

# Practical Wireless

# PW

amateur radio & more!

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YOUR CHANCE TO  
**WIN THE IC-756PRO!**

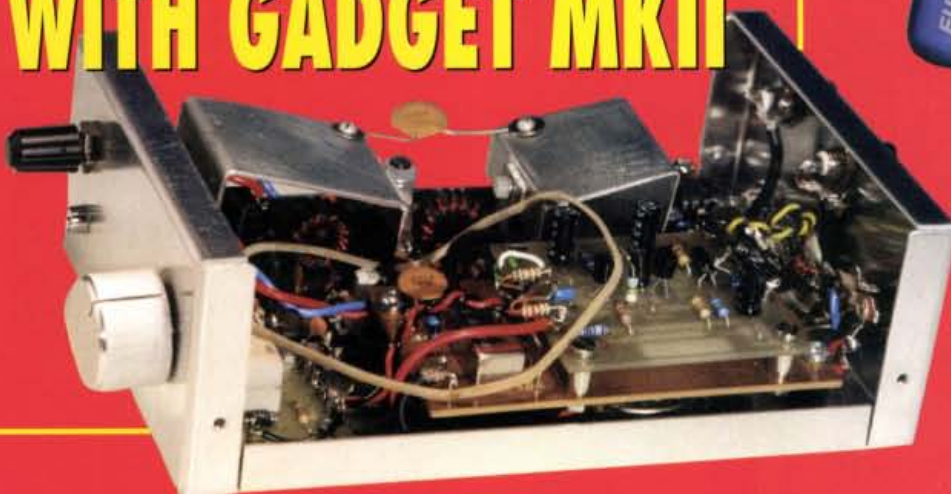


**LICENCE  
FREE  
HANDIES**



**THE TEACHER IN A BOX!**

**ADDING EXTRAS  
WITH GADGET MKII**



August 2000 £2.50



**FIRST IN  
Amateur  
Radio**

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## Welcome! New 2000 sq. ft. Showroom

No clutter or cramped surroundings  
Air conditioned with plenty of seating  
50 radios on permanent demonstration  
New customer car park at front

We've created the UK's most spacious amateur radio showroom, with comfortable surroundings and plenty of space to sit down and try any radio of your choice. There are no compromises. Imagine sitting in comfort, with coffee and tea on call, and being able to play with whatever rig takes your fancy. Experience the widest range of accessories ever displayed. Browse through an amazing variety of items dedicated to radio communications. There's only one truly dedicated Ham Store!



### YAESU Choice of the World's top DX'ers



**£799**  
Plus £7.50 Carr.

This diminutive HF transceiver will pump out 100 Watts of RF power from 1.8 - 50MHz ham bands. It will also give you 50 Watts on 2m and 20 Watts on 70cm. The removable head makes it easy for car installation, yet it is just as much at home when used for base station operation. There's a choice of extra CW filters and a front-end performance that matches many rigs costing much more. Yaesu make wishes come true!

Modes:	SSB CW FM AM	Head Unit:	Remote option
Receive Range:	100kHz - 970MHz	Bandwidths:	6kHz to 60Hz
Power HF & 6m :	100 Watts	Output 1:	HF - 6m
Power:	2m 50 Watts	Output 2:	2m -70cm
Power:	70cm 20 Watts	Size:	160 x 54 x 205mm
Memories:	300	Weight:	3kg.

### YAESU FT-840 160-10m



**24-Month FREE Warranty on Yaesu**

A firm favourite, this 100W radio is an ideal rig for those on a budget. Impossible to fault, it just goes on and on!

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



**SAVE**

*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 DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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



**£1349**  
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.

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



**Phone**  
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.

### 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.

### ICOM IC-706IIG 160 - 70cm All Mode



**Phone**  
Plus £7.50 Carr.

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

### YAESU FT-847

**SAVE**

160m - 70cm All Mode  
**£1329 with switch mode power supply**

**PRICE MATCH**



**£1249**  
Plus £7.50 Carr.

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!!

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



**£825**  
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.

# We Will **BEAT** Competitor's Prices Match or **wspic.com** On genuine UK Stock **Go**

## ADI AT-600 Dual Bander Airband Rx

**£199**  
Plus £6.00 Carr.



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

## KENWOOD TM-D700E 2m / 70cm

**£429**  
Plus £7.50 Carr.



### Data Mobile

**SAVE**

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

## HOKA Software

**The Secret's Out!**

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

**£349.95**

Plus £6.00 Carr.

## C-150 2m Handy

**£99.95**  
Plus £6.00 Carr.

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



**£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

**£199**  
Plus £6.00 Carr.

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



# SAVE C-408 70cm Handy

**£69.95**  
Plus £6.00 Carr.

Previously **£89.95**



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

**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.

## 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

## GARMIN In-Car GPS Street Pilot

**£419**  
Plus £6.00 Carr.

The complete car navigational system. Large screen with UK mapping and optional street level data cartridge - plus lots more! Designed for the driver with easy routing and special data screen for car use. Optional UK CD £69.95, memory storage card 8Mb £64.95. With CD & card £539.



## GARMIN In-Car GPS-III Plus

**£349**  
Plus £6.00 Carr.

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



## ICOM IC-2800H

In Full Colour!

**£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

**£239**  
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

**£299**  
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

# Waters & Stanton

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

## MFJ

FREE CATALOGUE

### MFJ-969 300W ATU



Every Model Stocked

£169.95  
Plus £7.50 Carr.

160 - 6m Wire,  
Coax or Balanced

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

### MFJ-949E 300W ATU



£139.95  
Plus £6.00 Carr.

160 - 10m Wire,  
Coax or Balanced

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

### MFJ-948 300W ATU



£119.95  
Plus £6.00 Carr.

160 - 10m Wire,  
Coax or Balanced

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

### MFJ-901B 300W ATU



£75.95  
Plus £6.00 Carr.

160 - 10m Wire,  
Coax or Balanced

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

### MFJ-962D 1.5kW ATU



£239.95  
Plus £7.50 Carr.

160 - 10m Wire,  
Coax or Balanced

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

### MFJ-986 3kW ATU



£289.95  
Plus £7.50 Carr.

160 - 10m Wire,  
Coax or Balanced

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

### MFJ-989C 3kW ATU



£299.95  
Plus £7.50 Carr.

160 - 10m Wire,  
Coax or Balanced

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

### MFJ-912 Ladder Feed Balun



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

£39.95  
Plus £8.00 Carr.

### WD- 25 Duplexer



£24.95  
Plus £2.00 Carr.

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

This duplexer may be used both indoors or outdoors. It is supplied with mast mounting clamps and weatherproof shrouds for the coaxial plugs. The mast bracket can easily be removed, allowing the unit to be used for indoor use.

## MFJ-269 Analyser

As Reviewed by RadCom

160m - 70cm  
Amazing Value

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!



£299.95  
Plus £6.00 Carr.

### MFJ-418 CW Tutor

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

£69.95  
Plus £6.00 Carr.



### Vectronics ATU

With Digital PEP Indicator

NEW



£169.95  
Plus £7.50 Carr.

### 1.8 - 30MHz 300W (150W 1.8MHz)

- \* Digital PEP Bargraph
- \* Internal Dummy Load
- \* 2-way Coax Switch
- \* Tune or Bypass
- \* Balanced wire terminals

- \* End Fed wire terminals
- \* Cross Needle VSWR/Power
- \* 30/300W Readings
- \* Adjustable PEP level and delay
- \* Requires 12V at 500mA approx.

