80m and change to 40m, the 80m solution is likely to present a very high SWR to your transmitter on 40m. This only lasts for a few milliseconds while the ATU measures that something radical has happened - and fetches and applies the 40m solution. But, during those few milliseconds, your PA transistors can exhibit their fuse-like properties.

I am not aware of any commercial auto-ATU which does other than rely on SWR protection in your transmitter to save the day. Ironically, if it works to shut down the PA quickly and hard, then there may not be enough RF energy reaching the ATU to allow measurement of the new frequency.

PicATUne has two defence mechanisms:

1. If very high reflected power is measured in normal use, PicATUne will switch instantly to its dummy load. This in turn allows your transmitter to develop full power - allowing PicATUne to measure the frequency, find the solution, apply it and then remove the dummy load. This all takes milliseconds and, unless you have a hard fault on your antenna, you are unlikely to be aware of it.
2. If your PA is unprotected - or you don't wish to rely on it every time you change bands, proceed as follows:-

- Change bands on your transceiver but, before transmitting, press the Command Switch to bring up the **MUSIC** menu.
- Transmit a Morse dot or utter a brief word. You are on dummy load, so nobody will hear you. Immediately key-up.
- If you continue to hear the main menu,

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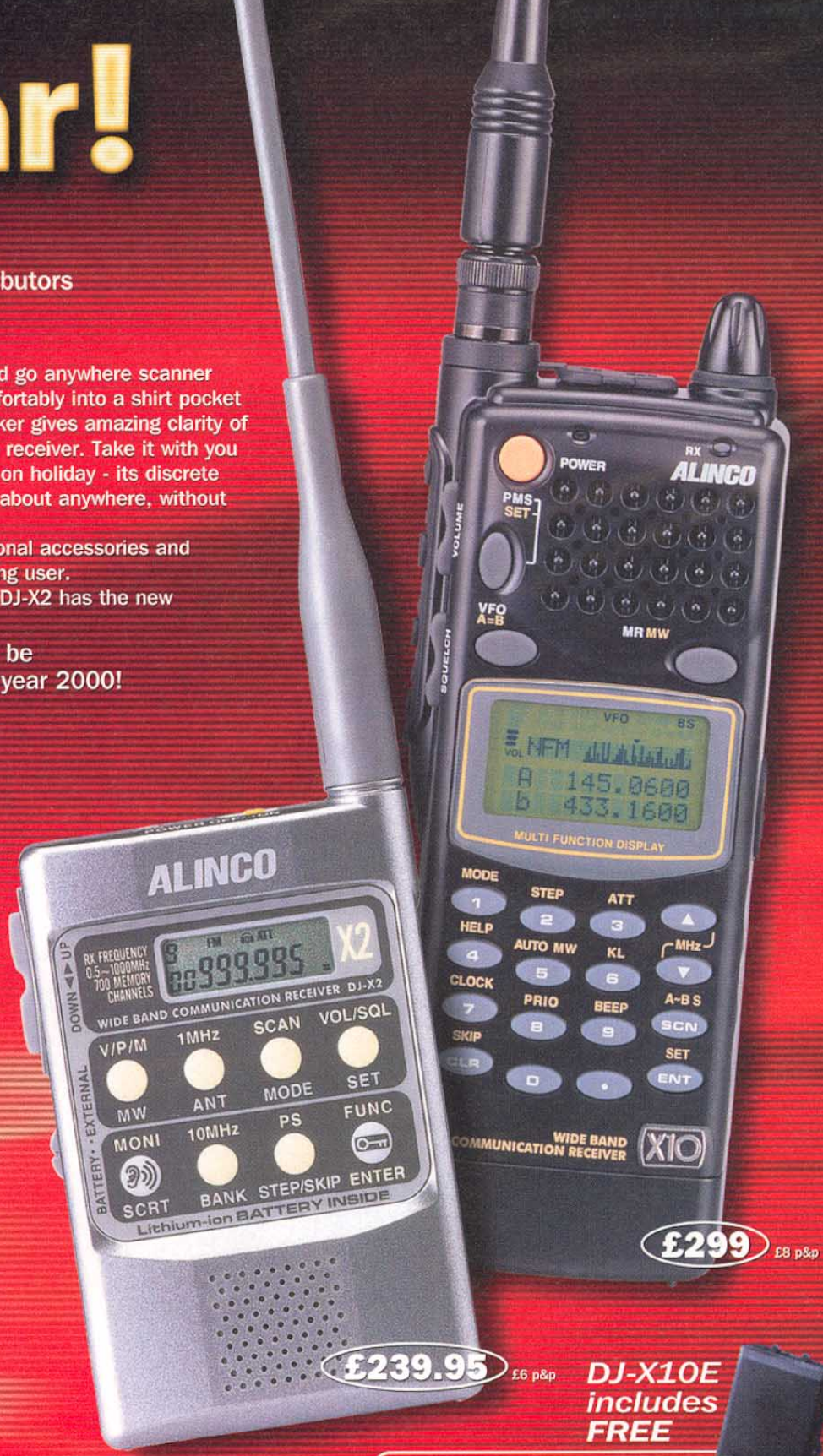

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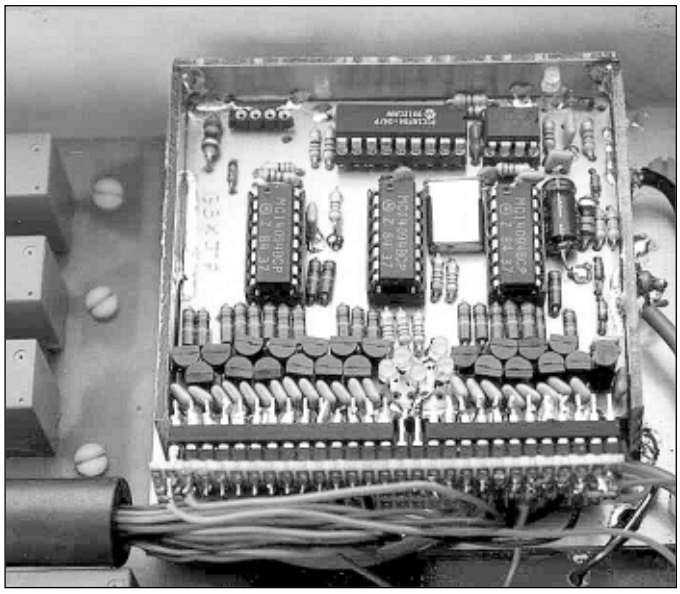
then you have not transmitted enough power even to be noticed. If you hear a succession of **T**s, then you have not applied enough power for long enough for accurate frequency measurement. Apply more, and the **T**s will cease. (Or press the Command Switch to escape completely.)

- Normally, however, you will hear **R K** and you will have changed bands without ever presenting your transmitter with other than 50Ω - even for an instant. Nor will you have radiated. For both these reasons, this is the preferred way to change bands.



The PicATUne logic board.

GENERAL INTERFACE ISSUES

Although PicATUne is simple to use, there are some issues to watch out for:-

- If you make a mistake in menu selection, the simple rule is - do nothing! PicATUne will find its own way to a stable situation - normally Mode K.
- If you want to hear CW messages from PicATUne, you must be listening! PicATUne cannot tell if your transceiver is on receive - or on transmit but with no output. If you are operating SSB without VOX, or CW without break-in, you will miss any message sent at key-up time if you do not lift the PTT line briefly.
- If you are using a narrow receive filter, PicATUne's CW note may fall outside your passband.
- An interesting phenomenon arises operationally when you are by chance on a frequency that is spot-on the transition between two different solutions. You may find PicATUne flips back and forth between them, especially on SSB where your actual voice frequencies of the moment determine the transmitted frequency. This is not a problem and can be safely ignored. But, if you are within earshot of PicATUne, the noise of relay switching can be a nuisance. You can always engage Mode I (Inhibit) to stop it happening. Equally this *may* be evidence that you have got too many closely-spaced - and unnecessary - matching solutions.

PIC YOUR ANTENNA

THE OPTIONAL bit outputs provide a unique and powerful means of automatic remote antenna selection. They are designed to drive external relays - though a few extra ones could be judiciously accommodated within the PicATUne enclosure. It is up to you to use relays which can stand the strain in your application.

Bit A is switched directly from the Command Unit, providing remote *manual* antenna swapping. It is designed to drive a relay which diverts the coax input to the L-match instead to a further coax socket and thence to an already well-matched alternate antenna. The L-match is thus bypassed, but will continue to be set. So when you switch back to the matched antenna, it will be instantly available.

If this 'alternate' antenna is, in fact, the only one you want to use on a given band, it would be better to configure one of the four frequency-sensitive bits (bits B-E). You would then *automatically* switch to this antenna whenever you used that band.

Here are a few other ideas for those frequency-sensitive bits:-

- Nested mono-band Quads or Yagis. Feed them with one coax run up to PicATUne near the masthead and then configure the bits to route a separate short coax lead to each antenna - as a function of frequency.
- A mast with both beam and wire antennas. Much as above, you can specify which antenna is to be selected on which band.
- On any band (particularly the low bands) if PicATUne has not enough matching range, you can arrange selectively to switch in some external reactance to improve the match.
- Many antennas benefit from different earthing arrangements or counterpoise lengths on each band. These too can be switched in automatically.

This feature is very versatile, but suffice it to say if you have no interest in it, all you have to do is ignore it.

BALANCED ANTENNA OPTION

IF YOU WANT to feed balanced loads - yet still retain an unbalanced capability - you need to insert a choke balun in the coax feed from the SWR head to the L-match input. This is made possible because the whole L-match is floating at RF - except for the braid of this coax.

I taped together four 3/8in ferrite rods, 145mm long to form a square(ish) cross section and then wound 23 turns of RG58 round this. This assembly fits in the space on the copper side of the RF deck sensor section - between the SWR head and the casing.

Another approach - but for balanced configurations only - is to fit an external 1:1 balun at the antenna and counterpoise terminals. This practice is employed by the commercial ATU manufacturers, but I confess doubts about its effectiveness. Such baluns do not work well in the presence of a reactive component.

FIRST USE

CONNECT UP any antenna of convenience to PicATUne, placing it where you can see and hear it. Keep your power level to no more than about 10W and set the spark gap to a few thou until you gain confidence.

Run through all the menu options to gain familiarity. Specifically, try out the erase mode (Mode E) since you may well not want to do so later once you have some real matching solutions stored.

Then use Mode M to find some matching solutions - preferably on different bands - and practise subsequent band changing.

TRAINING PicATUne

ONCE YOU ARE confident PicATUne is functional, mount it in its target location and connect up the antenna(s). Choose a pleasant day and fit PicATUne (not weatherproofed) to give you access to the spark gap. Remember to use Mode E first to get off to a clean start.

Starting on the lowest HF band of interest, check that you can obtain a reasonable match on all the HF bands. If you have any problems, pay particular attention to the quality of your counterpoise, ground plane or RF earth - depending on the type of antenna you are using.

Ultimately, if your antenna is too short, PicATUne will not be able to match it. A possible way round this was just discussed.

If your antenna system is near half-wave resonant and end-fed - or full-wave and centre fed - there may be portions of the band which will not produce a good match (see Part 1, Fig 1). Altering the antenna length slightly either way should fix it - and in general, longer is better.

For each band, start at the band bottom edge and use Mode M to 'Match from Scratch'. Then move up the band, check-

The author, G3XJP, completing the weatherproofing of PicATUne.

ing the SWR. As soon as it starts to become unacceptable, use Mode M again to find a new solution. Repeat until you get to the top band edge. With some antennas, the same match will cover the whole band. With others, especially if the antenna is naturally near resonance, you will need many different - potentially radically different - solutions.

Then (using Mode S), plot your operating points on the graphs provided in Part 1. Alternatively, the Mode S data may be entered directly into the QBASIC utility. This vital step ensures that you are not operating in a danger zone - or at least that you understand and accept the limitations.

In all the above caution is a wise practice but, in reality, there are few issues unless you want to push the power to (but not beyond) the design limits.

As a final check, turn your power up to the normal operating maximum and check that there is no flashover on the spark gap at any frequency. You will be able to see the arc at night from a distance and hear it on any broadcast receiver. If there is, open up the gap as little as you need to, but absolutely not to more than 75 thou (2mm) - ie 1.5kV. If the spark gap is flashing over you will generate substantial TVI and BCI, so you must check that there is no evidence of this at full power - on all the bands.

Finally, complete the weatherproofing and enjoy!

ACKNOWLEDGEMENTS

THIS PROJECT was tested by Alan, G3TIE; Keith, G3OHN; Peter, G3XJS; and David, G4FQR. Without them and the power of instant information and software exchange over the Internet, it would never have seen fruition. My thanks to them for their invaluable help in verifying the drawings, making suggestions for this article and getting the software features tested and honed.

My thanks to Steve, G4ZBV, who took all the photographs and to my wife, Fran, for her active contribution and endless patience. ♦

REFERENCES

[8] 'An Automatic Antenna Tuner: the AT-11', by Dwaine L Kincaid, WD8OYG, *QST*, Jan 1996.

[9] 'SGC SG-231 Smartuner', reviewed by Peter Hart, G3SJX, *RadCom*, Feb 2000.

The RF and Logic printed circuit boards can be obtained from M0CJX. Contact him for further information including price and availability.

Paul Berkeley, M0CJX,
1 The Beeches,
Banstead, Surrey SM7 2AZ.
Tel: 020 8255 3059
Fax: 020 8255 2436
E-mail: m0cjx@lineone.net

RadCom Helplines FOR MEMBERS

● Colin, G0GVN, is looking for help with a problem on his **Kenwood TS-530S**. Is anyone out there familiar with fault-finding on this model? G0GVN, QTHR. Tel: 01442 253 612.

● Harry, G3DAM, is searching for a plunger-type relay used in a modification to the **Heathkit SB-220 Linear** (modification 830-94). He is also looking for the click-on front cover for the meters in the SB-220. G3DAM. Tel: 01386 419 51.

● Adrian, G4JBH, is the Director of various radio courses held at Kilve Court Residential Centre in Somerset. He requests the donation, loan, or sale (for a nominal fee) of **Kenwood R-600 (or similar)** receivers for use by the students, with the intention of fitting out a permanent listening classroom at the centre. Condition is not important. G4JBH, QTHR. Tel: 01288 331 113. E-mail: g4jbh@compuserve.com

● Geoff, G4DED, is searching for the circuit diagram and specification of the **Microwave Modules MMT 432 / 28 Transverter**, and wishes to thank all those who responded to his previous plea for help. G4DED, QTHR. Tel: 07931 528 269.

● Don, G8AYK, is trying to find someone who could help him by supplying a copy of the Service Manual for the **Icom IC-505** six-metre transceiver. He will refund all expenses. G8AYK, QTHR. Tel: 01278 784 570.

● Dave, G0SFV, is seeking the manual for a **Standard C-468** 70cm hand-held, and will pay all expenses. G0SFV, QTHR. Tel: 01273 566 178.

● Roy, G3JNM, is looking for technical information on the **Star LC24-200 dot-matrix printer**, particularly the power supply output voltages and circuit diagram. G3JNM, QTHR. Tel: 01204 843 999.

● Ray, M0BZC, is looking for a **valve transmitter circuit** published by F G Rayer, G3OGR, in the late 1960s. Covering top band and 80m, it feature a VFO using an EF91, an ECC81/82/83 buffer/doubler and a PA using a 5763 or 6BW6. M0BZC, QTHR. Tel: 01277 625 649 (H) or 01277 632 759 (W).

● David, VE6DXX, is looking for a copy of the article on the '**Morseman**' and especially the software which was published in *RadCom* around 1989, perhaps. He is trying to get a new EPROM for a test version he built up, to help a friend learn CW. VE6DXX, tel/fax: 001 780 922 0881. Short e-mail: 7809915973@text.telus.com

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MARCH 18th 2001

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CROSSED FIELD ANTENNAS

HAT Compact and Inconspicuous antennas as advertised in Last Month's RadCom are the main business of our marketing activity. For details please refer to page 22 of the December issue. There are Multiband and Monoband forms for HF, so if you are restricted by site limitations or planning rules, consider a Delay-Line Radiator or a Loop both of which work on the principals of our patents of the Crossed Field Antenna. For technical information and suggested placements, please telephone or write.

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Newcomers' News

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

FOR SOME REASON this month's post seems to feature lots of news about antennas. This was not planned but here goes with the Newcomers' News antenna special!

ANTENNA ANTICS

IN THE DECEMBER column I mentioned that Don Lamb, G0ACK, had some interesting news on Novice antenna activities. Like several NRAE instructors, myself included, Don uses the syllabus requirement to put up an antenna as a good excuse for a 'mini field day'. In Don's case the day consisted of taking the students out to Horsenden Hill in Surrey for some portable work on the 144MHz band.

The station was quite modest, just the sort of thing the Novices might have, once licensed: a couple of watts of single sideband (SSB) and a 7-element beam. Nevertheless, the group was soon in contact with M2000A, the special Millennium call from Greenwich, and three of the students were able to pass greetings messages to the special event station. To prove that 2 metres is not *just* a local band, the Yagi was swung round to the continent. A Dutch beacon was received from 320km away and a French contact (QSO) was clearly heard to be in progress.

All in all the day went well, despite some unwanted attention from a kite flyer and an over-inquisitive youngster who almost tripped over the guy ropes keeping the portable mast upright.

The Novice students had learned something about VHF propagation, observed the directional properties of a beam antenna and experienced some of the more practical aspects of operating a portable station. Well done Don, and the students from the Radio Society of Harrow who should be licensed in their own right by now.

Mike Coombs, G3VTO, and I will be out with our NRAE class in February so look out for us on Saturday mornings and call in if you hear us.

'HOME BREW' ANTENNA

WHEN I VISITED David Berry, G4DDW, the other month he gave me the plans for a 70cm Yagi that he had built for himself.

Not only has he successfully used the antenna on air but he also used it to good effect to demonstrate those directional properties to his Novice students. Best of all, it cost next to nothing to build! The elements are made from 12mm aluminium tube but David says that welding rods also work well.

The tube is cut to length, slotted through a wooden boom and held in place by brass screws or self-tappers. The driven element is cut in the middle and supported by additional wooden blocks. The antenna is then centre fed with 50Ω coax. When complete, the whole structure is well varnished to keep out the weather.

David doesn't have any technical specifications for the antenna's performance but it has gain and it is directional. It can also be used for direction finding (DF) reception by fitting a small value (150Ω) potentiometer across the driven element and taking the coax feed from the wiper. This will allow you to attenuate the incoming signal but still seek out the direction. *Warning*: do not use this configuration for transmission! I have copies of the basic design and David has agreed that I can supply them to any interested parties. A stamped self addressed envelope (SASE) to the address at the bottom of the page will get you one. Thanks go to David for another super little 'home brew' project for the newcomer.

JODY STEPS UP

THE BROMSGROVE airwaves have yet another new callsign to deal with! Jody Preece, M1JOD, was one of the first under-14s to be allowed to hold a full Class B licence. Now she has passed her 12 words per minute Morse code test and has stepped up to a full Class A licence with the callsign M0JOD. Jody, now aged 13, took her test at the Telford Rally and passed without a single error on send or receive. The rally was held at the Cosford Aeronautical Museum (see page 89 November *RadCom*) and the Morse tests were held inside a BAC 1-11 aircraft. The first 10 candidates all received a special certificate from the Telford club to commemorate the unusual venue.

I am not sure what they are putting in the water in the Bromsgrove area but it does seem to be bringing the youngsters on a treat. As Jody's father, Mick, M0BQF, says, "Yes, the Bromsgrove club does have plenty of youngsters to take over the reins from us wrinklies". Keep up the good work!

SEASON'S GREETINGS

THIS TIME LAST YEAR I took over this column not really knowing how it would be received. I must thank all those who have contributed and those who have written saying how much they enjoy reading about the successes, trials and tribulations of newcomers to the hobby.

I am always pleased to receive news, views, photographs and anything else you think might be of interest to those just starting out, or instructors who are running courses. I would be particularly interested to hear how newly-licensed operators are fairing on the air. What have you worked? Have you managed any awards? Please keep your news and pictures coming in the New Year and have a very happy Millennium and one. ♦

* *5 Sydenham Buildings, Lower Bristol Road, Bath, BA2 3BS.*

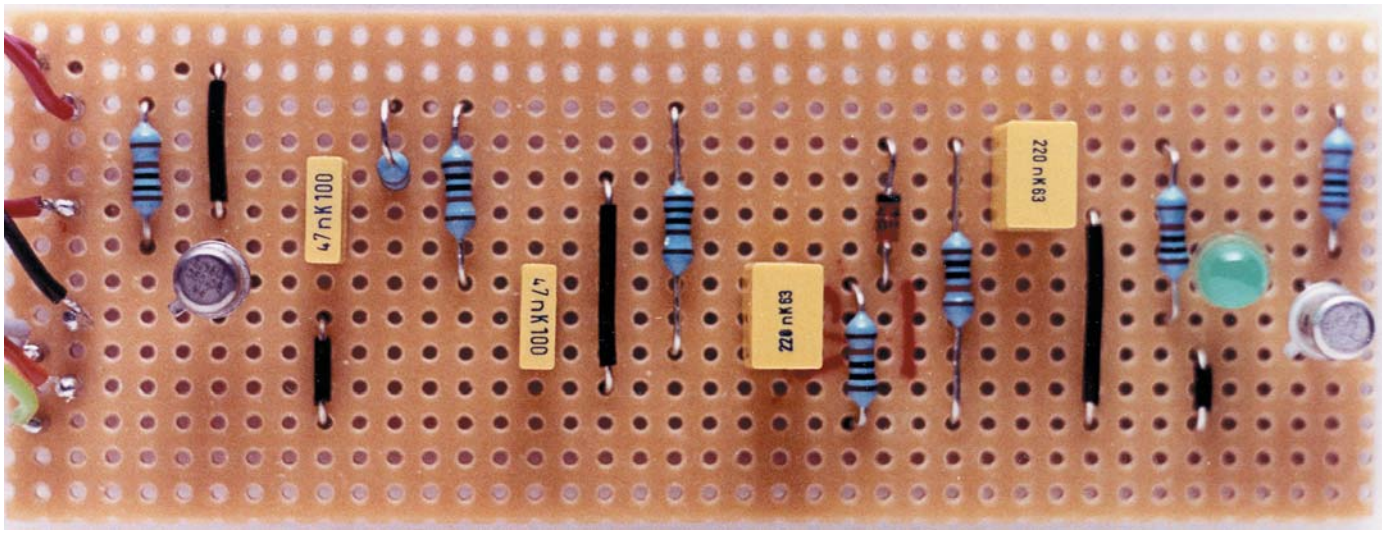
Tom, grandson of David Berry, G4DDW, showing how a Yagi should be used (see 'Home Brew' Antenna).

Jody, now the proud owner of the Full A callsign M0JOD, at her station in Bromsgrove (see 'Jody Steps Up').

Down To Earth

An npn Transistor Tester

by David Clark *



A FREQUENTLY-used method of checking that an npn transistor is not faulty involves measuring the resistance of its p-n junctions, ie between the base and emitter and the base and collector. These resistance values should be low when the junction is forward-biased (anode positive, cathode negative), and high when reverse-biased (anode negative, cathode positive). Additionally, the measured resistance between the collector and emitter should always be high since, whatever the polarity of the test voltage, one of the two 'back-to-back' junctions will always be reverse-biased. This means a minimum of five checks must be made with a multimeter, for example, before a transistor can be considered good.

An 'ideal' p-n junction would have zero resistance when forward-biased and infinite resistance when reverse-biased. Real p-n junctions, however, have a significant forward resistance and a far-from-infinite reverse resistance and so, when checking a transistor by this resistance method, it is often unclear whether the transistor is functioning or not. A more conclusive check would be to see if the device performs its correct function as a current amplifier, and this npn transistor tester circuit does exactly that. The tester also gives an LED indication if the transistor is working, thus avoiding the necessity of having to make a decision based on several meter readings. In this way, multiple checks and reconnections of the transistor leads are not required - only one test is needed after having connected the transistor to three test leads.

* 58 Murray Road, Sheffield S11 7GG

HOW IT WORKS

THE 'DETECTOR' PART of the circuit works by making the transistor under test part of an astable multivibrator (a free-running oscillator) circuit via flying test leads. If the transistor operates correctly, the output of the multivibrator will be approximately a square wave; otherwise it will be a DC voltage fixed at some point between zero and the supply voltage.

The signal from the multivibrator is connected via a DC blocking capacitor to straightforward rectification and smoothing circuits. The output voltage of this section will be zero if the signal from the multivibrator is a DC voltage (ie if the test transistor is faulty). However, if the transistor is switching correctly and the multivibrator is oscillating, the output will be a positive voltage.

The final stage is the 'indicator' section. The voltage from the rectification and smoothing circuits is connected to a transistor that drives the indicating LED; if this voltage is positive (greater than around 0.6 to 0.7V) the LED lights, indicating that the transistor under test is operating. If it is zero, the LED remains unlit.

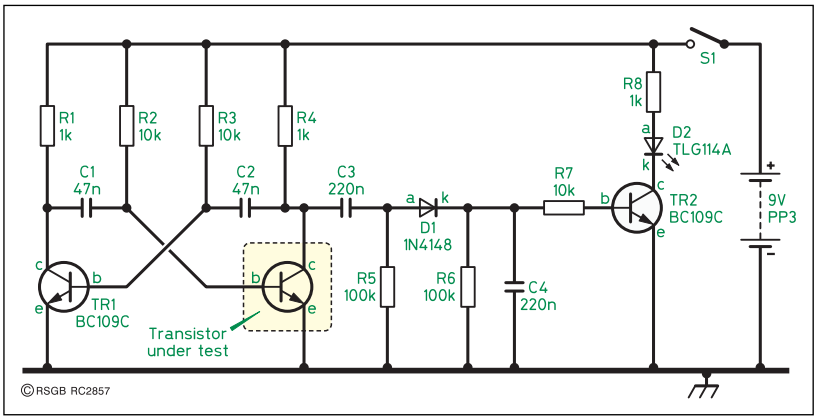


Fig 1: Circuit diagram of the npn transistor tester.

THE CIRCUIT

THE CIRCUIT diagram of the device is shown in **Fig 1**. Resistors R1 to R4, capacitors C1 and C2, transistors TR1 and the transistor under test, form the astable multivibrator. The basic operation of a transistor-based multivibrator involves each transistor alternately saturating (switching completely on) and cutting off

as the output of each transistor is fed back to the input of the other. The rate of switching is primarily determined by the rate of charging of C1 and C2 and hence on the values of C1 and C2, R2 and R3 (the resistors through which they charge). If C1 = C2 and R2 = R3, the frequency of oscillation, f (in Hz), is given by

$$f = \frac{0.7}{R2 \times C1}$$

when R2 is in ohms and C1 in farads. For this project, these values have been chosen to give a frequency of around 1.5kHz in order that both audio- and radio-frequency transistors can be checked. For correct operation, the ratio of R2/R1 and R3/R4 must be less than the current gain (h_{FE}) of the transistors. If this is not the case, the transistor will not switch completely on and the voltage across the associated capacitor will not fall enough to switch off the 'opposite' transistor. By making this a ratio of 10, all transistors likely to be tested are covered. Although a few transistors can have an h_{FE} as low as 25, most have a value of between 100 and 500, some rising to as much as 10,000 (unless faulty of course).

C3 is the DC blocking capacitor that links the multivibrator output to the rectification and smoothing sections made up of D1, C4 and R6. R5 provides a discharge path for C3, hence the voltage on the 'right hand side' of this capacitor can fall to zero if there is no oscillation present. The time constant of C3 and R5 which, at around 22ms, is much longer than the 0.7ms period of the 1.5kHz signal, allows the AC signal (if present) to pass through C3 to the rectifier diode, D1. The time constant of C4 and R6 is also around 22ms, so C4 and R6 smooth the rectified signal to provide a DC voltage to the indicator section (R7, R8, TR2 and D2), thus lighting LED D2 when the transistor under test is working correctly.

R7 and R8 limit the current values to those required to drive TR2 and switch on D2. R6 provides the discharge path for C4 and so, as well as being part of the smoothing circuit, it also ensures that the voltage at the base of TR2 can fall to zero when there is no AC signal. In this way, the LED remains unlit when the transistor under test is faulty.

CONSTRUCTION

A SUITABLE stripboard layout for this project is shown in **Fig 2**. The correct orientations of TR1, TR2, D1 and D2 need to be observed; details of the appearances of these components are also given. They are all general-purpose devices.

To facilitate the connection of the transistor under test to the device, it is useful to terminate the test leads with small crocodile or test clips. It is helpful to colour-code the leads as reminders of their functions. For example, green can be chosen for the lead to connect to the emitter, since it links to 0V. Orange might be chosen for the lead to connect to the transistor base, and red for the lead to the collector, the colours suggesting the increasing positive voltages applied to the emitter, base and collector. The use of coloured test clips or coloured covers for the crocodile clips would be a suitable alternative.

The device could, of course, be run from a power supply instead of a battery, if preferred. The supply voltage is not critical, but naturally should not exceed the maximum rated voltages of *any* of the transistors used. Values between 6V and 15V should be satisfactory.

IN USE

THIS DEVICE can be used to check any npn transistor whose operation is suspect, but it would be particularly useful for checking transistors salvaged from discarded or faulty equipment. Simply connect the test leads to the appropriate leads of the transistor under test and switch on. If the LED lights, the transistor should be fine for use in any circuit for which it is suitable. If the LED fails to light, discard the transistor! ♦

COMPONENT LIST

Resistors, metal film, 0.6W, 1%

R1, R4, R8	1kΩ
R2, R3, R7	10kΩ
R5, R6	100kΩ

Capacitors
(all polyester film)

C1, C2	47nF
C3, C4	220nF

Semiconductors

TR1, TR2	BC109C
D1	1N4148
D2	TLG114A (or any standard green LED)

Miscellaneous

S1	SPST switch
Stripboard	
Battery clip	(for PP3 battery)
Test clips or small crocodile clips	

WARNING!

THIS DEVICE should not, under any circumstances, be used to test a transistor already in another piece of equipment, whether this equipment is switched on or off, or whether it is mains- or battery-powered. Damage could occur to your transistor tester, or even worse, to your other equipment, should you disregard this warning.

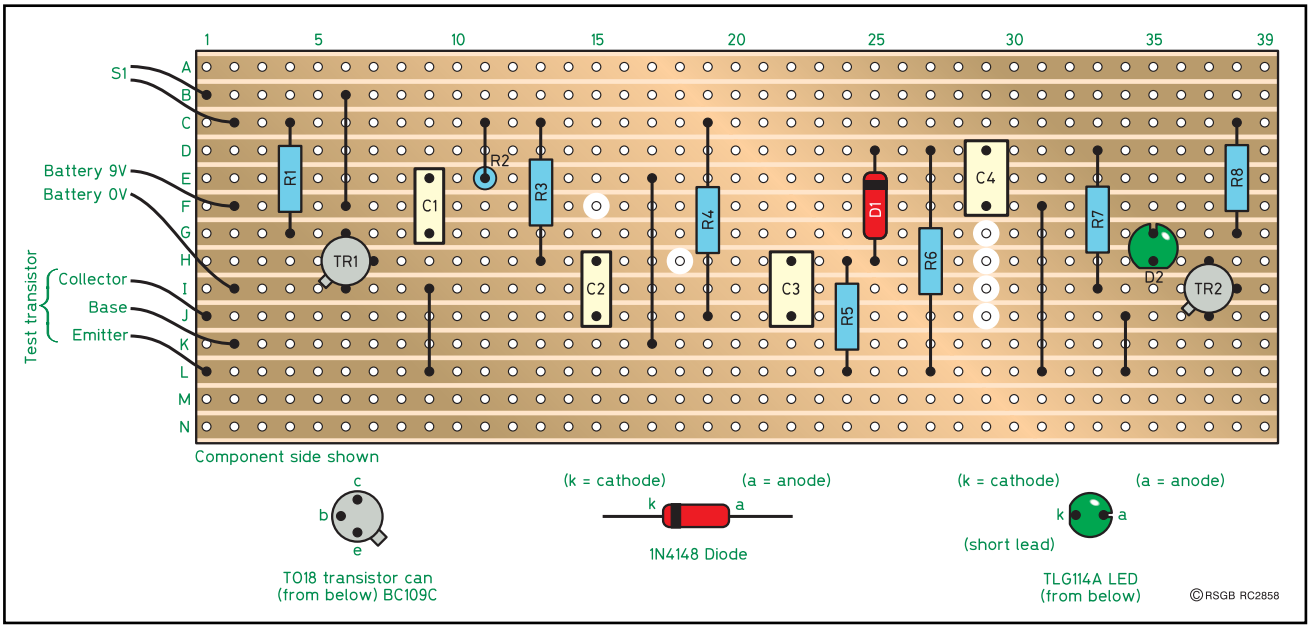


Fig 2: Stripboard layout and wiring diagram for the npn transistor tester.

The Voices

Part Seven, by Gordon L Adams, G3LEQ *

IN PART SIX I discussed the tangled web of intrigue involving the Orford Ness transmitter site used for the BBC's mediumwave broadcasts to Europe. I now start the New Year with another complicated government plot, and take a look at the ever-troubled eastern end of the Mediterranean.

To understand the origin of the 'Voice of Britain' in the Middle East, it is necessary to outline first the political situation in which Great Britain found herself during the 1930s. In 1935 Italy invaded Abyssinia, now called Ethiopia, although she was to be defeated subsequently by British and Ethiopian troops in 1941. The Italians entered the British Consul's office in Addis Ababa and disabled his radio transmitters. Italy was also an enthusiastic purveyor of radio propaganda, and set up a powerful station at Bari, on its Southern Adriatic coast, to direct anti-British broadcasts into Arabia and Palestine. Furthermore, they put out programmes in Hindustani to undermine British rule in India.

PARLIAMO ITALIANO

THE ALSO busied themselves running Italian lessons over the air, inviting their students to send in their 'homework' for correction – and thus built up a valuable mailing list of potential sympathisers. A number of expatriate Britons became sympathetic too. One such was the prominent Arabist Harry St John Bridger 'Jack' Philby, who wrote strongly worded articles against Great Britain to the Egyptian press. His son, Harold Adrian Russell 'Kim' Philby was the Soviet spy, who was employed at the outbreak of the war by MI6, and was later considered to be the most notorious double agent of the Cold War years.

On 3 September 1939 Great Britain and France declared war on Germany, and on 11 June 1940 Italy declared war on Great Britain. The Ministry of Information in the UK raised the matter of the violently anti-British propaganda being directed to India by both Germany and Italy – whose slogan was 'Asia for the Asians'. However, most Indians were at the time even more anti-Hitler than anti-Imperialist. The BBC began broadcasting in Hindustani in May 1941, and later in various other Indian dialects. They aimed particularly at Indian intellectuals, and used cultural material written by such eminent authors as T S Eliot, E M Forster and George Orwell (real name Eric Blair). Indeed, George Orwell was a producer as well as a speaker for the BBC. Apparently his description of the Ministry of Truth in his well-known novel *Nineteen Eighty-Four* was based upon his memories of the BBC staff canteen!

SETTING EUROPE ABLAZE

ON 19 JULY 1941, Hitler made a triumphant speech at the Reichstag in Berlin in which he proclaimed that the Third Reich would last for a thousand years and that "England" would soon be defeated. On the same day Winston Churchill ordered the setting up of the Special Operations Executive (SOE) to "co-ordinate all action by way of subversion and sabotage against the enemy overseas". Amongst their many clandestine activities, SOE formed in 1941 a bogus organisation called the Arab News Agency (ANA). This was organised under cover of the magazine *Picture Post.*

SOE also used government funds to found a radio station called Sharq al-Adna. As I mentioned in part three of *The Voices* (see *RadCom* August 2000), Sharq al-Adna is an Arabic reference to the Wise Old Man of the Ancient Near East. Presumably a British Intelligence officer, who was well read in Arabic literature, suggested this name. Perhaps it was a Major Jerry Parker or another senior SOE man, Bickham Sweet-Escott, who thought of it. At any rate, the two of them were involved in setting the station up in Jerusalem (then part of Palestine) overtly as an Arabic freedom radio under the umbrella title of the Near East Arab Broadcasting Station (NEABS). Privately, British diplomats referred to it as a "very dirty operation"; but it had the unique qualification that because it sold advertising time it actually made money for the British intelligence service!

NEABS was directly financed by the Political Warfare Executive (PWE), who had their offices on the upper floors of the BBC's Bush House; and by all accounts the station put out 'slick and effective programmes', including popular Arabic music, discussions and news involving Arabic affairs. The station even employed an anti-British rabble-rouser named Sheikh Muzaffar, and also the exiled Mufti of Jerusalem Haj Amin al-Husseini, who was a supporter of pan-Arabism. Both of these men added to the station's apparent Arab authenticity.

RADIO EDEN

ON 7 DECEMBER 1941 the Japanese attacked Pearl Harbour in the Hawaiian Islands, because their oil supplies had been blockaded; thus bringing the Americans into the war. The Japanese also broadcast to India, and in 1943 their radio threats actually brought about the partial evacuation of Bombay. The BBC did not broadcast back to Japan because shortwave receivers, both before and during the war, were illegal in Japan. At the time, Anthony Eden (later Sir Anthony) was in his second term as British

SHARQ AL ADNA

The Near East Arab Broadcasting Station

Wavelengths of our stations (all 7.5 kW)

ZJM3 90.36 meters (3320 kc/s) 5.55am-7am, 1230pm-4.45pm, 5.45pm-9.30pm

ZJM4 48.90 meters (6135 kc/s) 5.55am-7am, 5.45pm-9.30pm

ZJM5 48.62 meters (6170 kc/s) 5.55am-7am, 5.45pm-9.30pm

ZJM6 44.18 meters (6790 kc/s) 5.55am-7am, 1230pm-4.45pm, 5.45pm-9.30pm

ZJM7 25.60 meters (11720 kc/s) 1230pm-4.45pm

ZJM8 31.09 meters (9650 kc/s) 1230pm-4.45pm

Daily programmes in Arabic are from 5.55am to 7am, 1230pm to 4.45pm, and 5.45pm to 9.30pm

The news is broadcast at 6am, 7.30am, 1.30pm, 2.30pm (with a Press Review), 6pm, 6.15pm at dictation speed, 8.30pm and 9pm

Director: Mr F.W. Benton, Manager of Broadcasts: Mohhammed Bey Ghussein, Chief Engineer: Mr A.W. Dean, Deputy Manager of Broadcasts: Ahmed eff Jarrah

Mahhattat a sharq al adna

Reception reports will be welcomed and answered by QSL cards if requested

Table 3: HF schedule for Sharq al-Adna, callsign ZJM, in 1956 (the abbreviation kc/s was used for kilocycles, rather than the later kHz, meaning kilohertz).