### WATSON CS-600

2-way Coax Switch  
Rated to 1kW and up to 600MHz. Amazing value - superb quality. Ideal for switching between two antennas or rigs.



£12.95  
Plus £2.00 Carr.

### WATSON W-MM3

Versatile Modem  
Self-powered from PC, comprises Packet Modem & Soundcard Interface. Can transmit and receive SSTV, FAX, CW, RTTY, PSK-31, PACTOR, 1200 Baud Packet. Includes shareware software on CD. Great Value!



£69.95  
Plus £2.00 Carr.

### LINEAR AMP UK Amplifiers



£895  
Plus £7.50 Carr.

- UK Ranger 811H (illustrated)**
- \* 1.8 - 30 MHz. 800 watts output
  - \* Drive: - 10-100W \* Built in Power Supply
- UK Discovery-Two Amplifier** £1395 Plus £7.50 Carr.
- \* 144 - 146MHz \*400 - 1KW Output
  - \* Drive:-10-25W \*Built-in Power Supply

**UK Explorer 1200 Amplifier** £1595 Plus £7.50 Carr.

- \* 1.8-30MHz x 100W-1300W Output
- \* Drive:-10-120W \*Built-in Power Supply

British made Amplifiers with a Pedigree

GREAT VALUE

## Cushcraft

5 Band Compact Beam  
NEW MA5B Mini - Beam

£289.95  
Plus £7.50 Carr.



- 10-20m inc WARC bands
- 1.2KW 50 Ohm feed
- 2 Elements on 10/15/20m
- Dipole on 12m & 17m
- Max element length 5.2m
- Boom Length 2.2m
- Turning Radius 2.7m
- Weight 12Kg

### Regular HF Beams from Cushcraft

A3S	3 el. 10,15,20m	£389.95
A3WS	3 el. 12 & 17m	£299.95
A4S	4 el. 10,15,20m	£469.95
X7	7 el. 10,15,20m	£549.95
Ten-3	3 el. 10m	£139.95
XM520	5 el. 20m	£529.95

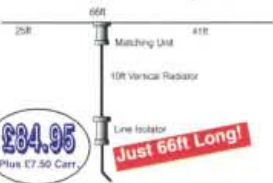
Full Cushcraft range stocked - Check our Web Catalogue

## Carolina Windows

### 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

### Carolina Window 80 Special



£84.95  
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

### PacComm TNCs from USA

Tiny-2	1200bps	£139.95
PicoPacket	1200bps	£139.95
Spirit-2	9600bps	£199.95

The lovely little PicoPacket even permits APRS with your mobile transceiver. Phone for leaflet.

## Power Supplies



SEC-1223  
13.8V PSU

£99.95  
Plus £6.00 Carr.

23 Amps - 3.2lbs!

Back In Stock

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

### WATSON

UK's top selling power supplies.



£89.95  
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	£29.95
W-10AM	10 Amp variable supply	£59.95
W-25AM	25 Amp variable supply	£89.95
W-30AM	30 Amp variable supply	£119.95

### Compact 10 Amp Switch Mode PSU

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.



£49.95  
Plus £6.00 Carr.

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### 11 'WIN AN IC-756PRO' - WORTH £2099!

The second instalment of the PW 'Win An IC-756PRO' competition in conjunction with **Icom (UK) Ltd.** has arrived! If you would like the opportunity to win one of these fantastic, top of the range rigs then turn to page 11 and discover just how easy it could be.



### 13 WHAT IS A?

**Ian Poole G3YWX** brings you another of his 'What Is A?' columns and this time he takes a look at 'What Is A ... Avalanche Photo-Diode?'

### 14 RADIO BASICS

Simple drawing pin projects are a great introduction to construction, **Rob Mannion G3XFD** has found a good source of reasonably priced cork boards to get you started.

### 16 CARRYING ON THE PRACTICAL WAY

The **Rev. George Dobbs G3RJV** describes how to etch your very own p.c.b. So, if you would like to be able to build your own projects from scratch (literally) then turn to page 16 to learn how.



### 22 THE MFJ-414 MORSE TUTOR REVIEW

Morse is one of **Rob Mannion G3XFD's** favourite aspects of radio and he's always keen to test out new ways to start beginners on the road to learning the 'code'. Read his review on MFJ's 'teacher in a box'.



### 24 THE VK2ABQ ANTENNA REVISTED

**Vic Westmoreland G3HKQ** describes how he designed and built his very own oblong version on the VK2ABQ antenna and it seems relatively simple - so why not have a go yourself?

### 28 EURO-WAVE PMR-446 REVIEW & COMPETITION

Licence free, compact and lightweight sums up the **EURO-WAVE PMR 446** hand-held transceivers - **Donna Vincent G7TZB** puts a pair to the test. There's also a chance to win a set of your own.



### 30 GADGET MkII

**John Seager G0UCP** shows you how to convert a small c.w. transceiver with a stable v.f.o. into a 'phone/c.w. rig.



### 36 WIRELESS & WOOMERA

Bringing a **Traeger** transceiver back to life re-awakened memories for **Steve Mahoney VK5AIM** of his days at Woomera, South Australia. In this article he recounts the tale of how it all came flooding back ...

### 40 ELECTRONICS-IN-ACTION

Join **Tex Swann** as he sets out to help a reader repair his **Aiwa HR-RS15** headphones, as well as showing you a design for simple variable power supply and lots more.



### 44 WEIRD WIRELESS

**Walter Farrar G3ESP** recounts his 'Weird Wireless' memories for your amusement. Perhaps some of them ring a bell with you?

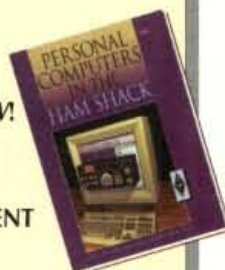
### 46 VALVE & VINTAGE

**Ben Nock G4BXD** returns to the **PW** pages this month with news of an 'On The Air' birthday 'bash' for the T1154 transmitter as well as news of his new addition to his **Eddystone** collection!



## REGULARS

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Weird Wireless...

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VK2ABQ Antenna Revisited...

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## 52 RadioScene

More regular reports from our reporters around the UK plus **Graham Hankins G8EMX** brings you his bi-monthly **ATV** column.

# MOONRAKER

www.amateurantennas.com

### Tri-Bander Beam

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

### HB9CV 2 Element Beam 3.5 dBd

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

### Halo Loops

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

### 1/2 Wave Vertical Fibre Glass (GRP) Base Antenna 3.5 dBd (without ground planes)

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

### G5RV Wire Antenna (10-40/80 metre) All fittings Stainless Steel

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

### Inductors

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

### Best Quality Antenna Wire

The Following Supplied in 50 metre lengths  
 Enamelled 16 gauge copper wire. £9.95  
 Hard Drawn 16 gauge copper wire .....£12.95  
 Multi Stranded Equipment wire .....£9.95  
 Flex Weave .....£27.95  
 Clear PVC Coated Flex Weave .....£37.95

### Traps

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

### Baluns

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

### Crossed Yagi Beams All fittings Stainless Steel

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

### Mounting Hardware ALL GALVANISED

6" Stand Off Bracket (complete with U Bolts) .....£6.95  
 9" Stand off bracket (complete with U Bolts) .....£9.95  
 12" T & K Bracket (complete with U Bolts) .....£10.95  
 18" T & K Bracket (complete with U Bolts) .....£14.95  
 24" T & K Bracket (complete with U Bolts) .....£16.95  
 1 1/2" x 5' Heavy Duty Aluminium Swaged Poles (set of 4) .....£19.95  
 1 1/2" x 5' Heavy Duty Aluminium Swaged Poles (set of 4) .....£29.95  
 3-Way Pole Spider for Guy Rope/wire .....£3.95  
 4-Way Pole Spider for Guy Rope/wire .....£4.95  
 1 1/2" Mast Sleeve/Joiner .....£8.95  
 2" Mast Sleeve/Joiner .....£9.95

### Vertical Fibre Glass (GRP) Base Antennas

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

BM100 Dual-Bander .....£29.95 (2 mts 3dBd) (70cms 6dBd) (Length 39")  
 SQBM100\* Dual-Bander .....£39.95 (2 mts 3dBd) (70cms 6dBd) (Length 39")  
 BM200 Dual-Bander .....£39.95 (2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")  
 SQBM200\* Dual-Bander .....£49.95 (2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")  
 BM500 Dual - Bander Super Gainer .....£49.95 (2 mts 6.8dBd) (70cms 9.2dBd) (Length 100")  
 SQBM500 Dual - Bander Super Gainer .....£59.95 (2 mts 6.8dBd) (70cms 9.2dBd) (Length 100")  
 SM1000 Tri-Bander .....£49.95 (2 mts 5.2dBd) (6 mts 2.6dBd) (70cms 7dBd) (Length 62")  
 BM1000 Tri-Bander .....£59.95 (2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")  
 SQBM1000\* Tri-Bander .....£69.95 (2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")  
 \*SQBM1000/200/100/500 are Stainless Steel, Chromed and Poly Coated. Full 2 year Warranty on these Antennas.

### 2 metre vertical co-linear base antenna

BM60 1/2 Wave, Length 62", 5.5dBd Gain .....£49.95  
 BM65 2 X 1/2 Wave, Length 100", 8.0 dBd Gain .....£69.95

### Reinforced hardened fibre glass masts (GRP)

1 1/2" Diameter 2 metres long .....£16.95  
 1 1/2" Diameter 2 metres long .....£20.95  
 2" Diameter 2 metres long .....£24.95

### Guy rope 30 metres

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

### 70cms vertical co-linear base antennas

BM33 2 X 5/8 wave Length 39" 7.0 dBd Gain .....£34.95  
 BM45 3 X 5/8 wave Length 62" 8.5 dBd Gain .....£49.95  
 BM55 4 X 5/8 wave Length 100" 10 dBd Gain .....£69.95

### Multi purpose antennas

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

### Yagi Beams All fittings Stainless Steel

2 metre 4 Element (Boom 48") (Gain 7dBd) .....£19.95  
 2 metre 5 Element (Boom 63") (Gain 10dBd) .....£34.95  
 2 metre 8 Element (Boom 125") (Gain 12dBd) .....£44.95  
 2 metre 11 Element (Boom 156") (Gain 13dBd) .....£65.95  
 4 metre 3 Element (Boom 45") (Gain 8dBd) .....£39.95  
 4 metre 5 Element (Boom 128") (Gain 10dBd) .....£54.95  
 6 metre 3 Element (Boom 72") (Gain 7.5dBd) .....£49.95  
 6 metre 5 Element (Boom 142") (Gain 9.5dBd) .....£69.95  
 10 metre 3 Element (Boom 110") (Gain 6.0 dBd) .....£79.95  
 70 cms 13 Element (Boom 76") (Gain 12.5dBd) .....£39.95  
 23cms Beam, 11 Element Boom Length 1 Metre, Gain 12.5dBd Price £44.95  
 23cms Beam, 19 Element Boom Length 1.5 Mts Gain 17 dBd Price £64.95

### Mobile HF Whips (with 3/8 base fitting)

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

### Single band mobile antennas

MR 214 2 Metre 1/2 wave (1/2 fitting) .....£39.95  
 MR 214 2 Metre 1/2 wave (SO239 fitting) .....£5.95  
 MR 258 2 Metre 1/2 wave 3.2 dBd Gain (1/2 fitting) (Length 58") .....£12.95  
 MR 650 2 Metre 1/2 wave open coil (3.2 dBd Gain) (Length 52") .....£9.95  
 MR 775 70 cms 1/2 wave 3.0 dBd Gain (Length 19") (SO239 fitting) .....£14.95  
 MR 775 70 cms 1/2 wave 3.0 dBd Gain (Length 19") (1/2 fitting) .....£16.95  
 MR 776 70 cms 1/2 over 1/2 wave 6.0 dBd Gain (Length 27") (SO239 fitting) .....£18.95  
 MR 776 70 cms 1/2 over 1/2 wave 6.0 dBd Gain (Length 27") (1/2 fitting) .....£16.95  
 MR 444 4 Metre loaded 1/4 wave (Length 24") (1/2 fitting) .....£12.95  
 MR 444 4 Metre loaded 1/4 wave (Length 24") (SO239 fitting) .....£15.95  
 MR 641 6 Metre loaded 1/2 wave (Length 56") (1/2 fitting) .....£13.95  
 MR 644 6 Metre loaded 1/2 wave (Length 40") (1/2 fitting) .....£12.95  
 MR 644 6 Metre loaded 1/2 wave (Length 40") (SO239 fitting) .....£13.95

### 2L Special Yagi beams All fittings stainless steel

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

### Dual band mobile antennas

MICRO MAG 2 Metre 70 cms Super Strong 1" Mag Mount (Length 22") .....£14.95  
 MR 700 2 Metre 70 cms (1/2 & 1/2 wave) (Length 20") (1/2 fitting) .....£6.95  
 MR 700 2 Metre 70 cms (1/2 & 1/2 wave) (Length 20") (SO239 fitting) .....£9.95

### Tri band mobile antennas

MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (1/2 & 5/8 wave) (Length 60") (3/8 fitting) .....£16.95  
 MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (1/2 & 1/2 wave) (Length 60") (SO239 fitting) .....£18.95  
 MR 750 2 Metre 70 cms 5.5 & 8.0 dBd Gain (1/2 & 3 x 1/2 wave) (Length 60") (SO239 fitting) .....£38.95

### Ribbon ladder USA imported

300 Ohm Ribbon (20 Metres) .....£13.95  
 450 Ohm Ribbon (20 Metres) .....£13.95

### Short Wave receiving antenna

MD37 SKY WIRE (Receives 0-40Mhz) .....£29.95  
 Complete with 25 mts of enamelled wire, insulator and choke Balun Matches any long wire to 50 Ohms. All mode no A.T.U. required. 2 "S" points greater than other Baluns.

### MWA-H.F. (Receives 0-30Mhz) .....£29.95

Adjustable to any length up to 60 metres. Comes complete with 50 mts of enamelled wire, guy rope, dog bones & connecting box.