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

BBC staff at Caversham Park in 1952 monitoring radio transmissions from around the world. The communications receivers are the GEC BRT-400 series and the headphones are by S G Brown.

Foreign Secretary. Indeed, it was he who had caused the setting up of NEABS, which was nicknamed by British expatriates in the Near East as "Radio Eden".

By the end of the war in 1946, a controversial character by the name of Frank W Benton had become the manager of Sharq al-Adna. SOE was wound down and MI6 (the Secret Intelligence Service) covertly restructured NEABS. In 1947 SIS put a second station on the air, using the facilities of Sharq al-Adna, to broadcast to Iran. However, in 1947 the United Nations agreed to try and partition Palestine into separate Arab and Jewish states. The British, who had been there between the two world wars under a League of Nations mandate, pulled out in May 1948 when the State of Israel came into being. Fighting broke out promptly between the Palestinian Arabs and the Jews, and the whole NEABS operation had to be moved to Cyprus. The newly-created Israeli intelligence service Mossad Institute-B would not have been well disposed towards Sharq al-Adna!

YES, MINISTER!

IN JUNE 1948, a British Communist MP, Philip Piratin, asked the Foreign Secretary Ernest Bevin "whether he was aware that the radio station in Cyprus, and run by the Foreign Office Information Department (FOID), has been encouraging the Arabs in their invasion of Palestine". Bevin replied that "the station is not run by the FOID, nor has the Government of Cyprus any responsibility for it". He went on to say "that it is operated by a body of people connected with the Arabs". In fact, NEABS was a front company and included on its board a number of British VIPs, all of whom were members of the Athenaeum Club.

This last comment might seem obscure to readers who cannot remember England during the immediate post-war years; but membership of a London club, and particularly the 'right' club indicated that you were likely to be an *'eminence grise'*. The Russians would say that such a person was a member of the *'nomenklatura'*, namely a behind-the-scenes political manipulator!

At the time of the move to Cyprus, Great Britain was its colonial administrator - having taken control of the island in 1878 from the Ottoman Empire. Sharq al-Adna was duly installed at a site called Polimedia, just north of Limassol. Its headquarters building had an air of peaceful opulence with a marble staircase and wall-mounted mirrors.

In 1956 Gamal Abdel Nasser became the first President of Egypt. He had fought in the Arab-Israeli war of 1948, and prior to his rise to power he had organised an anti-British republican group called the Free Officers Movement.

They ousted King Farouk in 1952 and toppled General Muhammad Naguib in 1954. On 26 July 1956 Nasser nationalised the Suez Canal, and he announced that the revenue would be employed to finance the Aswan High Dam, which Britain and the USA had refused to fund. Anthony Eden, who had succeeded Churchill as Prime Minister in the UK in 1955, was incensed by Nasser's action.

FEROUZ ENTERTAINS

UP TO THIS point in time, it is fair to say that Sharq al-Adna had a widely-spread Arabic audience throughout the Near East, and was especially popular in the Lebanon, Jordan and Palestine. The station had two MF outlets on 638kHz and 1322kHz, one of which employed a 100kW Marconi transmitter, plus several 7.5kW shortwave senders (see **Table 3**). The other MF transmitter was probably a 10kW black and chrome panelled machine of American Gates manufacture (see part 8 of 'The Voices'). However, later on, a second 100kW Marconi unit joined the first mentioned at the nearby BBC Zyggi site. Sharq al-Adna had studios in Beirut, its own orchestra and correspondents in Cairo.

Apart from management, the staff was primarily Palestinian Christian, for whom Frank Benton had a great empathy. Early in the morning the station would open with 30 minutes of Koranic readings.

Then, just after 7.00am and at 5.00pm, the staff would take tea under the carob trees outside the Polimedia building, which was situated on a hill with a fine view over the Bay of Limassol. Later in the day it would carry drama, poetry, Arab music and anti-communist pro-Arab news commentaries. The celebrated Lebanese female singer Ferouz was featured frequently. The station published a glossy brochure for advertisers, yet it was all operated secretly by the British government!

A cartoon from 1943 showing that it was possible to take a satirical look at foreign-language broadcasts.

VICAR OF DIBLEY?

THE SCENE CHANGED dramatically on 30 October 1956 (see part 3 of 'The Voices') when the British government openly seized its own station. This was because the BBC had been unwilling to become a mouthpiece of the Eden government. It was even said that Eden was so furious that he had considered a government take-over of the BBC. It was at this time that a Foreign Office MI6 appointee was placed in the BBC's Overseas Service HQ in Bush House, London. The British Chief Executive of Sharq al-Adna in Cyprus, Ralph Posten, called all the staff together, in order to explain the imminent changes. Unfortunately, in an effort to try and keep the staff, he agreed that they could state over the air that they were broadcasting "under duress".

The BBC Monitoring Service at Caversham Park near Reading received these statements, and Ralph Posten and his wife were put under house arrest by the British authorities in Cyprus. A Brigadier Bernard Ferguson flew out from London to take over, and immediately alienated all the Arabic staff – who walked out. Ralph Posten was said by the locals to have been given a choice of "committing suicide or returning to England and becoming a vicar"! Whatever the truth of this, he was brought back urgently to London, and Sharq al-Adna became 'The Voice of Britain' overnight. The BBC suddenly found that some of its transmission facilities in Cyprus had been taken over by the British government VOB station, and listeners became confused about the authenticity of the programmes that they were hearing.

British and French paratroopers dropped on Port Said on 5 November 1956, backed up by heavy bombing of Egyptian airfields. The rest, as they say, is history.

Next month Gordon Adams will reveal the purpose of some other strange 'Voices' – the so-called 'numbers stations' that have intrigued short wave listeners over the years. ♦

product news

ACOM AMPLIFIER

THE NEW **ACOM 1000** is a linear amplifier covering all HF bands from 160 to 10 metres, *plus* 6 metres. It provides up to 1000-watts continuous output, with comprehensive protection against mistuning, high SWR, overheating etc. It is easy tune using the LCD rapid-tune feature. The Acom 1000 measures 16.6 x 14 x 7.2in and weighs 40lb. The price is £1495 inc VAT and supplies should have arrived in the UK by the time this appears. We hope to feature a full review by Peter Hart of the Acom 1000, and its big brother, the Acom 2000, in *RadCom* soon.

Vine Antenna Products, The Vine, Llandrinio, Powys SY22 6SH; tel: 01691 831111; fax: 01691 831386; e-mail: ron@gw3ydx.demon.co.uk; web site: www.gw3ydx.demon.co.uk

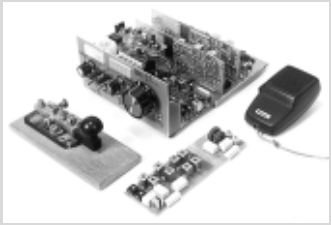
KENWOOD TS-2000 AND TS-B2000

KENWOOD'S LONG-AWAITED 'DC to daylight' transceiver is now available - in two versions. The **TS-2000** covers 160 - 10m plus 6m and 2m with 100-watts output, 50W on 430MHz, and 10W on 1296MHz (with the UT-20 option) - more bands than on any other transceiver in its category. For the first time in an HF radio, a built-in TNC allows operators to receive the DX Cluster, without the need of a PC. The transceiver is available in two versions: the 'conventional' TS-2000 and a 'black box' version known as the **TS-B2000** that can be remote controlled using a PC. Expected prices are just under the £2000 mark.

Kenwood UK Ltd, Kenwood House, Dwight Road, Watford, Herts WD1 8EB; tel: 01923 655284; fax: 01923 819131; e-mail: ts2000@kenwood-electronics.co.uk

WALFORD ELECTRONICS BRISTOL

THE **'BRISTOL'** IS **Walford Electronics'** latest for kit-building enthusiasts. It is a CW and SSB transceiver kit for any / all bands from 160 to 10m. The main transceiver can take either a single or two-band plug-in card, but, with the card switch kit added, up to four bands can be selected from the front panel and others added by changing a band card. The transmitter produces 5 watts on all bands using a tuned MOSFET output stage. Very detailed stage-by-stage instructions are provided in a smart project manual, which can be purchased alone for £5. The kit starts at £129 (+ £1 P&P) for a single-band version.



For further details send an SASE to: **Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ; or tel: 01458 241224; fax: 01458 241186; e-mail: walfor@gloabalnet.co.uk; web site: www.users.globalnet.co.uk/~walfor**

ICOM IC-910H

THE **IC-910H** is **Icom's** latest offering. It is a VHF / UHF dualband (2m / 70cm) all mode transceiver. Very few details were available at the time of going to press, but it is understood that the new transceiver will be launched early in the New Year. An early opportunity to see it will be at the London International Boat Show, where Icom (UK) will be holding a 'Radio Amateur Day' on their stand on Monday 8 January.

Icom (UK) Ltd, Sea Street, Herne Bay, Kent CT6 8LD; tel: 01227 741741; fax: 01227 741742; e-mail: info@icomuk.co.uk; web site: www.icomuk.co.uk

RADIO STATIONS IN THE UNITED KINGDOM

THE NEW 17th edition of ***Radio Stations in the United Kingdom*** (ISBN 09514723-9-9) is now available from the **British DX Club**, the group catering for broadcast-band DXers and SWLs. It is a comprehensive 56-page directory of mediumwave and FM radio stations in the UK. It covers all BBC, independent and long-term restricted service licence services and is a must for anyone interested in UK domestic radio, either as a casual radio listener or specialised DXer. This edition again includes a free supplementary guide to radio stations in the Republic of Ireland.

Radio Stations in the United Kingdom costs just £3.00 inc P&P in UK and EU, or US$6 inc airmail postage outside EU.

British DX Club, 126 Bargery Road, Catford, London SE6 2LR; web site: http://www.bdxc.org.uk

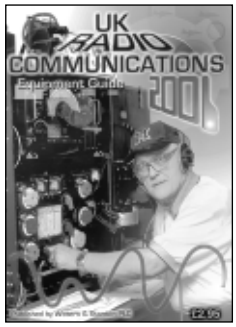
SAGA OF MARCONI-OSRAM VALVE

THIS NEW BOOK by Barry Vyse and George Jessop, G6JP, is a complete and detailed history of Marconi-Osram Valve (M-O V), one of the great names in the early days of wireless communications. With 346 pages and over 500 illustrations, many in colour, ***The Saga of Marconi-Osram Valve*** is a 'must' for anyone with an interest in the history of radio. It is available in both paperback and hardback at £25 and £35 respectively direct from the publisher:

Vyse Ltd, 14 Cranbourne Road, Pinner, Middx HA5 1BZ; tel: 020 8866 4428; fax: 020 8866 4334; e-mail: vyse.co@virgin.net

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.

NEWS FROM WATERS & STANTON



WATERS & STANTON'S new ***UK Radio Communications Equipment Guide 2001*** is a massive 304-page catalogue containing details and prices of the many thousands of items stocked for radio amateurs, short wave listeners and other radio enthusiasts. W&S believe this to be the biggest amateur radio catalogue in Europe. In addition to the equipment listings, there are several operating articles, technical hints and other features. The *Equipment Guide* costs £2.95 (plus £1.25 P&P).

Waters & Stanton have recently been appointed the exclusive **UK distributor** for the **SGC** brand of transceivers and antenna couplers made in USA. The complete SGC product line-up is featured in the new *Equipment Guide*.

The **Watson WM-2000 desk microphone** is a new product available from W&S. It features an electret condenser microphone with built-in compressor amplifier fitted with a four-channel graphic equaliser, allowing the audio to be separately tailored for SSB, FM or AM contacts. A triple modular socket arrangement means that it can be connected to Icom, Kenwood and Yaesu transceivers. Very similar to other microphones costing around £150, the Watson WM-2000 costs £89.95.

Waters & Stanton plc, Spa House, 22 Main Road, Hockley, Essex SS5 4QS; tel: 01702 206835; fax: 01702 205843; e-mail: info@wsplc.demon.co.uk; web site: www.waters-and-stanton.co.uk

NEW PREMISES FOR RONAL

MERSEYSIDE's **RONAL COMPUTERS Ltd** now has **new retail premises at 47b Liverpool Road South, Maghull, Merseyside**. The shop will be managed by Neil Watson. Trade and component sales will continue from Southport, while the Maghull branch will concentrate on system sales, peripherals and consumables.

Ronal Computers Ltd, Unit 1, 161 - 163 Bispham Road, Southport, Merseyside PR9 7BL; tel: 01704 507808; fax: 01704 506107; e-mail: mail@ronal.freeserve.co.uk; web site: http://ronal.freeserve.co.uk

LAKE ELECTRONICS

THE **LAKE ELECTRONICS web site** has recently been updated. It now includes a listing of vintage radio items - books (originals, not facsimiles), valves, magazines and components - as well as amateur and SWL kits including QRP transceivers, tuners and the popular 'Novice' range. Visit the site at: http://ourworld.compuserve.com/homepages/radkit

Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX; tel: 0115 938 2509.

NEW FROM YAESU

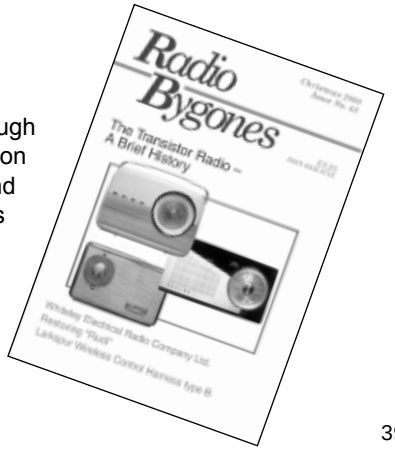
YAESU HAS ANNOUNCED the **FT-817**, a revolutionary new all-mode, all-band portable transceiver weighing in at just 2.6lb (with alkaline batteries) and a case size of only 5.3 x 1.5 x 6.5in! This impressive package will transmit 5 watts of SSB, CW or FM on 160 - 10 metres, 6m, 2m *and* 70cm, with a receive frequency range of 100kHz - 56MHz, 76 - 154MHz and 420 - 470 MHz. The FT-817 includes a host of features such as the ARTS system, 200 memories, AM aircraft band and wide FM reception.

Yaesu has also recently announced the **VR-5000** wide-band all-mode receiver. It covers 100kHz to 2600MHz and operates in CW, LSB, USB, AM-N, AM-W, FM-N and FM-W modes. Features include a 'bandscope', smart search, 2000 memory channels, plus a special bank of pre-programmed shortwave broadcast band stations for quick tuning.

Both the FT-817 and VR-5000 are expected in the UK by January.

Yaesu (UK) Ltd, Unit 12, Sun Valley Business Park, Winnall Close, Winchester SO23 0LB; web site: www.yaesu.co.uk

RADIO BYGONES ONLINE



RADIO BYGONES, the magazine for enthusiasts of old radio technology, is now available through the most up-to-date of modern technology - the Internet. A 12-month (six-issue) online subscription to *Radio Bygones* can be bought instantly using the secure server at www.radiobygones.com and paying by credit card. The magazine can then be downloaded from the Internet. The cost is US$9.99 anywhere in a world and a free issue is available so anyone can see what it is all about.

For readers that prefer the traditional printed paper verion, *Radio Bygones i*s available on subscription at £18.50 (in the UK).

Radio Bygones, Wimborne Publishing Ltd, East Borough, Wimborne, Dorset BH21 1PF; tel: 01202 881749; fax: 01202 841692; web site: www.radiobygones.com

The Albrecht AE485S 10m

*Reviewed by Chris Lorek, G4HCL**

WITH THE SUNSPOT cycle at its present high state the 10m band is often 'open', with world-wide QSOs possible even if you're just using low power and simple antennas. Several years ago, converted multimode CB rigs were very popular for this purpose, although you needed to have the required formal documentation from the Radiocommunications Agency to own and use one legally. Recent changes in the UK law now mean that we can freely purchase single-band 10m rigs again. Because of this, transceivers such as the Albrecht AE485S have become available.

The AE485S is a lightweight and easily transportable single-band 10m rig, weighing just 1.2kg and measuring 52 x 165 x 194mm. It has transceive modes of USB, LSB, FM and AM, with a maximum power output of 25W on SSB and FM, and 6W on AM. A variable power control lets you reduce this to a couple of watts for QRP work.

Being originally derived from a multimode CB transceiver design, it does *not* have CW transmit capabilities, and just tunes using the front panel click-step control in 10kHz increments. All isn't lost though, as a press of the front panel 'step' button also lets you select the 1kHz digit for frequency selection, so you can interpolate between the 10kHz steps. A variable clarifier also lets you tune in between the 1kHz steps, albeit only on receive.

For 10m FM operation it usefully has selectable plus and minus repeater shifts. There's even a 1750Hz toneburst button on the supplied fist microphone for use with repeaters which need this for access. Five programmable memory channels are available in which to store your operating frequencies, and a scan facility can search through the entire tuning range in 10kHz steps, pausing whenever the receive squelch opens.

CONTROLS

THE FIST microphone also comes with up / down buttons for frequency / channel change, which operate in parallel with the front panel click-step control. A combined power on / off and rotary volume knob is mounted just above the 6-pin microphone socket, and to the right of this are concentric controls for mic gain and receive RF gain, a further concentric control being fitted for variable transmit power and receive squelch adjustments. Each of the rotary controls has an orange backlit outer ring to help you locate them in the dark.

The orange backlit front panel LCD shows the operating frequency to within 1kHz in large easily-read digits, with a further smaller digit to the right indicating the selected memory channel if you've recalled one of these. Along the bottom is a five-section bargraph giving you an S-meter reading on receive and relative output power level on transmit. Smaller icons show the operation mode, shift status, scan, audio 'low' filter selection and noise blanker status.

Six large push buttons below the display act together with a push-button facility on the clarifier control to give multi-function capability. These let you control the 100kHz, 10kHz or 1kHz frequency digit selection, noise blanker on / off, operation mode (USB / LSB / FM / AM), a low pass audio filter to cut out high-frequency noise, transmit repeater shift, last channel recall, scan, and memory save and recall functions. The repeater shift can be varied between 0 and 999kHz, I programmed this for 100kHz to suit 10m operation but other shifts (eg 600kHz) could be useful if you're using, say, a 2m transverter with the rig.

The transceiver comes supplied with an adjustable mobile mounting bracket, mic clip, a fused DC power lead and a 17-page user instruction booklet. An internal speaker is fitted to the lower case lid of the transceiver, and a 3.5mm jack socket is also fitted at the rear which lets you plug in an external speaker if you wish. That's it, a no-nonsense, easy to use, rig to get you on to 10m. So let's see how it performed on-air.

IN USE

THE OPERATION OF the transceiver was very simple, as long as I kept to the pre-set 10kHz steps and within minutes of connecting it up to my power supply and antenna I was having my first contact on 29.600MHz FM. Over the review period, 10m was certainly lively during the daytime, with plenty of European, Russian, and both North and South American stations coming in. One such station was Ray, DL2GG/YV5, in Caracas, Venezuela, romping in at exceptional strength on FM one lunchtime working G stations.

As well as direct FM operation, I was able to operate through a number of 10m FM repeaters across 29.610 to 29.690MHz. Some of these, typically North American ones, require a CTCSS tone for access, which the AE485 isn't equipped with. However, I did successfully operate through a number of repeaters in areas around the world. I must say, though, that I often preferred simplex, as the overall multipath distortion was rather less. If you've ever operated HF FM in an ionospheric fading environment you'll know that signals often become quite distorted as a result of this.

The traditional DX modes are of course, CW and SSB and, together with various data modes such as PSK31, these are the mainstay of most HF operation (the AM mode included instead of CW on the AE485 revealing its design origins as a mass-user CB rig). This mass-production does, however, make it economic enough to be placed on to the amateur market, which we can't argue with! The transceiver did, in fact, operate reasonably well on SSB, with reports on my transmit audio being well up to those of a top-flight amateur transceiver costing much more - no wide transmit splatter here!

I felt the receive bandwidth was a little on the wide side, with the occasional adjacent SSB signal sometimes 'splitching' through. But then 10m isn't usually an overcrowded band, and I never found this to be a problem in use on SSB. A slight limitation I did find was that I couldn't always accurately 'net' on to a station calling CQ, or call in at the end of an existing contact, without sometimes being up to a few hundred Hertz off-frequency

* *PO Box 400, Eastleigh, Hants SO53 4ZF.*

Multimode Transceiver

due to the 1kHz minimum transmit steps. But even with this, calling invariably brought a response from the other station and I found that a quick explanation of the rig's 1kHz increments was always understood and acknowledged by the other station. They typically just continued to keep their RIT switched in for the remainder of the contact.

The 'step' button let me alter the 1kHz setting of the frequency display, but this didn't mean the transceiver tuned across the band in 1kHz steps - after 10kHz it 'rolled round' again, ie 8 kHz, 9 kHz, 0 kHz, 1 kHz etc, without incrementing the 10kHz digit when '0' kHz digit was reached. This meant that finding SSB signals over a range of, say, 100kHz or so was a bit of a two-handed affair in looking around 10 segments of 10kHz each, but I quickly got used to this.

FM was no problem whatsoever, with stations typically using 10kHz steps as operating 'channels'. Potential CW operation does suffer from this step limitation though, and naturally there's no CW key input jack.

The memory channels store the frequency but not the operating mode or repeater offset. But in use I tended to use these as handy 'scratch pad' memories when tuning around, particularly on SSB, making QSYing back an easy job. The 'last used frequency' button was also quite handy, this remembered the frequency which I'd either last transmitted on or listened to for at least a few seconds, again letting me QSY back very quickly.

The user manual doesn't give circuit or mic connection details and so I didn't test the transceiver on CW or data modes as this would need a bit of circuitry experimentation. But using a program such as *DigiPan* on PSK31 overcomes 1kHz step size and receive filter bandwidth limitations, and the transceiver would certainly be a powerful QRP tool using this mode.

LABORATORY TESTS

THESE SHOW THE receiver to be adequately sensitive as well as quite sensitive given its intended use in terms of blocking and other strong-signal rejection. The receive intermodulation rejection (where off-frequency signals combine internally to form an on-frequency interfering signal) wasn't up to that of an expensive top-flight purpose-built amateur transceiver, also the SSB receive bandwidth which was, as I found on air, a little wider than usual. But one would expect this and once again, 10m isn't usually the busiest of bands strong-signal wise.

On transmit, just over 25W maximum was produced on both FM and SSB modes, the operating frequency being accurate to within a few tens of Hertz. Transmit harmonics were nicely suppressed, something which surprised me at first, showing the internal filtering to be very effective. The transmit IMD (ie the amount of splatter you're likely to cause) again wasn't that of a rather more expensive top-flight rig, but it certainly wasn't as bad as I've seen on some transmitters!

CONCLUSIONS

THE ALBRECHT AE485S is an easy-to-use transceiver for 10m FM and SSB, it's also very lightweight and ideal for taking along with you on holiday for a spell of DX operation. The 1kHz minimum transmit steps are a slight limitation for SSB working, and no CW mode is available, but the receive clarifier allows received stations to be tuned in correctly.

The transceiver has recently been reduced in price to £169.95. Our thanks go to Martin Lynch and Sons (tel: 0208 566 1120) for the loan of the transceiver for review. If you order from ML&S before the end of January 2001 and quote '*RadCom*', you can claim free carriage. ♦

LABORATORY RESULTS

All measurements carried out on 29.000MHz in USB mode unless stated.

Blocking

Measured as increase over 12dB SINAD level of interfering signal, unmodulated carrier, causing 6dB degradation in 12dB SINAD on-channel signal.

	SSB	AM	FM
+100kHz:	85.9dB	74.2dB	87.5dB
+1MHz:	93.5dB	81.8dB	92.6dB
+10MHz:	104.4dB	98.6dB	98.1dB

S-Meter Linearity

	SSB		*AM*		*FM*	
	Sig Level	Rel Level	Sig Level	Rel Level	Sig Level	Rel Level
S1	1.40 µV pd	-38.6dB	2.18 µV pd	-36.0dB	1.68 µV pd	-28.9dB
S3	2.83 µV pd	-30.8dB	4.18 µV pd	-30.4dB	3.08 µV pd	-23.7dB
S5	7.59 µV pd	-22.2dB	10.6 µV pd	-22.2dB	6.56 µV pd	-17.1dB
S9	97.3 µV pd	-0dB ref	64.3 µV pd	0dB ref	48.5 µV pd	0dB ref
S9+30	825 µV pd	+18.7dB	1.31 µV pd	+19.7dB	738 µV pd	+23.9dB

3rd Order Intermodulation Rejection

Increase over 12dB SINAD level of two interfering signals giving identical 12dB SINAD on-channel 3rd order intermodulation product, measured at 21.4MHz.

	SSB	*AM*	*FM*
20kHz spaced signals:	54.9dB	53.8dB	55.8dB
40kHz spaced signals:	55.1dB	53.9dB	55.9dB

RECEIVER

Image Rejection

1st image:	92.5dB
2nd image:	78.7dB

Sensitivity

Input level in µV pd required to give 12dB SINAD

Freq	SSB	AM	FM
28.00	0.19	0.25	0.23
29.00	0.21	0.25	0.23
29.69	0.22	0.26	0.23

TRANSMITTER

SSB IMD Performance

Measured with a two-tone AF signal at onset of Tx ALC, results given as dB below PEP level.

	3rd Order	5th Order	7th Order	9th Order	11th Order
+ve:	-31dB	-33dB	-41dB	-39dB	-38dB
-ve:	-31dB	-41dB	-50dB	-43dB	-47dB

TX Power / Current Consumption

Connected to stabilised 13.8V DC using supplied DC lead

Max Power:	26.3W (5.6A)
Min Power:	1.85W (2.85A)

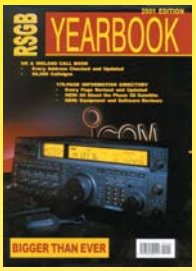
Harmonics

2nd:	-67dBc
3rd:	-75dBc
4th:	-77dBc
5th:	-72dBc
6th:	<-90dBc
7th:	<-90dBc

SSB Selectivity

-3dB:	3.58kHz
-6dB:	3.78kHz
-10dB:	4.36kHz
-20dB:	5.00kHz
-40dB:	6.05kHz
-60dB:	7.14kHz

THE BEST RSGB PUBLICATIONS OF 2000



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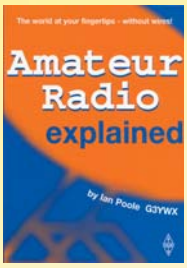

Amateur Radio Explained

Have you ever needed to explain to someone what amateur radio is all about? Have you ever wanted something to help fan the flames of someone's initial interest in the hobby? Do you give talks about amateur radio? If so, this book will help you. Building on the success of *Amateur Radio for Beginners* (thousands of copies sold), this new volume covers setting up a station, what you are likely to hear on each band, how to receive and transmit, what's involved in getting a licence, codes, propagation, equipment, construction and much more.

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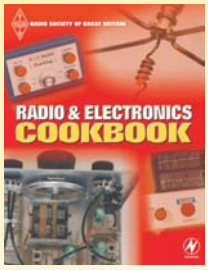

Radio & Electronics Cookbook

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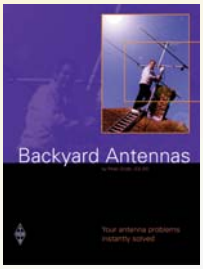

Backyard Antennas

Radio amateurs and short-wave listeners all want to chieve the very best from their HF and VHF equipment. Receivers and transmitters are available to professional standards, but very few people have the real estate to erect the sort of antenna used by a commercial radio station. 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.

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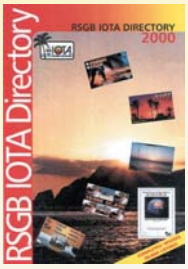

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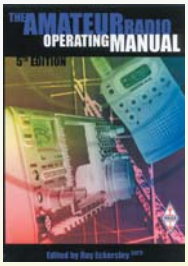

The Amateur Radio Operating Manual

This fifth edition has been extensively revised and enlarged. It features a completely new section on organising a DXpedition station.This book is essential reading for any amateur radio operator. It describes operating techniques invaluable for enjoying amateur radio to the full. The Amateur Radio Operating Manual is an invaluable aid to any operator, whether newly licensed or highly experienced. No amateur radio station is complete without it.

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Callseeker 2001 CD

The complete contents of the RSGB Yearbook are available on CD-ROM, the UK Callsign Directory is accessed by a sophisticated yet easy-to-use search program whilst all of the Information Directory section can be viewed using the supplied Adobe Acrobat Software (Windows 95/98)

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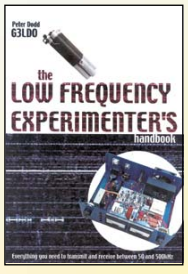

The Low Frequency Experimenters Handbook

This book has been written to meet the needs of amateurs and experimenters who have an interest in low power radio techniques at frequencies below 200kHz. Most of the techniques described are targeted at those using the 136kHz band, but they are also of great interest to readers in New Zealand and Australia with their 183kHz band and the Lowfers in the USA on 180kHz.

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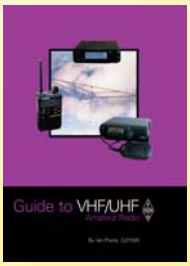

Guide to VHF/UHF Amateur Radio

The VHF and UHF band are some of the most interesting, useful and challenging of those available. Ian Poole explains just how to get the most from your VHF/UHF station: by studying the weather to predict greatly enhanced propagation; by using the correct part of each band; by choosing the right transmitter, receiver and antenna, and by using the correct procedure. A chapter explains how to transmit and receive computer data on these bands.

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Telephone: 01702 206835 Fax: 01702 205843 E-mail: sales@wsplc.com

Whatever Next

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

WELCOME TO an entirely new regular column, dedicated to the technology of communication in a wider sense than is usually covered in *RadCom*.

Let me say from the outset that the 'flavour' of the column is most definitely intended to be in *your* hands. If you find the topics that are being covered interesting, if you are aware of a bit of modern technology that you think should be mentioned, or if you would like a greater insight into a particular subject, please let me know.

MOBILE DATA SPEEDS TO SOAR?

THOSE OF YOU who own a mobile phone and use it to transfer data, perhaps by accessing Internet pages from a laptop computer, will be aware of its speed limitation. This is brought about by the fact that standard GSM phones employ a form of time division multiplexing, there being eight time slots per channel. The new GPRS (General Packet Radio Service) relieves this bottleneck by using all eight time slots at the same time, resulting in a *theoretical* maximum speed of 171.2 kilobytes per second (about three times as fast as the data rate you can expect on a standard landline and 10 times as fast as a standard GSM phone).

On the face of it you might think that dedicating all eight time slots of a GSM channel to one user would mean that a great deal more base stations would be required, each with a reduced geographical coverage (as there is only a finite number of channels available). Thankfully this is not the case, because with GPRS a user only occupies airtime during the transferring of data (at other times during a call a 'virtual connection' is maintained). Also, users who access data via the present method or send and receive SMS messages are expected to migrate to GPRS.

However, the introduction of GPRS in not entirely straightforward. First you'll need a phone that supports GPRS, which current GSM phones don't. Next, you'll need a subscription to a mobile network that supports GPRS, which will require the network operators to upgrade their systems (and not all of them seem likely to). Then, you'll need the service to be enabled. Then there are billing issues to be resolved.

GPRS services have already been demonstrated live and are likely to be further implemented and promoted during 2001. Initially the speed will be limited by not permitting users to occupy all eight time slots on a channel. By the end of 2002, however, mobile communications could have taken on a decidedly different appearance.

AVAILABLE SOON - CLEARER SPEECH

WHEN MARTIN F JUE, K5FLU, the President and Founder of MFJ Enterprises started to lose his HF hearing, he found that it seriously affected his enjoyment of amateur radio. Speech just wasn't as intelligible as it used to be, and he often found himself asking QSO partners to repeat what they had said. Rather than accept the situation or give up his hobby, he decided to develop something that would restore his enjoyment - a speech intelligibility enhancer.

According to the research he uncovered, 55% of the sound energy of spoken English is contained in frequencies below 500Hz, but those frequencies contribute only 4% to the intelligibility of it. By contrast, frequencies over 1kHz contribute 48% of the intelligibility, but contain only 4% of the sound energy. His solution to the problem was to attenuate the frequencies that don't contribute much to the intelligibility and boost the ones that do.

The result is the MFJ-616 Speech Intelligibility Enhancer, an add-on audio amplifier and equalisation unit. It works by splitting the audio bandwidth below 4kHz into four overlapping segments, each of which can be boosted or cut by almost 20dB - in other words it is a kind of bespoke graphic equaliser. The equalised audio is then recombined, but the unit goes somewhat further than that.

When hearing loss occurs, it doesn't always affect the ears equally, indeed it is more than likely that one will perform better than the other. For this reason the signal is then fed to independent amplifiers which can be adjusted for a balanced sound.

The results were summed-up by K5FLU as, "I couldn't believe my ears. Speech that I could hear but barely understand before was now highly understandable. I got my ham radio back!"

Could this black box be the answer to many a deaf radio amateur's prayer?

The only MFJ-616s in Britain at the time of writing were samples, but they should be generally available soon. Waters & Stanton PLC quoted a retail price of £149.

TAPELESS VIDEOS

A FEW YEARS ago ATI introduced the 'All-in-Wonder', a video card for a PC. The hardware included features which are now commonplace (ie video input / output, a TV tuner and a TV modulator), but equally remarkable was the software, which included a video editor. The 'All-in-Wonder' is still available today, but in a much upgraded form.

The first-generation standard of moving image files that PCs recorded was the AVI. However, depending on the resolution of image you chose to record, you could find a Gigabyte of hard disc gobbled up with just a few minutes of recording. The quality wasn't fantastic, either.

As we moved into the late 1990s and technology progressed, dedicated machines emerged which recorded television on to disc rather than tape. The 'TiVo' and the 'Replay TV' were the original Hard Disc Recorders, and it is those technologies that are now being adopted by well-known companies such as Sony and Panasonic. Increased hard drive capacity meant that recently you could achieve up to 15 hours of recording at the most basic video quality, but hard drive prices continue to tumble and the capacities of them continue to increase.

In itself the increased capacity of the hardware doesn't account for the ability of the latest generation of machine to record up to 30 hours of television. The other major change is the format of the recorded file. MPEG2 (Motion Pictures En-

The ShowStopper and its remote control. You'll be lost without the remote - literally!

coding Groups) is the current standard for the video and MPEG1 is used to compress the audio.

The latest machine from Panasonic, the 'ShowStopper', features a 20.4Gb hard drive, capable of recording up to 30 hours of television. Also included is a modem, the unit making a call in the small hours of the morning to download the program guide for the next day. Programming recordings is via on-screen menus.

What many say is the most nifty feature of this new generation of recorder is the ability to pause live programmes. Pressing the pause button causes the machine to buffer the program to disc; and, depending on how full the disc is, it can buffer up to 10 hours. To resume watching you press the pause button again, at which point the previously buffered programme is output while the machine continues to record the live program. If you skip through adverts or scenes and manage to catch up with the live program, the machine informs you.

An even more advanced programming feature is that the ShowStopper has the ability to record what it thinks you would like to watch! For example, if you tell it that you like rugby, it will search through its downloaded schedules for the week ahead and record all the rugby programmes, without you having to program individual recordings. You can tailor the recordings so that, for example, you only record rugby programmes on certain days of the week. Equally, you can easily program the machine to record every episode of your favourite soap, even if the times of transmission vary from day to day.

The system features variable quality picture, so now you can decide what is acceptable to you. In the lowest-quality mode you get 30 hours of recording, the quality of video being said to be comparable to a VHS recorder in long play. The medium-quality mode provides a better picture but reduces the maximum recording time to 20 hours. Finally, the highest-quality mode (Panasonic compares it with DVD quality) provides 10 hours of recording.

Almost inevitably, this new system doesn't seem to be without its snags. The first is that the downloaded programme guide is taken by the machine as gospel.

In other words, if you use the programme schedule to make a recording and it overruns the scheduled end time, the machine won't record the end of it (unless you take the precaution of instructing it to record the next programme as well). Ventilation also seems to be an issue, as the ShowStopper generates somewhat more heat than the typical VHS video recorder. There is also a 'Big Brother' issue, as during the call that the machine makes to download the TV schedule it also reports to the server what you have been watching (although personal privacy is said to be assured). Finally, there is the small matter of the remote control. If you lose it or the batteries run down, you're out of business, as the only button on the machine itself is the on / off.

ELECTRONICALLY STEERABLE ANTENNAS

AS MANY READERS will be aware, the licences for the forthcoming third generation of mobile phones cost the operators a fortune, so much so that some analysts have said that it will be very difficult for them to recover their outlay. Now, help may be at hand in the form of a miniature solid-state mobile phone antenna that is electronically steerable. It has been developed by Cambridge-based company Antenova Ltd.