### Duplexer & antenna switches

MD-24 (2 Way Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd .....£22.95  
 MD-25 (2 Way external/Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd .....£24.95  
 CS201 Two way antenna switch, frequency range 0-1Ghz, 2.5 Kw Power Handling .....£18.95

### Log Periodic

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

### Mounts

TURBO MAG MOUNT (7") 3/8 or SO239 .....£14.95  
 TRI-MAG MOUNT (3x5") 1/2 or SO239 .....£39.95  
 Stainless Steel Heavy Duty Hatch Back Mount with 4 mts of coax and PL259 plug (1/2 or SO239 fully adjustable with turn knob) .....£29.95  
 Stainless Steel Heavy Duty Gutter Mount with 4 mts of coax and PL259 plug (1/2 or SO239 fully adjustable with turn knob) .....£29.95

### Coax

RG58 BEST QUALITY STANDARD per mt .....35p  
 RG58 BEST QUALITY MILITARY SPEC per mt .....60p  
 BEST QUALITY MILITARY SPEC MINI 8 per mt .....70p  
 RG213 BEST QUALITY MILITARY SPEC per mt .....85p  
 H100 Coax Cable per mt .....£1.15

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

All prices plus £6.00 P&P per order

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Over the last two years or so readers, advertisers and traders have got to know **Joanna Williams**, the *PW News & Production Editor*, extremely well indeed. Many of you have also had the opportunity of meeting Jo at the shows she's attended. And from the favourable comments I've received - it didn't go unnoticed that she was a much more attractive addition to my 'battery buggy' (hitching a lift on the rear bumper!) at the London Show at Picketts lock in March of this year than I was!

In a way I'm very sorry to inform you all that Jo is leaving *PW* to take up a new post in publishing here in Dorset. However, at the same time I'm very proud of her as she's shown superb versatility, dedication and drive since she's worked on the *PW* team. In particular she's been of great support with my day-to-day work load.

On behalf of everyone here I wish Jo well and I hope that when she's a famous novelist and writer (she has a great creative gift) she'll put me on her 'free list' as her work is published! I'm proud to see such keen young professionals progress in their careers. Good luck Jo!

## Return of G7TZB

Because of a truly amazing series of coincidences, I'm delighted to tell you all that **Donna Vincent G7TZB** has rejoined *PW* as News & Production Editor as Joanna Williams leaves us on promotion. In her

two years away from *PW* Donna has gained much experience in her work as a very professional journalist to add to that already gained with her previous eight and half years with *PW*.

However, although Donna has



rejoined **Tex Swann G1TEX** and myself, as News & Production Editor, she'll also be working with me even more closely than before.

When you meet Donna and myself at the various shows and



rallies in future, I hope you'll all treat her very much as my Editorial confidant. Any ideas you have, suggestions, comments - and even complaints! - will be dealt with as if it was myself you were talking to. And in line with the new responsibilities Donna and I are planning that (whenever possible) she'll be accompanying me on *PW* 'Club Visits' and you'll be able to chat with her in the same way as you do with me!

Additionally, now that Donna G7TZB is 'back on the team' we've got some exciting new ideas and developments on their way for *PW* readers. So here's to the future and welcome back Donna! You can E-mail Donna at **donna.vincent@pwpublishing.ltd.uk**

## Editor in 'Dry Dock'

Thanks to the RSGB's dedicated GB2RS 'Newreaders' and the service they provide - many of you already know that I was in 'Dry Dock' for several weeks in early June. And I must also say a big 'Thank you' for the large number of 'Get Well' cards which arrived - some of which were hilarious and helped me tackle the uncomfortable treatment.

My enforced stay in hospital to relieve problems of cervical (neck) spinal arthritis helped - but has left me even taller than before! The 'Cervical Traction' added several inches to my height even though my great friend and former President of the RSGB, **Terry Barnes G13USS** said he hoped I wouldn't be taller than before!

The main reason for mentioning the hospital visit in 'Keylines' is to apologise publicly to the **Cray Valley, Sutton and Cheam and New Forest (Waterside) Clubs**

who were due to have a *PW* 'Visit' in June. Sorry folks! Incidentally, Sutton and Cheam were doubly unlucky because the day before I was due to visit them in late April their football club hosts cancelled their venue booking with less than 24 hours notice! Let's hope it'll be third time lucky, eh?

Finally on this topic, I apologise to everyone who took part in the *PW* 144MHz QRP Contest and who expected me to be on air during 18th June as promised. Due to my hospital treatment this wasn't possible - but I am planning to operate /P on v.h.f. as already mentioned in 'Keylines' (June 2000).

My hospital stay has also affected the planned 'Radio Basics' contents this month, so I hope readers will understand. Promised articles, features and Editorial 'Keylines' subjects will appear as soon as possible.

## Buying *PW* In Ireland

Thanks to renewed efforts on our behalf by our distributors - *PW* should be much easier to buy in Ireland in the coming months. Those readers who've found the magazine difficult to get in the many smaller shops in Eire, should find the situation eased.

Of course, everyone here at *PW* realises how many Irish readers (North and South) appreciate *PW*. So we'll be delighted to hear from you with reports of distribution problems/improvements direct to the Editorial offices via post, E-mails or telephone calls - thank you.

## Broadcast Bands Column

There's no 'Broadcast' column in *PW* this month because the professional broadcaster who writes under the pen name of 'Peter Shore' has decided - after many years of supporting the magazine - to cease writing because of his work load.

On behalf of readers who, like myself, enjoy the column very much I thank 'Peter' and we wish him well. In the meantime I hope to announce our plans for the future of the column very soon so we can continue supporting this important aspect of radio communications.

**Rob G3XFD**

# Letters

COMPILED BY ROB MANNION



The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by Practical Wireless. All other letters will receive a £5 voucher.

## Comforting Voices

Dear Sir

In her last years my late wife did not really understand speech yet she loved to have my receiver left tuned to a channel much used by local amateurs for 'rag chewing'. She liked the comforting sound of voices chatting away in local accents although she had no idea what they were saying. Thanks lads for keeping her company.

**J. Wilshaw (Wil) G3MPX  
Kent**

**Editor's comment:** Our hobby can benefit many people who can't actually 'get on air' themselves and they often write to us and we enjoy replying as part of the friendship *PW* actively promotes. Ever since I first joined *PW* I've been in correspondence with a gentleman who suffers from severe autism, in the form of Asberger's Syndrome. He's an avid listener, a great supporter of the hobby and reads *PW* from cover-to-cover. His only regular complaint is that there's not enough 144MHz activity in his area nowadays. Radio is a great companion, particularly for those people who are unable (because of their personal communication problems) to use 'interactive' mediums such as the Internet.

## Number Plate Lament From Ulster

Dear Sir

I was interested in your comments in the May issue of *PW* regarding the availability of car registration numbers with Amateur Radio callsigns. About two years ago the RSGB asked their members to advise them if they would be interested in purchasing a 'callsign' car registration number as the DVLA were soon to release 'G' plates.

After showing my interest in the number plate GI4RMA, I eventually received a list of numbers which were to be auctioned. A few days later, I received a letter from the DVLA saying the number was not to be auctioned but would be available for £499. Shortly after the sale of these numbers started, I decided to phone the DVLA and was told that the number was still available but couldn't be transferred to a car already registered in Northern Ireland but if I could get someone in Great Britain to transfer it to

their car then I could transfer it from that car to my car!

Out of curiosity I contacted one of the companies which specialise in car registrations who said they would be happy to make the transfer but the whole transaction would cost around £800! At the time of writing the number GI4RMA is still for sale but I will not be wasting my money on it.

I have been purchasing *PW* for more years than I care to remember and look forward to receiving it each month. Keep up the good work.