Whether the effect of a mobile phone's transmitter upon the user is significant or not, it does seem sensible to direct its output towards the receiving antenna, the problem of course being that you can't expect the user of a mobile phone to swing a beam! **Fig 1(a)** demonstrates how the roughly omnidirectional radiation pattern of a mobile phone can result in its signal being received at more than one base station. Because Antenova's antenna would permit a lower-power transmitter to be used, battery life would be extended and net exposure of the user to RF reduced. **Fig 1(b)** shows how it might reduce the received signal level at two nearby base stations, whilst maintaining the signal level at its intended base station. Also, and perhaps most significantly, it would enable mobile communications operators to multiply the capacity of their networks by the use of 'spatial multiplexing'. ♦

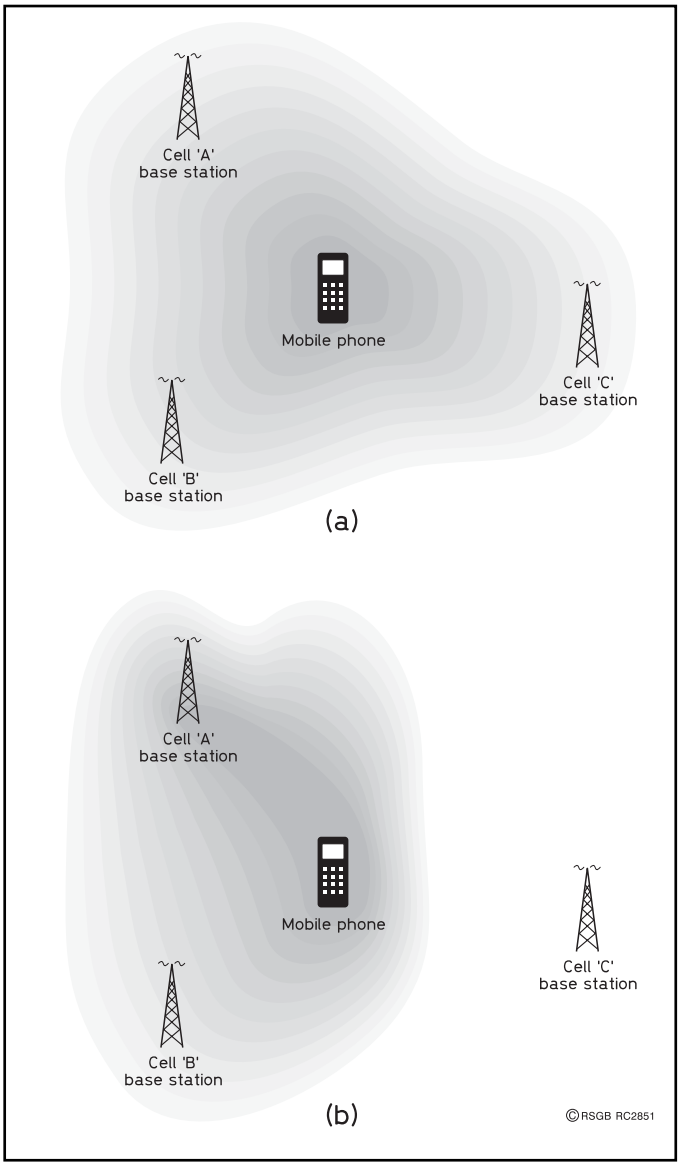


Fig 1: (a) The roughly omnidirectional radiation pattern of a current mobile phone can result in its signal being received well by the base station in more than one cell, resulting in interference to other users whose handsets happen to be operating on the same frequency and in the same time slot. (b) A lower power transmitter into an electronically-steerable antenna could result in a similar level of received signal at the base station of one cell, whilst reducing or eliminating the signal received by the base stations in adjacent cells.

Further Information

GPRS: www.gsmworld.com/technology/yes2gprs.html
MFJ: www.mfjenterprises.com/new/mfj616.html
Antenova: www.wordsun.com/an1 and www.antenova.com

Marconi's "First Little Miracle"

*By David Barlow, G3PLE**

IN MID-1900, THE Marconi Telegraph Company needed to finance its experiments and, having found much interest - but few buyers - for its 'wireless apparatus', realised the importance of merchant shipping to its operations. It set up the Marconi International Marine Communications Company, with the object of putting the apparatus on board ships. However, to make this effective there was a need for coastal stations to receive the ships signals.

Simultaneously Guglielmo Marconi himself announced to the board of directors that he intended to set up stations to transmit signals across the Atlantic. This would, of course, have stretched the company's financial resources considerably and also in retrospect it can be seen as a very brave gamble, as the distance record at that time was less than 100 miles.

In the summer of 1900, Major Flood Page and Marconi visited the Lizard Peninsula in south-west Cornwall and stayed at the Housel Bay Hotel at Church Cove, near Lizard village. The entry for 'G Marconi' on 5 August 1900 can still be seen in the hotel register to this day. After some considerable investigation and negotiation, the site for the 'great experiment' was found at Poldhu and simultaneously a site was purchased between the Lizard lighthouse and the Lloyds Signal Station. This was to be both a coastal station and a test site for Poldhu.

On 23 January 1901 the Lizard Wireless Telegraphy Station (which had no transmitting facilities at that time) received signals from St Catherine's Point on the Isle of Wight, a new distance record of 196 miles. Marconi is reputed to have said this was "my first little miracle".

Initially the coast stations had two-letter callsigns. Poldhu was PD and the Lizard station LD. In 1909 the Post Office took over the stations and callsigns became three letters; GPO callsigns began with a G, Marconi with M and the Admiralty with a B. Thus Poldhu became MPD for maritime use (but also used ZZ) and the Lizard Wireless Station became GLD.

In the early years of the century LD played an important part in the development of tuned circuits to prevent signals on adjacent frequencies from causing interference with each other. The proximity to Poldhu made this an ideal location for such experiments.

FIRST SOS

IN THOSE EARLY days the distress signal was 'CQD', before various international discussions and conventions took place and the letters 'SOS' were introduced. On 18 April 1910 GLD was to become the first known coast station to receive the signal SOS when the Atlantic Transport Company's ship the *Minnehaha* went aground off the Isles of Scilly (note that this was three years before the *Titanic* disaster). So our station has yet another claim to fame. As the *Minnehaha* signals were not heard at Bolt Head in Devon, this was to save GLD from closure for a short time.

In 1913 the station at Land's End was built and Lizard was to close. Land's End took the call letters GLD, which seemed appropriate for both stations. The station was used again, although not at the original site. It then had the callsign BVY and was a direction finding station using 667kc/s (kHz).

The masts at the Lizard were removed in 1920. The two huts, however, survived and much more of the original building survived than at any other Marconi coast and experimental station. The National Trust acquired the site in 1996 and has carefully restored the huts to their original configuration. One of the huts is used by the National Trust as staff accommodation and the other has been re-equipped by the Trevithick Trust with replica radio equipment as it existed in 1903. In addition there will be a fully-equipped amateur radio station with the permanent special event station callsign GB2LD on site.

OPEN TO VISITORS

THE TREVITHICK TRUST is operating the Lizard Wireless Station under a management agreement from the National Trust and will be opening the station to the public on regular occasions, as well as allowing radio amateurs to operate from this historic site. This famous site will be reopened for public viewing on 23 January 2001. On that occasion former Merchant Navy and Coast Station Radio Officers will man the station and the contact with St Catherine's Point on the Isle of Wight will be re-enacted 100 years after the event. The two stations will have the callsigns GB100LD (for the Lizard Wireless Station) and GB100GNI (GNI being the old Niton Radio call).

Located between Lizard lighthouse and Lloyds Signal Station, the Lizard Wireless Station is accessible only on foot. It is in the

The Housel Bay Hotel today.

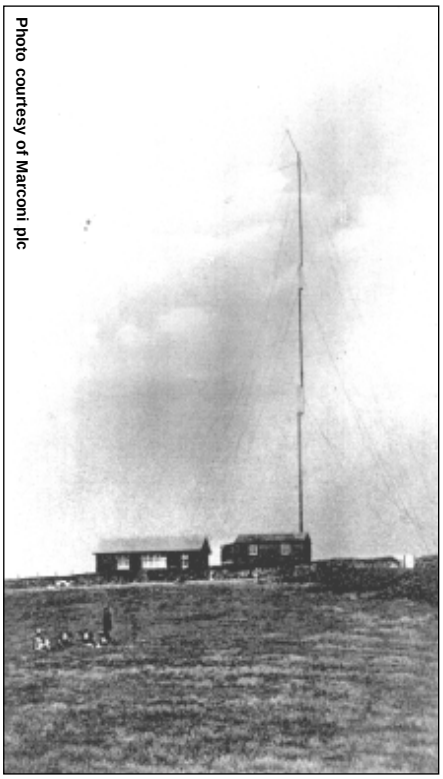


Photo courtesy of Marconi plc

The Lizard Wireless Station in 1901.

** PO Box 50, Helston, Cornwall TR12 7YQ.*

only mainland square below 50 degrees North, in IN79, and WAB square SW71. Using the GB2LD callsign you can expect pile-ups on the HF bands, or you may wish to use your own callsign /P. You can try meteor scatter on 2m, using the station's equipment or bringing your own. An inverted-V trapped dipole will be available for you to use from the original base position where once a 200ft wooden lattice mast stood.

The Housel Bay Hotel (Housel Cove, The Lizard, Cornwall TR12 7PG; tel: 01326 290417) is to arrange special facilities for radio amateurs who may wish to visit the area, operate from the Lizard Wireless Station, visit the famous Poldhu site and the Poldhu Amateur Radio Club, and the Earth Satellite Station at Goonhilly [see the advert on page 90 - *Ed*.]. To round off a true amateur radio experience, a visit to the Porthcurno Museum of Submarine Telegraphy and Cable station will complete your holiday.

Incidentally, if you wish to play radio while other family members enjoy themselves with other pursuits, the Lizard peninsular has beautiful beaches (Kynance Cove and Kennack Sands are close by), spectacular scenery and miles of coastal path walking.

Also in the area are a fine links golf course at Mullion, Flambards Theme Park, horse riding and the famous market town of Helston (from where GB800HEL will help to celebrate the 800th anniversary of its charter during 2001).

In order to operate from the Lizard Wireless Station you must show your licence to the station coordinator, David Barlow, G3PLE, PO Box 50, Helston, Cornwall TR12 7YQ; we must ensure that we comply fully with the conditions laid down by the RA.

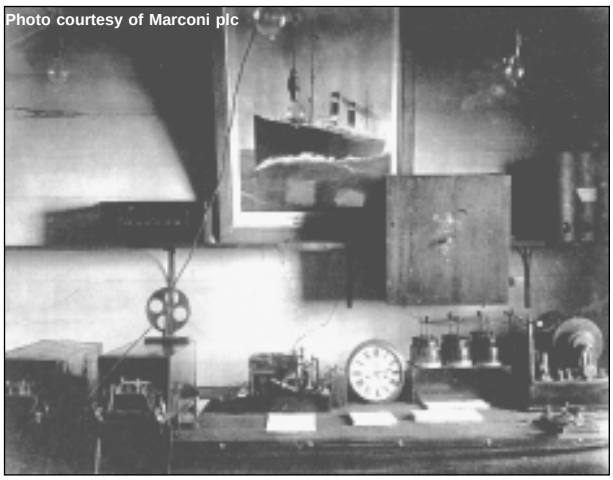


Photo courtesy of Marconi plc

Interior of the station ca 1910 and as it can be seen again today.

MARCONI COIN

AS REPORTED in *RadCom* last month, the Royal Mint is to issue a £2 coin to commemorate the centenary of Marconi's first wireless transmission across the Atlantic. The signal was transmitted from Poldhu in Cornwall to St John's, Newfoundland, in December 1901.

The coin will be released on 1 January. It is planned that a limited edition of mint examples of the coin, including a special gold version, will be available in presentation packs from RSGB Sales at reduced prices for members. Unfortunately further details were not available at the time of going to press, but if you are interested, please contact RSGB Sales for full information.

FURTHER READING

A NEW BOOK has recently been published by Marconi plc. *Marconi's Atlantic Leap*, by Gordon Bussey, describes Marconi's great achievement in bridging the Atlantic by wireless in 1901. It is a hardback book and excellent value at just £6.99. For RSGB members only it is available at a special discount price of £5.25 (25% off) until the end of February 2001. Call RSGB Sales on tel: 0870 904 7373 to order. ♦

Further Information

The Trevithick Trust	**www.trevithicktrust.com**
Housel Bay Hotel	**www.houselbay.com**

Win! A Trip to Friedrichshafen

Visit Europe's Biggest Amateur Radio Exhibition, Courtesy of the South Yorkshire Repeater Group and the RSGB!

Holiday between 25 June and 3 July 2001, worth £349.


Picturesque square in Lindau.

A REMINDER THAT there is still time to enter the *RadCom* / South Yorkshire Repeater Group Friedrichshafen competition that was featured in the December 2000 issue of *RadCom*. The competition is being run in conjuction with the trip to the Friedrichshafen HamRadio exhibition being organised by Ernie Bailey, G4LUE, on behalf of the South Yorkshire Repeater Group. For further details, or to book the trip, contact Ernie on tel: 01226 716339 or 0778 7546515; or visit the South Yorkshire Repeater Group's web site at www.syrg.co.uk and follow the links. If you are the lucky winner of the competition, your money will of course be refunded!

Look at the three questions below. Write your answers on **a postcard or the back of a sealed envelope** (no letters accepted) and send them to: Friedrichshafen Competition, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Don't forget to include your own name and address! The closing date is first post on **Monday 31 January.**

Questions

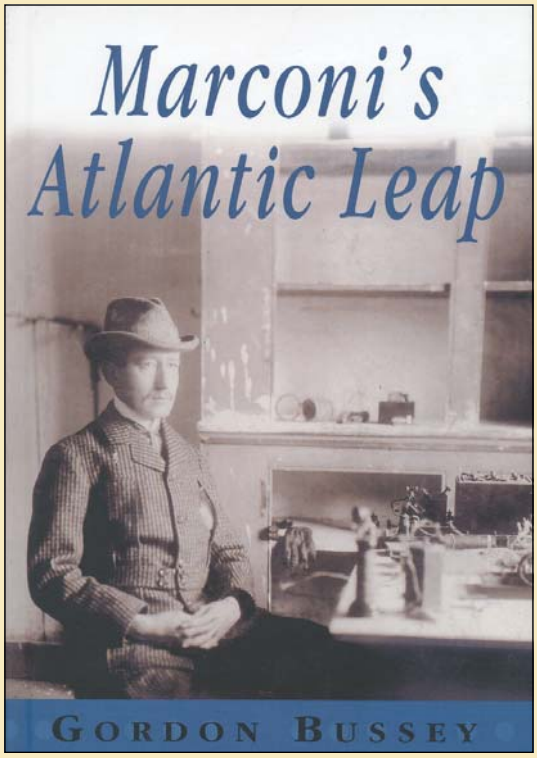
1) On which lake is Friedrichshafen located?
2) What is the name or the town and the island where the tour stays?
3) Which four countries (excluding England) will the coach travel through to arrive at its destination?

HINT: if you are unsure of any of the answers, re-reading the article on page 53 of the December 2000 RadCom will help!

Only one entry per RSGB member (multiple entries will be disqualified). No other correspondence can be entered into. All entries will become the property of the RSGB; please state on your entry if you do *not* wish to receive further promotional material or offers from the RSGB. Employees of the RSGB are not eligible to enter. The winner will be the first **correct** entry drawn at random. The draw will take place on 31 Jan 2001.

MARCONI - 2001

100 YEARS SINCE THE FIRST TRANSMISSION ACROSS THE ATLANTIC



NEW- Marconi's Atlantic Leap

This book contains a description of the bridging of the Atlantic by wireless in 1901. It was an extraordinary achievement by Guglielmo Marconi. He was only 27 at the time. Behind it was his scientific confidence that wireless waves would follow the curvature of the earth, against the view of many distinguished scientists. In July 1900, he was determined to send a wireless message across the Atlantic, and on the 12th December 1901 he achieved his ambition. His vision, his speed of operation, his ability to inspire his Company to produce $50,000 (equal to several millions today), can be compared with the modern achievement of putting a man on the moon.

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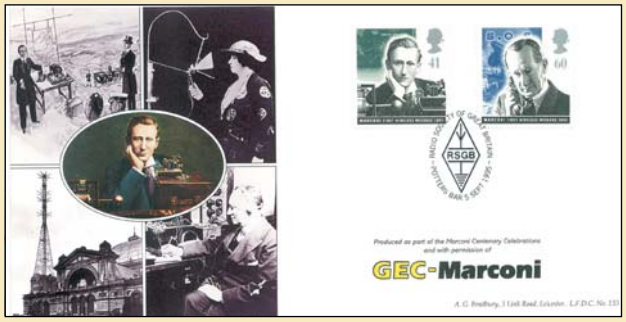

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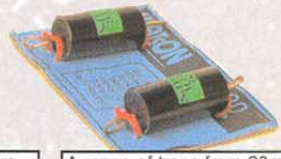

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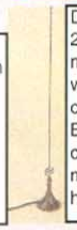

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DIY DESOLDERING BRAID

FOR REPAIRING PC boards, there is often no substitute for desoldering braid. Here's a way to make your own.

DESOLDERING BRAID is often better than a solder pump for cleaning-up tracks and holes before inserting new components. In particular, it has the almost magical property of clearing out plated-through holes by capillary attraction, leaving a clean, tinned pad ready to re-solder (never try to clear out a plated-through hole with a drill!). The August 1997 'In Practice' showed how to use desoldering braid, which is impregnated with flux so that the surplus solder easily tins the braid and is sucked away. However, desoldering braid is quite expensive and the flux tends to 'go off' if it's kept for some time. Here's a cheaper and better alternative: use plain copper braid, salvaged from scraps of coax, and add your own flux when you're ready to use it. Just give the braid a swipe with an Electrolube flux pen, or use one of the much cheaper sources of liquid flux that were mentioned in the October 1999 'In Practice'.

INVERTED-U ANTENNA

*IF I USE a half-wave 'Inverted U' antenna (**Fig 1**) what is the effect of grounding or ungrounding the far end?*

THE EFFECT IS to transform the same wire into a different antenna. To see why and how, we'll use the rules for drawing current and voltage distributions on a piece of wire ('In Practice', September/October 1998). This simple pencil-and-paper method used to be in all the antenna handbooks, and is in danger of becoming lost in the computer age, but it gives you the fundamental understanding that is always essential to ensure that computer models have been applied correctly.

Let's take the ungrounded case first (**Fig 1(a)**). The place to start is at the open-circuited end, remote from the feedpoint, because we know that here the current is close to zero - the wire has ended. The equation derived from Ohm's Law, R = V/I, says this must be a point of high impedance. A quarter-wave back from the open end, a current minimum becomes a current maximum, a voltage maximum becomes a voltage minimum, and high impedance becomes low; this is at the mid-point of the horizontal section. A further quarter-wave back, at the feedpoint, voltage and current have swapped over again, so we're back to high impedance. The main radiation will be from the current maximum on the horizontal leg, and the pattern is very similar to that of a low horizontal dipole. The small amounts of current in the two vertical legs flow in opposite directions (Fig 1(a)) and will substantially cancel. However, because there is some physical separation between the two legs, there will be a small amount of vertically-polarised radiation from the antenna, almost bi-directional from left to right.

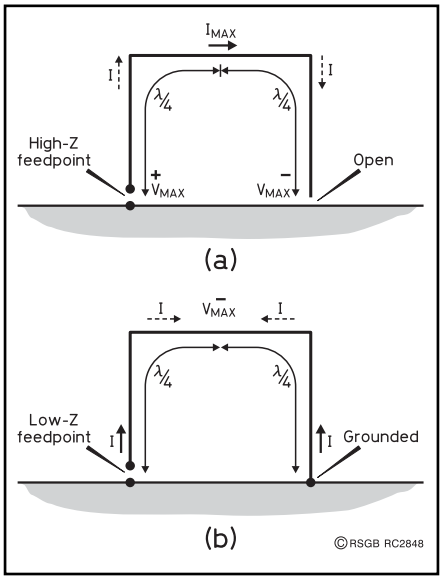

Fig 1: Half-wave inverted-U antenna has two completely different modes of radiation, depending whether the far end is (a) ungrounded, or (b) grounded to make a 'half loop'.

The same length of wire behaves completely differently when the far end is grounded (**Fig (1b)**). This configuration is often called a 'half-loop' and was popularised by Jack Belrose, VE2CV [1, 2]. You can think of this antenna as the top half of a full-wave loop, with the lower half supplied by ground reflection. To analyse the voltage and current distributions, once again we start at the far end. This time it is grounded, so we have a voltage minimum and a current maximum. A quarter-wave back, at the mid-point of the horizontal section, we now have a voltage maximum and a current minimum. At the feedpoint, we're back to low voltage and high current, so the feed impedance is low. Comparing Figs 1(a) and 1(b), by grounding the far end we have forced the voltage and current to distribute itself along the wire in a totally different way. Notice the current reversal at the top centre, which happens each time the wire passes through a voltage maximum. This means that the currents in the two vertical legs are now both flowing in the same direction, and will reinforce. Although the pattern is slightly bi-directional in and out of the page, for practical purposes it is almost omni-directional. However, the small currents in the horizontal section are almost exactly equal and opposite, so the horizontally-polarised radiation from this antenna is very weak.

In many ways Fig 1(b) is like two short verticals, so naturally you can expect performance to be highly dependent on the ground beneath. VE2CV describes a number of different grounding arrangements for the two ends, including buried radials, elevated radials and a distributed 'ring' system using all the concreted posts for his metal boundary fence [2]. He writes mainly about triangular loops which can use a single support, eg a 20m tower makes a good support for a 3.5MHz half-loop, but the principle can also be scaled down for 7MHz. Although the effects of voltage and current distributions on triangular loops are more difficult to visualise than on the inverted-U configuration of Fig 1, in fact the same principles apply. For a sloping wire, you simply divide the currents into the separate vertical and horizontal components (see below). **Figs 2(a)** and **2(b)** show the same two feed and grounding options as Figs 1(a) and 1(b) with the same total length of wire, a half-wavelength.

Fig 2(c) shows the detail of how the current is divided (resolved) into its horizontal and vertical components. The current arrow is drawn parallel to the physical wire. The length of the arrow (a vector) is proportional to the current. Then the horizontal and vertical components are the projected lengths from the tip of the main current vector on to the horizontal and vertical axes.

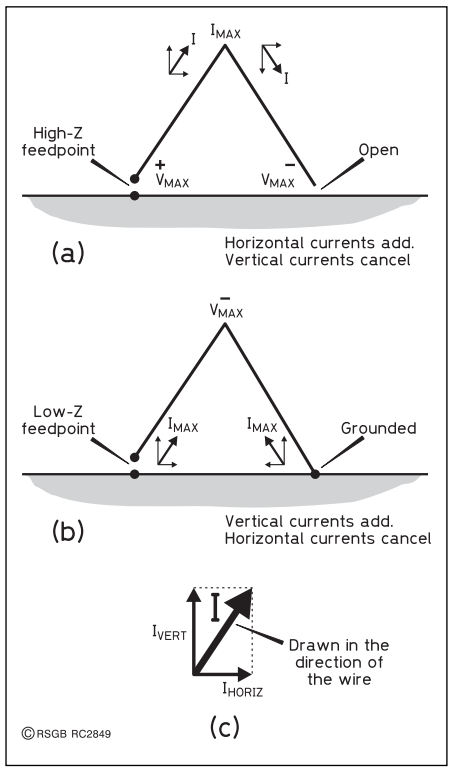

Fig 2: Half-wave inverted-V antenna. (a) and (b) are equivalent to Fig 1(a) and Fig 1(b). (c) shows how the current in a sloping wire is resolved into horizontal and vertical components.

In Fig 2(a) the horizontal components at the sides of the apex add together, while the vertical components tend to cancel. In Fig 2(b) it's the horizontal components that cancel while the vertical components add. Comparing Fig 1(a) against Fig 2(a), and Fig 1(b) against Fig 2(b), you can see there is relatively little difference between an inverted-U configuration and an inverted-V. To find any detailed differences between the radiation patterns, you would need to use an antenna modelling program, but there will be no surprises if you have already used the simple pencil-and-paper method described here.

REFERENCES

1. 'The Half-Delta Loop' by J S Belrose, VE2CV, *Ham Radio Magazine*, May 1982.

2. 'Loops for 80-meter DX' by J S Belrose, VE2CV, *QEX*, August 1997.

Reference 1 is out of print, but reference 2 is available on an ARRL CD-ROM.

RF GROUNDING ON PC BOARDS

WHAT'S THE difference between plated-though holes and solid copper for making grounds to the top surface of a double-sided PC board?

IN A WORD, none. The RF current flows on the outside of a conductor owing to the skin effect, but it doesn't flow through holes ('In Practice', April 1995). We're talking here about VHF/UHF/microwave printed-circuit boards for microstrip and/or surface-mounted devices. In this type of construction, the main RF groundplane is the underside of the board, but there will be several locations on the component side that need to be RF-grounded. The 'cold' ends of SMD bypass capacitors are typical examples. The usual technique is to make a patch on the component side and link it through to the groundplane in several places to create a low-impedance ground. In production boards, the links would be plated-through holes (PTH), but for prototyping or amateur construction it is more normal to use 'dip-links' made of solid wire (**Fig 3(a)**).

The performance is almost identical, because the inside of the PTH doesn't count in RF terms. Therefore it is not necessary to use hollow rivets or any other attempt to simulate a true PTH. Such rivets are available, but are mostly intended either for repair of PTH boards or when making an exact mock-up of a future production version. For amateur boards you can use 1.5-2mm tinned copper wire for the links. Instead of a straight wire, it's easier to bend the wire sharply into an L-shape which is soldered to the groundplane first (Fig 3(a)). Then you can solder the top side more easily without the bottom side becoming unsoldered too. Finally, cut off the wire almost flush with the top side, but be sure to keep a continuous solder joint all the way around.

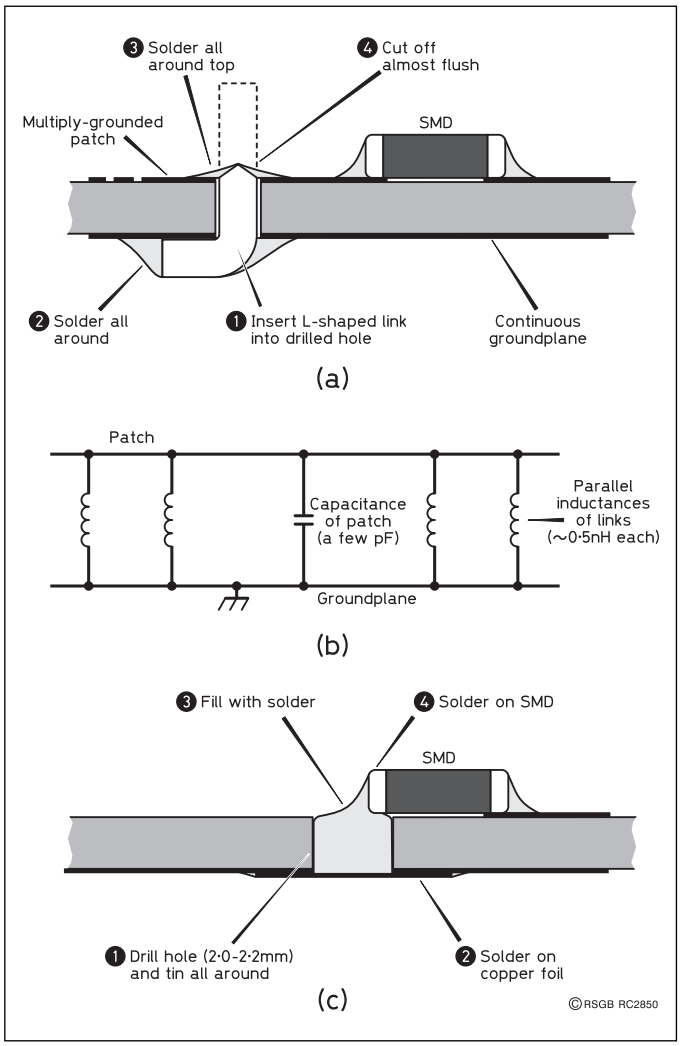

Fig 3: (a) Making 'dip-links' out of solid wire. (b) Equivalent circuit of several dip-links in parallel. (c) Alternative by S53MV.

Fig 3(b) shows the equivalent circuit for multiple grounding of a patch on the upper surface of the board. Each link or PTH has a very small self-inductance in parallel with the self-capacitance of the patch. At low frequencies, the combined impedance will be dominated by the multiple low inductances in parallel, and this gives the good RF ground you were hoping for. However, there will also be a higher frequency at which the combination will be parallel-resonant and totally ineffective. The capacitance of the patch will be a few picofarads, and the inductance of each link will be about half a nanohenry. This puts the parallel-resonant frequency of a multiply-grounded patch somewhere in the region of 5GHz. Hopefully this frequency will be much higher than any frequency at which you need to establish a good RF ground - but that is far from guaranteed if you're designing a VHF/UHF amplifier using a microwave GaAsFET which will try to oscillate at all frequencies from LF to light! Fortunately, other RF grounding methods become available at frequencies of several gigahertz, such as broadband quarter-wave resonators (those little quarter-circles that you see on microwave PC boards).

Fig 3(c) shows a simple alternative grounding method favoured by S53MV. A 2.0-2.5mm hole is drilled through the PC board, and the groundplane underneath is replaced by soldering on a piece of copper foil. Then the hole is simply filled with solder, and the SMD component is soldered directly to it. This creates a conducting 'post' of relatively large diameter which provides a very effective RF ground - it has much lower inductance than anything you could reasonably achieve with foil or by bending component leads sharply downwards. It doesn't look pretty, and it doesn't fit in with modern automated assembly techniques (which is why you don't see it on commercial boards), but like many so-called 'ugly' construction techniques its RF performance is excellent.

Most amateur VHF/UHF/microwave construction requires a mixture of grounding techniques for optimum performance. Typically the board is soldered into a metal box, and any areas of foil on the component side that have one edge soldered direct to the box walls can be regarded as a good RF ground. Out in the middle of the board, you might use multiple links to 'nail down' the edges of large grounded areas. Then for the grounding individual components you can use either smaller patches with multiple grounding, or the S53MV technique. On the other hand, if the designer of a modern project has specified a particular method of grounding for active devices, go with that - the ground lead inductances may well have been included in the circuit modelling, and changing the method of grounding could in some cases make performance worse. ♦

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.

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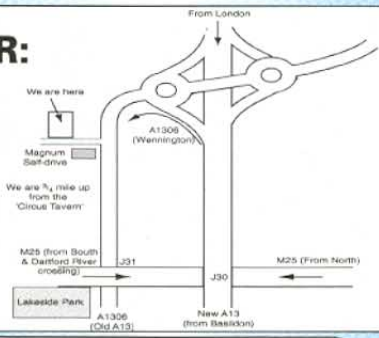

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'SWEEP-TUBE' REPLACEMENTS

THERE ARE STILL many 'older generation' transceivers in use, such as the once very popular FT-101 series, that rely on sweep-tube (TV line-output valve) power amplifiers. Several items in 'TT' (eg August 1999) have indicated how some of these now rare (and hence expensive) valve-types can be replaced by still-available RF power valves such as the 6146B. Bill Tipton, K5JRI, in the 'Hints & Kinks' column of *QST,* September 2000, pp68-69) provides useful additional information on this topic.

He writes: "I've done a fair amount of thinking and research about ways to solve the problem of the once common-and-cheap, but now scarce-and-expensive sweep tubes in HF transceivers and linear amplifiers. There are two categories of sweep tube: small (about 18W dissipation and 1.25A heaters); large (30W+ dissipation and 2.5A heaters). The former include the 6DQ6B/6LQ6, 6JB6 and such (used in Drake equipment) and the latter include 6JE6 / 6LQ6, 6JS6, 6KD6 and so on. Except for their bases, the 6146, 6146A (20W CCS dissipation) or the 6146B (27W CCS dissipation) match up closely to the smaller sweep tubes. The higher dissipation of the 6146B would be an obvious bonus. I would use only new-old-stock (NOS) 6146Bs; according to *RF Parts*, the current Chinese-made 6146Bs must be de-rated to 75% of published specifications. [CCS is 'Continuous Commercial Service'; a more relaxed rating generally used by amateurs is ICAS: 'Intermittent Commercial and Amateur Service' - G3VA].

"For the larger sweep tubes, the current (Russian-manufactured) Svetlana EL-509 / 6KG6 is – except for its base – a close match in heater current, dissipation and inter-electrode capacitances. According to Svetlana, it has a hard glass envelopment, many other features of a transmitting tube and is usable at full ratings to 30MHz. *Svetlana Technical Bulletin 32* gives detailed instructions for conversion from 6KD6 tubes to EL-509 …

"The Chinese-made 6146B tubes, marketed under the 'Penta' (and possibly other) brand names are priced substantially lower than NOS 6146Bs. Assuming the recommended 75% derating factor, their effective dissipation (20.25W) is still sufficient to replace directly American-made 6146 and 6146A (but not the 6146B) and the smaller sweep tubes … In addition to base changes, differences in inter-electrode capacitances may require changes in tank and neutralisation circuits.

"You can expect reasonably close tube-to-tube uniformity between different Svetlana EL-509 tubes, or among American-made 6146A / B / W series tubes from the same manufacturer and with similar date codes. This may not be true for Chinese 6146B tubes. Although the 6146W is a 'rugged' variant of the 6146A, some vendors have claimed that their 6146W tubes were selected out of regular production runs of 6146B tubes. This may have been true of late-production tubes, but experimental evidence would be needed to support this claim…"

I must confess that I have within easy reach a good source of a wide range of MoD-released NOS valves at not unreasonable prices: Langrex Supplies Ltd of 1 Mayo Road, Croydon (6146B at £15 + VAT). Perhaps the Society could persuade them to advertise in *RadCom!*

FAST TUNING DDS WITH TWO PICS

RON TAYLOR, G4GXO, writes: "After building and using an AD9850 DDS synthesiser based on information from several DDS and PIC projects, I came to appreciate one of the chief limitations of the single PIC control system (**Fig 1**), particularly when used in a synthesiser employing a 'slow' LCD frequency display.

"The drawback is that, for every tuning step, the processor has to perform a complete program cycle, often involving long iterative computations and slow dialogue with the LCD processor. The time taken limits the number of tuning steps that can be executed over a given time. Without any compensation, this results in an unbearably slow tuning rate.

"A couple of techniques are commonly used to overcome this problem: first, variable-rate tuning, in which the frequency step size increases with the speed of rotation of the tuning control; second, the use of an encoder with relatively few increments per revolution, allowing a reasonable rotation rate with the variable step-rate function.

"I found the variable-rate tuning off-putting and at times difficult to use. After attempting without success to improve this system, I decided to try a new approach that would not use variable-rate tuning, and with the aim of obtaining a true 'VFO-feel' to the tuning.

"I rebuilt my synthesiser, exchanging my home-made 32-step ex-PC mouse shaft encoder for a reasonably-priced 512-step HP-Agilent HEDS 9100 encoder from Farnell. I adapted a fine piece of software, jointly developed by Curtis W Preuss, WB2V, Bruce Slough, AA0ED, and Craig Johnson, AA0ZZ, and published as 'siggen3a' on the PIC resources section of the NJ-QRP web site (www.njqrp.org/). This software was designed to operate on a single PIC DDS system for use as a signal generator or local oscillator for direct-conversion transceivers. The logical program structure and comprehensive line documentation proved a real benefit. Having never previously programmed PICs, I used this program as a combined tutorial and crash course in 16F84 programming!

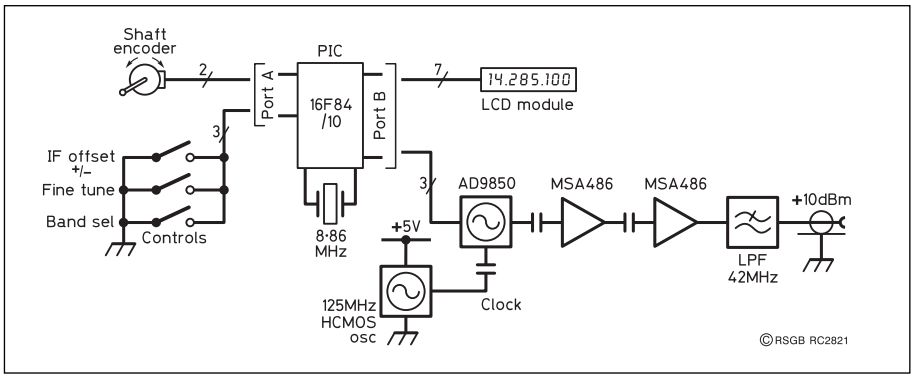

Fig 1: Typical single-PIC DDS synthesiser configuration.

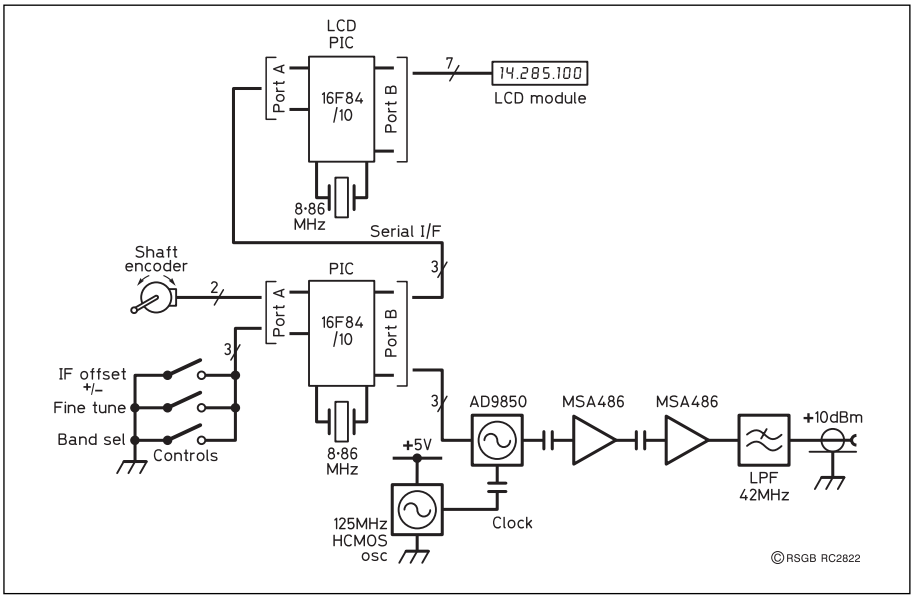

Fig 2: Dual-PIC-controlled DDS synthesiser supporting parallel program activities, as used by G4GXO.

"First, I modified the LCD routines slightly to make them compatible with my display. Next, I added an IF offset routine to adapt the system for use with my Belthorn SSB IF Module. Once I had checked that the software worked in a single PIC system, I took the bold step of splitting the software into two programs, each running on a 16F84-10 PIC, one to scan the controls and manage the DDS, the other to convert binary frequency data into ASCII and manage the LCD display. A simple serial interface allows the two PICs to communicate with each other: **Fig 2**. Both PICs are clocked at 8.86MHz (my transceiver has a 10MHz IF and these crystals just happened to be available and were far enough from the IF to avoid interference).

"The key to increasing the system tuning speed is that both processors run independently, allowing the tuning and display processes to run in parallel, until the LCD PIC calls for the correct frequency. When this happens, the DDS PIC passes the current binary frequency-word over the serial interface and resumes scanning the controls and managing the DDS. Once it has received a new frequency update, the LCD PIC processes it, formats it and feeds it to the embedded LCD processor for display. An additional 10ms delay in the frequency-request routine reduces the number of frequency calls to the DDS PIC, further increasing the time available in the DDS PIC for the tuning process.

"The result is a nice 'VFO-like' tuning action with 10Hz steps and a 10kHz per revolution (double encoder size) tuning rate. Even though there is a delay between the displayed frequency and the actual DDS output, the processes run fast enough not to be noticeable to the eye. The tuning action limits at about two revolutions per second. With further program and hardware optimisation, this could be increased significantly. For example, the IF shift routine resides in the DDS PIC allowing USB/LSB switching with my single crystal carrier oscillator and typically-asymmetric ladder filter, by shifting the DDS output. With two carrier crystals and a symmetrical lattice filter, this routine could reside in the LCD PIC, freeing-up processor time for the tuning routines.

"This technique could also be applied to conventional serial-programmed PLL synthesisers, perhaps using a varicap crystal-oscillator conversion loop and main PLL step size of 10kHz to keep the loop tuning rate high."

HERE & THERE

A COUPLE OF errors slipped into the November item on G3JIR's 'Reference Voltage Supply'. In Fig 7 the voltage reference IC should be REF01 (as in the text) and IC2 pin 2 is the *negative* input and pin 3 is the *positive* input. In the final text paragraph the two resistor references to 1kW should, of course, have been 1kΩ. Apologies!

ARE POWER LINES OR CELLPHONES HAZARDOUS?

FOR YEARS THE debate about the safety or otherwise of living near electricity overhead power lines has failed to come up with any clear evidence, other than a few inconclusive epidemiological studies. Yet many people are convinced that living close to high-voltage distribution lines of the National Grid puts their families at increased risk of developing cancers.

A September BBC Radio 4 programme, in the 'Costing the World' series, revealed work in progress by Professor Dennis Henshaw and Dr Alan Preece at Bristol University. This work, although still not proven, offers for the first time a feasible explanation for enhanced rates of cancer amongst those living within a few hundred metres, on the windward side, of high voltage power lines. This again ('TT' December 2000) postulates that it is the electric field rather than the magnetic field that is involved - but puts the blame primarily on the airborne pollutants (aerosols) that nowadays exist in vast number in both urban and rural areas. For example, the tiny particles emitted by car exhausts, etc.

The hypothesis, as I understand it, is that the corona discharge field from the power lines ionises the tiny pollutant particles in the immediate area of the electricity cables. The charged particles will then be carried by the wind over considerable distances towards the gardens and homes where these charged particles are likely to be inhaled. In a process similar to that by which the dust is attracted to a TV screen by the static charge, the ionised particles will tend to stick to the lungs rather than being exhaled. As with cigarette smoke, there will then exist the possibility in time of lung cancer. The charged particles would also tend to stick to the skin, giving an enhanced risk of skin cancers, particularly in children.

Recognising how often one has to wipe away the dust attracted by the static charge of a TV screen, Professor Henshaw's hypothesis seems the most convincing explanation yet, and could be a strong argument in favour of even the high-voltage distribution cables being buried underground. From an amateur radio viewpoint, it would mean that we could safely forget any fears of the magnetic fields generated by transformers, tube trains, etc.

Unfortunately, there seems little prospect of any early ending to the controversy regarding the possible hazard to those making considerable use of mobile phones, with their antennas close to the brain. A long survey article 'Are mobile phones safe?', by two American academics, Kenneth R Foster and John E Moulder, appears in the August issue of *IEEE Spectrum* (pp23-28). This shows how a plethora of research projects (more than 200 recent ongoing and completed studies) was sparked off in 1992 following an (unsuccessful) attempt on the part of an American citizen, David Reynard, to claim that the use of a cellphone had caused his wife's fatal brain cancer. The Reynard lawsuit was dismissed in 1995, as have been a number of subsequent similar suits.

The *Spectrum* authors write: "Identifying links between cancer and environmental exposure of any kind is surprisingly difficult because of the absence of a single cause of cancer and for a variety of other reasons. Even if cancer has no connection with mobile phones, thousands of users would develop brain cancer every year, given the hundreds of millions of mobile phone users around the world. In the USA, brain cancer strikes about six in 100,000 people per year. Identifying an effect of cell phones against this background of the disease requires carefully-designed studies."

A study of the causes of death among 300,000 mobile phone users in several US cities reported in November 1999: "The only category of cause of death for which there was an indication of increasing risk with increasing 'minutes of use' was motor vehicle collisions." A timely reminder of the hazards associated with the

use of handheld devices while driving! Other epidemiological studies have been mostly or entirely negative.

However, it is pointed out in the article that "Brain cancer takes years or decades to develop, and these studies say nothing about future risks. Detecting small or long-term cancer risks is not an easy task. Detecting small increases in risk would require large studies that are hard to control and usually are controversial in their interpretation. Any valid study would also have to assess an individual's use of mobile phones over a decade or more; an assessment complicated by the rapid technological developments in this industry.

"Analogue hand-held cellphones radiate 600mW or less of time-averaged power, and many digital models produce 125mW. However, the output of most modern phones is adaptively controlled by the base station, the handset constantly adjusts its power to provide the minimum signal needed to communicate reliably with the base station. [If only adaptive power control were used on the amateur bands! - G3VA] A mobile phone user with health concerns has simple remedies: use an external earpiece that keeps the phone away from the head; decrease phone use; avoid using the phone in areas where the signal is poor. Neither of us would recommend such measures on health grounds, but people can decide for themselves whether to take such precautions."

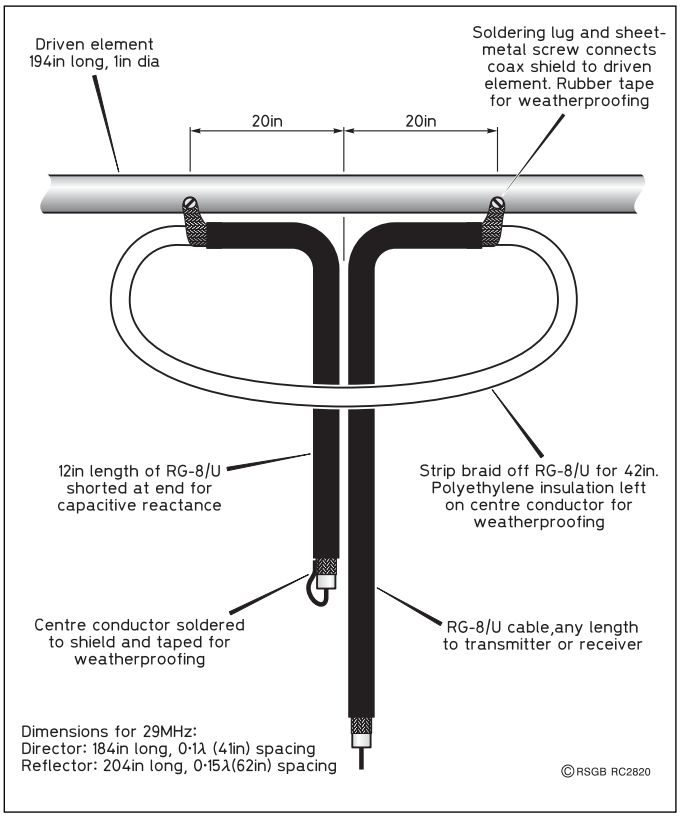

Fig 3: Details of the original Clemens Match applied to a 3-element 29MHz Yagi antenna as given by W9ERN in the February 1951 *QST*. For other bands, the dimensions can be scaled up or down for 3-element beams. For other single-element or multi-element antennas, the driving point connections to the element need to be calculated as for delta-matching systems.

THE CLEMENS MATCH

THE OCTOBER 'TT' (p63) included an appeal for information on the origins of the Clemens balanced feed for beam arrays using coaxial cable. David Macey, G6STD / M5AFA, had reported successful use of this system on 144MHz based on a scaled-down version of the 14MHz Clemens match described in several editions of the *Radio Communication Handbook*, but absent from many other books on amateur radio antenna systems.

Jack Hardcastle, G3JIR, promptly sent along a photocopy of 'The 'Clemens Match' - Balanced Feed with Coaxial Line', by John F Clemens, W9ERN (*QST*, February 1951, pp26-28). This article had been requested by the *QST* editors following the publication of 'Coaxial Feed System for Antennas', by John F Clemens (Project Engineer of Electronics Research Inc) in *Electronics* (October 1950, spread over seven advert-laden pages 154, 158, 162, 166, 174, 178, 182). I was able to obtain a copy of this from the Science Museum Library.

It appears that the 'Clemens Match', as a development of delta-matching, emerged from experimental work on a 300MHz model antenna and was then applied to a full-size 29MHz 3-element Yagi antenna. In his *Electronics* article, W9ERN wrote: "A system of coaxial-cable feed for balanced horizontal antennas should find wide application to television and FM receiving antennas and for transmitting antennas such as parasitic beams. It has a feature of prime importance in these applications: splitting the driven element is unnecessary". In other words, it permits what is known as 'plumbers' delight' construction; it allows the use of unbalanced coax line as a balanced feed system without the addition of a further balun transformer, yet without incurring the drawback of unbalanced RF current on the outer shield of the cable. W9ERN noted that twin-wire feeder, then often used with delta matching, was subject to significant impedance variations in wet weather, something avoided with coaxial cable.

The absence of RF currents on the outer shield preserves the radiation pattern of the antenna and, equally important on reception, eliminates pick-up of local electrical interference on the feeder. On transmission, the absence of radiation from the outer braid of the feeder can greatly reduce the problem of RFI.

The *QST* text reported the performance of the 29MHz beam, erected at one-wavelength above ground, as follows: "Standing-wave measurements on the transmission line showed a perfect 1:1 match at 29MHz, rising to approximately 1.5:1 at 28.5 and 30.0MHz. Experiments then continued to determine the balance of the feed-line currents. Balance is essential to achieve maximum signal-to-noise ratio, since the beam and not the feed line does the receiving. One test for balance is the alignment between the direction of maximum radiation and the elements of the antenna… The voltages at the two tips of the antenna were compared and found to be the same by dangling flashlight bulbs at each tip. The centre conductor of the coax was then broken at the antenna where it emerged from the shield; the receiver in the shack went completely dead, demonstrating the lack of signal pick-up on the shield. The directional characteristic of the beam was just as pronounced on reception as on transmission, a further indication of balanced feed". The feed system itself is a wide-band system compared with the antenna array.

Fig 3 provides an annotated diagram, with dimensions, of W9ERN's 29MHz beam, taken from the 1951 *QST* article. More detailed design data was published in the *Electronics* article. I note that Fig 3 differs from the version published in *Radio Communication Handbook* and possibly provides a better balance. It is claimed that, for a three-element Yagi at frequencies other than 29MHz, all dimensions can be scaled. To quote: "Theoretically, to be exactly similar to the original, even the diameter of the elements should be scaled to the new frequency; in practice, only the lengths of the elements and longitudinal dimensions need be scaled. The effect of a different element diameter, within reason, should be negligible."

W9ERN claimed: "The same matching system should be applicable to other types of antennas, such as a 4-element beam or simple half-wave single element. It is possible that 50-ohm cable can be matched even to a half-wave dipole having a centre impedance of 73 ohms. This is because the antenna is not broken but allowed to shunt the resistive component which can produce a 50-ohm equivalent series resistance by suitable selection of the driving points."

Altogether it would seem that the Clemens Match is worthy of remaining in the stable of matching systems, along with Delta-, T-, Bazooka- and Gamma-matching systems. It still offers opportunities for applications other than the original three-element Yagi

array for those prepared to dig into the 1950 design data. For any reader seriously interested, I am willing to send photocopies of both articles (five A4 sheets) on receipt of a SASE plus 50p to cover the photocopying costs.

A late note from Tony Crake, G0OVA, reports experience of many forms of Clemens Match. He considers that waterproofing and mechanical stability can be problems.

GIVING VALVES NEW LIFE

A NOVEMBER 1998 'TT' item 'Valves – Not dead yet?', based largely on an *IEEE Spectrum* article, discussed in some depth the continued demand, especially in the audio and TV field, for audio valves (tubes) and cathode-ray picture tubes. It reviewed some of the advantages and disadvantages of both valves and transistors and forecast that thermionic devices would still be important, and in a few cases dominant, well into the 21st century.

Morgan Jones in *Electronics World*, (November 2000, pp863-67) provides further confirmation of the continuing use of valves in audio applications. He writes: "It is perhaps less well known that valves are extremely popular in professional recording studios, and that all the major microphone manufacturers feature at least one microphone with a valve head-amplifier in their condenser microphone range – and they are popular for vocals. Because a microphone level signal is, by definition, uncontrolled, it is not uncommon for recording engineers to want the entire vocal channel to have valve electronics until it reaches the channel fader. Consequently, other valve studio electronics includes outboard microphone channels, equalisers, and compressor/limiters."

Morgan Jones makes it clear that the audio valve market is minuscule in comparison to the electronics market as a whole. "Worldwide, there is now only a handful of factories producing audio valves in significant quantities. Production runs are short, so quality control is difficult and contemporary production engineers are having to rediscover the skills of their counterparts in the 1950s and 1960s." He points out, however, that governments are now releasing huge stockpiles of unused valves generated during the Cold War period. Such valves are known as 'NOS' (new old stock) and were made at a time when quality control was rarely an issue. The result is that many designers and users choose to specify NOS rather than recently-manufactured valves. Some NOS valves, such as the KT66, a favourite with hi-fi enthusiasts, command high prices. Purchasers expect them to be in perfect condition and to meet their original specification fully.

However, he shows that valves having been stored for some 30 or more years tend to exhibit a small, but unwanted, grid ionisation current. With very high gain head-amplifier valves such as the Siemens D3a, an average of around a microamp of grid current is found in valves taken from their containers and tested (triode-strapped) with an anode potential of 175V and –2V on the grid. Since a condenser microphone amplifier my have a grid leak resistor of up to 500 megohms its grid ionisation current needs to be minimised to avoid degradation of the SNR. A test made on 29 NOS Siemens D3a valves showed a significant spread in characteristics, including five as 'soft' and most showing 1 - 1.5mA. Power valves, as still used by amateurs, tend to specify a maximum value of grid-leak resistor to ensure that the cathode-grid voltage is kept within safe limits and low values of grid current are far less important.

A similar test on 29 NOS EF184 high-gain pentodes, resulted in 16 showing no defects, with three having grid currents of from 0.5 to 2mA. Two had low emission.

The EF184 frame-grid pentode. (The Valve Museum)

Morgan Jones shows that the problem of grid ionisation current arises from storage deterioration of the valve getter and will be most marked where the grid mesh is very fine. This very low but unwanted grid current can be reduced by a factor of five or so by heating the valve in an oven to 120°C (gas mark 2) for 12 hours, without any risk to the cathode. Even the five 'soft' D3a valves after baking showed a grid current of only between 0.15 to 1.3mA.

The article discusses other valve defects such as low cathode-to-heater resistance due to contamination which, while unlikely to affect the performance of a power valve, can significantly reduce the SNR of a valve used in stringent audio applications as a cathode-follower. Morgan Jones suggests that the contamination can sometimes be burnt away by running the heater at 150% of its nominal rating for a short time while carefully monitoring the resistance. This can be risky since the effect may tend to reduce rather than increase the resistance. If this occurs, allow the valve to cool down, and it should then be found that the resistance has increased. The process may need to be repeated several times, but it is claimed that the success rate is high. A risk is that by overheating the cathode some of the cathode material may be deposited on the grid, and can cause thermal runaway if the valve is afterwards operated near its maximum anode dissipation.

He enters well-trodden territory in suggesting that low emission due to cathode poisoning can sometimes be cured by similarly running the heater at 150% of specification, but with normal anode voltage applied and the negative grid voltage reduced until the anode runs cherry red for about five seconds. It is stressed, however, that such forms of rejuvenation carry a very high risk of ruining the valve, though may be justified for expensive items such as picture-tubes.

A detailed description of overcoming the effects of 'soft' and low-emission valves due to ageing rather than storage, based on advice given in a 1948 RSGB publication *Valve Technique,* can be found in 'TT' February 1986 or *Technical Topics Scrapbook 1985-89,* pp81-82.

A later 'TT' item (July 1987 or '*TTS 1985-90*' pp182-83) reported that KI3U in *QST* had shown that it is sometimes possible to reweld the broken filaments of high-cost high-power valves such as the 100TH if they have broken prematurely. First discover if the break can be temporarily closed when tapping the valve gently with a screwdriver and with an ohmmeter connected across the filament pins. This is then repeated with a 12V/6V battery-charger, set to 12V, connected across the filament pins. Bluish-white sparks show when contact is made; then after a few seconds reduce the charger voltage to 6V and hopefully observe a steady filament current. This should be continued for about half an hour and then the polarity of the supply reversed for a further period. The original report is more detailed, but it showed that with a bit of luck a valve costing hundreds of pounds can sometimes be brought back from the dead. It has also been shown in a past 'TT' that inter-electrode short-circuits can sometimes be removed on high-power transmitting valves

The problem of the (hopefully) temporary loss of emission in thoriated tungsten filaments due to overheating was discussed in some detail in a recent 'TT' (May 2000). ♦

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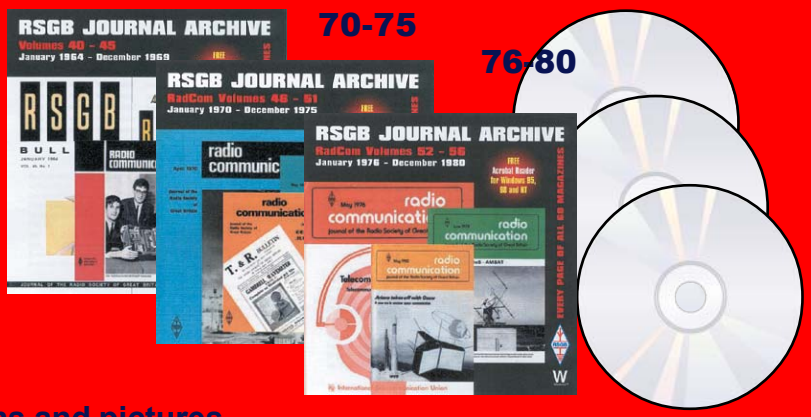

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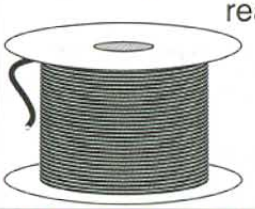

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YAESU	FT-847 HF/6M/2M/70cm/4m	£999.00
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YAESU	MD-1 DESK MICROPHONE (MINT!)	£80.00
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YAESU	QUADRA AMPLIFIER HF/6M 1KW	£2,999.00
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Members' Advertisements

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

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

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

FOR SALE

2001 2m FM 25W new, boxed, cost £195, take £95. Shure 444 desk mic, £30. 2m 5W h/held (scanner rcvr) new, boxed, with £40-worth accessories, cost £190, take £90. Collectable Morse keys - ask for details. As new, boxed GDO, 44kHz - 280MHz, £35. 1.5kW Vectronics dummy load, 1 - 650MHz, like new, £50. Other bargains, e-mail for list. Inspect and collect or pay carriage. 07866 077 249 (Aspley, Notts).
E-mail: howardwalton@thersgb.net

ICOM 746, exc cond, 500Hz CW filter fitted, £850. Inrad 2.1kHz SSB filters, 9MHz and 455kHz IF, £110 the pair. Heil mic preamp HMP, £35, both suit IC-746. ZX-2000 mini-beam for 10-15-20m, partially assembled but unused, not mini enough for my QTH, £145. 6m 4-ele beam, 12ft boom, £40. All items collect or pay carriage. Paul, M0CVX. 01522 878 784 (Lincoln).
E-mail: bradbeerfamily@aol.com

KENWOOD TS-850SAT with DSP1 digital processing unit, owned from new, as new cond with box, mic, mans, £850. Kenwood SM-220 station monitor with man, exc, £195. SGC-230 Smart tuner with man, exc, £195. Heathkit SB-200 linear, £150. Heathkit SB-614 station monitor, £50. Heathkit valve voltmeter, £30. Pair Capco mag loops covering 20 and 80m bands, £200. 01494 440 865 (High Wycombe).
E-mail: afielder@skynow.net

SKANTI TRP-5000 tcvr with 250V AC PSU (faulty) and 24V DC PSU, continuous-tuning rcvr and channelised transmitter, 400W PEP, full h/book and programming info. Buyer collects or delivery extra. This is very heavy, £75 ono. John, G4XBL, QTHR. 01697 322 412 (Aspatria, Cumbria).
E-mail: jay.bell@u.genie.co.uk

VINTAGE radio sale. AR88LF, £80. AR88D, £80.Murphy B40, £80. Murphy B41, £80. Eddystone 358X, £60. Eddystone 358, £60. Racal RA-17, £70. CR100-B28, £70. Delivery negotiable within 50 miles of Portsmouth. 01590 645 872 (Lymington, Hants).
E-mail: jfg@tesco.net

ALBRECHT AE485S 10m AM/SSB/FM mobile tcvr, £130. Kenwood TH-42E 70cm h/held with speaker/mic, fitted CTSS, cigar socket cable, FB-10 battery case, but no nicad, £100. Kenwood MC-35S fist mic, £25. Kenwood DM-81 dipmeter c/w all accessories, £60. ERA Mk2 Morse Micro-reader, £70. HW-8 CW QRP tcvr, £80. All with mans. Jim, G4LWY, QTHR. 01925 762 485 (Warrington).
ALINCO DJ-191E as new, boxed, unused, no reasonable offer refused, gift not needed. 01638 662 527 (Newmarket, Suffolk).
ALINCO DJ-F1, VHF FM, h/held, 2m, marine, air rx only. 40 memory channels charger, speaker/mic, case, boxed, £100. G4EUW. 01206 305 851 (Brightlingsea).
ALINCO DX-70TH HF + 6m 100W, £350. Desk mic-processor, £35. CFA antenna, £99. Psion 5 plus extras, £150. PSU 25A, £40. 01299 828 487 (Stourport).
COLLECTORS' books. 4 volumes *Newnes Complete Wireless,* beautiful binding in blue and gold, really exc cond, date guessed 1935, £35. 01404 850 461 (Honiton).
COLLECTORS' items. Labgear fault tracer (RC bridge, sig gen, AF osc, tracer, insulation test), £15. Taylor C / R bridge, £5. Taylor sig gen 100kHz – 45MHz, £10. All untested due to age. Bell & Howell 16mm sound projector + 8mm projector, £15 the pair, carr extra. 0116 287 1522 (Leicester).
EDDYSTONE rcvr 750S, beautiful cond plus speaker S688 and S-meter plug-in unit, buyer to collect, £160. 01706 633 362 (Rochdale).
FREE to good home. Treasured BBC micro. PC style case c/w fan, dual drives, monitor, sideways extension board, software, SSTV interface, vgc. 01277 353 127 (Chelmsford).
E-mail: ericlawley@compuserve.com
FT-200 tcvr with h/book, £110. CR-100, £10. TF-144G sig-gen, £15, buyers collect. 01923 445 609 (Watford).
E-mail: tony.griffiths@mcmail.com
HEATHKIT scope, KW160 and man, £25. WW2 aircraft frequency meter LH7 with man, £25. KW Atlanta man, £5. WW2 h/phones, £4. Tank h/phones, £4. Ono on items. Buyer collects. Also Morse training records, £5. G3ZUN, QTHR. 01825 767 496 (Uckfield).
HRO MX rcvr with dynamo, 2 dials, complete spare valves lineup, man, PSU, gwo, £130. Chris, G4ILR, QTHR. 01603 736 147 (Coltishall).
ICOM 706 Mk2G boxed, like new with man, hardly used, £650. 01580 764 179 (Tenterden).
ICOM 735, 250Hz filter, h/book, one non-smoker owner, £350. Matching PS-55 PSU, £80. Both boxed. Taken together, £420 ono. Ten-Tec model 238 2kW ATU, h/book, £230 ono pay carriage, can help with delivery up to 50 miles. Bill, G3WNI. 01823 680 778 (Hemyock, Devon).
E-mail: g3wni@bigfoot.com
ICOM 746 exc cond with book and box, £890. Chelcom CL-80 80m vertical, £90. Too big for me! Kenwood MC-85 mic, exc cond, £65. MFJ-948 ATU, boxed and instructions, £80. Steve. Mobile 07719 112 983 or 01691 650 722 (Oswestry).
E-mail: m0ccn@btinternet.com
ICOM 765 matched SP-20 extension speaker. Icom SM-8 desk mic. Kenwood low-pass filter. Noisy QTH forces HF QRT, buyer must collect, £850. 0115 919 0236 (Nottingham).
E-mail: francis.cokayne@ntlworld.com
ICOM IC-736, built in ATU, PSU, 28V PA complete, boxed as new, 1996 little use, £575 - was £1600. Peter, G3GYE, QTHR. 01736 362 486 (Penzance).
ICOM IC-740 HF tcvr, WARC bands, plus ICOM SP-3 speaker, gc, £250 ono. Datong FL-2 filter, £20. 01925 226 197 (Merseyside).
ICOM IC-T8E triple band h/held (50/144/430), 2W with std battery (5W at 13.5V). Receives NBFM, AM/WBFM broadcast, boxed with charger, duck, Icom guarantee to July 2001. Unused, unwanted gift with IC-706 purchase, £185 ono, carriage paid. Phone evenings, weekends. 01723 863 137 (Scarborough).
ICOM R-72 HF comms rcvr, mint cond, boxed, £250. G4GUV. 01300 341 516 (Dorchester).
IC-R70 immaculate, original man & box, £275. Trio 9R59DS exc cond, man, ideal first rcvr, £75. KW Atlanta & PSU restored but rcvr needs aligning, man & cct diagrams, £50. Adrian, G4JBH. 01288 331 113 (Bude).
E-mail: g4jbh@compuserve.com
JRC NRD-345 rcvr 0.1 to 30MHz, exc cond. 01452 612 234 (e/w) (Gloucester)
KENWOOD 520S with mic, man, £150. 902DM with mic, man, £250. All in good clean cond, non-smoker, used freq, see log book. Phone to discuss carriage, prefer collection if poss. Bob, G3JJU. 01252 403 655 (day) or 01252 615 831 (eve) (Fleet).
KENWOOD TR-751E, mint, boxed, man, mount, £285. Yaesu FT-70G manpack, QRP, full coverage HF tcvr with matching FC-70M ATU, £250. STR18 Tx unit, £40. Two Army Wireless sets C12, offers? Collins 180L-2 ATU, offers? Hugh, G4TMO. 01985 248 194 (Salisbury).
E-mail: hugh.kemp@btinternet.com
KENWOOD TS-530SP, VFO-230, vgc, mans, boxed, mic, CW/SSB filters fitted, new 6146Bs. Buyer collects or pays carriage, £300. Mike, G3TMB. 01704 214 012 (Southport).
E-mail: mike@g3tmb.freeserve.co.uk
KENWOOD TS-570D HF tcvr with separate power supply DPS-300GL, £820 ono. ERA Micro-Reader, £100 ono. Carriage extra. GW4VUC. 01633 484 577 (Cwmbran, Gwent).
KENWOOD TS-850SAT tcvr, mint cond, no mods, original packing, £700. Bob, GM4DZX. 01856 761 662 (Orkney).
E-mail: gm4dzx@qsl.net
LINEAR amplifier TL-922 exc cond. Phone between Tuesday and Saturday, 9am - 5pm. 01592 756 962 (Lanarks).
MFJ voice keyer, model MFJ-432, £50. 01543 255 992 (Lichfield).
PENTAX Efina micro APS camera, with three films, unwanted gift and never opened or used, exc Christmas present, £70. 01908 503 355 (Milton Keynes).
E-mail: adrian@euroneta.com
QRP tcvr kit partly built. Howes 10/15m with all bits, including case, £60. G4DPJ, QTHR. 0117 959 0413 (Bristol).
Q-TEK Penetrator vertical, £100. 3-el Yagi 50MHz, £30, buyer collects. 01474 534 694 (Gravesend).
E-mail: lbelger@aol.com
R1155A rcvr in original wooden case with original PSU for restoration, not used for many many years, £60 plus carriage. 01443 437 345 (Tonypandy, Mid-Glamorgan).
RACAL HF communications rcvr type RA-1771, mint cond, £550. Racal RA-117 rcvr, mint cond, £450. Racal RA-17 rcvr, £150. Racal tactical HF wide-band antenna type RA-905 with 9m mast type MA-675, mint cond, £550. Granger commercial HF log-periodic antenna type 2004 with 10m self-supporting articulated tower. Call for further details. Nigel, G0UDG. 01327 357 824 (W) 01323 486 822 (H) (Eastbourne).
RACAL RA1972 with works man, vg looks and performance. Realigned and serviced professionally, £550. Spare RA1792 mans, £50 each. New high quality equipment case 19in x 15in x 5in ideal HB project, £75. RA17 Mk2 gwo, but meter U/S, £110, some spare valves. 01526 860 546 (Lincoln).
SAILOR 1000UB marine tcvr HF, CW, SSB, 400W, 19in cabinet consists rcvr R1120 exciter, S1303 transmitter, T1130 ATU, 240V, £600. 0151 928 9419 (Liverpool).
SB-220 amp, £300. RA17, £80. FX-1 GDO, £10. MFJ-202 noise bridge, £10. 365A key, £75. 24GHz w/b tcvr, £15. Pay carriage or collect. 01409 231 301 (Highampton).
E-mail: engineman@ntlworld.com
SHACK clearout, Trio TR-500S rcvr vgc h/book, £40. Class D wavemeter, £20. G3KHZ keyer, £15. G2DYM balun, £5. H-brew 4.1 balun, £2. Howes external audio filter, £5, free with rcvr. G5RV, £5. Scrap KW Vespa case, £5. GW3YTL. 01824 704 010 eves (Ruthin).
E-mail: gw@3ytl.freeserve.co.uk
SILENT key sale. Yaesu FT-920AF HF + 6m, with 500Hz CW filter, £795. Yaesu FT-101ZD inc man and spare valves, £185. Trio TH-77E 2m/70cm h/held with TSU-7 tone unit and man, £75. 01603 868 712 (Norwich).
SPECTRUM analyser 0.1-21GHz, HP-181T, MF, 8559A PI gwo, £650, spare MF, £50. HP-8620C sweep osc MF, £40. HP-180C scope MF, £30. Huntron tracker in-circuit component tester, small neat unit, CRT display, wkg, £40. Fluke DC calibrator to 1000V minimum 4 decimal places, £50. Ring for chat/details. Jake Adamson. 01304 373 788 (Dover).
STANDARD C-510E h/held, CMP-115 S/P mic, CMA-510 mobile adapter, dual band mini mag aerial, £90. 01455 449 602 (Hinckley).
TRIO 530SP HF tcvr, £200. Kenwood AT-230, £100. SP-230, £40. VFO-230, £50. All in exc cond and full working order with mans. FT-290 Mk1, carry case, man, box, £190. Microset SR100 4-25W in 100W out amplifier, £100, buyer inspects collects or pays carriage. G4ZVS, QTHR. 0121 605 2877 (Birmingham).
E-mail: colin@drof96.freeserve.co.uk
TS-530SP, matching tuner and speaker, phones, mic, new, spare valves, Kent EK4 keyer with paddle MFJ 6m rig, £400, buyer collect, OAP. G3KMH, QTHR. 01434 600 316 (Hexham).
VARIOUS Pye PMR manuals £5 each, ring for list. 01354 741 168 (March, Cambs).
VINE Antennas Eagle 6m 3-ele Yagi, heavy duty boom, unused due to neighbour problems, £50 including carriage. G4FAB, QTHR. 01949 831 558 (Bingham, Notts).
YAESU FRG-9600 VHF/UHF rcvr, vgc, £175. G1RLD. 01386 793 175 (Inkberrow, Worcs).
E-mail: dgrb@aol.com
YAESU FT-50RD high power deluxe h/held. Dualband, c/w soft case and high power (5W) battery. Second high-capacity (1800 mAh) battery. Man, charger, boxed as new, £200 ono. Bill, G0VDE. 01728 724 087 or 01728 723 605 (Suffolk).
E-mail: bill.rothwell@btinternet.com
YAESU FT-901DM, FC-901 ATU, SP-901 speaker, £275. Kenwood TM-731E VHF/UHF mobile 12.5/25kHz 50W 2m, 35W 70cm, £150, with man. 01743 709 639 (Shrewsbury).
E-mail: allanmccartney@allsar.freeserve.co.uk
YAESU FT-DX401 HF tcvr, FV-401 external 2nd VFO, SP-401 speaker, man. Exc cosmetic and working order, £120 ono. G4OEE, QTHR. 0115 972 8064 (Nottingham).
YAESU FTV-901R with modules for 6m, 2m, 70cm, leads, man, £300. Datong RF speech processor, £40. Converted CB 10FM, £25. 01202 460 174 (Poole).
E-mail: g0faj@freenet.co.uk
YAESU G-400RC antenna rotator plus Jaybeam tribander antenna model TB-2, £200 ono. 01908 510 900 (eve). (Milton Keynes).
YAESU G5400-B AZ-EL rotator, £300. Jaybeam 88-ele crossed-Yagi, 432MHz

SILENT KEYS

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

9H1R	Mr R Meachen	06/00
G0BGG	Mr D V Rawlings	04/10/00
G0HEO	Mr T Hart	
G0ILE	Mr E H West	
G0KCI	Mr B F Parkes	17/10/00
G3AAE	Mr J D Kay	09/00
G3BYX	Mr D Dowson	11/11/00
G3GJV	Mr H Brooke	27/10/00
G3JOC	Mr O S Chilvers	
G3SOI	Mr R S Pace	11/11/00
G4CAL	Mr L Wade	21/10/00
G4DHZ	Mr S H Davis	15/10/00
G4FKM	Mr N T Wright	22/10/00
G4HDQ	Mr C G Clews	24/10/00
G4STT	Mr D Cameron	11/00
G4XGC	Mr L Ward	09/11/00
G8XTQ	Mr F J Eite	14/11/00
GM1VAX	Mr R Burns	14/11/00
GW4XNT	Mrs S J Morrison	27/10/00
K7RM	Mr D R Kelly	08/04/99
KC5TU	Mr R R Halls	26/09/00
RS181340	Mr D J Hansford	06/00
ZF1HJ	Mr J Hollingworth	15/04/00

antennas (2), £50 each. KLM 12-ele crossed-Yagi, 144MHz antenna plus reverse phase option, £70. WW2 R107 HF rcvr + man, offers? Kenwood R-1000 HF rcvr + man, bargain, £230. Global AT1000 HF-ATU, £40. ERA Microreader, £70. BNOS 432MHz 50W linear, £180. Navico AMR-1000S 2m FM mobile with ATU, bargain, £120 + man. 01763 262 443 (Royston, Herts).
E-mail: alan.florence@tinyonline.co.uk
YAESU MD-100ABX desktop mic, new, unused and boxed £70. Reg. 01784 491 778 (Staines).
E-mail: reg@reggie.worldonline.co.uk
YAESU Micro Commander FT-90R, VHF/UHF dual-band FM tcvr, boxed with man and mounting brackets, mint cond, sell for, £250. 01942 830 254 (Wigan).

EXCHANGE

UNUSED 2 x 4CX250B, 2 x QQV06-40, 1 x QQV03-20, base for latter, swap for cheap HF tcvr eg DSB80/160 kit part/unfinished or under-performing KW2000 series, HW101, WHY? Free up your shack space! Steve, GW0EZB. 01492 593 343 (Llandudno).
WANTED any accessories for Trio TS-530SP. Exchange Kenwood TM-G707 dual bander plus remote kit, possible cash adjustment. 01673 849 470 (Market Rasen).

WANTED

'**BATHTUB'** Morse key, paying £10 plus carriage. 07866 077 249 (Aspley, Notts).
E-mail: howardwalton@thersgb.net

CRYSTAL sets and early valve radios wanted: all old equipment, valves, etc is of interest. Jim, G4ERU, QTHR. 01202 510 400 (Bournemouth).

SGC SG-235/SG-230, gc please. Yaesu SP-6 speaker. Vibroplex Vibrokeyer. Bird Thruline HF QRO slugs. Please phone eves/weekends. 028 9268 9782 (Hillsborough).

YOUR price paid for a clean unmodified Racal RA-63 SSB converter, will collect. David, G4JMF. 0151 347 2169 (W) 0151 355 3854 (H). (Ellesmere Port)

4 METRE gear; 70MHz transverter, any type considered, and 70MHz linear amp; also need 70MHz low-pass filter. 01530 230 443 (Coalville).
E-mail: g4glt@thersgb.net
4m transverter, also HF beam 6 or 7 elements. 01708 373 366. (Hornchurch, Essex).
E-mail: martin.foster@itn.co.uk
CREED 7B teleprinter or similar equipment, tools or stationery. I like RTTY the hard way! Andrew, G0AMS, QTHR. 01329 235 397 (Fareham).
DISABLED collector / researcher seeks unwanted QSL cards, log books etc, also to buy pre-1970 *RadCom*, *CQ*, *QST* magazines. Mike, 8 Windsor Rd, Reydon, Southwold, Suffolk, IP18 6PQ
EX-military HF manpack tcvrs, types sought: PRC-320, PRC-2000, PRM-4021, 4031 etc, etc. WHY? G0TBI, QTHR. 01384 872157 (nr Stourbridge).
FT-225RD has anyone a dead, scrap, any cond, for spares to help rebuild mine. FT-290 for transverter use. Scrap broken CD-45 or TR-44 rotator for spares. 70cm beam antenna. Someone must have FT-225RD workshop man, please help. Geoff, G4DED, QTHR. 07931 528 269 (Banbury, Oxon).
IC-735 in good order, fair price paid. Racal 100W linear type TA-944. PRC-316 in any cond, also accessories. John, G3GTJ. 01963 240 319 (Castle Cary).
ICOM AT-180 AV-70 tuner for IC-706. Terry, G0VTI. 01924 822 796 (Wakefield).
E-mail: ibbitsont@kagraah.cs.com
KW Ezematch, RAF D-type key with cover, Kenwood R-820. 01392 216 579 (Exeter).
E-mail: steve.p.taylor@btinternet.com
SERVICE man and spare parts for HP-8640A signal generator. G1OXB, QTHR. 07760 452 758 (Nottingham).
SILENT key clearout or just not needed. Wanted for research project QSL accumulations, old call books etc, can collect. 0113 269 3892 (Leeds).
E-mail: g4uzn@qsl.net
SKANTI TRP-8250 marine MF/HF SSB, complete and working. Paul. 07768 492 562 (Isle of Wight).
E-mail: paul.i.martin@btinternet.com
VERSATOWER trailer must be in good order. Peter. 01493 780 044 (Great Yarmouth).
WANTED Marconi HF transmitters: Oceanspan, Globespan, Commander, Commandant, Crusader, also any HF transmitter Redifon, Sait, ITT, Nera, also Apollo rcvr. 0151 928 9419 (Liverpool).
WANTED Vickers M17 microscope. G3TDZ, QTHR. 0113 263 7885 (Leeds).
E-mail: john.hey@phasing.fsnet.co.uk

Rallies & Events

21 JANUARY 2001

OLDHAM ARC Rally – Queen Elizabeth Hall, Civic Centre, West Street, Oldham. OT 10.30/11am, TS, B&B, MT (two photos needed), TI on S22 (GB4ORC) starting 7.30am, C, LB, CP free. Geoff, 01706 846 143 or M0AUG@thersgb.net or Mike, 01706 367 454 or M1CVL@thersgb.net

28 JANUARY 2001

HORNCASTLE Amateur Radio, Electronics & Computer Fair - The Old School, Cagthorpe, Horncastle, Lincolnshire. OT 10.30am, 50p, C, MT (two photos required). 01526 860 320 or 07778 274 535.
LANCASTRIAN Rally - CANCELLED for this year only. G0GVA, 01772 621 954.