**Leslie McCullough GI4RMA  
Co. Down, Northern Ireland**

**Editor's comments:** What a ludicrous situation Leslie! As the DVLA are so anxious to make even more money from the driving public ... you'd think that they would make it easier for themselves to 'rubber stamp' the procedure to get the extra income wouldn't you? On the same subject, as I have other things I could do with the £500 or so - I dropped the idea of buying the number plate with the configuration G3XFD and copied Duncan Walters G4DFV's idea (*PW* page 11 November 1998 'Letters' in having vinyl lettering made up by my local car accessories shop (who also fitted the awkward-to-handle transfer for me). It cost £15, does the job very well and also 'freed up' money for my radio hobby rather than to the latest (politicians are all the same when it comes to taxation!) extremely greedy Government!

## The EF50 Valve & Memories

Dear Sir

I was taken back a few years, indeed many, when I read the piece in the May issue of *PW*!

I was out of the army by June 1945 and my first week as a civilian was with the R&D lab of the Mullard Radio Valve Co, then located in the Longham Hotel - close to the Carlton Hotel in Meyrick Road (Bournemouth) - it is now, I believe renamed the Queens Hotel. Anyhow, all experiments seem to be involved with the EF50 with ubiquitous (good word!) application and revolutionary design! The place was littered with EF50s. Although not involved with

Radar myself, I understood the EF50 was widely used in Radar circuits.

Talking of Radar (Radio location as we then called it) I have very positive memories of the station at Hengistbury Head near Bournemouth. Then, as an 18 year old schoolboy I was in the Home Guard at Southbourne and we had to 'guard' the approach road to the site, the guardroom being adjacent to the Saxon King public house (since demolished) which suited all wardens admirably!

I have just recalled this Home Guard episode to my school friend (Portsmouth Grammar School relocated to Bournemouth because of the hostilities) namely **Phil VK6PZ** - who said he had totally forgotten the Saxon King - I wonder ... was the beer that strong? Anyway the EF50 triggered off all this - sorry to ramble on!

**David Tanner G0OZD  
Hampshire**

**Editor's comments:** In the days when I could still enjoy a walk - Hengistbury Head was a favourite place David. However, I never knew there was a Radar station there. Perhaps it's where the Coastguard Station is now? Thanks for the memories of the EF50, which was still 'on duty' with the Royal Navy when I joined in the late 1950s. A truly marvellous valve!

## Amateur Radio is Alive and Well!

Dear Sir

Recently there has been much discussion at club level, and across the bands, about the uncertainty of the future of Amateur Radio, and indeed some of our membership have become rather disillusioned by the rather negative forecasts of the future and the damage the Internet may well bring about. (I do not believe that personally).

This short account of a recent incident on 7MHz recently has revitalised one of our rather senior members so much, that he took great pleasure and pride, in recounting the events I am about to describe ...

A station was calling "CQ CQ" with a very poor signal and atrocious audio and was answered by **Jack G0RWX** from Dorking, who immediately told the amateur of his poor performance, in a constructive way. The station was **Neil M0NJL**, who explained to Jack that he had only been licensed one week, was



disabled, had saved very hard to purchase a Yaesu FT-1000MP, but he could not understand all the controls and had been receiving terrible reports, but no help, and he was becoming very upset and disillusioned with the situation.

Jack went back to Neil and told him that a very good friend of his (**Julian GORWX**) was an expert on that particular radio and Jack's wife was already on the 'phone to ask for some help! Within a few minutes Julian appeared on the band and Jack and Julian then calmed Neil down, told him not to get upset, as they would cure his problems.

Apparently they then spent some time going through each control with Neil and the senior member of our club told me that the audio quality of the FT-1000MP was superb, by the time these two ambassadors of Amateur Radio had finished rendering both knowledgeable advice, words of sympathy, and active support!

To sum it up, as **Laurie G4ZQS** our 'statesman' of the Southdown ARC, said to me, whilst bursting with pride, "That's what Amateur Radio is all about boy"! (I am 56 years of age!).

In conclusion, a vote of thanks to two radio amateurs who should be extremely proud of themselves, for proving that within our numbers there are people who continually prove that Amateur Radio is both alive and well!

**Glyn Burton M0CHO**  
Scarborough

**Editor's comment: Well done everyone!**

## Frequency Of RAE & Exam Centres

Dear Sir

I write following the Editor's comments in the May edition of 'Keylines', regarding the frequency of the RAE and the number of examination centres.

Living in rural Scotland myself, I know that one of the biggest problems facing prospective radio amateurs in rural areas of the UK is attending RAE classes and ultimately an examination centre. In my own case I was very fortunate that I had a schoolteacher and a local amateur who gave me every help and encouraged me to take up the hobby. However, I had to attend an examination centre in Dundee and although only 15 miles from my home, public transport did not run at times appropriate to take the test. Therefore I had to stay overnight with a relative in Dundee after sitting the exam.

If Open University degree examinations can be taken in remote and distant places using a local invigilator, why not the RAE? I can see no practical reason why candidates living in rural areas cannot be allowed to use external invigilators. The examination might be taken at the home of

the candidate, the invigilator or some other mutually agreeable location. As a former Lay Member of Her Majesty's Inspectorate of Schools (HMIS), I know that Scottish secondary schools use local invigilators made up of JPs, Ministers of religion and other appropriate persons during Standard, Higher and SYS grade examinations. Therefore I am certain that there must be many suitable persons able to administer an external examination such as the RAE.

If we are to encourage prospective amateurs in remote areas to take the RAE, something has to be done to make the examination more accessible, as well as more frequent. I would ask all relevant bodies such as the C&G, RSGB and the RA to consider these proposals in the wider interest of our hobby.

**Colin Topping**  
**GM6HGW/ZD9HW**  
Fife, Scotland

## Disappearing Helium

Dear Sir

I saw a query from *PW* author **Phil Cadman G4JCP** ('Valve & Vintage' page 46, second paragraph down under 'Separate Bases') in a recent *PW* as to whether helium would diffuse through glass valve envelopes. And to answer Phil's question I must say I'm pretty sure the answer is yes!

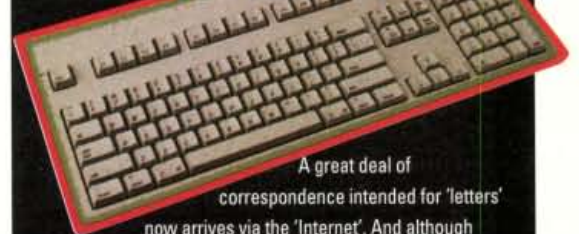
A rather long time ago, I worked on electrical equipment to be used in scuba diving enclosures. Helium was added to the atmosphere in these chambers, I think to prevent divers developing the painful effect called "bends" due to nitrogen bubbles in the blood. Special helium-proof incandescent bulbs had to be used in all indicator lamps and presumably for general lighting also.

Time to 'resurface' to introduce another topic now! The recent interest in super-regenerative receivers in *PW* has reminded me that, although I built many receivers using 'reaction' in the past, I've never built a proper 'super-regen'!

I want to remedy the failing soon and have noted a circuit published in *QST* for June 1998 in which the signal from the antenna (plus a bias) is applied to the light emitting diode of an HCPL4562 opto-coupler. The regenerating detector is fed from the coupler's photo-transistor output. This seems an excellent way of decoupling the antenna from the detector to prevent spurious emission. The only snag I can see is that the chosen "video" photo-coupler is only good to about 8MHz and I've not found any couplers offering 28MHz or higher!