4 FEBRUARY 2001

SOUTH ESSEX ARS 16th Mobile Rally – The Paddocks, Long Road, Canvey Island (at the southern extremity of the A130). OT 10.30am, C, CP free, DF, MT (two photos required). Brian, G7IIO, 01268 756 331 or briang7iio@yahoo.com

11 FEBRUARY 2001

10th NORTHERN CROSS Radio Rally - Thornes Park Athletics Stadium, Wakefield, W Yorkshire. Just out of town on the Horbury Road. Easy access from M1 jns 39 and 40 - well signposted. OT 10.30/11am, TI on 2m and 70cm, B&B, MT (two photos required). John, G7JTH, 01924 251 822 or rally@sandalmagna.demon.co.uk or www.sandalmagna.demon.co.uk/rally/
CAMBRIDGE & DARC Radio Rally & Car Boot Sale – New venue: Lordsbridge Arena, Wimpole Road, Barton. M11 jn 12, A603, follow signs. OT 10/10.30am, £1.50 (£1 for OAP/disabled) children free, CP free, C, B&B, CBS under cover, TI on S22. G0GKP, 01954 200 072.
HARWELL ARS Radio & Computer Rally - Didcot Leisure Centre, Mereland Road, Didcot, signposted from the A34. OT 10.15/10.30am, £1. CP, TS, B&B, SIG, LB, C, DF, TI on S22. Ann, G8NVI, 01235 816 379 or AnnStevens@compuserve.com

17 FEBRUARY 2001

THE REDDISH RALLY - St Mary's Parish Hall, Reddish, Stockport. OT 10am. John, G4ILA, 0161 477 6702.

25 FEBRUARY 2001

CENTRAL COAST AMATEUR RADIO FIELD DAY - Wyong Racecourse, about 90 minutes by road or rail north of Sydney city. This is the largest amateur radio event in Australia, if not in the southern hemisphere. OT 8.30am, A$10 for adults and A$5 for concessions. TS, FM, B&B, LEC, TI, club and emergency service displays and foxhunts. www.ccarc.org.au/

CONGRATULATIONS

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

50 years

G3GYF	Mr AJF Powell
G3IGW	Mr M G Whitaker
G3JLH	Mr I L Hampton

SWANSEA ARS Radio & Computer Show – Swansea Leisure Centre on the A4067 Swansea to Mumbles coast road. OT 10.30am, £1.50, children 50p, TS, B&B, SIG, C LB. Roger, GW4HSH, 01792 404 422.

11 MARCH 2001

WYTHALL RC 16th Annual Radio & Computer Rally - Wythall Park, Silver Street, Wythall. On A435, two miles from jn 3 M42. OT 10am, £1.50. TS, LB, C, B&B, TI on S22, free Park & Ride. Chris, G0EYO, 0121 246 7267, e/w, or fax 0121 246 7268 or e-mail chris@g0eyo.freeserve.co.uk

18 MARCH 2001

BOURNEMOUTH RS 14th Annual Sale – Kinson Community Centre, Pelhams Park, Millhams Road, Kinson. OT 10am, £1, C, TI on S22, TS, B&B, SIG. Olive or Frank, 01202 887 721.
BREDHURST R & TS Rainham Radio Rally - Rainham School for Girls, Derwent Way, Rainham, Kent - easy to find from M2 jn 4 (A278) and from A2 at Rainham; follow the RRR arrows. OT 9.30/10am, C, TS, SIG, TI on S22, B&B, CP. www.thebrats.net
NORBRECK Amateur Radio, Electronics & Computing Exhibition – Norbreck Castle Hotel Exhibition Centre, Queen's Promenade, North Shore, Blackpool. The largest single-day exhibition in the country. MT. Peter, G6CGF, 0151 630 5790.

25 MARCH 2001

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

7/8 APRIL 2001

RSGB Spring Radio & Computer Show (incorporating **RSGB National VHF Convention**) - Bletchley Leisure Centre. Derek, 0870 904 7373.

8 APRIL 2001

CAMBRIDGESHIRE RG Annual Rally - 01462 683 574.

21 APRIL 2001

CORNISH RAC INTERNATIONAL MARCONI DAY 2001 - www.users.globalnet.co.uk/~straff/

22 APRIL 2001

HARROGATE Radio, Computer & Electronics Rally – Gerald, G0UFI, 01765 640 229 or e-mail g0ufi@qsl.net
LOUGH ERNE ARC Rally - Frank, GI3ZMX, 028 6632 9507.
YEOVIL & DARC 17th QRP CONVENTION – D Bowden, M1WOB, 01935 414 452.

29 APRIL 2001

ANDOVER RAC New Radio & Computer Boot Sale - Jack, G0UJW, 01264 391 383.

7 MAY 2001

DARTMOOR RC Rally – Ron, G7LLG, 01822 852 586.
MID-CHESHIRE ARS Rally - David, G4XUV, 01606 777 87.

13 MAY 2001

THREE COUNTIES Radio & Computer Rally – John, 01527 545 823.

20 MAY 2001

DRAYTON MANOR Radio & Computer Rally - Peter, G6DRN, 0121 443 1189 (eve).

3 JUNE 2001

RED ROSE QRP FESTIVAL - Les, G4HZJ, 01942 870 634.

10 JUNE 2001

NUNSFIELD HOUSE ARG Elvaston Castle National Radio Rally - Les, G4CWD, 01332 559 965 or rally@g4cwd.demon.co.uk

8 JULY 2001

SUSSEX Amateur Radio & Computer Fair – Ron, G8VEH, 01903 763 978 or 01273 417 756 (office hours).

21 JULY 2001

CORNISH RAC Radio Rally & Computer Fair - Robin, 01209 820 118.

9 SEPTEMBER 2001

LINCOLN SWC Lincoln Hamfest - John, G8VGF, 01522 525 760 or 07968 050 318.

21/22 SEPTEMBER 2001

LEICESTER Amateur Radio Show – Geoff, 01455 823344, fax 01455 828273, or e-mail g4afj@argonet.co.uk

7 OCTOBER 2001

NORTH WAKEFIELD RC 18th Amateur Radio & Computer Rally - 01924 824 451 or www.nwrc.mcmail.com

12 - 14 OCTOBER 2001

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

3/4 NOVEMBER 2001

NORTH WALES RRC Rally 2001 – Muriel, GW7NFY, 01745 591 704 or www.nwrrcw.org.uk

GB calls

These callsigns are valid for use from the date given, but the period of operation may vary from 1 – 28 days before or after the event date. Operating details are provided in an abbreviated form as follows:
T = 160m; L = 80 or 40m; H = HF bands (30 - 10m); V = 6 and / or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet.
Please send operational details of your special event station to the *RadCom* office at least five weeks before publication.

1 Jan	GB2LD: Lizard Radio. Cornwall. TLHV27 (M0ROA)
23 Jan	GB100LD: Lizard Wireless Station. The Lizard, Cornwall. LH2 (G3PLE) GB2PK: Porthcurno Telegraphic Callsign. Penzance, Cornwall. L (G3NRD)

KEY

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

Regional and Club News

WELCOME TO the new-look club news pages in *RadCom*. In accordance with the new RSGB Regional Representational Scheme, details of your local club's meetings will now be found listed in alphabetical order under the appropriate Region.

To kick off the new system, I asked the RSGB Regional Manager for the North East Region, Peter Sheppard, G4EJP, to explain the thinking behind the scheme and to provide a detailed breakdown of the new Regions and their constituent Districts.

These pages will also be where you can find news of what is going on around the country, not just at a local level but also at the Regional level. In future too, you will find club news stories appearing in these pages rather than in the *RadCom* news at the front of the magazine. If you are proud of what your club has achieved - perhaps a particularly successful special event station, fundraising or charity work in the community, training a record number of Novices or RAE candidates - or if there's anything to do with your club that you wish to share with all RSGB members, please send in the story, preferably with a photograph, to *RadCom Regional / Club News*, Lambda House, Cranborne Road, Potters Bar EN6 3JE. Stories and / or photos can also be e-mailed, to: radcom@rsgb.org.uk (please note we cannot guarantee to use all stories or photographs that are submitted).

I hope to increase the space devoted to clubs on a regular basis so, when submitting details of future events, if you wish to have information on where and when your club meets also included in *RadCom*, please specify these details and request that they're included. Finally, the new Regional scheme is new to me too. If I have inadvertently put your club in the wrong Region, I apologise in advance. Please simply send a correction with the next club details update - *Ed*.

The RSGB Regional Representational Scheme

By Peter R Sheppard, DipOS, FInstSMM, G4EJP, RSGB Regional Manager - North East Region

AS PART OF RSGB Council's review of the Society, a total review of the way the Society represents its members at both National and Regional level has taken place. These changes were agreed at the Society's AGM at Harrogate in December 2000.

This article covers only the Regional elements of the scheme: other changes to the Society's Memorandum and Articles were promulgated elsewhere.

OBJECTIVES

THE OBJECTIVE of the representational scheme is to manage the relationship between the membership of the RSGB at Regional level, and the nationally elected Council of the Society in a competent and professional manner, in order to maximise the benefits members receive at Regional level from the Society. In particular:

- To provide advice and support to RSGB Affiliated Societies.
- To encourage the growth of amateur radio and the Society's activities at regional level.
- To provide a link between the membership and the Society's central organisation.
- To submit important regional issues requiring clarification at National or Regional level to Council.
- To support members within the region.
- To support all RSGB officers, managers, committee chairman and members of committees within the region.

OVERVIEW

UNDER THE 2001 scheme the United Kingdom is divided into 12 Regions, each of which is supervised by a Regional Manager elected by the members resident in that Region.

Additionally, each region is divided into up to four districts. Each district is supervised by a Deputy Regional Manager. The boundaries of the district are as defined by the Regional Manager, but typically represent one to three counties. There are 48 districts within the UK and our 600-plus clubs are located in these districts and are represented within the scheme by an RSGB affiliated club contact.

The representational scheme ensures that those members who live in the more remote parts of the country have an opportunity to make their views known and to learn of the services which are available.

An extensive use of e-mail and electronic communications is integrated into the new scheme. This will allow the quick dissemination of information to clubs and members and provide the ability to obtain support from the Society by its members at regional and national level.

REGIONAL RSGB GROUPS

THE REGIONAL RSGB Group is formed as an organised grouping that will enable RSGB members to debate issues of local interest and to provide a feedback to the RSGB National Council in a formal manner.

Objectives

- To be representative of local radio amateurs' views
- To discuss and resolve local and Regional issues
- To set up forums to develop amateur radio
- To encourage good neighbour and good housekeeping principles
- To support where possible all radio amateurs and SWLs
- To support where practical radio events and rallies within their area.

Overview

- The Regional RSGB Group is the body formed to manage the affairs of the Region; this enables the membership to become involved in affairs that concern their particular Region without recourse to the National Council.
- The Regional RSGB Group consists of all the RSGB officials who support the membership at local level, is managed by the Regional Manager and the Deputy Regional Managers and offers members first line support.
- Membership of the group is only open to RSGB Members.

A Regional RSGB Group typically consists of the following:

- RSGB Regional Manager (RRM)
- All Deputy Regional Managers (DRRM)
- All RSGB Affiliated Club Contacts (RACC)
- Other members may be co-opted to advise the Group on specific issues; typically members from repeater, ATV or other specialist interest groups
- Any paid-up RSGB member may apply to join the group, but only the RRM, DRM and RACCs will have voting rights. This will not exclude RSGB members from taking part in any debates or attending the meetings.

Regional RSGB Group Meetings

- RSGB Groups will hold regular meetings in different lo-

cations to take input from members and will consider and debate local issues.

- A number of Regional Meetings will be held each year as required by the Group.
- Any regional concerns will be fed back to RSGB Council via the Regional Manager who is a member of the Regional Council.

CONCLUSION

THE CHANGES TO THE representational scheme are radical and will offer the membership a real opportunity to shape the future of amateur radio within the UK. The RSGB will always strive to represent amateurs and amateur radio in the UK to the highest standard. However, any scheme is only as good as the members who manage it. The representation scheme is managed by volunteers, so if you feel you can contribute to the future of amateur radio at Regional or National level, please contact your local radio club or your RSGB Regional team.

Alternately contact the author, Peter Sheppard, G4EJP (QTHR), or visit the North East RSGB Regional website at: www.peter-sheppard.co.uk

Club NEWS

Scotland West & the Islands Region

No club details submitted.

Scotland East & the Highlands Region

ABERDEEN ARS
5, Junk sale. Robert, 01224 896 142.
DUNDEE ARC
16, 'HF CW National Field Day' video by Jim Burke, GM4TNP; 30, Lecture 'GZ7V - CQWW Contest - Shetland, October 2000', by Stewart, GM4AFF. Donald, GM0PIV, 01382 455 771.

North West Region

CHESTER & DRS
9, Annual General Meeting; 16, Talks by Construction Contest entrants; 23, Surplus sale. Bob, G4CMI, 01244 378 699.
MORECAMBE BAY ARS
9, Annual General Meeting and 'Outstanding Club Member of the Year' Trophy. Brian, G0RDH, 01524 424 522.
WHITEHAVEN ARC
4, Club closed; 11, Night on the air; 18, Contest & Special Event planning for 2001; 25, CW night. Norman, M0CRM, 01946 692 462.

North East Region

GRIMSBY ARS
4, AFS organisation; 18, Video night - 'Radio Caroline'. Brian, G4DXB.
HALIFAX & DARS
16, Details to be announced. Ray, G0PMU, 01274 600 297.
HAMBLETON ARS
10, On-the-air night; 24, Annual General Meeting. John, G0VXH, 01845 537 547.
WAKEFIELD & DARS
2, On-the-air evening; 9, Rally meeting; 16, Talk 'Ultimate Receiver', by G4IZH; 23, On-the-air evening; 30, Great Egg Race. John, G7JTH, 01824 251 822.

Midlands Region

CAMBRIDGE & DARC
5, Talk 'Amateur Radio and Linux Operating System', by Mike, VE1MCT; 12, Installing packet radio in the shack by club members; 19, Talk '*PW* 80/40 QRP Project in Two Hours?', by Clive, M5CHH; 26, 'Won't work!' - 2m DF revisited by Clive, M5CHH. Bob, G0GVZ, 01223 413 401.
COVENTRY ARS
5, Computer evening; 12, Night on the air, Novice class, CW practice; 19, Annual Dinner - *Black Horse*, Marton; 26, Night on the air, Novice class, CW practice. John, G8SEQ, 024 7627 3190.
DENBY DALE (PIE HALL) ARS
17, Talk 'Scotland - Part 2', by Kevin, G1FYS. Tony, G4LLZ, 01484 318 750.
GLOUCESTER AR & ES
8, Talk 'Morse - Old and New'; 15, On-the-air night - 160/80 metres; 22, Morse practice - 5WPM; 29, 2m operating event. Tony, 01452 618 930, office hours only.
LOUGHBOROUGH & DARC
2, New Year drink - venue to be announced; 9, Club info night - collect details for data file; 16, Junk sale; 23, Computer forum - bring a PC, old or new; 30, Three-transistor construction competition - judging night. Chris, G1ETZ, 01509 504 319.
MID-WARWICKSHIRE ARS
9, Mini talks by members; 23, Talk 'PSK31', by Brian. Bernard, M1AUK, 01926 420 913.
SOUTH NORMANTON, ALFRETON & DARC
1, Club Shack - Night on the air; 8, Club Shack - Talk 'Data Modes', by G0OKD; 15, Hall - Junk sale; 22, Club Shack - Night on the air. Dave, M5RST.
STRATFORD-UPON-AVON & DRS
8, Annual Dinner - *The Stag* at Redhill; 22, Round Table. David, G6FEO, 07970 148 204.
TELFORD & DARS
3, On the air; 10, Talk '*Practical Wireless*, Past, Present & Future', by Rob, G3XFD (Editor). Mike, G3JKX, 01952 299 677.

North Wales Region

No club details submitted.

South Wales Region

CLEDDAU ARS
8, Talk 'New Zealand', by John, GW0JRF. Trevor, GW4XQK, 01646 600 725.

Northern Ireland Region

BANGOR & DARS
3, Annual quiz night. Mike, GI4XSF, 028 4277 2383.

London & Central Region

BRACKNELL ARC
10, Annual General Meeting. Baugh @compuserve.com
COULSDON ATS
8, Talk 'The Construction of an Automatic Weather Station', by Dave, G8VXB. Steve, G7SYO, 01737 354 271.
CRYSTAL PALACE & DRC
3, No meeting as *Beechwood* is closed; 20, Talk 'Bee Keeping', by Peter Springall. Bob, G3OOU, 01737 552 170.
ECHELFORD ARS
14, RSGB AFS CW Contest; 20, RSGB AFS SSB Contest; 25, Details to be announced. Robin, G3TDR, 01784 456 513.
EDGWARE & DARS
11, Annual General Meeting; 25, Informal meeting and subscriptions payment. David, G5HY, 01923 655 284.
MAIDENHEAD & DARC
4, Talk 'Air to Ground Radio', by Dave, G3RZF; 16, The Great Egg Race - light-hearted competitive event. John, G3TWG, 01628 525 275.
SILVERTHORN RC
19, 'Come and Rake' sale; 26, Provisional date for club meal. David, G0KHC, 020 8504 2831.
SURREY RC CLUB
8, Symposium 'Where is Amateur Radio Going?'. Berni, G8TB, 020 8660 7517.
VERULAM ARC
22, Talk by Trevor Cullimore, Operations Manager of the RA. Walter, G3PMF, 01923 262 180.

South & South East Region

FAREHAM & DARS
3, Project Night - construction begins; 10, On-the-air night; 17, Video night; 24, Annual General Meeting; 31, Circuit diagrams and components - part 8. Steve, G7HEP, 01329 663 673.
HASTINGS E & RC
17, The Internet and Amateur Radio. R C Gornall, G7DME, 01424 444 466.
HORNDEAN & DARC
2, Club Social Evening; 23, Video of G0DHZ's DXpedition to St Kilda and other Scottish islands. Stuart, G0FYX, 023 9247 2846.
ITCHEN VALLEY ARC
12, Equipment review by Chris,

G4HCL; 26, Packet cluster by Colin, G3PSM. Pete, M0CFQ, 023 8034 5052.

QRZ ARG OF SUSSEX

12, 'Amateur Radio Direction Finding', a Dutch experience, by Peter Johnson, M1BCV; 26, Special Events projects evening. Stuart, M0CHW, 01435 863 020.

TROWBRIDGE & DARC

17, 17th Annual General Meeting. Ian, G0GRI, 01225 864 698 evenings & weekends.

WORTHING & DARC

3, The Future of International Broadcasting; 10, Videos; 24, Southdown Radio. Roy, G4GPX, 01903 753 893.

South West & Channel Islands Region

APPLEDORE & DARC

15, Talk 'Radio Antennas', by Mike, G4NCU. Brian, 01237 473 251.

BLACKMORE VALE ARS

2, VHF on-the-air night & CW class; 9, Talk 'Linux OS', by Paul, G8GJA; 16, HF on-the-air night & CW class; 23, Construction practical by Tony, G0GFL; 30, Shack upkeep & club project. Tony, G0GFL, tel: 01258 860 741.

CORNISH RAC

8, Computer Section - 'Australia's Little Cornwall', a video documentary by Peter, G3WKP. Robin, G0MYR, 01209 820 118.

SOUTH BRISTOL ARC

3, Plans for club events in 2001 - Fred, G7LPP; 10, Bring & Buy sale - Len, G4RZY; 17, Display of club archives - Muriel, G4YZR; 24, On-the-air evening; 31, 10m Challenge. Len, G4RZY, 01275 834 282.

Members of the Cockenzie and Port Seton Amateur Radio Club (and canine friend) at the presentation of a cheque for £766 to the British Heart Foundation. Since 1994 the club has donated £5310 to their adopted charity.

East & East Anglia Region

BRAINTREE & DARS

1, Operating evening; 15, Amateur radio software. Keith, M0CLO, 01376 347 736.

HARWICH ARIG

10, Lecture 'Hubble Space telescope', by Paul, G4YQC. Eugene, G4FTP, 01206 826 633.

MAIDSTONE YMCA ARS

5, RAE 'Transmitter Interference'; 12, RAE 'Measurements'; 19, RAE 'EMC'; 27, RAE 'EMC' (additional). John, G0RHO, 01622 832 259.

MEDWAY R & TS

12, Talk 'Lasers', by Greg, G4XMS; 26, Talk 'Long-Range Weather Forecast', by Prof Piers Corbyn; 27, Annual Dinner. George, G4INO, 01634 220 086.

THE REGIONS AND DISTRICTS

At the time of preparing this table some district boundaries have not been finalised, therefore some changes to the following districts may take place. The scheme is designed to allow district boundary changes as required to support the membership most effectively.

Scotland West and the Islands Region
- District 1 – Argyle & Bute
- District 2 – Ayrshire, Lanarkshire
- District 3 – Dumfries & Galloway
- District 4 – Borders

Scotland East and the Highlands Region
- District 5 – Highlands
- District 6 – Moray, Aberdeenshire
- District 7 – Perth & Kinross, Angus
- District 8 – Fife, Lothian, Borders

North West Region
- District 9 – Cumbria, Lancashire
- District 10 – Isle of Man
- District 11 – Greater Manchester
- District 12 – Cheshire, Merseyside

North East Region
- District 13 – Northumberland, Tyne and Wear, Cleveland, County Durham
- District 14 – North Yorkshire, East Yorkshire, NE Lincs
- District 15 – West Yorkshire
- District 16 – South Yorkshire

Midlands Region
- District 17 – Shropshire, Staffordshire, West Midlands
- District 18 – Derbyshire, Lincolnshire, Nottinghamshire. Rutland
- District 19 – Bedfordshire, Cambridgeshire. Leicestershire, Northamptonshire
- District 20 – Gloucestershire, Herefordshire, Warwickshire, Worcestershire

North Wales Region
- District 21 – Wrexham, Denbighshire, Flintshire.
- District 22 – Conwy
- District 23 – Gwynedd
- District 24 – Powys

South Wales Region
- District 25 – Pembrokeshire
- District 26 – Ceredigion
- District 27 – Carmarthenshire
- District 28 – Vale of Glamorgan, Cardiff, Newport

Northern Ireland Region
- District 29 – North Belfast, Co Antrim
- District 30 – South Belfast, Co Down
- District 31 – Co Armagh, Co Fermanagh
- District 32 – Co Londonderry, Co Tyrone

London & Central Region
- District 33 – London
- District 34 – Buckinghamshire, Berkshire
- District 35 – Hertfordshire
- District 36 – Surrey

South & South East Region
- District 37 – Oxfordshire
- District 38 – Wiltshire
- District 39 – East Sussex, West Sussex
- District 40 – Wiltshire, Hampshire

South West & Channel Islands Region
- District 41 – Cornwall & Channel Islands
- District 42 – Devon
- District 43 – Somerset & Bristol
- District 44 – Dorset

East & East Anglia Region
- District 45 – Norfolk
- District 46 – Suffolk
- District 47 – Essex
- District 48 – Kent

Overseas Regions
- District 49 - IARU Region 1
- District 50 - IARU Region 2
- District 51 - IARU Region 3

Table 1: The breakdown of the new RSGB Regions and Districts.

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

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

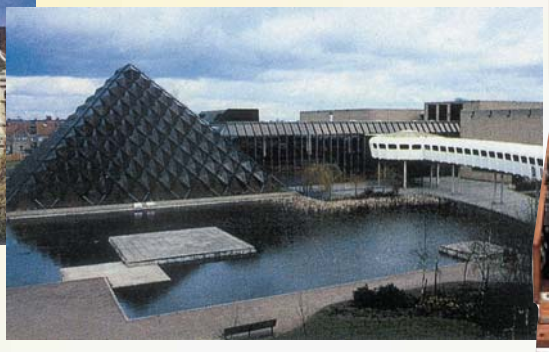
NEW EVENT

THE RSGB SPRING SHOW & VHF CONVENTION

BLETCHLEY 2001

7&8 APRIL

(Trade exhibition in Bletchley Leisure Centre)



RECRUITMENT FAIR
TOURS OF BLETCHLEY PARK
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Towards More Accurate F-Layer Propagation Predictions

by Gwyn Williams, G4FKH, Vice-Chairman, RSGB Propagation Studies Committee

AT THE BEGINNING of the year the RSGB Propagation Studies Committee (PSC) decided that the propagation predictions published in *RadCom* were neither accurate enough nor presented to their best advantage. This was the catalyst for my current NCDXF monitoring project, which has enabled me to verify and change the prediction model used to prepare the predictions for *RadCom*.

Before explaining the table below, I would like to make some general comments about producing predictions and a few words about these in particular. All PC prediction engines suffer from the same sort of deficiencies and these have made many compromises necessary. These compromises mean that it is difficult to produce a world-wide prediction table utilising a set of parameters for all destinations.

Sylvan J Katz, VE5ZX / G0TZX, has written a suite of programs which allows me to manipulate a particular engine to reflect actual monitoring results. For this model we are using an engine in the REC533 series, which is freely available through our web site (1). This notwithstanding, a lot of thought has to be given each month before the predictions can be produced. For example, the predictions are prepared two and a half months in advance, which necessarily means that varying geomagnetic conditions cannot be catered for.

THE NEW TABLE

THE NEW PROPAGATION prediction table, below, has three colours and figures between 1 and 9, but any other similarities to the previous table ends here.

The *figures* now represent expected *circuit reliability* and the *colours* represent the expected *signal strength*, ie '1' represents an expected reliability of between 1 and 19% of days, '2' between 20 and 29% of days, etc. No signal is expected when a '.' is shown. **Black** is shown where the signal strength is expected to be very low to low; **blue** when the signal strength is expected to be fair and **red** when the signal strength is expected to be strong.

It should be pointed out that these tables are produced with 'Mr Average Radio Amateur' in mind: an average transmitter with about 100W, a dipole type antenna in a quiet urban environment.

However, the rest of the amateur population is not left out: should your set-up be superior to this, merely go 'up' one colour and if you are not quite so lucky, go 'down' one colour. In all circumstances the *figures* should remain the same. ♦

(1) The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated monthly.

HF F-Layer **Propagation Predictions** for **January 2001**

	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	999888999999	669999989877	..9899899...	..9976998...	..8999996...	...99999....	...99999....
*** Asia							
Yakutsk	877...299888	754865899678	322998577235	...986243...	...784.2....	...672.....	...56.....
Tokyo	...85.89999.	...986899887	...98.787...	...97.....	...8.....	.....	.....
Singapore	589876	899665	....3997...	....799....	....2898....	...34786....	...34672....
Hyderabad	8.....99999	9.....999999	6.5..7999876	..6889998...	..7999997...	...99999....	...99999....
Tel Aviv	414....67646	86111	...422683...	...56667....	...45564....	...26542....	....332....
*** Oceania							
Wellington	....21261...	...266771...	...27886....	....7873....	....677.....	....465.....	.....5.....
Perth	.....28888.	.....89976.	.....9972..	....5993...	....698....	....2686....	...23574....
Sydney	.....7886..	....79973..	....39993...	....8998....	....8996....	...3898.....	...3788.....
Honolulu	.8797679....	79.999999...	...889.89...	.....8...	.....	.....	.....
Samoa	..287679....	...99999....	...799998...	....9999....	....8998....	.....12.....	.....
*** Africa							
Mauritius	9.....79999	9.....99999	8.....99988	.....8998..	...778999...	...89999....	...89999....
Johannesburg	87.....1788	85.....7988	5.....38865	.....786..	...3.23873..	...435586...	...335573...
Ibadan	999.....9999	989....69999	7.7973799977	...9999998..	...9999997..	...999999...	...999998...
Nairobi	98.....59999	99.....99999	889...799999	8.8999999977	8.9999999888	..89999998..	...9999998..
Canary Isles	9865....9999	8729522899 77	32.9888997 63	1..6888 8621	...79999731.	...4667772..	...2457751..
*** S. America							
Buenos Aires	7759.....36	55.9.....55	...9.....12.	...8.....1..	...62...2...	....32.22...	....32.3....
Rio de Janeiro	9999.....99	9999.....999	99.9.....999	...99...99..	...9999999..	...999999...	....99999...
Lima	8859.....27	67194.....56	.1.97....131	...664..22..	....47555...	.....8765...	.....8763...
Caracas	9978.....89	78.9.....98	....8....86.	....88..8...	.....9889...	.....9998...	.....999....
*** N. America							
Guatemala	99999.....9	99.99.....99	.9.999...88.	.....9999...	.....9999...	.....9999...	.....99....
New Orleans	7737.....7	44.72.....74	...2.4....1.	.....2646...	.....777...	.....885...	.....883...
Washington	7889.....99	8949 2....899	46.6383178 76	.....988965.	.....89996..	.....6999...	.....6998...
Quebec	8818.....988	11.71...8931	...2853793..	....87798...	....78997...	....69995...	....48983...
Anchorage	9967...58658	7625777897 56	13.2553482..	....33.23...	.....1...	.....	.....
Vancouver	99681.....8	87.77.172357	21.23..98212	.....88...	.....76...	.....43...	.....
San Francisco	89795.....7	8838721...17	33.46..53..2	.....76...	.....75...	.....62...	.....5....

The provisional mean sunspot number for November 2000 issued by the Sunspot Data Centre, Brussels, was 106.5. The maximum daily sunspot number was 147 on 2 November and the minimum was 59 on 26 November. The predicted smoothed sunspot numbers for January, February and March are respectively: (SIDC classical method – Waldmeier's standard) 114, 113, 111 (combined method) 124, 125, 126.

HF HF HF HF

DON FIELD, G3XTT
105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.
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THE GOOD HIGH band conditions which I reported last month continued into October. UK stations were able to work such exotic DX as FO0WEG (Austral Islands), ZK1BQI (S Cook Islands), ZK1NDK (N Cook Islands) and K5K (Kingman Reef) on 10 and 12m. But you do have to check the bands daily, as there have also been many disruptions to propagation due to solar disturbances, one of which affected the second day of the *CQ* World Wide (CQWW) Phone contest. However, I had several notes from readers commenting on how the contest had given them an opportunity to boost their totals, especially on 10m. Most of these were from folk using low power and simple antennas. Typical was Mike, G4NSZ, who runs an IC-706MkII to a piece of wire strung from a 'town house' with just a small courtyard. Nevertheless, he managed to work many of the Caribbean DXpeditions as well as V7 (Marshall Islands). I guess this is the difference between casual holiday-style DXpeditions and serious contest DXpeditions. The latter make a big effort to be loud and to be able to hear, and provide a great opportunity for the 'little pistol' to work some new ones.

On a more negative note, Paul, G3AWP, forwarded me a release from DJ0FX following his recent Pacific DXpedition as FO0PT. Walter says he has travelled to French Polynesia some seven times since 1982, and that the problem of pirates in the amateur bands has become considerably worse during that time. These people live on the myriad islands in Indonesia, Malaysia, etc, buy amateur equipment and amplifiers, and use them to communicate without any form of licence, some for personal use but many for commercial purposes. There seems to be no solution, as the governments concerned seem unable or unwilling to take action.

DX NEWS

PETER CHADWICK, G3RZP, reports that he was at 4U1ITU for the CQWW Phone contest and is happy to provide a QSL (for that operation only) to those who need one. All contacts that he made on 10 and 18MHz while there have been confirmed automatically via the bureau.

John, G3IZM, was due to be active (on 20 and 15m SSB and CW) as DU7/G3IZM from Guimeras Island in the Visayan Group (OC-129) between 19 December and 5 January. QSL to his home call.

Masa, JA6GXK, was due to be active from Me-shima, Danjo Islands (AS-056), on 5 - 16 January, 6 - 16 February and 20 - 30 March. He will operate in his spare time. Look for him on or around 14260 and 21260kHz. QSL via bureau to his home call.

Takeshi, JI3DST, reports that he will be active from Daito Island (AS-047) from 30 December until 7 January, signing JI3DST/6 on 7, 18, 21, 24 and 28MHz, SSB only. QSL via the bureau to his home call.

Your columnist with regular IOTA DXpeditioner, Take, JI3DST, at the HF Convention at Windsor in October.

EP4PTT is the newest club station from Iran (not to be confused with EP3PTT which has been active for some time). Operators include Hamid, EP3HR, and Yar, EP3SP. The station includes a homebrew rig with 20 watts and a dipole. QSL via the bureau.

The following news regarding North Korea appeared during October: "Members of a multinational group of amateur radio operators met on Thursday 19 October in Seoul, South Korea, in preparation for a trip and possible demonstration operation of amateur radio in North Korea. Approximately six to eight hours before the team was to take a bus ride north to P5, North Korean authorities informed them that permission to operate amateur radio would not be granted. They were, however, given a new date of 7 January 2001 for possible amateur radio operations. Team members will be returning home Saturday morning (Korean time). Due to the sensitive nature of this operation only certain details could be presented to the public at this time. More details to follow." The watchword must be to keep an eye on the bands for a possible operation from this, the rarest of DXCC entities.

Antonio, CT1EGH (4W6GH / D2EGH), plans to be in Guinea Bissau (J5) for a short-term assignment and to return to East Timor in February.

No less than three groups have announced their intention to operate from Conway Reef (3D2). Firstly, Hrane, YT1AD; Rasa, YU1RL; Miki, YU1AU (or Ratko, YU1NR); Rale, YT6A; Dragan, Z32AU; Mome, Z32ZM; and Ray, YS1RR (to be confirmed), will activate Conway Reef, arriving on the island on 7 February and closing down on 15 February. They will have three complete stations, and be active on all bands and modes. They will also be active from Fiji for a few days on their return journey. A team consisting of Nils-Göran, SM6CAS; Mats, SM7PKK; Janne, SM0DJZ; Pekka, OH1RY; Siggi, TF3CW; and Steve, G4EDG, plan to activate Conway Reef from 5 to 24 April (ie covering three complete weekends). This group plan to have four complete stations, again covering all bands and modes. Finally, Bill, VK4FW, is also reported to be putting together an expedition to the Reef, but no other details are available at this time.

There will be a major DXpedition to San Felix and Ambrosio Islands (CE0X) beginning the second full week of February. Operators include: CE6NE, CE6SAX, CE3AQI / NP4IW, OH1EB, OH2BH, OH2RF, DJ9ZB, K0EU and CE6TBN. They will be on the air as CE0XT from San Ambrosio (IOTA SA-013). The operation will cover all bands and modes. A web site has been set up at www.qsl.net/ce0xt

Kenny, K2KW, has launched a new web site called DX Holiday. The goal of this site is to share information on DX operating locations, and DXpedition 'how-to' information. It can be found at: http://pages.prodigy.net/k2kw/qthlist/

CONTESTS

IN THE UBA DX Contest, held last February, UK stations were placed as follows: CW, Single-op all-band (SOAB) G5LP

WARC BANDS TABLE, 2000
(sorted this month by 10MHz totals)

Call	10	18	24MHz	Total
G3SXW	176	199	175	550
G0NXX	152	168	164	484
MU0FAL	104	72	57	233
G4UCJ	97	113	90	300
G3WGV	84	119	77	280
G4KHM	77	92	27	196
G3YVH	73	97	82	252
G3WP	50	42	34	126
G3ING	41	57	45	143
GW0VSW	33	24	53	110
GM4OBK	32	52	38	122
G4AFI	28	69	80	177
M0BIB	24	51	120	195
G0VLC	24	37	21	82
G0TSM	21	18	32	71
MM0BQI	20	23	20	63
G4OBK	18	35	26	79
M0CNP	5	22	11	38
G4FVK	2	17	23	42
G4YWY/M	0	46	30	76
G4ERP/M	0	68	0	68
M0CAL	0	29	37	66
GM3IBU	0	0	63	63
M5AFA	0	11	16	27

2000532 points (12th), G0MTN 26796 (72), G4OGB 22230 (77), 142 entries. SSB, SO 20m, G0MTN 515 (51) 51 entries, SOAB G5LP 65037 (30) 126 entries, multi-op G3XYZ (ops: G0MQL G0IJQ G0KZI) 65192 (18) 24 entries. (Tnx G4OGB).

I recently received a copy of the excellent results booklet of the 1999 OK / OM DX Contest. G4OGB was leading UK station in the European all-band category, coming 18th with 107136 points, then M0AJT 25th 84568, G3RSD 29th 79856, GM3CFS 38th 59349, G4EBK 45th 49500, G3UFY 50th 40664, GW3SYL 54th 39025, G0MTN 55th 36050, G3VQO 79th 12947, and G0WHO 92nd 7548. There were 116 entries. G3ULT (G0VQR op) was 25th (from 44) on 20m, with 2475 points. G0VQR was 30th (of 49) on 80m with 2820 points. There were no other single-band entries from the UK, which is a pity given the high participation from the rest of Europe.