**Justin Underwood**  
Herefordshire

## Letters Received Via The 'Internet'



A great deal of correspondence intended for 'letters' now arrives via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! All letters intended for publication on this page must be clearly marked 'For Publication' (on the letter itself). **Letters for possible publication are not normally acknowledged and we ask that wherever possible letters are not sent in by 'FAX'.** Editor

Dear Sir

I feel I must reply to **Mr Lunney's** letter 'Amateur Radio & CB' in *PW* June. I will not comment on c.w. as many words have already been written. However, regarding his other opinions I think the RAE examination has to be the way it is to avoid cheating, etc., after all it is a City & Guilds Exam and should be a highly regarded achievement.

Now to CB: It is great for what it is a low power, simple, 'no frills' means of communication. No test, buy the box and antenna, check the s.w.r. when it's all set up and off you go - ideal. But we all know that the vast majority have no wish to pay for a licence, do not adhere to the legal power limits and use very bad language. That is why after much consideration the authority decided against allowing CB, s.s.b., a.m. and Packet and said "If you want the rest, take the test".

Finally, I disagree with Kevin and say "No" - **radio is not about talking, it's much more than that - it's a hobby**, what you want of it, construction, c.w., Packet, Slow Scan and many other facets of our wonderful hobby. If you only want to talk, and try basic communication - CB was created for you.

**Ken Evans M0AQQ**  
Lancashire

**Editor's comment: Personally, I think that more CB licences would be taken up (there are many 'decent & legal' CB operators and many more who could be - given the chance) if the authorities reversed their decision not to sell them 'over the counter' at Post Offices as they were from the introduction of the service in 1981.**

# News

COMPILED BY JOANNA WILLIAMS

## Headline News

### Major New Kenwood Radio

An official press release from David Wilkins G5HY at Kenwood Electronics UK Ltd. confirms initial information of a "forthcoming major new amateur multi-band transceiver". A prototype of this new rig was previewed at the Dayton show in May and looks set to take the market by storm.

As the samples shown at Dayton were only prototypes, the front panel facilities haven't yet been fixed but technical details released at the time were "broadly correct". The new rig will cover all h.f. bands plus 50, 144 and 430MHz with the 1296MHz band as an option and will also have a built-in TNC - offering the same functions as Kenwood's latest transceiver - the TM-D700E. (Along with Packet Cluster reception with auto QSY to the spot's frequency).



The two samples shown at Dayton were of a "normal base station model and also a 'black box' unit with no front panel, for mobile/remote mount operation" the press release states. Kenwood plan for the mobile/remote mount version to be computer driven (using supplied software) and controllable from a small detached mobile head unit.

As both designs are finalised there may be some changes but David G5HY says that the radios should be on display in Europe at Friedrichshafen (Germany) on the 22-24 June 2000 and possibly at Leicester too (22 & 23 September 2000). As you may expect, prices and model numbers haven't yet been finalised but as soon as they are, be sure that PW will let you know what they are.

For more information please contact Kenwood direct on Tel: (01923) 655284, FAX: (01923) 655297 or E-mail: david.wilkins@kenwood-electronics.co.uk Kenwood also have a Web site which can be accessed at: www.kenwood-electronics.co.uk so why not take a look?

### Kenwood Support All Ladies Team

The British Young Ladies' Amateur Radio Association (BYLARA) will be activating EU099 Les Minquiers Reef, during the IOTA Contest weekend of the 29 & 30th July 2000. The small, all ladies team from England, Jersey, Germany and Sweden will be using the callsign GJ4L for the duration of the contest.

In the meantime, the BYLARA team will be familiarising themselves with the Kenwood TS-570D and matching p.s.u., kindly loaned to them by Kenwood UK Ltd using the callsign: MJ0BYL.

Anne Mourant, BYLARA 21st Birthday Co-ordinator and Treasurer, says that they are very grateful to Kenwood UK for "all their valuable help in the run up to the weekend".

For more information on BYLARA and their activities, contact Anne on Tel: (01534) 734948, Little Mead, Claremount Rd, St. Saviour, Jersey JE2 7RT or E-mail: anne\_mourant@hotmail.com Alternatively, you can contact Maureen Ritson (Secretary) on Tel: 0191-237 1963, 14 Dunsdale Rd, Holywell, Whitley Bay, Tyne & Wear. Or E-mail: g0vrt@aol.com

Amateur Radio business. If you've never paid a visit to the Jaycee Electronics shop then you should - as well as being Yaesu's "main Amateur Radio dealer for Scotland" (Paul Bigwood at Yaesu states), Jaycee Electronics Ltd. is also an approved dealer for Kenwood and Icom radio equipment.

As a magazine, we are constantly hearing about how there aren't enough Amateur Radio dealers in the Northern part of the UK but there are many dealers around that readers either don't know about or have forgotten. Jaycee Electronics, according to their advert, have "a good stock of new and second-hand equipment" so why not



drop in on Bill Hay at Jaycee and see what he has to offer?

For more information on Jaycee Electronics Ltd and the products they stock, please contact them direct on Tel: (01592) 756962 (day or night), FAX: (01592) 610451 or write to them at 20 Woodside Way, Glenrothes, Fife KY7 5DF. They are open from 0900-1700 (Tuesday to Friday) and between the hours of 0900 and 1600 on Saturdays.

You can also contact Jaycee via the Internet. Either E-mail: jayceecom@aol.com or visit their Web site at: www.jayceecom.com

### Jaycee Going Strong

Bill Hay at Jaycee Electronics Ltd based in Fife, Scotland, has been in touch with Practical Wireless to say that they are still going strong after 21 years in the

also makes an appearance, the press release claims, and there are links to other relevant Web sites.

Keep your eyes trained on this new Icom Web site as Ian Lockyer (Marketing Executive at Icom) states that these changes are only the first stages in the development of their site. "The company has big plans for the site and aims to make interactive dealer access a fundamental part of the site allowing dealers access to vital information". (Also in the pipeline, he says, is an E-Commerce function which will make the site a fundamental part of the company's sales operation).

For more information about Icom (UK) Ltd, their products and activities why not visit their new Web site at www.icomuk.co.uk

E-mail: info@icomuk.co.uk Or, if you aren't on the Internet you can telephone them on (01227) 741741, FAX: (01227) 741742 or write to them at Sea Street, Herne Bay, Kent CT6 8LD.

### New Web Site For Icom

A press release came in from Herne Bay based communications company, Icom (UK) Ltd, regarding the launch of their new Web site which can be found at: www.icomuk.co.uk "Aimed at providing customers with quick and easy access to Icom's increasing product catalogue, the new site contains many useful features including a comprehensive news section as well as a complete listing of all the company's products".

The press release points out that Icom have tried to combine detailed and clear graphics with a site that should be quick and easy to use. Something that hasn't always been the case with other sites where the graphics employed are excellent - IF you have the 15 minutes (and the money!) to spare to download it!

Included on the all new Icom site are features such as new product information and news of special offers. "Frequently Answered Question"



## Police World Congress Station

Every three years the **International Police Association (IPA)** holds a world congress and this year the venue was Bournemouth (Dorset). The 2000 congress coincided with the association's 50th anniversary celebrations and the IPA itself has many interest groups, one of which is the **IPA Radio Club**.