In the 2000 SP DX Contest, UK results included Single-op multi-band (mixed mode) G0RGH 57717 points, SOMB-CW G3RSD 45738, GM3KHH 36714, G5LP 27612, G3VQO 8256, SOMB-SSB GM0NTL 35028, GM4ELV/QRP 1734, SOSB-80-Mixed G0MTN 1980, SOSB-40-CW G3UFY 360, SOSB-20-Mixed G3KNU 12624, GM3CFS 9900, SOSB-20-CW G0VQR 5136, SWL-Mixed RS-17748 29808.

28MHz COUNTRIES TABLE, 2000
(sorted this month by CW totals)

Call	CW	SSB	Mixed
G3SXW	193	0	193
G4DUW	186	236	256
G0NXX	164	0	164
G4UCJ	123	0	123
G3WGV	116	0	116
G4IDL	100	0	100
G0CGV	89	32	97
G0TSM	88	194	221
MU0FAL	76	0	76
G3WP	55	0	55
G4OBK	51	6	55
GW0VSW	38	45	67
GM4OBK	31	1	32
M0BZQ	28	230	252
MM0BQI	23	57	71
G0CAS	1	169	170
G0VHI	0	250	250
G3MDH	0	165	165
G4MUW	0	155	155
MM5AJN	0	139	139
GI4XSF	0	109	109
M0CAL	0	95	95
GM4CHX	0	93	93
G0KDS/M	0	60	60
G4ERP/M	0	60	60
M0CNP	0	48	48
M0CTQ	-	-	232
G3YVH	-	-	108
G4FVK	-	-	70
G0URR	-	-	53 (RTTY)
G0NCS	-	-	48 (PSK)
GM0FNE	-	-	48 (RTTY)
GU0SUP	-	-	42 (RTTY)
G4YWY/M	-	-	41
M0ASJ	-	-	41
G3ING	-	-	37
M5AFA	-	-	22

The REF (French) Contest takes place over the last full weekend of January (27 / 28th, CW) and the last full weekend of February (24 / 25th, SSB), in each case from 0600 on the Saturday to 1800 on the Sunday. I can provide a copy of the rules in return for an SASE.

In the 1999 Scandinavian Activity Contests, UK results were: CW Single-op multi-band high-power (SOMB HP) G0LII with 44838 points, G3TXF 38989, G3RSD 20045, G3UFY 14450, M0AJT 7316; SOMB LP GW3NJW 23226, G0MTN 22878, GW3KDB 22470, G3VQO 13529, G3YEC 13167; SOMB QRP G4FDC 17139; SSB SOMB HP GW0RYT 5520, SOMB LP GW4BLE 19992, G0MTN 11890, G3VAO 2686, SOMB QRP GM4ELV 1272.

TABLES

BY THE TIME this appears, those of you who have supported the 28MHz and WARC band tables will be wrapping up for the year. Please ensure you send me your end-of-year totals as soon as possible, along with any observations, comments, highlights, etc so that I can put together a suitable summary for the March column.

AWARDS

EFFECTIVE IMMEDIATELY, DXCC will be posting on the DXCC website a list of applications received and logged into the computer. TX0 and 4W cards can now be submitted. If the new entities caused you to drop off the Honor Roll (the new Honor Roll number is 325 current) you will need to bring your totals to 325 by 31 March 2001, which is the cut-off for the Honor Roll list which will appear in the August 2001 *QST*. The URL is www.arrl.org/awards/dxcc/appstatus.html

Ted, W8TTS, reports that "The WACS (Worked All Caribbean Sea) Award is alive and well. Check out the nice plaque and the rules at www.qsl.net/ik7nxu/wacs.htm Jim (IK7NXU) is the manager."

The W-18-Z award is available for making QSOs with stations of the Russian oblasts situated in WAZ zone 18: UA9H (TO ex 158), UA9O (NS ex 145), UA9U (KE ex 130), UA9Y (AL ex 99), UA9Z (GA ex 100), UA0A (KK ex 103), UA0B (TM ex 105), UA0H (EW ex 106), UA0O (BU ex 85), UA0S (IR ex 124), UA0U (CT ex 166), UA0W (HA ex 104), UA8T (UO ex 174) , UA8V (AB ex 175).

The award has three classes. First class: the applicant should work 18 different stations in zone 18, among them at least one station from each one of the above-listed oblasts. Second class: the applicant should work 18 different stations from at least seven different oblasts in zone 18. Third class: the applicant should work 10 different stations in zone 18. QSLs from SWLs located in zone 18 are valid for the award. There are no restrictions regarding date, mode or band. SWLs can obtain the award on the same con-

CONTINUED ON PAGE 83

QTH Corner

A52B	Takashi Nakamura, JR7TEQ, 20-2 Midorigaoka, Shiroishi, Miyagi 989-0221, Japan.
A52DX	Harumi Kukita, JF1PJK, 1916-18 Minami-Yokokawa, Ooami-Shirasato, Chiba 299-32, Japan.
A52JA	Fumiyuki Ohwada, JK1AFI, 965-100 Ohwada Sanwa, Sashima-Gun, Ibaraki 306-0111, Japan.
A52W	Yoosuke Uchiyama, JH1NBN, 924-4 Yokokawacho, Hachioji, 193-0823, Japan.
A52XX	Hirotaro Tsukahara, JA1PCY, 1-26 Fukai, Kitamoto, Saitama 364-0001, Japan.
A92ZE	Capt J Gostel, PSC 451, Box 1198, FPO AE 09834, USA.
CE0XTA	Quijada, CE6TBN, Marco PO Box 1234, Temuco, Chile.
EP2MKO	Igor V Kovalyov, RU6FZ (ex UA6HCW), PO Box 59, Pyatigorsk 357500, Russia.
FO0WEG	SP9FIH, P.O. Box 480, 44-100 Gliwice, Poland.
K5K	Dudley's DXers of NE Georgia, K4TSJ, 2011 New High Shoals Rd, Watkinsville, GA 30677, USA.
T88TU	Koji Fukui, JK7TKE, 1840-5 Izumi-cho, Tokorozawa 359-1112, Japan.
YC8TXW	Ronny Monoarfa, PO Box 166, Tahuna, 95800, Indonesia.
ZK1NDK	Yuichi Yoshida, JR2KDN, 4th Floor Kato Building, 529 Rokugaike-cho, Kita-ku, Nagoya, Japan 462-1112.
ZK2VF	Bill Dawson, W7TVF, PO Box 4049, Pahrump, Nevada 89061, USA.
ZM8CW	Jacques Calvo, ZL3CW, 14 Hooper Avenue, Pukekohe, Auckland 1800, New Zealand.

CONTEST

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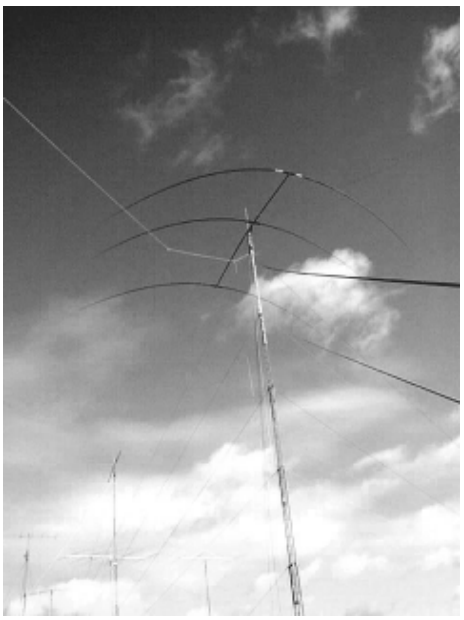
THE POSTBAG usually seems to swell after either of the major CQWW contests. Partly from contestants who had a great time and partly from other band users who didn't have a great time and write to tell me about bandplan infringements.

I have the greatest sympathy with those who have their enjoyment of the bands reduced by the major contests. It is hard to offer any solutions, except to say that contesters should abide by the bandplans and most particularly avoid any non-contest segments. Not to do so only fuels the argument that contesters don't care about other band users - and don't care about anything other than winning. Some violations on a very narrow band such as 40m seem very likely, given the sheer level of activity. Nevertheless, it is not good to hear well-known stations calling CQ on SSB below 7030! In the same way that points are deducted for 'busted' calls, perhaps persistently identified bandplan offenders should have their scores reduced.

I joined the team at M6T for part of the CQWW weekend. We had a very enjoyable time, despite appalling weather conditions. We were relieved that no major antenna damage was sustained – testament to the professionalism of the team that erected all the antennas. Conditions were pretty good, until the aurora hit!

Up in Shetland, the GZ7V team also had a very tough time with the weather and of course, the aurora does not help when you are that far north! Nevertheless, the team did a brilliant job in the circumstances and I can't remember a time when the Shetlands multiplier was so easy to cross off the checklist. Thanks guys!

John, G3TWG, wrote with some comments regarding the 'Exchange Etiquette' item last month. He says, "The risk where a contact takes place where one station never gives the other's callsign at any stage is, of course, that if confusion has thereby arisen, the adjudicators with the benefit of both contest logs before them will award 'no points' to either station for the 'non contact' that has occurred".



A new design of 40m Yagi? Not really! This is how strong the wind was at times during the M6T operation in *CQ* World Wide SSB in October.

This is very true. At some stage in the QSO, although not on every over, it seems a requirement to give the other station's callsign, otherwise, strictly speaking, the rules of the RSGB contests are not being adhered to. Whether or not this is standard practice, I will leave you to decide for yourself by listening on the bands.

There are lots of contest results to include this month, so here goes. . .

Ropoco 1 Contest, 2000

THE FOLLOWING STATEMENT has been received from the HF Contests Committee. "The HFCC has experienced difficulty in producing the results for the Ropoco 1 April 2000 contest. Unfortunately the volunteer adjudicator for this contest who is in receipt of the logs has disappeared without trace. The committee will continue to try to resolve this matter, however, this may take some time. With this in mind the committee has decided not to award the Verulam Silver Jubilee and G5MY Trophies for this year although the results will be published in *RadCom* as they become available."

Ropoco 2 Contest, 2000

WHERE COMMENTED upon, most contestants found conditions to be average, which in the writer's experience at such an early hour in summer is not good! Many also commented that the going particularly in the second hour was slow, and that if anything the contest is too long, which is an understandable comment. However, realistically it could hardly be shorter and perhaps a more operator friendly time slot would address both these issues: AFS may well be a pointer in this regard.

Fraser Robertson, G4BJM, once again combined the attributes of a strong signal, slick operating and high accuracy to top the table. G3RSD using only 100 watts output and an antenna at modest height achieved second place, beating a clutch of stations with 6dB greater output. Steve Knell, G0CKP, submitted the highest-scoring perfect log, and therefore receives the G3XTJ memorial trophy. Antenna heights ranged from below 20ft to greater than 80ft, with a remarkable number in the former category, which makes the author's antenna seem less modest than he had previously thought!

The very obvious mangling of postcodes, which clearly are then repeated *ad infinitum*, belies the fact that overall accuracy is high, with a mean deduction of less than 1%, with the median below 2%, the range being zero to 27%, with four perfect logs, a very commendable performance. The latter figure is less than in recent events but there is no truth in the rumour that the adjudicator is heavy handed!

Over a third of logs received were still paper-based, which is disappointing in the current era, particularly having regard to the high per capita level of computer ownership in the UK. The author, although not computer illiterate, came late to computer logging and found keyboarding to be the major problem. However, it revolutionised his contest approach and activity, so advancing years should not be a barrier. It is clear that accuracy in the computer-based logs is very much higher than the paper-based equivalents, which should provide further motivation (but see Trophy winner above).

As a function of the semi-automated (aka manual!) checking process it has been possible to produce individual error reports. These are inevitably more detailed for the computerised logs, but provide useful information in all cases. Those interested in their personal reports, may e-mail: gw3njw@arrl.net for a copy.

Clive Whelan, GW3NJW

Ropoco 2, 2000

Pos	Call	Equipment	Score	Pos	Call	Equipment	Score
1	G4BJM	4C1	657	23	G3HEJ	3C13	477
2	G3RSD	3C13	597	24	G3JJG	4C11	477
3	G3IZD	4C13	575	25	G3TJE	3Q12	474
*4	G0CKP	4C15	570	26	G3VYI	4W14	472
5	GM3POI	4C18	568	27	G3MA	3C1	466
6	GM3JKS	4C15	564	28	G3JYP	4C14	457
7	G3WUX	3C14	554	29	G4XPE	3C11	450
*8	GW3WWN	3C1	550	30	G0WBC	3C13	439
9	G2HLU	4C12	547	31	M0AJT	3C12	408
10	G4ARI	3C14	547	32	G3GC	3C13	368
11	G4RCG	4C16	545	33	G3JSR	3C1	367
12	G3SXW	3C14	540	34	GW0KZW	3C1	359
13	G3KKQ	3C1	527	35	G0IGP	3C11	351
14	G3LIK	3C13	527	36	G3VQO	3W1	344
15	G0MTN	3C13	521	37	G4OOS	3C1	341
16	G3JJZ	3C1	517	38	GM4OSS	3G1	341
17	G4OGB	3C13	517	39	G4PTE	3G1	334
18	G2AFV	4C14	511	40	GW3SB	3C11	311
19	G4CWH/P	4C1	501	41	G3GMM	3G1	308
*20	G4EBK	3C13	500	42	G3CQR	3C1	241
21	G3KKP	3C11	484	43	G4CZB	4C12	237
22	G0JQN	4C12	477	*44	G3GMS	3G12	190

*= Perfect log

May 144 MHz Cumulative Results, 2000

DESPITE THE rule changes allowing /P entries for the first time, the number of logs submitted was slightly down on previous years, although there did appear to be plenty of activity to keep people occupied. Multiplier scores tended to be slightly higher for the more easterly-located stations, although that didn't prevent M0AFC/P in Lancashire from winning the low power section first time out. Several of the leading entrants only submitted entries for two out of three sessions, and if this practice continues there are some interesting tactical possibilities you might want to consider in order to maximise your normalised score next year!

The Wythall Contest Group had it all its own way in the Multi-Operator section and G4PIQ once again dominates the high power Single Operator section. Nigel, G4VVZ, operating G4ZAP takes the high power runner up slot and Michael, G0GCI, is runner-up in the low-power section. Thanks to all the stalwarts for their entries and for the unusually high standard of the logs again this year.

Steve Redfern G4AEQ

May 144 MHz Cumulative Results 2000

HIGH-POWER SECTION

Multi-Operator

Pos	Call	Loc	Pwr	Ant.	28.3.00 QSOs	28.3.00 Mults	28.3.00 Score	28.3.00 Norm	5.4.00 QSOs	5.4.00 Mults	5.4.00 Score	5.4.00 Norm	13.4.99 QSOs	13.4.99 Mults	13.4.99 Score	13.4.99 Norm	Total Norm
1	G1WAC*	IO92BJ	400	18Y	39	11	429	1000	27	8	216	1000	63	17	1071	1000	3000

Single Operator

Pos	Call	Loc	Pwr	Ant.	28.3.00 QSOs	28.3.00 Mults	28.3.00 Score	28.3.00 Norm	5.4.00 QSOs	5.4.00 Mults	5.4.00 Score	5.4.00 Norm	13.4.99 QSOs	13.4.99 Mults	13.4.99 Score	13.4.99 Norm	Total Norm
1	G4PIQ*	JO01MU	400	4X15Y	0	0	0	0	102	23	2346	1000	101	23	2323	1000	2000
2	G4ZAP*	IO81SG	400	2X12	70	20	1400	1000	56	12	672	286	0	0	0	0	1286
3	G7RAU	IO90IR	400	2X9Y	0	0	0	0	73	19	1387	591	69	18	1242	535	1126
4	G7ULL	JO01AK	150	11Y	49	15	735	525	48	14	672	286	49	12	588	253	811
5	G8HGN	JO01FO	50	2X15Y	32	12	384	274	0	0	0	0	36	13	468	201	475
7	G1KHX	IO81MI	80	9Y	20	6	120	86	18	5	90	38	27	8	216	93	179
9	PE1EWR*	JO11SL	80	10Y	0	0	0	0	19	7	133	57	12	7	84	36	93
10	G7NBE	IO92GS	50	9Y	12	4	48	34	11	6	66	28	14	6	84	36	70

LOW-POWER SECTION

Single Operator

Pos	Call	Loc	Pwr	Ant.	28.3.00 QSOs	28.3.00 Mults	28.3.00 Score	28.3.00 Norm	5.4.00 QSOs	5.4.00 Mults	5.4.00 Score	5.4.00 Norm	13.4.99 QSOs	13.4.99 Mults	13.4.99 Score	13.4.99 Norm	Total Norm
1	M0AFC/P*	IO84SA	25	11Y	0	0	0	0	51	12	612	1000	47	11	517	1000	2000
2	G0GCI*	JO01ED	25	9Y	29	10	290	1000	37	16	592	967	36	14	504	975	1975
3	G0DVJ	JO01MX	25	5Y	28	7	196	676	36	12	432	706	27	12	324	627	1706
4	G4APJ	IO83UP	25	9Y	18	7	126	434	0	0	0	0	21	9	189	366	1009
5	G1TWS	JO01HO	25	11Y	17	4	68	234	27	9	243	397	29	9	261	505	902
6	2E1GUA	JO01FS	10	13Y	12	5	60	207	14	6	168	274	0	0	0	0	580
7	2E0AUD	JO01BO	10	12ZL	12	5	60	207	21	7	147	240	15	7	105	203	546
8	G8ZRE/P	IO91XM	25	HB9CV	19	4	76	262	23	7	161	263	21	4	84	162	525
9	G6FQZ	IO91JR	25	LOOP	11	4	44	152	18	7	126	206	15	7	105	203	430
10	G4XPE	IO92GU	10	10Y	8	4	32	110	8	5	40	65	0	0	0	0	228
11	G7VBY	IO91SD	20	7ZL	0	0	0	0	14	5	70	114	0	0	0	0	128

*Certificate Winner

1st 50MHz Backpackers Contest, 2000

THIS CONTEST was timed to overlap the 24-hour RSGB 6m Trophy contest. As a result of this, most entrants found that DX was easy to hear. Working it with only 3W or 10W was another matter entirely!

Several stations remarked that once the 24-hour contest had finished, new QSOs become very sparse. One station also had the added distraction of a pair of motorcycles practising 'flying' only 20 yards away.

Congratulations to M0AFC/P for winning the 10W Single Operator section and to G1WKS/P for winning the 3W Single Operator section. Congratulations to the One Man and His Dog Contest Group, G8NWM/P, and to G0FUW/P for winning the multi-operator 10W and 3W sections respectively.

Ian Pawson, G0FCT

1st 50MHz Backpackers Contest, 2000

Multi-Operator 10W

Pos	Group Name	Callsign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	One Man & His Dog CG	G8NWM/P	IO92TR	40	33	28540	941820	9H1XT	2207	10	5Y	FT736

Multi-Operator 3W

Pos	Group Name	Callsign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	G0FUW	G0FUW/P	IO81PH	30	23	13116	301668	ID9/I2ADN	1991	3	3Y	FT690
2*	Wythall CG	G1WAC/P	IO82XJ	40	19	11447	217493	I7CSB	1769	2.5	HB9	FT690
3	Oldham RC	G1ORC/P	IO83XN	29	17	6484	110228	9A4VV	1813	2.5	4Y	FT690

Single Operator 10W

Pos	Callsign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	M0AFC/P	IO84SA	90	36	39628	1426608	LZ1KWT	2424	10	5Y	TS690
2*	G8JAY/P	IO91AW	64	35	29695	1039325	LZ1KG	2401	10	5Y	TS130+TVT
3	M0BAO/P	IO80QR	20	21	13569	284949	9A5D	1811	10	4Y	IC706
4	G4IDF/P	IO81FF	29	19	12527	238013	9A5D	1891	10	5Y	FT690

Single Operator 3W

Pos	Callsign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	G1WKS/P	JO01ED	48	39	31790	1239810	LZ1KWT	2144	3	4Y	IC505
2*	GW0PZO/P	IO83ID	84	30	25360	760800	LZ4A	2362	2.5	3Y	FT690
3	G4FAA/P	JO01DH	23	15	7999	119985	LZ4A	2070	3	3Y	IC726
4	GI7JYK/P	IO74BS	17	14	6210	86940	9A6A	2070	2	2Y	HT106
5	G0NFO/P	IO82RJ	14	7	1164	8148	G6BRA/P	176	2	2Y	FT690

* Certificate Winner

1st 144MHz Backpackers Contest, 2000

THIS SERIES of contests continues to be popular with entrants. The first 144MHz Backpackers contest of the millennium started as the last one in the previous millennium ended - with intense but friendly competition.

The overall standard of logging has deteriorated since last year with stations losing an average of 10% of their score. If you do not use a computer to produce your log it is worthwhile performing a manual duplicate contact check before you submit it. Two stations did manage to submit perfect logs, however - congratulations!

M0AFC/P claimed a very convincing win in the Single Operator 10W section with GM4IGS/P achieving first place in the 3W section. In the Multi-Operator sections, the One Man & His Dog Contest Group, G8NWM/P, claimed first place in the 10W section with the Malvern Hills RAC 'B', GW4IDF/P, claiming first place in the 3W section.

Ian Pawson, G0FCT

1st 144MHz Backpackers Contest, 2000

Single Operator 3W

Pos	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	GM4IGS/P	IO75MB	31	9660	45	434700	G4MJS/P	556	2.5	17Y	FT290
2*	G8JAY/P	IO91AW	56	7293	53	386529	MM1CXE	476	3	9Y	IC202S
3	G0BVW/P	IO92XA	44	6397	52	332644	GM4CXM	519	2.5	9Y	FT290
4	GW0PZO/P	IO83JF	30	4145	38	157510	G4MJS/P	322	2.5	5Q	FT290
5	G1WKS/P	JO01ED	32	3634	35	127190	M0AFC/P	373	2.5	13Y	FT290
6	G0NFO/P	IO82RJ	29	3136	30	94080	G4ZAP/P	270	2.5	7ZL	FT290

Single Operator 10W

Pos	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	M0AFC/P	IO84SA	124	27280	94	2564320	DC6IA	711	10	13Y	IC706
2*	G4ERP/P	IO81XW	91	13035	78	1016730	PA4VHF	576	10	12Y	FT847
3	GW8ZRE/P	IO83JF	81	13613	70	952910	DK3BU	685	10	12ZL	TR751E
4	G4RQI/P	IO93PW	51	9160	55	503800	F6CBH	550	10	10Y	IC746
5	G0GRI/P	IO81ED	52	8483	44	373252	PE1EWR	499	10	13Y	TR751E
6	G0PQF/P	JO02HV	38	7281	47	342207	GU3EJL	403	10	9Y	FT847
7	M0BAO/P	IO80PT	38	6203	45	279135	GM4WLL/P	547	10	17Y	IC706
8	G4EDR/P	IO94RD	24	5061	33	167013	G4MJS/P	396	10	4Q	IC706
9	M0BHE/P	IO80MU	27	3822	31	118482	G4ZAP/P	374	10	5Y	IC706
10	GI0OUM/P	IO74CN	10	2748	12	32976	G0VHF/P	517	5	5ZL	TR9130

Multi-Operator 3W

Pos	Group	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	Malvern Hills RAC B	GW4IDF/P	IO81NV	49	6843	53	362679	MM1CXE	477	3	19Y	IC202S
2*	Red Dragon CG	GW8GT/P	IO81KR	55	6785	48	325680	G4ZAP/P	332	2.5	9Y	FT290
3	Oldham RC	G1ORC/P	IO83XN	58	5954	46	273884	G4ADV/P	393	2.5	2x9Y	FT290
4	Stockport RS	G8SRS/P	IO83XH	40	4639	46	213394	G4MJS/P	307	2.5	9Y	FT290
5	Wigan Douglas Valley RC	G3BPK/P	IO83PN	46	4482	40	179280	G4XBF	304	2.5	8Y	FT290
6	Wythall CG	G1WAC/P	IO82XG	42	4094	43	176042	GM4WLL/P	388	2.5	5Y	FT290
7	G0WRT	G0WRT/P	IO93AX	33	4678	37	173086	G4MJS/P	379	3	14Y	FT290
8	G0HDV	G0HDV/P	IO93UK	35	4438	38	168644	GM4IGS/P	353	3	13Y	TR751E
9	Coulsdon ATS	M1FUR/P	IO91WH	30	1407	25	35175	G4ZAP/P	204	3	9Y	FT290

Multi-Operator 10W

Pos	Group	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	One Man & His Dog CG	G8NWM/P	IO92TR	68	11897	71	844687	F1FYE/P	489	10	2x10Y	FT736R
2*	Barpackers CG	M1BAR/P	IO83XG	61	8821	65	573365	GI1XIB	333	10	14Y	TR751E

*Certificate winner

70 MHz Cumulatives, 2000

ONCE AGAIN, Robert Ferguson, GD4GNH, demonstrated complete control in this contest, taking first place in the Single Operator Fixed section from Nigel Wilson, G4VVZ, who was operating from G4ZAP. Activity and entries were at about the usual good levels, though it is clear that things regularly tail off for the last session. John Quarmby, G3XDY, was somewhat frustrated by this as he finally managed to get water out of his feeder for the final session. There was a good portable field this year, with Ross Wilkinson, G0WJR, operating from five different sites once again to add a little variety to the event. For once, the portables didn't suffer too badly with the weather, considering it was the depth of winter!

It was nice to see two stations active from GU in this contest, although Mike Johnson, GU6AJE, commented that he felt very much on the edge of activity, and with low power and a small antenna found things a little frustrating sometimes. On one occasion, a large station turned his antenna to work GU6EFB who was on the band and then turned it straight back without even listening for any other calls in that direction - you never know who might be calling!

Congratulations to winners and runners-up as usual, and to Nick Garbett, M1DDD, for taking the single antenna, low power certificate with an extremely creditable fifth place in the Single Operator Fixed Section.

Andy Cook, G4PIQ

70MHz Cumulatives, 2000

Single Operator Fixed Section

Pos	Callsign	16-Jan	30-Jan	13-Feb	27-Feb	19-Mar	Norm	QSO	Loc	Pwr	Ant	km
1*	GD4GNH	861	18940	19586	17038	10204	3000	219	74QD	160	8Y	543
2*	G4ZAP	8629	0	7282	7093	4764	1884	178	81SG	160	2 x 6Y	616
3	G3XDY	6450	0	5150	0	5228	1523	81	02OB	150	6Y	487
4	G4ZTR	0	8111	7205	6387	4978	1291	118	01KW	150	8Y	584
5*	M1DDD	4563	4456	3769	3272	3699	1127	123	93AE	10	3Y	278
6	G3TCU	4266	3800	3235	0	3394	1028	111	91QE	150	6Y	526
7	G0GCI	3021	4171	2880	3905	3484	921	113	01ED	100	4Y	657
8	G1OGY	3043	3905	2897	0	3225	875	82	01GR	10	5Y	441
9	G1KHX	3710	2870	2967	2620	2725	851	106	81MI	90	5Y	330
10	GM4AFF	2787	5138	3052	3501	0	800	42	86ST	150	8Y	673
11	G4JTJ	2236	3579	0	3182	2787	722	94	92SD	60	6Y	193
12	G1EHF	2783	2431	2433	2973	0	626	95	91LH	50	4Y	396
13	G3FIJ	2049	1241	90	1970	0	419	36	01KV	15	4Y	445
14	G4SJH	0	1135	747	2016	1865	362	54	91PI	50	3Y	407
15	G4OUT	1564	1032	813	1602	0	330	47	92AT	10	3Y	230
16	GU6AJE	997	1309	1156	847	1138	297	26	89RL	10	2Q	538
17	G7NBE	0	826	1389	1381	0	196	29	92GS	25	3Y	260
18	GM4DIJ	795	187	390	348	0	133	19	85IW	50	4Y	305
19	GM4UYZ	704	0	209	0	288	121	21	85MX	50	Dipole	230

All Others Section

Pos	Callsign	17-Jan	31-Jan	14-Feb	28-Feb	14-Mar	Norm	QSO	Loc	Pwr	Ant	km
1*	G4RFR	11027	9796	2877	7246	4986	3000	192	90AS	120	12Y	686
2*	GM4WLL/P	3142	4728	3847	0	3952	2132	55	85NR	90	6Y	555
3	M0AFC/P	0	0	4492	0	3608	1724	40	84SA	20	5Y	373
4	G0WJR/P	1695	2111	2186	1885	3686	1487	92		15	2Y	337
5	G4XRV/P	0	0	0	0	2649	532	18	91RU	8	5Y	458

*Certificate winner

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest
6/7 Jan	*1800-2400*	*RTTY*	*ARRL RTTY Roundup*
6 Jan	1000-1200	CW	RSGB 7MHz Cumulative #1
7 Jan	1600-1800	CW	RSGB 3.5MHz Cumulative #1
9 Jan	2000-2200	CW	RSGB 1.8MHz Cumulative #1
13 Jan	1600-1800	CW	RSGB 3.5MHz Cumulative #2
14 Jan	1400-1800	CW	RSGB Affiliated Societies Contest (3.5MHz)
17 Jan	2000-2200	CW	RSGB 1.8MHz Cumulative #2
20 Jan	*1200-2000*	*CW*	*LZ Open*
20 Jan	1400-1800	SSB	RSGB Affiliated Societies Contest (3.5MHz)
21 Jan	1000-1200	CW	RSGB 7MHz Cumulative #2
25 Jan	2000-2200	CW	RSGB 1.8MHz Cumulative #3
26/28 Jan	*2200-1600*	*CW*	*CQ 1.8MHz CW*
27/28 Jan	*0600-1800*	*CW*	*REF*
27/28 Jan	*1200-1159*	*RTTY*	*BARTG Sprint*
27/28 Jan	*1300-1300*	*SSB*	*UBA*
27 Jan	1000-1200	CW	RSGB 7MHz Cumulative #3
28 Jan	1600-1800	CW	RSGB 3.5MHz Cumulative #3

VHF Contests

Date	Time	Mode	Contest
2 Jan	2000-2300	ALL	RSGB 144MHz UK Activity Contest
7 Jan	1000-1600	CW	RSGB 144MHz CW
14 Jan	1000-1200	ALL	RSGB 70MHz Cumulative #1
28 Jan	1000-1200	ALL	RSGB 70MHz Cumulative #2

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 2000 *RadCom*. Brief rules for non-RSGB contests, which are listed in italics above, can often be found in the 'HF' and 'VHF/UHF' columns. The HF and VHF Contest Committees both have web sites from which comprehensive details are available. These are www.g4tsh.demon.co.uk/HFCC/index.htm and www.blacksheep.org/vhfcc

VHF/UHF

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

HAPPY NEW YEAR to all readers and especially to the contributors. The autumnal gales took their toll of antenna systems, but although gusts of up to 90mph were reported in London, there was little structural damage to buildings. The main problem was with fallen trees. Even so, only one of the smaller oaks in the field backing on to the G3FPK QRA suffered some unplanned pollarding.

As this is being compiled in mid-November, many areas of Britain are still affected by disastrous floods. In spite of the appalling weather, some excellent DX has been worked on 50MHz. As to be expected at sunspot maximum, the Sun has been very active, with coronal mass ejections (CMEs) causing auroral events on Earth.

All times UTC unless stated otherwise and ODX means best DX. An asterisk (*) denotes a CW contact. QTHR signifies that the operator's address is in the current *RSGB Yearbook,* (LS), (UB) etc after a callsign denotes the postal area and (IL22) etc is the Maidenhead grid.

Radio and electronics have dominated the lifetime of Ken Rosier, G3DJK (ex-XZ2AF), seen here in his shack in Norbury, South London. Now Ken takes a keen interest in promoting the fellowship, skill and creativity embodied in the hobby through the Crystal Palace and District Radio Club.

THE ANNUAL TABLE

INTEREST IN THE Annual Table has been steadily declining in recent years, as has day-to-day band activity. The 2000 table has so far attracted only seven entries: in the previous two years it was 13. Therefore I am suggesting that it be dropped for 2001 and am open to suggestions as to what, if anything, to publish in its place.

One idea would be a cumulative table based on the districts and countries worked, along the lines of the Squares Table. The obvious starting date would be 1 January 1998 when postal districts replaced the counties. Your views please.

REPEATERS

AS YOU WILL see, there is now a dedicated bi-monthly column devoted to repeaters and I will no longer include news about them. So from now on please send all your newsletters and information to Roger Jones, G3YMK (QTHR), whose e-mail address is g3ymk@aol.com

BEACON NEWS

THOSE WHO OPERATE on the HF bands will know that there is an HF International Beacon Project, with 18 strategically-located beacons transmitting sequentially within a three-minute cycle in the 14, 18, 21, 24 and 28MHz bands. These have proved their worth as guides to operating and in propagation studies.

Prof Martin Harrison, G3USF, Chairman of the RSGB's Propagation Studies Committee, has produced a memorandum in which he proposes that further beacons be added in the 40.36 - 40.40MHz region of the spectrum. The PSC has already developed a prototype multiband beacon designed to output on four frequencies on the pattern of the IBP HF transmitters.

Three of the frequencies in the 28, 50 and 70MHz bands already have IARU Region 1 approval. One at 40MHz would fill in the large gap between 28 and 50MHz, so would be well suited to tracking the rise and fall of usable frequencies in the lower VHF region. This idea has been discussed at CEPT level but, to quote Martin, ". . . is currently on the back burner". However, national administrations can exercise discretion in such matters so it is hoped that the Radiocommunications Agency (RA) will not object to the idea.

Emil Pocock, W3EP, passed along news from Paul, ZS6PJS, that a new 6m beacon is now operating (QRV) in South Africa. ZS6TWB/b is located in grid KG46 and runs 15W into a five-eighths wavelength omnidirectional vertical antenna on 50.044MHz. It has already been copied by VE9AA and Ted Collins, G4UPS (EX), logged it at S7 on 14 October at 1050.

At 0905 on 1 November, G4UPS heard a new Israeli beacon 4Z5AY in KM72JB on 50.080MHz peaking to S8. It was sending the alphabet and numbers on CW.

Bob, EA1TH, forwarded a message from Enrique Bermudez, EA1BSK, that the 2m beacon EA1VHF recommenced operation at 1830 on 15 October. The allocated frequency (QRG) is 144.404MHz and it transmits the message "EA1VHF IN52RE 25W 615m ASL antena omnid hitiz" in CW. It's nice to know it's QRV again after a long absence. Enrique has a website - see the panel.

Peter, I5CTE, reports that V51E in Outjo, Namibia, has a beacon running again on 144.399MHz between 1730 and 2000 beaming towards Europe. Stations in southern Europe and the Mediterranean might be able to hear it via transequatorial propagation mode (TEP). Kosie had success on the band at the peaks of the last two sunspot cycles and frequently checks 144.335MHz SSB when TEP is likely.

PUBLICATION

THE NOVEMBER ISSUE of *The VHF Journal*, published by the Rochester VHF Group in New York, includes a couple of items of general interest to readers this side of the Atlantic. George, K5TR, describes how to adjust the power output of the popular FT-736T transceiver for correct transverter operation.

N2GKM has compiled a comprehensive 'Summary of Connector Facts' about the many connectors used in weak signal applications. These include N, BNC, TNC, UHF, Mini-UHF, F, SMA, SMB, SMX and MCX types. Descriptions and specifications are given based on data from the British company, Vitalec Electronics Ltd, which has a website - see the panel. Tom Richmond, VE1IEY, edits *The VHF Journal* and the group has a website - see the panel.

A FIRST

AN IMPORTANT 'FIRST' on 6m was achieved at 0913 on 28 October 2000 when Ian Williams, M0BCG (SN), worked T88TU in Palau, Zone 27, in a mixed mode SSB / CW contact to complete his Worked All Continents (WAC). This was a first UK / T88 QSO and the T88's first into Europe. Ian received e-mail confirmation from the operator JK7TKE who reported working eight other UK stations on CW that day. He did not work any continental Europeans, though.

CONTEST NOTES

RSGB VHF MANAGER David Butler, G4ASR, has received 53 booklets from the Dutch national

society, VERON, containing the results of the various IARU VHF, UHF and Microwave contests held in 1998, including the ATV ones. I can't list all the calls here but if you would like a copy, send me an e-mail and I'll forward Dave's message.

PROPAGATION

THE SEPTEMBER ISSUE of *SunMag,* compiled and distributed by Neil Clarke, G0CAS, includes the usual tables of daily solar, geomagnetic, particle and sunspot group data and a solar flare list. There are diagrams showing the development of coronal holes in a 24-hour period from 1531 on the 15th. A huge area across the central meridian on the 16th covered from heliographic latitude 50° north across the solar equator to 49° south.

Subscription inquiries about *SunMag* should go to G0CAS (QTHR), or by e-mail: neil@g0cas.demon.co.uk Neil can be reached on packet via g0cas@gb7don.#19.gbr.eu

The Daily Solar Data from the Space Environment Center (SEC) for the period 12 October through 10 November shows that the lowest solar flux was 151 units on 18 October, the highest value being 204 on 1 November. The average for the 30 days was 172.7. For details of the DSD website see the December panel.

METEOR SCATTER

THE NEW YEAR starts with the Quadrantids meteor shower. The peak is usually quite sharp and the OH5IY program suggests it should be around 1030 on 3 January with a zenithal hourly rate (ZHR) of 116. This is an all-day stream and reflection efficiency should be over 50% of that at maximum for about 10 hours.

BAND REPORTS

50MHZ

2000 has been a productive year for 6m operators. Up to the end of October, G4UPS had, for the first time, worked / heard 104 countries. On 27 October Ted worked OD5/OK1MU* (KM73), 9E1S (KJ99) and ST2SA (KK65) to bring his DXCC total to 157 countries. From 1400 on the 31st he worked K1TOL* (FN41), W1TP* (FN42), W1JJM*, K1SG* (FN42), VE1CSM* (FN75) and VE1YX (FN74). The opening faded out by 1510 but the North Americans were enjoying a big opening to African countries such as EH9, FR, ZS6 and 7Q.

On 1 November Ted worked TR8CA* (JJ40) for the first time in 2000 and heard VR2XMT and TR8KPJ. Some ZS6s were copied from 1137 on the 2nd. At 1122 on the 4th he contacted UN3G* (MN83) who faded from S9 to S3 within two minutes. From 2057 on the 6th ES1AJ (KO29), SM3JGG* (JP71), SM4BDQ (JP80), LA8AJA* (JP50), LA3BO* (JO59), LA4LN* (JP50), SM3BIU, OH7KM* (KP11) and OH1XT (KP01) were contacted, with fade-out of this auroral-E event by 2145. At 1106 on the 7th Ted worked ZD8SIX* after which Chris was in and out till just after 1200.