The IPA Radio Club, in association with the **Dorset Police ARS**, set up a special event station in the world congress venue, using a special event callsign, **GB50IPA**. **Richard Newton G0RSN**, **Terry Bain 2E1EJC**, **John Goodall G0SKR**, **Clive Hardy G4SLU** and **Bob Knight G6DZM** worked together to run the station throughout the week.

Three Amateur Radio operators who were actually attending the conference assisted the Dorset Police ARS operators: **Doug Bayliss G4OEF** (UK); **Jari Liimatta OH7JL** (Finland) and **Joar Michelsen LA6IY** (Norway). It was especially good to have Doug around as he actually set up and operated GB40IPA ten years ago.

The Special Event Station made just short of 300 contacts during the week, including stations from Japan, South Africa, Tel Aviv, British Columbia and all over the US, Canada and Europe. The station also managed to contact IPA stations from around the world and above all, good times were had by all and many new friends were made!

The station consisted of an **Icom IC-756PRO** and a Tri-Band beam covering the 14, 21 and 28MHz bands, the a.a.t.u. in the '756PRO tuned the beam on 18MHz as well. There was a v.h.f. and u.h.f. station for local contacts and an APRS (Automatic Packet Reporting Station) running **UIVIEW**.

The IPA Radio Club would like to thank **Icom (UK) Ltd**, **The Shortwave Shop Radio Communications Centre** in Christchurch (Dorset) and **The Dorset Police ARS** for supplying equipment used for this event. A special thank you also goes to the proprietor of the Shortwave Shop, **Bob G6DUN**, who spent all day on Sunday helping to set up the station!

Fig. 1: The GB50IPA team (left to right): Terry G7VJJ, Clive G4SLU, Bob G6DZM, Richard G0RSN, Terry 2E1EJC, Steve G1YNY and Bob G6DUN.



Fig. 2: The Special Event Station's radio controlled antenna rotator - sorry, that's actually Terry 2E1EJC!



Fig. 3: Richard Newton G0RSN using the IC-756PRO.

Fig. 4: A certificate like this was presented to all operators who helped operated GB50IPA - this particular one was given to Richard G0RSN.



## Support The 'Sound Of Old England'

The **Brickfields ARS (BARS)** on the Isle of Wight have asked *Practical Wireless* to publicise their **Isle of Wight Church Bell Preservation Special Event**. The first Saturday in August is the last opportunity for listeners and operators to take part in the scheme and gain the Award (pictured right).

In order to receive one of these awards you'll need to provide reports of the three village Church bell tower Special Event stations (**GB4BP**, **GB6BP** and **GB8BP**) transmitting in callsign sequence on the first Saturday of August (5th), September (2nd) and October (2nd).

The first Saturday in May saw the first day of this Special Event and **Alan Gardner** (Chairman of the BARS) says that it was very successful with 73 stations worked before closing at 1600UTC.

Stations in Scotland, Northern Ireland, Eire, Wales, the UK, France, Germany, Belgium and the Netherlands had all been logged on that first day and Alan says that he hopes that many of them will be seeking to claim the 'Gold Seal' Isle of Wight Church Bell Preservation Award provided, of course, that they had gone on to work the other two Special Event stations.

So, if you've missed working the stations up until now then why not try for the last three months of the event? You could earn yourself one of these awards and be satisfied that, in doing so, you've helped preserve the "sound of old England".



## New Products From W&S

Some news from **Waters & Stanton PLC (W&S)** landed on the *PW* news desk this month regarding more new products. At the Dayton show in May, **MFJ**

**Enterprises** launched a number of new products including a **Contest Voice Keyer** - the **MFJ-434** - and the **MFJ Cub Transceiver** - a new low power Morse transceiver (both are pictured here).

The microprocessor controlled **MFJ-434 Contest Voice Keyer** uses the very latest **EEPROM** technology to store "up to five voice messages of 75 seconds total length which can be recalled at any time" according to **Jeff Stanton** of **W&S**. It can work as a stand alone unit or via a computer control and is "fully filtered and isolated".

Messages can be halted by pressing the stop button, your p.t.t. microphone button or by pressing your **VOX** p.t.t. line. It's easy to use - "just plug in your 8-pin microphone cable and plug the **MFJ-434** shielded cable into your transceiver's microphone connector" and internal jumpers enable you to customise it to Kenwood, Icom, Yaesu and Alinco rigs according to the press release. The **MFJ-434** will sell at **£169.95** and should be available now.



The second piece of new equipment from **MFJ** is the **MFJ Cub Transceiver** which we will be reviewing in a future issue of *PW*. This low power Morse transceiver covers various amateur bands and is available either in kit form or ready assembled.

The kit form of the Cub will cover the 3.5, 7, 10, 14 and 21MHz bands and will cost **£89.95**. The ready assembled version will later be available for the same bands at a price of **£139.95**.

**Waters & Stanton** also have news of two new **Diamond Switch Mode Power Supplies** from Japanese antenna manufacturer **Diamond Antenna Corporation**. The two models (**GZV-2500** and the **GZV-4000**) are fully approved for CE and LVD for use in the UK.

The **GZV-2500** is a 25A unit weighing in at only 2.5kg and has a retail price of **£119.95** and the **GZV-4000** is a 40A power supply which weighs 3.5kg and will retail at **£159.95**. These two models include volts and amps metering, variable voltage, choice





of outputs and built-in cooling fan.

For more information on these or any other product available from W&S please contact them direct on Tel: (01702) 206835, FAX: (01702) 205843, Spa House, 22 Main Road, Hockley, Essex SS5 4QS. You can also E-mail: [info@wsplc.demon.co.uk](mailto:info@wsplc.demon.co.uk)

## Nunfield Novice Contest 2000

The Nunfield ARG based in Alvaston in Derby are organising and running an Annual Novice Contest. They say that they have revised and the rules and changed the format of the contest in order to raise the profile of the contest within the Amateur Radio contest calendar and increase the number of contestants taking part.

The contest is now spread out over two days with two different entry categories (Category A - h.f. only - is open to any person holding a Class A Novice Licence and Category B - v.h.f./u.h.f. only - is open to any person holding a Novice Licence) - contestants may choose the best six consecutive hours to operate from within the 24-hour period. This year's contest will be taking place on the 26 & 27th of August 2000.

Martin Lynch & Sons, Waters & Stanton and

Radioworld have all agreed to sponsor the contest, the group say, and the winner of each category will receive a Standard C108 v.h.f. transceiver - gift vouchers will be given to the runner up in each category. There will also be an Hora C408 u.h.f. transceiver awarded to the contestant who contacts the greatest number of Novice Licensees during the contest with certificates presented to the top six scores in each category.

A copy of the rules and conditions can be obtained from Neil Davison M1AFB, Novice Contest Manager, 1 Retford Close, Breadhill Estate, Derby DE21 4DX. To enter, all contestants need to send a copy of their log, in accordance with the rules and conditions to the Novice Contest Manager at the above address. Why not take a look at their Club Web site at: [www.nharg.freemove.co.uk](http://www.nharg.freemove.co.uk)



## News Update

Following a news story published in the July 2000 *Practical Wireless* ('New Dealer For Scotland') about Ultimate Aerials, the news desk was contacted by Yaesu (UK) Ltd. They wanted to put the record straight regarding the claim in Ultimate Aerials' press release which said that they had "won the main dealerships for Yaesu ...".