Tony Selmes, A45ZN, is QRV again from Muscat. On 31 October he worked 40 Europeans in ER, I7, IT9, LZ, YO, YU, Z3, 9A and 9H. Next day brought 200 Europeans, with GM heard. On 2 and 3 November stations in A5, BD, FR1, FR5, FY, JA, J28, SV, VK9, VR, ZS6, 4F and 8R were contacted. All the foregoing using 100W to an end-fed quarter-wave vertical antenna. Thanks to David Bowman, G0MRF, for this news.

John Hoban, G0EVT (WF), is now up to 115 countries on the band. From mid-October, his DX included XT2OW* (IK92), J28FF (LK11), 5X1GS (KJ60), FR1AN (LG79), E30TA (KK95), ST2SA, XU7ABF (OK10), 3C5I* (JJ43), 9E1S*, EY8MM (MN48) and JH4IUO (PM64), all mouth-watering stuff. The auroral-E event on 6 November brought lots of Scandinavian stations and LA3PU (JO49) was a new grid.

Neil Carr, G0JHC (PR), worked similar stations plus 8Q7QQ (MJ64), HP2CWB, VK6DIR, ZD8SIX (II22), SU1SK, UN6P (MO60), TR8KPJ, VR2XMT, FY/W7XU (GJ35), ZR1ADI right down on the Cape, and VP2MJD bringing his grids total to a leading 800.

Frank Howe, G3FIJ (CO), has been a regular contributor to VHF columns in this and other publications for decades. His ODX this time was JX7DFA* (IQ51) at 2035 on 6 November in the auroral-E opening to Scandinavia.

Bryn Llewellyn, G4DEZ (SS), caught the auroral-E on 6 November which brought very strong signals from Estonia and Finland. A telephone call from M0CQK alerted him to ZD8SIX's appearance on 8 November after which he worked Chris Gare, G3WOS, on his brief visit to Ascension Island.

Geoff Brown went back to Jersey during October and enjoyed some excellent conditions enabling him to boost the GJ4ICD grid tally to 780. During the JOTA weekend, propagation on 21 October was "fantastic" and he worked strings of

MOONBOUNCE

ACCORDING TO THE November *432 and Above EME Newsletter*, reports on the first leg of the 2000 ARRL EME Contest were mixed, ranging all the way from good to poor. The big leaders on 70cm are DL9KR (97 x 33) followed by OH2PO (91 x 33). As usual, on 23cm OE9XXI is well ahead with 70 x 28, the next closest station being K2DS with 60 completions.

Peter Blair, G3LTF (IO91), reports high activity on 70cm and 23cm but on 70cm, "... the polarisation was all over the place, non-reciprocal and spread everything!" On 70cm his score so far is 31 x 16 and on 23cm 40 x 21. On 21 October new initials on 23cm were JA7BMB, JA8IAD, F1ANH and DL6YDH. The next day brought DL6LAU, DK0ZAB and K0JW to bring his total to 163. The only new one on 70cm was LA9NEA on the 22nd, his 352nd initial.

Roy Reed, G3ZIG (JO02), had a great contest weekend on 2m completing 104 contacts, 25 up on the 1999 total for the first weekend. This gave him a further 27 initials bringing his total to 233. He reckons the small improvements he keeps making to the receiving system appear to be paying off.

Iain Barnetson, GM0ONN (IO87), made a few contacts on 70cm from 0230 on the Sunday morning but there was a lot of QRM. There were flashovers in the PA and things went a bit quiet by 0630. Ron Adam, GM4ILS, also operated the station and they, together with GM4TXX, GM4ISM and GM3WOJ, are planning a large multi-operator station for this year's event.

Stuart Jones, GW3XYW (IO71), reports high activity on 70cm on both contest days and ended with a score of 19 x 10. He re-installed the W2IMU feed on the dish antenna with a new G3WDG preamp in preparation for a 23cm session in the second leg.

The first suitable weekend of the year for EME is 6 / 7 January when there will be about 28.4 hours of Moon time for London latitude stations. The declination starts at +14.55° increasing to +21.12° by Sunday midnight. The 144/432MHz sky temperature range is 400/28K to 531/40K and the signal degradation, referred to perigee, is -0.61dB to -0.24dB.

ANNUAL VHF / UHF TABLE - JAN TO DEC 2000

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Points
G4DEZ	76	67	18	3	56	13	27	6	18	7	291
G3FIJ	50	39	30	4	71	12	30	6	9	2	253
G4APJ	26	29	-	-	89	11	45	5	-	-	205
G7NBE	23	25	14	2	56	9	1	1	-	-	131
G4OUT	-	-	33	4	26	6	-	-	-	-	69
G1UGH	3	18	-	-	26	9	4	4	-	-	64
M0CNP	-	-	-	-	3	3	2	1	-	-	9

The District Codes are the 124 listed on page 85 in the 2001 *RSGB Yearbook*. Up to 6 different GI stations and up to 3 different GM stations in each Scottish district may be counted. Countries are the current DXCC ones plus IT9. The deadline for the final 2000 scores is 12 January.

ZSs right down to the Cape. A few days later the band opened up to the Middle East, Far East, all over Africa plus some VKs heard / worked. First QSOs from GJ were completed with ST2SA, 9E1C, XU7AAP, BG7OH, J28 and VQ9. Other juicy DX included E30TA, TR8, 9M2, V5 and 5C8 to bring Geoff's DXCC total to 176 countries.

Jamie Ashford's, GW7SMV (NP), list of DX worked looks like an HF station log. From 20 October he contacted J28FF, E30TA, 5C8M (IM64), 8Q7QQ*, JY9NX*, OD5/OK1MU*, ST2SA, XU7ABF, FY/W7XU, 9E1S*, UN3G, UN6P, HC2FG (FI07), PY0FF (HI36), PY7ZZ (HI21) and ZD8SIX. Some ZS6s and a VE were worked and a couple of OHs in the auroral-E event on 6 November. In a later report, he mentions QSOs with VP2MJJ, LU5VV (FE48) and LU3DCA (GF05) on 10 November between 1455 and 1622. To illustrate how good the band has been in 2000 up to 10 November, Jamie's QSO with HC2FG was his 100th DXCC country. He is now up to 110 all-time.

144MHZ

Some time ago Nigel Wilson, G4VVZ, sent in a report 'G4ZAP in Somerset' with details of VHF activity from his office QTH at Linear Modulation Technology. Together with John Flowers, G0JLF, they have built up a station comprising a TS-940S with preamp, a transverter, a two 4CX250B PA and two 12-ele Yagis. They also have a 4m station. He holds the G4ZAP A1 Contest Group's callsign. They were QRV in VHF NFD and in other contests and also caught some Es in July. The site (IO81SG) is not all that good but they do have an 80ft tower for the antennas. Other amateurs at the office are Rick Hillum, G6PAE, Derek Love, G7ORK and Chris Bartram, G4DGU.

G0EVT reckons summer 2000 was the best on 2m for many years and it brought John five new countries - EA9, ER, EW, RA3 and T9. He was QRV in the auroral-E 6 November event, which lasted between 2015 - 2025, when UA2TII* was S9+ but, as soon as he had finished a QSO with G4LOH, he disappeared. John completed with ES2QH (KO29) but couldn't break the pile-up of DLs and PAs working RW1AW. There were lots of DL, ON, OZ, PA and SM stations on before and after the event via 'normal' auroral propagation.

Ian Cornes, G4OUT (ST), operated for a limited period in the Marconi Memorial CW contest on 4 / 5 November completing 35 QSOs in six countries and 18 grids. ODX were LX2DX (JN29) at 651km and F6ETI/P at 575km. He didn't hear any PAs or DLs and remarks on the lack of G stations. G3FIJ found plenty of good DX and Frank worked into JN39, 49, JO40 and 51.

David Dodds, GM4WLL, was out portable in IO85NR for the contest and made 25 QSOs in five countries and 14 grids for a claimed score of 9609 points. ODX were DL0KM (JO31 at 786km) and ON4DRW (JO10 at 708km) with a further eight over 500km. He remarks, "Activity in the UK was appalling yet the band was full of continental stations begging for Gs to work." He writes, "Surely a little bit of weather isn't enough to put everyone off?" which brought the rejoinder from Mike Ray, G4XBF, "'A little bit of weather?' You have *no* idea. We weren't on because the portable QTH no longer has a roof and the field it is in is the consistency of a particularly runny soft cheese."

USEFUL WORLDWIDE WEB SITES

EA1BSK	http://www.qsl.net/ea1bsk
Vitalec	http://www.vitalec.co.uk
Rochester VHFG	http://vhfgroup.rochesterny.org

DEADLINES

THE MARCH COPY deadline is **12 January**, when I'll need your final 2000 Annual Table claims, and for April it's **13 February**. My telephone answering and fax machine is on 020 8763 **9457** and *not* 9459 as printed in the December issue; sorry, finger trouble! My CompuServe ID is g3fpk ♦

HF, CONTINUED FROM PAGE 77

ditions. Applications should be sent to: O A Maljavskij, UA9UAX, Box 1, Topki, Kemerovskaja obl, 652320 Russia, with a complete log extract. The award fee is $5 or 10 IRCs. E-mail: ua9uax@kuzbass.net

QSL VIA RW6HS

VASIL, RW6HS (rw6hs@aport.ru) reports he is the QSL manager for the following stations: 3B8FQ 3DA0BL 4K2BDU 4K2BY 4K2OX 4K4BCU 4K4BDU 4K4CDE 4K4CDE/UL7B 4K6CM 4L1QX 4L1RK 4L1UN 4L4KA 4L6FU 4L6QQ 4Z5BZ 4Z5FB 4Z5FL 4Z5FW 4Z5GV 9H1ED 9H1GY CE2EZE CT3FF DU1EIB EK3AA (*) EK3AW EK6GZ EO6AHG ER1OO ER2OG ER3DX ER5AL EX8A EX8QA EX8VI EY8VV EZ6DK EZ8AI FP5EK KP2J KP3EM LY2ER OD5EH OD5NO OD5SE R1FJC RA6WA RA6WF RA0BY RA0FAC RA0FAN RF6QAI RI3B RI8AJ RI8BAM RI8BDN RL0O RL2O RP6HWF RU0LX RV0AM RW9AY RW0LIA RW0LOG RX3DQN RZ9DX/0 TA1AZ UA2FBR UA2FFM UA2FGU UA9CDE UA0BC UA0BCU UA0I/UV3DDC UA0LDY UA0LQJ UA0QBQ UA0Y/UA9YC UE6ADI UF6QAT UF6QBA UI8IAW UI9B/RB3MO UI9BWO UJ3I UJ8JKK UK8ABT UK8AJ UK8BAM UK8BN UK8BWO UK8CK UK8FC UK8GA UK8GBS UK8GK UK8IAO UK8IG UK8IT UK8IWK UK8IWW UK8OAN UK8OB UK8OM UK8ZAB UK8ZAH UK8ZAV UK8ZL UK8ZC UK8ZK UK8ZR UK8ZU UK50A...Z UL7JW UL7OB UL7TX UM4BWO UM5BWO UM8AWP UM8OM UM8QA UM9AA UM0MO UM51BWO UN2O UN5J UN7AD UN7AM UN7AO UN7GHG UN7GN UN7IG UN7QX UN7SK UN7TX UN9GB UN0GN VK4SJP YL2BI YV5DEH ZB2EO. (*) ex UD6KBL, UD6KW, RG6GW, EK3GW

QSL direct only ($1 or 2 IRC + SAE) to Vasil M Kasyanenko, PO Box 0, Novopavlovsk, 357300 Stavropolskij kr, Russia.

The W-18-Z Award (see 'Awards' on page 77).

DXView

THIS NEW SOFTWARE (currently in beta release), available free from www.qsl.net/dxview/ responds to the input of a callsign or prefix with the associated DXCC entity, reporting its location and beam heading from your QTH. *DXView* presents a world map, upon which beam headings, stations you spot, the sun's position, and the solar terminator are continuously displayed. *DXView* can also display country maps for more than 250 DXCC entities. A PC running Windows 95, 98, 2000, or NT with an SVGA or better display is required. Both the program and its optional bundle of country maps are large - a 12.5Mbyte download for the former, and a 6.8Mbyte download for the latter. It is therefore recommended that potential users review the screenshot and online help before downloading; both are accessible via the above URL. (Tnx Dave, AA6YQ.)

THANKS

Special thanks go to the authors of the following for information extracted: *OPDX Bulletin* (KB8NW), *The Daily DX* (W3UR) and *425 DX News* (I1JQJ). Please send items for the **March** issue by **10th January.** ♦

REPEATERS

ROGER JONES, G3YMK
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THE FEBRUARY 2000 edition of *RadCom* carried an article outlining the Repeater Management Committee's thoughts about the future repeater scene in the UK. Feedback from readers asked for a regular update on repeater matters and the *RadCom* editor has agreed to a bi-monthly column dedicated to repeater matters. The RMC recognised the plea from many correspondents that whilst RMCNET, the committee's web site run by Colin Dalziel, GM8LBC, is always up to date, not everybody has Internet access.

INTENDED CONTENT

THE *RSGB YEARBOOK* contains details of all UK repeaters correct at publication date. However, changes occur almost weekly as new repeaters are commissioned or sadly as old repeaters are closed down. It is also intended to publish details of new proposals and the progress towards licensing, so that potential users are informed and can support if they wish. With the lead-time of any magazine, operational status will always be out of date and that information is best communicated via RMCWEB. Any changes to the repeater licensing process will be included, as will items affecting other band users and RSGB committees. TV repeater news will continue to be part of the ATV column in alternating months. We would also like to run a 'Featured Repeater' spot, which is your opportunity to get a free plug for your own group. Pictures of your repeater are always welcome.

LICENSING UPDATE

DURING THE LAST year the whole process of repeater licensing has undergone detailed review by the Radiocommunications Agency and the RMC. The intention was to simplify and update the process introducing as much flexibility as possible. The result is a *New Guide to Repeater Licensing*, a draft of which was circulated early in 2000 by the RA to all existing keepers and other interested individuals for comment. The final draft, which considered all the feedback, is available from the RA. The RMC along with the RA have been working within the spirit of the new process for some months. Of particular interest to potential groups is that timescales for each part of the licensing process have been agreed. Monitoring of present proposals in the pipeline is being carried out and any improvements necessary will be discussed with the RA at our regular review meetings.

COVERAGE UPDATE

ONE OF THE most welcome policy changes agreed with the RA during 2000 was the relaxation of the rules regarding overlap coverage. This recognised that in some areas repeaters were so busy that many potential users no longer used them, while in other areas there was a desire to use repeaters for Internet gateways. Responding to demands the RMC decided to adopt the following:

The Repeater Management Committee has a coverage policy of trying to accommodate the applicant's requirements without causing problems to other band users.

Now the policy is decided, a strategy can be developed to try to accommodate the wishes of all without causing co-channel interference, although we realise this is never going to be completely achieved. It may well be that existing groups might be prepared to change frequencies taking advantage of 12.5kHz channelling on 2m and 7.6MHz spacing on 70cm. The RMC is willing to help and advise any group if they wish.


Photo courtesy of Worthing Video Repeater Group

Peter, G4PAP, adjusts the logic of the new GB3SR 2m repeater in Brighton.

INTERNET GATEWAYS

THE LATEST information from the RA is that some 70 Gateway NoVs have been granted; about 10 using existing repeaters. It may be that some of the initial enthusiasm has waned because of the withdrawal of the popular iPhone software product.

This is still available as a time-limited 'trial' from various sources, but the original company, Vocaltec, is no longer marketing the product or issuing further licences. Pirate patches to get round the licensing are supposedly available but it would be a foolish amateur to use such a cheat. Some stations are experimenting with Real Audio and similar software, but these are nowhere near as useful as the original iPhone. We look forward with interest to see how things evolve.

COMMITTEE VACANCIES

IN ORDER TO address the changing technologies and produce solutions to the challenges faced by the Committee, a number of vacancies have arisen on the Repeater Management Committee. The first is for a full member as Zonal Representative for RSGB Zone B (Midlands), and the other vacancies, which could be either full or corresponding members, are open to those who would like to offer particular areas of speciality to the team. In particular, knowledge of Voice over IP techniques, Microwave engineering and design of PMR networks would be particularly valuable at present, but knowledge of other technologies and other amateur radio special interest areas would be equally welcome.

It is the Committee's desire to serve all interests equally and thoroughly. If anybody is interested in joining the team please contact Committee Chairman, Carlos Eavis, G0AKI (QTHR).

2m CTCSS ACCESS

THE NEW GB3AL 2m repeater in Amersham, Bucks, will be the first unit on this band to use CTCSS access only. This was at request of the group who also operate the GB3AM and GB3HZ repeaters from the same site. No 1750Hz tone will be required, but the repeater will not remain open with plain carrier. This will help the group as the site has multiple amateur and PMR equipment close by and the potential for intermodulation problems is high.

The RA has indicated that by 2004 they will probably require all FM voice repeaters to be CTCSS access only; the RMC anticipates user objections and would like to hear *your* views. ♦

LATEST CLEARED REPEATERS

The following voice repeater applications were cleared by the Radiocommunications Agency on 9 November 2000:

Callsign	Application type	Channel	Keeper
GB3BC	Resited 2m Repeater, Newport, Gwent.	RV60	GW8ERA
GB3BN	Resited 70 cm Repeater, Bracknell.	RB0	G4HLF
GB3DB	New 6m Repeater, Danbury, Essex.	R50-6	G4DUT
GB3IW	Power increase, 70cm, Isle of Wight	RB4	G1VGM
GB3SY	Resited 70 cm Repeater, Barnsley.	RB6	G4LUE

The outstanding voice repeater proposals submitted for licensing are:

Callsign	Application type	Process Stage	Proposed Keeper
GB3AB	Resited 70cm Repeater, Aberdeen	RA	GM0GIB
GB3CK	Resited 70cm Repeater, Kent	RA	G6ZAA
GB3NA	Resited 2 metres, Barnsley	RA	G4LUE
GB3PZ	Dedicated 70cm Internet, Cheshire	Primary User	G4ZPZ
GB3UO	New 70cm Repeater, Wrexham	Primary User	G4UDE

As the channel allocated to a proposal is not finalised until the application is approved, it has not been included. However, full proposal details including an expected coverage map can be found on RMCWEB at: www.coldal.org.uk/rmc.htm or from any RMC member.

BOB TREACHER, BRS32525
93 Elibank Road, Eltham, SE9 1QJ.
E-Mail: brs32525@compuserve.com

SWL

I RELEASED RESULTS of the major SWL contests held in 1999 and early in 2000 in early October in *The BRS32525 SWL Contest Digest*. Unfortunately, I made an error when checking the log from Jean-Jacques Yerganian, ONL383, and wrongly showed his log in the 'multi-single' category. I am sorry that the mistake occurred and am pleased to say that the difficulty has been resolved amicably.

The problem arose largely because I was so far behind with the log checking of four or five contests but was determined that the results booklet would be available to all before the SSB leg of *CQ* World Wide. As a result, over 150 logs were checked in a relatively short space of time, many in the small hours of the morning. There will be no repeat this year, as Mick Toms, BRS31976, has volunteered to help with the CQWW log checking this year, meaning that the results will be available without controversy, and a good deal earlier.

Clare, RS102891, and Simon, RS177448, Treacher man the UK SWL stand at the RSGB HF and IOTA Convention in October.

SWL VP8 DXPEDITION

BILL, G3UOL, had planned an expedition to the Antarctic for January / February but has suffered a serious illness so his daughter Kathy and wife Kath will be going instead. Kathy is an SWL. Their itinerary will be as follows:

23 Jan: Ushuaia (LU)
25 / 26 Jan: Port Stanley (VP8, Falkland Is)
30 Jan - 1 Feb: VP8 (South Georgia)
3 Feb: VP8 (South Orkney Is)
5 Feb: VP8 (South Shetland Is)
7 / 8 Feb: Deception Is and the Antarctic mainland at Hope Bay.

Unfortunately, Bill's illness means months of planning for giving the 'deserving' a 20m QSO (or logging) from some pretty rare DX locations is rendered useless. He passes his apologies to those who were looking forward to a QSO. Instead, I look forward to receiving Kathy's write-up and some photos of her SWL DXpedition that I can feature in this column.

QSL MYSTERY

DEREK, G8TOK, has received a QSL card from VE2HRP for BRS88078 for a report that Bill sent in October 1989 for a QSO between G4NSY and VE2HRP. Derek is keen that the card finds its way to BRS88078 but the Society has no current information for him. Bill may no longer be interested in amateur radio or may now be licensed but not a member of the Society. However, if Bill or anyone who knows him sees this, an e-mail to nsyars@g8tok.demon.co.uk will secure the card.

NEW YEAR CONTESTS

THERE ARE THREE SWL contests taking place early in January. The rules of all three are reproduced here. All three favour listening on the 'low bands': 7, 3.5 or 1.8MHz, because traditionally the best DX conditions occur on those bands at the turn of the year. The New Year Contest is organised by Joukje, NL-11971, and covers SSB reception of stations on 7 and 3.5MHz. The Cray Valley RS Contest is actually a re-vamp of the popular White Rose, and latterly, the SMC SWL Contest. Thirdly, the *CQ* 160m contest is a *CQ* magazine contest for which I am the SWL Contest Director: CW at the end of January, SSB at the end of February. Please support all three if you enjoy DXing on the low bands. ♦

SWL NEW YEAR CONTEST

The idea of the contest is to log stations on 40 and 80 metre SSB only.
When: Sunday 7 January 2001
Time: Any three hours between 0000 and 2400UTC.
Points: Log only three stations from each DXCC country. First station counts 5 points, second station counts 3 points, third station counts 1 point. Maximum score for any DXCC country is 9 points.
Entries: The winner will receive a plaque or a cup. Any SWL logging 10 QSOs will receive a New Year Contest Award. Logs must be sent before 31 January 2001 to Joukje van Stralen, NL-11971, Roswinkelerstraat 117, 7895-AR Roswinkel, Netherlands. Logs can also be sent by e-mail to: NL11971@amsat.org

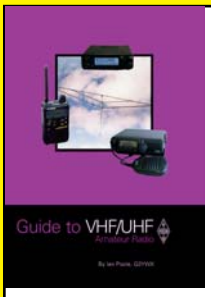
SWL RULES FOR THE 2001 *CQ* WORLD WIDE 160 METER DX CONTEST

Short Wave Listeners around the world are invited to take part in the 2001 *CQ* World Wide 160m DX Contests. The objective is to hear as many countries, US states and Canadian provinces as possible on the 160 metre band.
When: CW: 2200UTC 26 January to 1600UTC 28 January 2001.
SSB: 2200UTC 23 February to 1600UTC 25 February 2001.
Sections: Single and multi-operator sections.
Scoring: Stations from the SWL's own country count 2 points. Stations from other countries in the same continent as the SWL count 5 points. Stations from countries in other continents count 10 points.
Multiplier: Each DXCC country (not W and VE), US state and Canadian Province heard counts as a multiplier. Countries are those on the current DXCC list plus additional countries from the WAE list (IT9, GM Shetland Is, etc).
Final Score: Total points multiplied by the total number of multipliers (DX countries, states and provinces).
Awards: Certificates of merit will be sent to the leading SWLs in each section and the leading listener in each DXCC country providing the listener has at least 25% of the winner's score.
Logs: Logs should show Date, Time (UTC), station heard, RS(T)report and country prefix or country abbreviation, USA state or Canadian province given by station heard, RS(T) report of station heard [no report shall be less than 33(9) and reports are not expected to be 59(9) in every case], station worked, multiplier, points. Any unmarked duplicate will lose 10 times the logging value. A Multiplier check list *must* be provided.
Entries: CW Logs *must* be postmarked no later than 26 February 2001; SSB logs *must* be postmarked no later than 26 March 2001. Entries to CQ160 SWL Contest Director, Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, England. Please enclose 2 IRC or $1 if you want a copy of the results.

CRAY VALLEY SWL CONTEST

The Cray Valley Radio Society was delighted to be asked to take over the running of the popular LF Bands contest from 2001. The LF Bands contest has been a regular in the SWL Contest Calendar for over 20 years. The White Rose Amateur Radio Society ran the event for many years and South Midlands Communications were the most recent sponsors of the contest.
When: 1600UTC 13 January 2001 to 0900UTC 14 January 2001
Bands: 7, 3.5 and 1.8MHz only.
Modes: Section A: Single Operator SSB (*no* external help allowed)
Section B: Multi Operator SSB (more than one SWL; use of Packet Cluster or 'DX Summit')
Section C: Single Operator CW (*no* external help allowed)
Section D: Multi Operator CW (more than one SWL; use of Packet Cluster or 'DX Summit')
Scoring: 7MHz - 3 points for any station heard from outside the SWL's own continent; 1 point for stations heard from the SWL's own continent.
3.5MHz - 5 points for any station heard from outside the SWL's own continent, 2 points for stations heard from the SWL's own continent.
1.8MHz - 10 points for any station heard from outside the SWL's own continent; 3 points for stations heard from the SWL's own continent.
Any station heard will count for points, except /AM and /MM stations. All stations logged *must* be in QSO.
Multipliers: Each country heard on each band will count as 1 multiplier point. The call areas of Canada, Japan, Australia and New Zealand will each count as a separate multiplier. All other countries will be determined using the ARRL DXCC Countries List.
Logs: Logs should show: Date, Time (UTC), Station heard, Station being worked, RS(T) of station heard at SWL's QTH, Multipliers, Points. If both sides of a QSO are heard, they may both be claimed for points. Each station *must* be shown in the 'station heard' column. A separate sheet showing multipliers heard on each band *must* be submitted. Computer-generated entries, especially those using EI5DI's SDL software, will be welcomed, but please remember to include a Multiplier Check Sheet.
Entries: Entries should be sent to Cray Valley Radio Society, c/o 93 Elibank Road, Eltham, London SE9 1QJ, England. E-mail logs will be accepted if sent to brs32525@compuserve.com All entries *must* be received no later than 28 days from the end of the contest.
Awards: Cray Valley Radio Society will issue certificates at its discretion. All decisions made by the Society will be final in all cases. A copy of the results can be obtained by enclosing 1 IRC or $1 with your log.

RSGB BOOKSHOP



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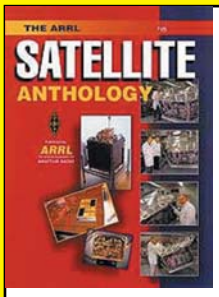

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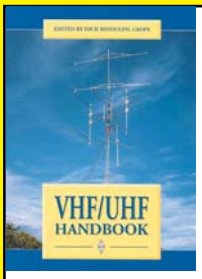

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This guide to the theory and practice of amateur radio reception and transmission on the VHF and UHF bands gives the reader the background to such essential topics ad antennas, EMC, propagation, receivers and transmitters, together with constructional details of many itmes of equipment. As most amateurs today use commecial transceivers, the emphasis is on accessories and add-ons which are relatively simple to build.

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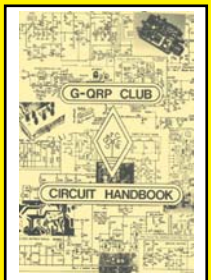

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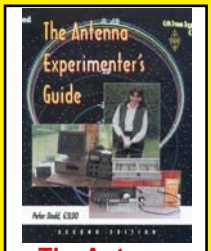

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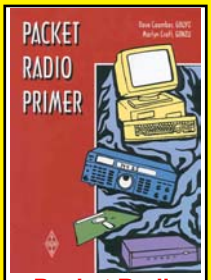

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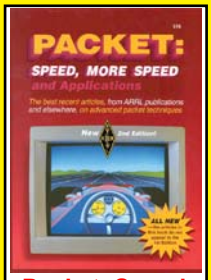

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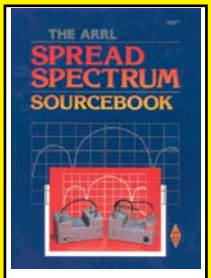

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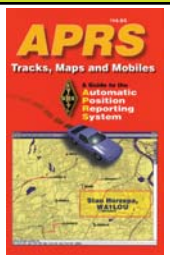

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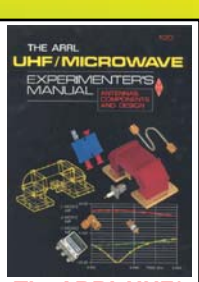

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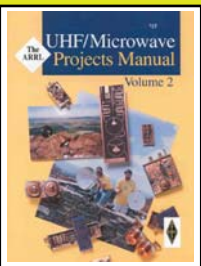

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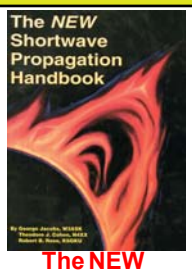

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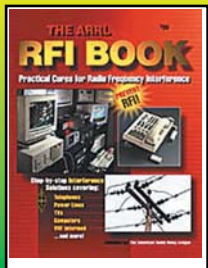

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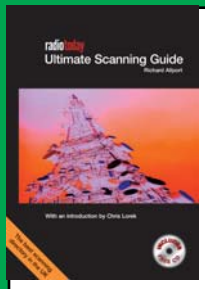

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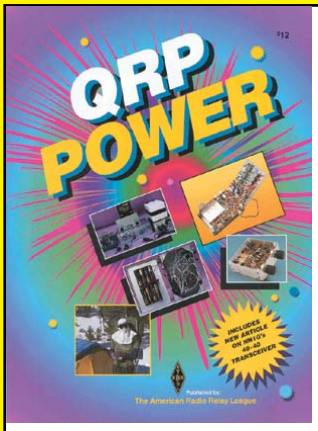

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Whether you've just been bitten by the urge to operate flea power, or you've already discovered just how much fun it is to operate with 5W or less, QRP Power is just what you've been looking for. It's crammed with pro-jects you can build and resource information you can use. There's also a new, in-depth article on NN1G's popular 40-40 transceiver.

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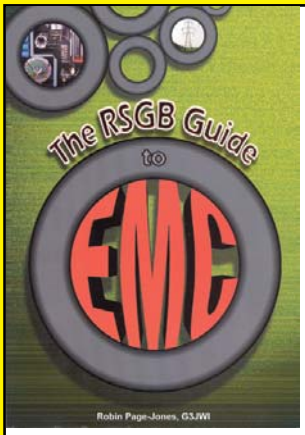

The RSGB Guide to EMC

Radio amateurs have a wealth of practical EMC experience as they need to use transmitters in ur-ban environments, and they receive very weak stations in the presence of man-made interference. This book from the Radio Society of Great Britan is of immense use to anyone called upon to resolve EMC problems that occur in the real world.

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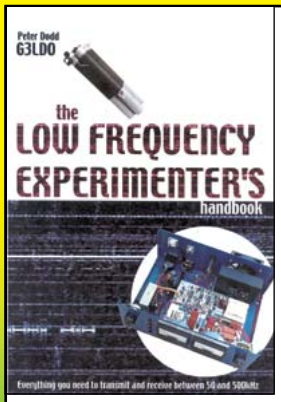

The Low Frequency Experimenter's Handbook

The LF Experimenter's Handbook has been written to meet the needs of ama-teurs and experimenters who have an interest in low power radio techniques at frequencies below 200kHz. Most of the techniques described are targeted at those using the 136kHz band, but they are also of great interest to readers in New Zealand and Aus-tralia with their 183kHz band and the Lowfers in the USA on 180kHz.

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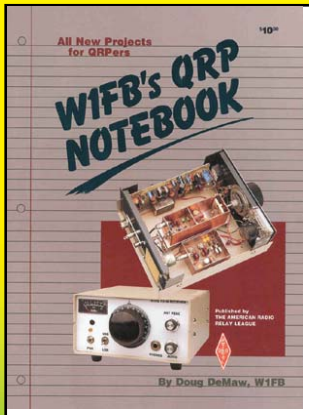

W1FB's QRP Notebook

This book by Doug DeMaw is packed with cons-truction projects for QRP transmitters, receivers and accessories. This edition is the completely rewritten successor to Doug's popular QRP Notebook, and features totally new circuits. Learn the inside secrets from this veteran builder, writer and former QST Technical Editor. Most of the projects feature printed circuit boards that are available from a commercial source.

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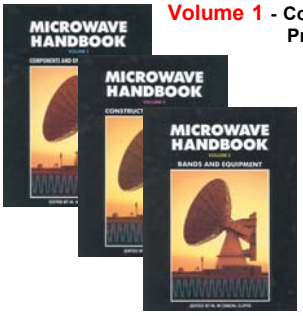
Microwave Handbook

In the last few years there has been an almost explosive growth in amateur microwave techniques, designs and devices available, leading to increased band occupancy and to some qite startling practical results. As a consequence, the need for an authorative yet accessible source book for the growing numbers of enthusiasts involved has never been greater.



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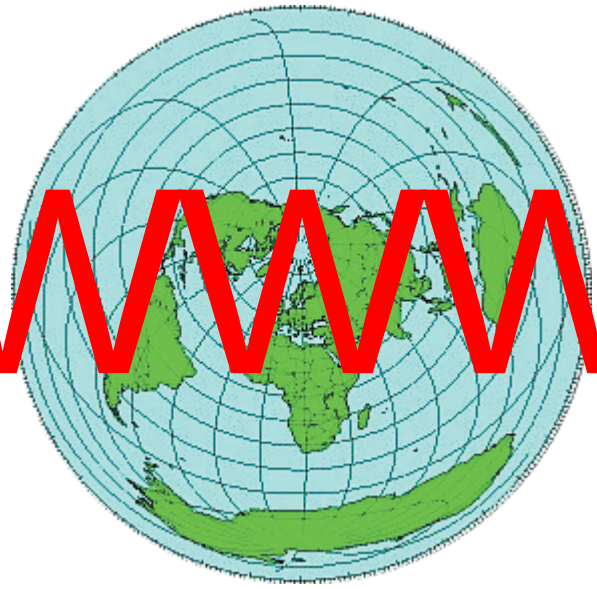

ANDY GAYNE, G7KPF
119 Lower Lickhill Road, Stourport-on-Severn, Worcestershire DY13 8UQ.
E-mail: www.radcom@rsgb.org.uk

HAVING produced this column for almost three years now, I thought this month would be a good time to reflect on the purpose of the 'WWW' reviews, and perhaps encourage some feedback from you, the readers, to determine how it should proceed in the future.

We are now well and truly into the new millennium and if there is one certainty as we move headlong into the next century, it is the increasing impact that the Internet is going to have on our lives. The World Wide Web in particular is likely to become the dominant source of information, especially as the cost of equipment and telephone charges continues to fall. In recent years the commercial giants (and perhaps the minnows too) have encouraged the web's popularity, but as a reference medium it is almost entirely driven by enthusiasts with no thought of financial gain. Anyone can create web pages about any subject they wish, and if you can conceive of any topic then you will find someone, somewhere who has produced a web site about it.

With so much information being readily available on the web, why write a column in a printed magazine about it? Does this not defeat the object somewhat? Well no, because the target audience for 'WWW' has, in my opinion, always been those who do not have Internet access (strange, but true), or those who have only recently taken themselves 'on-line'.

FEEDBACK REQUIRED

SO WHY WRITE primarily for these groups of people, especially those without Internet access? The reason is quite simple. Those people who have been on-line for even a modest length of time will have quickly developed the art of using the search engines to find what they are looking for, as well as having a growing 'favourites' list of subject-specific directory sites. For these people, the web is not a daunting prospect, but has established itself as an integral part of daily life, much like the newspaper or television. The recent initiate, on the other hand, is likely to welcome a few pointers on what can be found and where to find it. More importantly, those without web access need to be shown just what this medium is capable of, and of the variety and level of detail of the information available.

This is why I try to look at a number of diverse topics each time, rather than concentrating on a specific subject. I present reviews of established sites from the world of amateur radio, with many of these having been recommended by readers. Of course even long term users of the Internet will find sites reviewed here that are new to them; the web is a huge resource and you would have to spend a long time on-line to visit most of the sites, even for a subject as specialised as amateur radio.

Since starting the 'WWW' column, I have received a reasonable though infrequent amount of feedback from readers, almost all of it positive and constructive in nature. I would now like to ask for your thoughts on the content and aims of the column, in order to provide you with the best possible 'WWW' column in the future. Are there any changes you would like to see, is the target audience correct, do you want shorter reviews of more sites each time, or longer reviews of fewer sites? Please drop me a line by e-mail or by post and let me know what you think, even if it's just to say you think the current balance is about right, and I'll try my best to accommodate your wishes.

DX CLUSTER

WHILST I AM optimistically waiting for the correspondence to flood in, I'll continue to review sites in the same manner as before. Sites such as the DX Monitor software download site by Peter Jennings, VE3SUN [1]. This software provides an easy interface to real-time data collected from the DX Summit web site [2], previously reviewed in the July 2000 edition of *RadCom*. Suitable for running under Windows 95,98 and NT operating systems, the DX Monitor software considerably expands the capabilities of the on-line portal to the DX Cluster network.

The software has far too many features to list here, but it is capable of automating all types of cluster monitoring activities. For example, the software will sort DX spots by frequency, callsign, spotter, etc; it can activate alarms on callsigns or at specific times, produce beam heading and distance information from spots listed and, most impressively, produce great circle maps from any required data set. This is a professionally-produced software package that is distributed as freeware by the author, and is likely to be highly appreciated by anyone who is a regular DX Cluster user.

COMPONENT DATA

THE DX MONITOR site was recommended recently by Stan, G3MEA, who also told me "I have searched in vain for a source of data for obsolete semiconductors in my junk box". Stan's requirements are for pin connections, maximum voltage, and so on, when the manufacturer is not known or the device is not currently in production. This is a bit of a tall order that has so far defeated my searching skills, so if you can suggest any suitable sites then please do let me know.

Don't forget, if you want to find out what sites have been reviewed in the past, or just want to save typing in the URLs printed here, then visit the 'WWW' on-line web page [3], which also has corrected URLs for older reviews as and when they become known. ♦

REFERENCES

[1] www.benlo.com/dxmon.html (DX Monitor software)
[2] http://oh2aq.kolumbus.com/dxs/ (DX Summit)
[3] www.users.zetnet.co.uk/kama/radcom.htm (WWW On-Line)

The DX Cluster as you've never seen it before, thanks to DX Monitor.

QRP QRP QRP QRP QRP

REV GEORGE DOBBS, G3RJV
St Aidan's Vicarage,
498 Manchester Road,
Rochdale OL11 3HE.
E-mail: g3rjv@gqrp.com

SOMETIMES, EVEN the most seasoned of radio amateurs can be taken by surprise by the viability of low-power operation on the modern HF bands. Recently I received an email from Peter Waters, G3OJV, of Waters and Stanton plc, about his experiences with the MFJ Cub. The MFJ Cub is a small single-band transceiver, available in semi-kit form for a range of HF bands.

Peter writes: "It's many years since I built any ham gear - although at one time all my gear was home-built - I rarely get enough time these days. Waters and Stanton recently took delivery of some MFJ Cub kits and, as we did not have a ready-built one, I decided to build one myself at home. I chose the 15-metre 1-watt model because it is ideal for Novices and the band is quite good at present. It took me about three hours to construct and it worked fine, alignment requiring no more than an additional HF receiver.

"It might come as a surprise to learn that I don't have a great antenna farm and I had to make myself a wire dipole in order to test it, which I strung up in an upstairs room. To my surprise, I was able to work European stations with ease. I actually had a lot of fun and it took me back to the good old days of home construction. I took the rig out to Hong Kong and Taiwan and, using the same antenna, monitored stations from all over the world. I am now back in the UK and intend to do some more portable operation.

"Isn't it amazing? I am surrounded by the world's best ham gear and yet I still get a thrill from home-brew and simple gear. It goes to show that there is a place for both types of gear in the modern ham shack."

So follow Peter's enthusiasm and try QRP, which is usually considered to be 5W of RF output or less, on the international QRP frequencies. These frequencies are agreed amongst the world-wide QRP groups as being the places where QRP stations operate. They are: CW: 1843, 3560, 7030, 10106, 14060, 21060 and 28060kHz; SSB: 3690, 7090, 14285, 21285 and 28360kHz.

17th YEOVIL QRP CONVENTION

THE DATE FOR the 2001 Convention is Sunday 22 April, preceded (as usual) by the Convention Dinner on the Saturday evening. For details please contact Peter, G3CQR, QTHR (or via e-mail to petercqr@ukgateway.net). In conjunction with the Yeovil QRP Convention, an annual contest is being held called the 'QRP Funrun'. See the box below.

THE FIFTH RED ROSE QRP FESTIVAL

THIS IS TO BE HELD on Sunday 3 June 2001, from 11am to 4pm at the Formby Hall, Alders Street (off the High Street), Atherton, Manchester. The aim is to promote interest in low-power operating and home construction. The event is at a large spacious hall at ground level with disabled facilities and a large car park. Refreshments and a bar are available throughout the event. The stands will include lots of 'junk', radio parts and a large, inexpensive bring-and-buy section. Details can be had from Les Jackson, G4HZJ, at 1 Belvedere Avenue, Atherton, Manchester M46 9LQ; tel: 01942 870 634.

A front view of the main transceiver unit in the GM4YLN station.

UNUSUAL STATION

I LIKE TO REPORT the use of completely home-built HF stations in this column. One slightly unusual station has recently come to my attention. Chris Grierson, GM4YLN, uses a home-built transceiver, which consists of a main transceiver that operates on 28MHz, and a series of plug-in transverters to obtain coverage of the other HF bands. This reminds me of the station used over many years by another Scottish QRPer, George Burt, GM3OXX. Using this station, Chris has secured quite a number of prestigious QRP operating awards. He holds the American Milliwatt DXCC QRPp Trophy (100 DXCC countries with 1W or less). He is QRP Master number 29, a very difficult-to-obtain G QRP Club Award, and has won the G QRP Club Winter Sports Award. A fine record of achievement with home-built equipment. ♦

The Milliwatt DXCC QRPp Trophy flanked by the G QRP Master Plaque and the G QRP Club Winter Sports Trophy, all won by GM4YLN with his home-built transceiver.

THE 17th YEOVIL QRP CONVENTION 'FUNRUN' RULES

When: Monday 2 April to Thursday 5 April 2001 inclusive. 1900 to 2100 UTC on 3,560kHz and 7,030kHz - both ±10kHz.

Bonus stations and frequencies: GB2LOW (from G3CQR) at Sherborne, Dorset on 3,558 and 7,028kHz ±2kHz; G0KZO (Eva) at Stockport, Cheshire on 3,563 and 7,023kHz ±2kHz; G3LHJ (Derrick) at Newton Abbot, Devon on 3,553 and 7,033kHz ±2kHz.

Contacts: Should be between QRP stations with a maximum 5W output. However, contacts with QRO stations are permitted, but with reduced points value. All stations may be worked once each evening on each band. Bonus stations will be operating each evening randomly for one hour on each band.

Call: "CQ FR"

Scoring: Each QSO with another QRP station scores 10 points. Each QSO with any Bonus station (including GB2LOW) scores 25 points. Each QSO with a QRO station scores 5 points.

Duplicates: All duplicates must be marked and no points claimed. Points will be deducted for unmarked duplicates at twice that particular QSO score.

Exchange: RST Serial number (see below), output power and name.

Serial number: The three-figure serial number must start at a random number of your choice, but not less than 100, and must be incremented by 1 for each QSO throughout the *whole* contest. However the three Bonus stations will start at 001 with all leading zeros being sent.

Entry Sheets: Separate log sheets for each band with sub-totals for each evening, (preferably in RSGB format), and a signed RSGB-style cover sheet stating rig, power output and aerial used.

Send to: G Davis, G3ICO, Broadview, East Lanes, Mudford, Yeovil, Somerset BA21 5SP, to arrive not later than Thursday 12 April 2001.

Awards: Certificates are awarded for the highest score for *any three evenings* out of four on each band, also for the highest overall total score for any three evenings on both bands. These evenings do not necessarily have to be the same on 3.5MHz as on 7MHz. A certificate will also be awarded to the station consistently using the lowest power and also for the most comprehensive SWL report.

LF

DAVE PICK, G3YXM
178 AlcesterRoad South,
Kings Heath,
Birmingham B14 6DE.
E-mail: lf.radcom@rsgb.org.uk

FURTHER READING AND INTERNET SITE

The Low Frequency Experimenter's Handbook, **by Peter Dodd, G3LDO. Available from RSGB Books.**

(1) http://www.east.no/priv/la7tia/arim/engarim.htm

THE OPINION of the LFers who attended the HF convention at Windsor in October was "the best yet". Overseas visitors were more numerous than last year and most of the well-known calls from 136 and 73kHz in the UK were present. In the true spirit of amateur radio (of which LF operators are not short!), several people brought items for others to make use of; there were insulators, RF ammeters, rolls of litz wire and information on all kinds of LF topics.

The special event station MB2HFC was radiating about 750mW EIRP, as measured by PA0SE at a distance of a few kilometres, but reception was hampered by the banks of computers above the operating position. Aerial erection honours go to G3XTZ and his catapult, G0MRF and to the Crawley club for the loan of their Versatower.

TRANS-ATLANTIC

UNFORTUNATELY, the promised trip by VA3LK to Newfoundland, mentioned in the last LF column, did not take place. Larry felt that, as a trans-Atlantic cross-band contact had taken place, it was no longer necessary for him to make such an arduous journey. He is still dedicated to the cause however, and is radiating test signals from his home QTH, 1000 miles further from the UK. Now there's a challenge!

The key to working trans-Atlantic on LF is, of course, hitting the conditions just right. David Bowman, G0MRF, appeared to manage it by sheer luck the night he was active from the tower block. It is now becoming obvious that conditions as good as they were that night are the exception rather than the rule!

Some excellent research work has been done by Alan, G3NYK, who has developed a system to plot the strength of the Canadian Navy transmission on 137.0kHz throughout the night. The mass of information collected should help us to predict when trans-Atlantic conditions are going to be sufficiently good for 1W stations to make it across. Presently, all we can do is to transmit when we hear CFH at good strength and hope that our signals are heard.

As I write, only G0MRF, G3LDO, M0BMU and OK1FIG have been copied in Canada by VE1ZJ. John has been the lynch-pin of the experiments by consistently listening for European signals over several weeks.

OK1FIG's transmission was made from a commercial site with a 120m-high aerial so we are still not sure whether such a distance can be achieved with a normal amateur set-up. We'll keep trying though!

GUERNSEY GETS THE TREATMENT

THE ISLE OF MAN team of G3XTZ, G0MRF and G3YXM decided to activate GU on 136 and 73kHz this year. Problems with Loran interference from the nearby Lessay transmitter on the French coast were anticipated. I should have a report on the success or failure of the expedition next time.

NORWAY ON 136kHz

NORWAY HAS had access to 136kHz for some time, but not much activity has taken place so far. In November Christer, SM6PXJ, crossed the border into Norway, by about 2 feet, to operate a unique station, LG5LG at Morokulien. The shack straddles the border between Sweden and Norway and has been set up to encourage a spirit of co-operation between the amateur communities in the neighbouring countries and to help disabled hams. They have a web-site (1).

HERE'S TO A HAPPY NEW YEAR ON LF

THERE'S A LOT to look forward to in the coming year on LF. New countries still coming on air, DXpeditions to under-activated areas and more 73kHz experiments. New modes to try, new aerials to put up, new rigs to build. We've come a long way since the first 73kHz experiments just a few short years ago and we're not finished yet. Cheers, and see you on the LF bands! ♦

David, G0MRF, receiving the Nevada Cup from Mike Devereux, G3SED.

ROGER BALISTER, G3KMA
La Quinta, Mimbridge, Chobham, Surrey, GU24 8AR.
E-mail: iota.hq@rsgb.org.uk

WINNERS OF the three IOTA Shell Trophies awarded by the IOTA Committee for DXpedition performance in 1999 were announced at the RSGB HF and IOTA Convention at Windsor on 13 October. The trophy for the Most Courageous IOTA DXpedition was awarded jointly to Giuseppe de Gasperin, I2YDX, and Roberto Zanchin, IK2WXZ, for their E30LA and E30MA operations from the Dahlak Islands AF-038; Sheikh Said Island, AF-080; and Gerebsasa Island, AF-081. The operators saw their activity from the last island, Gerebsasa, cut short by news that the main airport was under attack by Ethiopian warplanes. As this could prevent them leaving Eritrea, it was quite an inducement not to hang around.

The trophy for the Most Outstanding IOTA DXpedition in Africa, Asia and Europe was awarded by a vote of the IOTA community to the team of Tunisian and Italian operators led by Giovanni Bini, I5JHW, for their 3V8DJ operation from Djerba Island, AF-083. The equivalent trophy for the Most Outstanding IOTA DXpedition in North and South America and Oceania went to James Model, K9PPY; Samuel Pimenta, CT1EEN; Stephen Pall, VK2PS; and Malcolm Johnson, VK6LC, for their VK9RS operation from Rowley Shoals OC-230 off the coast of Western Australia.

Each award is a pearl shell trophy mounted on polished hardwood. It is in the same style as a number of trophies generously presented to the IOTA Programme by Malcolm Johnson, VK6LC, at the URE IOTA Convention in May 1998. These annually-awarded trophies have been funded from a generous contribution by Victor Rusinov, UT8LL, and are retained permanently by the winners. Details on how to vote for Year 2000 DXpedition winners will be published early in 2001.

The IOTA Committee also presented Premier IOTA Awards to Wolfgang and Annegret Dattenberg, DL2SCQ and DL1SCQ, for their numerous successful IOTA DXpeditions in Europe, North America and Oceania, and honouring Annegret who so sadly became a Silent Key in early 2000; to Mike Crownover, AD5A, for the creation and operation of the Island Radio Expedition Foundation Inc, dedicated to funding IOTA DXpeditions; and to the Royal Omani Amateur Radio Society, for IOTA DXpeditions in Oman and Tanzania and for support and encouragement to the IOTA Programme.

Hearty congratulations to everyone concerned. All have provided outstanding service to the IOTA community. And, of course, our thanks and appreciation go to all IOTA DXpeditioners in 1999.

PERSISTENCE REWARDED

LANNY'S, W5BOS, ambition was to activate the Cay Sal Bank Cays, the last unnumbered IOTA group in the West Indies. It was a difficult one. Although administered by the Bahamas, this cluster of uninhabited cays, partially submerged reefs and rocks lies some 100 miles or so from Andros, the nearest inhabited Bahamian island. It was, however, on the direct route to the Florida Keys and Miami for rafters from Cuba and Haiti and drug runners. To say that it was a dangerous area to sail into, let alone hang around in, to provide the Deserving with this rarest of IOTAs, is an almost criminal understatement. All sorts of unpleasant things could happen, as evidenced by insurance being unobtainable.

Lanny, W5BOS/C6A, on NA-219. The arduous nature of the terrain can be seen behind the tent.

But, it was a '*new one*'. So, one day in early October, Lanny set off in a chartered boat, initially to the Bimini Islands where he needed to clear Bahamas immigration control, and then on to the nearest landfall on the Cay Sal Bank. This was Dog Rocks, a cluster of scattered coral rocks of maximum height three metres. W5BOS/C6A was soon on the air on 20 CW and, within two or three hours, had secured the new provisional reference number NA-219. But just six hours and 500 contacts into the operation, to his great disappointment, he had to close down. Severe storm conditions were approaching and the boat captain had decided that it was too dangerous to stay - they had to leave the area. To the great relief of his friends he made it back to Key Largo in Florida without mishap after what was perhaps the riskiest so far of his IOTA ventures. But not satisfied, Lanny has started looking for the next island to target!

ANNUAL UPDATE

IOTA MEMBERS are reminded that the last date for mailing applications or updates to checkpoints for the 2001 Honour Roll and Annual Listings is 1 February. Updates postmarked after that date will be processed in the normal way but the scores will be held over to the following year's listing.

Members who intend to claim credit for any of the new references marked with an asterisk in the IOTA *RadCom* columns for September onwards and who have not yet completed a Conversion Sheet, should include one with their annual update, enclosing appropriate QSLs. Checkpoints are under instructions not to process cards from asterisked groups where a Conversion Sheet has not yet been submitted.

A reminder that you can download the Conversion Sheet and get the latest official IOTA news, particularly on new IOTA numbers issued, on operations which have submitted acceptable validation and on additions to the *IOTA Directory* island listings, from the IOTA Manager's website at www.eo19.dial.pipex.com/index.shtml You can also access it through www.rsgbiota.org

IOTA MILLENNIUM PROGRAMME

THIS POPULAR year-long programme is drawing to an end as you receive this *RadCom* issue. Without doubt participation has exceeded all expectation. From comments received island chasers and DXpeditioners alike have had a thoroughly enjoyable time. Our thanks go to CDXC (Chiltern DX Club) - The UK DX Foundation, who managed the programme on behalf of the RSGB IOTA Committee. A full report will appear later. ♦

RSGB IOTA Programme, PO Box 9, Potters Bar, Herts EN6 3RH

NEW REFERENCES

AF-088	C9	Nampula District group
AF-089	TR	Ogooue-Maritime Province group
AS-152	R0Q	Respublika Sakha: Laptev Sea Coast West group
NA-216	KL	Northern Alaska Peninsula West group
NA-217	*W1	New Hampshire State group
NA-219	C6	Cay Sal Bank Cays
OC-235	*DU8-9	Mindanao's Coastal Islands
OC-236	*YB8	Celebes's Coastal Islands
OC-237/Pr	*YB0-3	Java's Coastal Islands
OC-238/Pr	FO	Pukarua and Reao Atolls

Pr = provisional * see text

Regular Feature

MICROWAVE

SIMON LEWIS, GM4PLM
Creoch Farm, Ochiltree, Ayrshire KA18 2QH.
E-mail: uwave.radcom@rsgb.org.uk

HELLO ALL and welcome to another 'Microwave' column. Hopefully, by the time you read this, AMSAT will have successfully launched the latest of their amateur satellites in the form of Phase 3-D. If the satellite launch by Ariane is successful, we should be on the way to a most exciting time in microwaves. It will give microwaves the biggest PR boost in a long time, and we must be ready to meet the challenge and assist others in becoming active on microwaves, even via satellite.

MISSING THE POINT?

THAT IS A SUBJECT which brings me neatly along to another point that we in the microwave world seem to be missing. A recent phone call complained that I was not pushing 10GHz narrow-band as a mode, and why weren't we concentrating on extending our distances via rain scatter etc? After the telephone call and some further thought, I became quite worried. Worried, because I would hate to think that for microwaves that is all we are publicising. There is an awful lot more to this part of the hobby that a few fleeting long-distance contacts via rain scatter.

There are several regulars who make daily long-distance contacts using microwaves. I have yet to hear from *anyone* publishing information on these via this column. In fact, since I took the column over, I have received almost nothing in the way of input from readers. I know for a fact that many of you are making long-distance contacts across the North Sea via ATV. Some are making contact via the moon using microwaves, some using wide-band FM and simple transceivers. I have yet to receive a single report on *any* of it!

There is plenty of information available on the net and via the other specialised publications, but what *we* need to do is to publicise our activities more via columns such as this. The column is not specifically for microwavers, most of us subscribe to more specialised newsletters for our technical information. But this column acts as a window on the world of microwaves, a sort of shop window, to use an analogy. With the right material on view in the window, people will stop and come into the shop. And that's what we need to publicise and capitalise upon. This is *your* responsibility. To attract newcomers into microwaves for whatever reason, we need to publicise our activities. So what are *you* going to do about it? I await your input.

PROJECT TIME

WELL, WINTER is definitely here! Snow and ice - we have had both at the farm here so far and it's only November! I know it's winter as I am still recovering from a particularly nasty bout of cold. Modern times eh? We can work DX over thousands of kilometres, but can't cure a silly cold bug! As the nights have now drawn in, it's time to think of projects for the spring. I am sure that many of you will be building this winter, and I have found a few new projects around the suppliers, so here is my Christmas Top 10 Present List for the man (or woman) who has everything, but always wants something else!

- DB6NT 23cm uplink transmit converter kit – just the thing for the new satellite in orbit. Uplink your 2m multimode to 23cm for mode L/S (1).
- GH Engineering high power 23cm PA. Uses four Mitsubishi bricks to give 75W output. Make yourself heard next year (2).
- New Generation 10GHz narrow-band transverter. Join the masses on the hilltops in the spring with a new transverter (3).
- G3WDG 10W 13cm amplifier kit. Boost your 13cm signal with a compact 10W PA from the microwave master (4).
- K10 CW / beacon keyer kit. Just the thing for long CQs on microwaves. Miniature PCB-based PIC keyer (5).
- One-year subscription to *Microwave Newsletter*. Just the thing to keep in touch with all the microwave gossip (6).
- Copy of *Microwave Update 2000*. The proceedings of the biggest and best microwave get-together in the world (3).
- G0MRF Mode S downconverter kit. Get ready for Phase 3-D with a great little kit from Dave, G0MRF (7).
- DB6NT Mk2 13cm transverter. Make a New Year's resolution to become active on a new band (8).
- 23 / 13cm ATV transceiver modules. Supplied by G1MFG, these tiny modules look great for ATV (9).

UK MICROWAVE GROUP

THIS IS A FAIRLY new group dedicated to the promotion of microwave radio in the UK. It aims to provide information, components, advice and, most of all, support to all radio amateurs working on projects from 1GHz upwards. The Group is not dedicated to any one mode or band, and is certainly interested in promoting satellite, wide-band, ATV and data as well as weak-signal operation. It publishes a quarterly newsletter, *Scatterpoint*, with technical information and news. Martyn, G0CZD, is the editor and he would welcome any news and articles. A pdf file of the pilot issue is available for download on its website (10). *Scatterpoint 3* has just been published. Contents include: a look at the 'DC' bands, the WA5VJB log periodic, a proposal for a scatter monitoring system, a look at sun noise measurements, a roundup of sweep oscillators, and using the DiSQeC™ system to control masthead equipment. The Group operates a components service to all its members and this will hopefully grow with time. The WA5VJB log periodic antenna is now available from the components service.

'MICROWAVE UPDATE 2000'

PETER DAY, G3PHO, brought back some amazing pictures from this year's 'Microwave Update' held in Trevose, near Philadelphia, USA. Of particular interest is the great picture of the portable station of Stan, KA1ZE. He doesn't fool around when he operates portable on VHF to microwaves! This magnificent vehicle and antenna system was driven down to Update 2000 and a few were fortunate enough to see him raise the antenna mast in the hotel car park. The vehicle is entirely self-contained with motors and power supplies to raise the mast, rotate the many antennas and operate the station. Surely the envy of many UK portable operators! ♦

INTERNET SITES

(1) www.db6nt.com
(2) www.ghengineering.co.uk
(3) www.downeastmicrowave.com
(4) www.g3wdg.free-online.co.uk
(5) www.k1el.com
(6) www.rsgb.org
(7) www.g0mrf.freeserve.co.uk
(8) www.db6nt.com
(9) www.g1mfg.com
(10) www.microwavers.org

KA1ZE's portable VHF-to-microwave station.

DENNIS KITCHEN, G0FCL
'Hazelbeech', 13 Lenwood Park, Northam,
Bideford, Devon EX39 3PD.
E-mail: space.radcom@rsgb.org.uk

SPACE

AS THE NEW year approaches, it is normal to reflect on the past year and look forward to planning the next. With space activities, everything is gathering momentum for what promises to be an exciting year 2001, particularly for radio amateurs.

At the time of writing, we have a 'Space Station Alpha', otherwise known as the International Space Station (ISS), and collective fingers are crossed for the launch of Phase 3-D. In view of various unscheduled delays, perhaps it isn't advisable to hold one's breath!

On 31 October 2000, two Russians and an American blasted off from Baikonur in Kazakhstan *en route* to the International Space Station. They left at 0752 UTC in a Soyuz TM-31 rocket from the same launch pad as Yuri Gagarin some 39 years ago. William Shepherd, Yuri Gidzenko and Sergei Krikalyov, known as 'Expedition One' are the first of the crews to man the Space Station. Prior to take-off, the crew was blessed by a Russian Orthodox priest and shared champagne with colleagues and representatives of the press.

After a faultless two-day journey, the Soyuz docked with ISS on 2 November. The crew, commanded by Bill Shepherd, had to activate the life-support systems and create a computer network which would allow full control of the space station from lap-top computers. However, one of their first tasks was to call Daniel Goldin, administrator of NASA. During that conversation, Bill Shepherd surprised him by saying, "The first expedition on the space station requests permission to take the radio call-sign Alpha". Temporary permission was granted for the duration of the crew's stay, in spite of the fact that the question was something of a political hot potato.

The crew's overall work schedule is based on the UTC clock starting at 0800 and occupies some 12 hours for six days a week. On Sundays they can talk to their families and catch up on personal e-mail. It is quite likely that Sunday will see the maximum amateur radio activity. Initial operation is on 2m. Downlink (voice and packet) is 145.80MHz. Packet uplink, 145.99MHz. and Region 1 voice uplink, 145.20MHz. Regions 2 and 3 voice uplink is 145.9MHz. More information can be found on (1).

The present crew expects to be in residence for some four months until around 26 February 2001.

PHASE 3-D

THIS MOST VAUNTED of amateur radio satellites is due to fly on an Ariane 5 rocket, flight 135, from Kourou, early on Wednesday 15 November 2000. [However, the launch was postponed 24 hours due to a microwave link failure on one of the other satellites, the PAS 1R - *Ed.*]

USEFUL INTERNET ADDRESSES

(1) http://ariss.gsfc.nasa.govt/ExpeditionOne/
(2) www.arianespace.com/news_missionupdate.html
(3) www.dera.gov.uk/html/news/strv_overview.htm
(4) www.uk.amsat.org/images/onp3d.jpg
(5) www.amsat-dl.org/launch/

Phase 3-D will eventually be launched with three other satellites. All four will be placed into geostationary transfer orbit. In this case, the all-up mass to transfer into orbit is in excess of 6200kg. A view of the entire payload is available (2), and information on the other satellites can also be found (3).

Once in geostationary transfer orbit, two firings of the 400-Newton motor will raise the perigee height to 4000km and the apogee to 47,000km. Further adjustments will give the satellite an inclination of 60 degrees.

The Callsign-to-Fly plaque (4) was mounted on a side panel before the panel was installed on Phase 3-D. The launch team's Internet web site has been very popular with satellite operators everywhere. The site features photographs showing the preparation of Phase 3-D for launch, as shown here (5).

Putting the bottom plate on Phase 3-D. (AMSAT-DL)

MIR

ACCORDING TO AMSAT News Service, several news agencies are reporting that the Mir space station will be de-orbited early in 2001. The previously-announced hope that private funds might save the nearly 15-year-old Mir are apparently not coming to fruition.

Russian officials have left no doubt that the decision to de-orbit Mir is indeed final and are now preparing details of the operation to discard the venerable station, launched on 18 February 1986.

Mir has been losing altitude quickly since its last crew left in June 2000. The current thinking is that a *Progress* supply ship with a larger amount of fuel will be launched to Mir to give it the final impulse and start the splashdown. At present, it is uninhabited and all the amateur radio equipment is switched off, the space station being on auto-pilot.

SNAP-1

THIS SSTL SATELLITE has been living up to its name and taking pictures of satellites in orbit, according to a recent Surrey Satellite Technology press release. Remarkable images were taken under automatic control seconds after the satellite was deployed into orbit, by an innovative 'machine vision system' comprising four micro-miniature single-chip video cameras smaller than a two pence piece. SNAP-1 was launched on 28 June 2000, along with Tsinghua-1, a 50kg Chinese satellite (see the September 2000 *RadCom*). ♦

COMING SOON

IN BRITAIN'S BEST SELLING RADIO MAGAZINES

Practical Wireless

- **Reviewed** - Watson WM-2000 Desktop Mic
- **New column** - Tips & Topics by **G1TEX**
- **Reviewed-** Icom IC-446S Hand-helds
- **PSK31** - An exciting data mode
- **Antenna Workshop** -Fishing rod antennas!

Short Wave Magazine

- January's *Short Wave Magazine* including Scanning Scene
- The *SWM* - PROMA CD is bursting with data you'll not have seen before.
- The only scanning acccesssory you'll ever need!
- January's *SWM* is the only way to get your very own copy - miss the chance and you'll regret it.
- DXTV Special - a fascinating aspect of the hobby

Radio Active

- Trafficmaster explained
- Internet DXing
- FT-101ZD servicing
- Yaesu FT-1000MP on test
- Military scope command
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- On sale 15th December

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the last Word

Contesters Right to Reply

I just had to reply to 'Contests - Again' (*The Last Word*, December 2000). I have read many letters on the contest argument over the years, but allow me to put forward a personal view to a side of contesting which I believe has never been aired.

As I like tinkering around and building in the shack, I tend not to go on the air very often. I have 100 watts, a dipole, and a 32ft pole - just a simple set-up. Under normal use, this gets me around Europe, and just 'over the pond'.

However, there is one time when I can magically increase my transmit range. That is during contests, where contesting stations have the ability, and the incentive, to go back to as many stations as possible, regardless of signal strength.

So, take for example the *CQ* World Wide SSB contest in October, I was on for a little over nine hours over the weekend, and worked just 217 stations. But wow, what DX that I could *never* had worked normally. Check this out: CN8, KL7, UA9, FY5, CT3, HB0, UP0, 9K2, V26, ZX4, JT1, LU3, 5X1, EX2, HC8, FM5, CX9, PJ7, CE3, 4K5, YV4, P43, FS, VP5, all worked with the 32ft pole, and 40 to 100 watts SSB!

My argument is, the only time some of us can only realistically chase DX is when there is a contest. But remember, not all bands will have a contest on.

John Fletcher, G4EDD

. . . I wish to complain at the level of non-contest activity during the recent *CQ* World Wide SSB contest, particularly on 80m. At times, it was difficult to find a clear frequency to call "CQ contest" on between the endless nets of people just chatting away amongst themselves, seemingly oblivious to the world-wide DX contest activity all around them. I think these people should have more consideration for others and QRT during contest weekends, or maybe stick to the WARC bands.

Come on chaps, we all have different interests. Some of us like contests, some prefer 'ragchews', DXing, CW, SSTV, construction, whatever. We all have to occupy the same crowded bands, so tolerance and good operating are required all round - indeed this is an important part of the self-training.

Gary Hinson, G4IFB

New Year's Resolution

In recent years there have been numerous letters in 'The Last Word' where amateurs have a 'go' at various aspects of our hobby - in the December issue it was contests, often it has been the Morse debate, but also Special Event Stations and 2m packet and FM have come in for some stick.

Is it not time that all amateurs realise that our hobby is diverse, it embraces old communication methods as well as modern ones, it ranges from CW to satellite, from 'ragchewing' to contests. There are those who experiment with aerials and those who use grey boxes and buy ready-made aerials.

Perhaps in 2001 we can all make a resolution that we recognise that our own preferences are not necessarily those of others. The hobby would be better if we encourage all aspects, rather than criticising those that do not interest us personally.

Wishing *all* radio amateurs a very happy new year and enjoyment from our hobby (in whatever form that takes).

David Barlow, G3PLE

What *is* DX, Anyway?

Having been an SWL since 1950, I am sick to the back teeth of so-called senior operators / hams, namely G3s and G4s - not newcomers to the hobby - replying to "CQ DX" calls from the continent in the DX portion of 80 metres. The majority of stations calling are using a kilowatt, and large antennas, and do not want to know that they are 59 in G-land. It makes my blood boil when senior amateurs do not seem to know what DX means. A good operator who respects and understands the DX window will QSY down the band by 10 or 20kHz, when having a local or European QSO.

As the society that represents amateur radio in the UK, could you please inform these people that DX means 'long distance', which is outside Europe.

Stan Webb, SWL

Static Discharge

I read with interest the article by Ian Poole about ESD (*Down to Earth*, November 2000). This could account for why over the years I have been disappointed using ICs. I did not realise how easy it is to blow these through handling due to a build up of static charge. I have also noticed that most of my tools have become magnetised and wonder if this can also cause a semi-conductor to break down. Never had this trouble in the old days with valve circuits!

William Ashley, 2E1GYN

The Death of /M?

I quote from an article I read today [18 October] in *Motorcycle News*: "At last, authorities are planning to clamp down on car drivers who use mobile phones on the move. Though the campaign has yet to start, a new sign was erected in error in Greater Manchester last week showing exactly how the new policy will work. The sign, which shows a mobile phone with a red line through it above the slogan 'Police No Phone Zone', will be used across the city. Talking on a mobile is illegal anyway, but these zones will also ban people talking on hands-free sets. The sign was quickly removed when the mistake was noticed, but it is expected to go up again - along with many more like it - when the crackdown starts officially later this year."

How is this going to impact amateur mobile operation? The end of /M? I hope not!

Paul Zimmermann, G0UPS

Hams on Film?

First, I would like to say how much more interesting *RadCom* is now. I can remember how it was about 20 years ago when it mostly consisted of pictures of the President, with his or her chain of office, but not a lot to interest the average radio ham.

About 12 years ago I attended a talk by the late Louis Varney, G5RV, at the Blackwood Radio Club and I believe it was video recorded. I am wondering if talks by some of the very talented RSGB members that are given at various conventions could be video taped and sold to hams such as myself who are unable to attend these functions? Video recordings can help to demonstrate practical jobs, such as making PCB boards, so much more easily than by reading a book.

J Duck, GW0DQT

Close-Knit Community

I write to express my sincere appreciation at the result of my request ('Helplines', November 2000) on the source of supply of transistors to enable me to repair my Yaesu FT-102.

No fewer than five amateurs rang me with advice and one actually sent me some transistors. It shows what a closely-knit fraternity the amateur radio movement is, and how useful the 'Helplines' feature is.

Some of the amateurs have their addresses withheld in the *RSGB Yearbook* so I have not been able to write to thank them direct.

Pat Perkins, G3MA

Radio Life in N Wales

With reference to the letter from G4JCP ('The Last Word', December), might I suggest he looks at www.nwrrcw.org.uk - the site of the North Wales Radio Rally Club? He will find a site full of information, details of club activities, rally details, committee members and photos of club expeditions to Puffin and Bardsey Islands. The site provides links to other Welsh radio clubs, the RSGB, other radio sites and the North Wales index. It has a search facility and last but not least an invitation to comment.

Tony Wilkinson, GW4PVU

Friends till Bedtime

I creep away some time to pinch,
Time is right to crank the winch.
Mast it rises to maximum height,
Neighbours can't see no moon tonight.
Rotator turns beam to a new quarter,
Pointing out over the water.
I sit in the shack and loosen my tie,
Weather fine and glass is high.
Band is selected tuning is right,
I hear my call on this dark night.
Pleased to make contact at last,
With an old friend from the past.
Happy for my friend over the water,
His wife's just given birth to a daughter.
Chatted so long dawn starting to break,
I forgot the time that's my mistake.
Hey look at the clock my friend cries,
Yes it's time for bed my wife replies.
With that good byees are all exchanged,
Best 73s that's another holiday arranged.

M E Stevens, G0SWW

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.

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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

LANDWEHR VHF/UHF MASTHEAD PREAM- PLIFIERS, 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.

PSK-31 INTERFACES FULLY ISOLATED. See www.g31iv.co.uk - info johnny@melvin.com Phone: 0191 2843028 G3LIV QTHR.

PROGRAMMED PROMS AND EPROMS FOR PMR EQUIPMENT, Details, S.A.E.: Atlanta Communications (RC), PO Box 5, Chatteris, Cambridgeshire PE16 6JT.

THE RIG REVIEW is a diskette with details of 720 rigs and receivers. Unravel those readers advertisements. It costs £7.00 post free from Twrog Press - see following:

QSL CARDS - Gloss or Tinted cards. SAE for samples to Twrog Press, Penybont, Gellilydan Blaenau, Ffestinlog, Gwynedd LL41 4EP. E-mail:- twrog@hotmail.com
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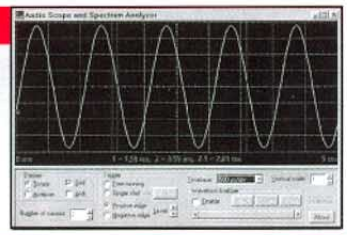

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- **WR3100e - £1169** INC VAT

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"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-1000i & WR-1000e	WR-1550i & WR-1550e	WR-3100i & WR-3100e
Construction of internals	WR-1000i/WR-1550i-3100iDSP- Internal full length ISA cards		
Construction of externals	WR-1000e/WR-1550e - 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 resolution	100 Hz (5 Hz BFO)	10 Hz (1Hz for SSB and CW)	10 Hz (1Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 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	6-8 cards (please ask)
Dynamic range	65 dB	70 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 vat when bought with 'e' series unit (otherwise: £99 inc vat)
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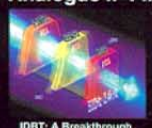
"Brick-Wall" Selectivity

Today's Premier class operators demand the best RF weaponry available. Yaesu's exciting new MARK-V FT-1000MP answers the call, with an expanded array of receiver filtering, 200 Watts of power output, and Class-A SSB operation capability for the cleanest signal on the band. Enhanced front-panel ergonomics saves you precious seconds in a DX or contest pile-up. Yaesu HF design and manufacturing know-how ensures that no short-cuts have been taken in our effort to bring you the best HF transceiver money can buy. For more QSOs in your log, and more awards on your wall, there is only one choice: the MARK-V FT-1000MP from Yaesu!

I. IDBT: Interlocked Digital Bandwidth Tracking System

The IDBT feature greatly simplifies operation by matching the bandwidth of the DSP (Digital Signal Processing) system to the net bandwidth of the 8.2 MHz and 455 kHz IF stages. The IDBT system monitors the settings of the SHIFT and WIDTH controls, and automatically sets the DSP bandwidth to match the user settings within the net bandwidth of the Analogue IF Filtering.



IDBT: A Breakthrough in Selectivity!

10-pole Collins® Mechanical SSB Filter

II. VRF: Variable RF Front-End Filter

Protecting the MARK-V's receiver components from strong out-of-band signals, the VRF system acts as a high-Q "Preselector," located between the antenna and the main bandpass filter networks, providing additional RF selectivity on the 160-20 meter Amateur bands for multi-operator contest teams, DX-peditions, or for operation near MW/SW broadcast stations.

VRF Features Large, High-Q Coils and High-Quality Relays

VRF Typical Bandpass Response (3.5 MHz)

III. 200 Watts of Transmitter Power Output

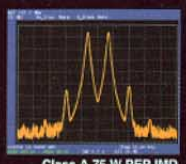
Utilising two Philips® BLF 147 Power MOSFETs in a 30 V push-pull configuration the MARK-V's Transmitter generates up to 200 Watts of the cleanest RF Power output available thanks to the conservative design of the PA Section.

Philips Power MOSFETs

High-Speed Automatic Antenna Tuner

IV. Class-A SSB Operation

Exclusively available on the MARK-V FT-1000MP , a press of a front-panel button engages Class-A SSB operation of the transmitter, at a power output level of 75 Watts. Class-A operation produces incredibly clean signal quality, with 3rd- order IMD suppressed 50 dB or more, and 5th- and higher-order products typically down 80 dB or more!



Class A 75 W PEP IMD

V. Multi-Function Shuttle Jog Tuning/ Control Ring

The immensely-popular Shuttle Jog tuning ring, which is concentric with the Main Tuning Knob, has a new look in the MARK-V: it now includes the activation switches for the VRF (left side) and IDBT (right side) features, so you don't have to move your hand position to activate these important circuits during contest or pile-up situations!

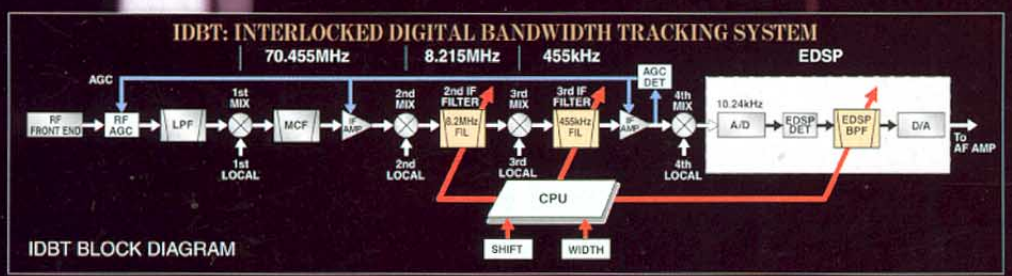
Access VRF and IDBT Features via Shuttle Jog Dial

DC 30 V / 13.8 V Power Supply FP-29

Photo shows optional MD-100A8X Deluxe Desk Microphone

HF 200 W All-Mode Transceiver

MARK-V FT-1000MP



IDBT BLOCK DIAGRAM

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