Paul Bigwood at Yaesu wrote to PW to say the following: "I can confirm that Ultimate Aerials are NOT an authorised Amateur Radio dealer for Yaesu UK, nor have they been appointed as the main dealer for Yaesu. They are not permitted to purchase Amateur Radio products from Yaesu UK". Paul goes on to say that: "Please note that Jaycee Electronics is still and remains our main Amateur Radio dealer for Scotland".

## Latest Lake Literature

The latest illustrated catalogue (July 2000) from Lake Electronics is now available direct from them. The "complete Lake range is fully described, including the new Novice Receivers and Amplifier - essential for aspiring NRAE students" the press release from Alan Lake states.

A 'Summer Discount' voucher is enclosed in the catalogue which offers a 10% discount on all orders placed before the end of August 2000 - this includes any payments made by credit card, Alan states. In order to receive your free copy of the catalogue please send a large, A5 s.a.e. to Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX or Tel: 0115-938 2509.

## Frank Lee G3YCC - An Appreciation



It's with very deep regret that I learned that Frank Lee G3YCC died on 31st May 2000 aged 63. Extremely well known within the QRP fraternity, Frank was one of our specialist authors. He was also one of the very first amateurs to buy his own 'callsign number plate' and proudly displaying it on his car.

Although illness brought early retirement, Frank was a keen musician, and supported football, his local Amateur Radio club and had his own website which became an internationally famous talking point! Frank also paid regular visits to a maximum security prison (not something for the faint hearted!) to visit a reader. A great companion, Frank and his wife Margaret were marvellous hosts and I was made so welcome in the Hull area that I became a regular visitor to the North Ferriby (later East Yorkshire) Amateur Radio Club. Our deepest sympathies goes to Margaret, the family and grandchildren.

Rob Mannion G3XFD

## Celticon 2000 - The Millennium QRP Event

Fancy a trip to the 'Emerald Isle' and enjoy sharing your Amateur Radio hobby with like minded QRP friends? If so, September 1st, 2nd and 3rd are the dates for you to remember as that's when 'Celticon 2000' is taking place at the Marino Institute of Education in Dublin.

Hosted by the G-QRP club, with well-known PW author and internationally famous QRP Amateur Radio enthusiast the Rev. George Dobbs G3RJV being very closely involved with organising the weekend, the event looks like being a remarkable success. Taking place in the attractive Georgian-style Marino Institute - not far from Dublin Airport and close by the beautiful Georgian City, there'll be much on offer for the Radio Amateur and family.

*Practical Wireless* Editor, Rob Mannion G3XFD/EI5IW, comments: "I stayed at the Marino Institute in 1999 with George G3RJV during the opening ceremonies of the Dublin QRP Club headquarters station EI2MIE. It's a wonderful location for such an event as Celticon 2000, it'll make a good weekend for all the family - and the Dublin food, hospitality and social life has got to be tried to be believed!"

The weekend included: guest speakers on QRP related subjects, Practical Workshops - you can build and take home an item of QRP

equipment - and Master Classes for the more advanced QRP projects. There'll also be QRP items for sale, many opportunities to meet old friends and make new ones and enjoy the Institute's own beautiful grounds and Dublin itself. There's also an optional special 'Celtic' exploration trip organised by G3RJV himself.

**Costs are as follows:** Conference only £40 (all prices are in Irish pounds, currently lower value than UK Sterling) and includes all conference activities plus Friday supper, Saturday lunch, coffee/tea breaks and Sunday morning coffee. Bed & (Full Irish) Breakfast (Friday & Saturday night) cost £44. B&B for Friday, Saturday and Sunday night will be £66. The 'Celtic' visit (organised by G3RJV - QTHR for full details) costs approximately £10 (to be paid at the Convention). 'Day tickets' for the conference are also available.

**Booking form, with further details etc., is available from Donal Leader, The Marino Institute of Education, Griffith Avenue, Dublin 9, Republic of Ireland. Telephone 00-353-1-8335111, FAX 00-353-1-8369264. E-mail: [mai@mie.ie](mailto:mai@mie.ie) or (alternatively) [leader@mie.ie](mailto:leader@mie.ie)**

Readers in the UK may also like to contact George G3RJV for further information by writing to him at St. Aidan's Vicarage, 498 Manchester Road, Rochdale, Lancashire OL11 3HE. Tel: (01706) 631812.

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If you need the July *PW* then call (01202 659930) for your copy.

• 'Looking in on frequency'. The main display on the Icom IC-756PRO provides a great deal of information plus a built in RTTY screen.

All you need to do is collect the special corner flash in the **July** and **August** issues of *PW* and answer the questions on the IC-756PRO which will be set on the combined final coupon/entry form to be published in the **September** issue.



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# Avalanche PHOTO-DIODE?

Ian Poole G3YWX is back this month with his explanation of 'What Is A ... Avalanche Photo-Diode'? He looks at its structure, applications and the differences between it and the ordinary p.i.n. photo-diode.

Although the p.i.n. photo-diode is the most commonly used form of photo-diode, there are a number of other types that are available. One of the most interesting is the avalanche photo-diode.

The avalanche photo-diode overcomes the main limitation of the p.i.n. photo-diode which is its lack of sensitivity. Offering very significant levels of gain resulting from the avalanche process, the device is interesting because it has two separate areas that perform different functions essential to the operation of the whole diode.

## Structure More Complicated

The structure of the avalanche diode is more complicated than that of the ordinary p.i.n. device. From Fig. 1 it can be seen that it is made up of four layers.

There are  $n+$ ,  $p$ , intrinsic or undoped and  $p+$  regions. The two main active areas of the diode are the avalanche region and the light absorption region, which are in separate regions of the device.

Light absorption takes place in the intrinsic region and, as in the case of the p.i.n. photo-diode, this may be relatively thick. The second active area is the avalanche region that is found between the  $n+$  and  $p$  regions.

The avalanche photo-diode is operated under conditions of reverse bias. Normally no current would flow under these conditions and this means that any current caused by the action of light entering the device is more pronounced, and therefore easier to utilise.

Light enters the intrinsic region and causes the generation of hole-electron pairs. Here there are normally no carriers, but the light photons may strike an atom in the semiconductor lattice freeing an electron and also create a hole.

Under the action of the electric

field, the electrons migrate towards the avalanche region. Here the electric field causes their velocity to increase to the extent that collisions with the crystal lattice create further hole electron pairs. In turn, these electrons may collide with the crystal lattice to create even more hole-electron pairs.

A single electron created by light in the intrinsic region may result in many more being created. This means that one electron generated by the action of light falling on the intrinsic light detecting region could ultimately give rise to many more electrons as a result of the multiplication caused by the avalanche process. Accordingly, these devices are able to detect lower levels of light and any changes in light level give a greater change in the output when compared to a conventional photo-diode.

## Number Of Differences

The avalanche diode has a number of differences when compared to the ordinary p.i.n. diode. Its prime advantage will be a greatly increased sensitivity and ability to operate under much lower light levels, however, the device isn't nearly as linear.

Additionally, the avalanche

process means that the resultant signal is far noisier than one from a p.i.n. diode. This is because the avalanche process occurs in a random fashion, electrons colliding with other atoms when one is in its path and not in any form of synchronised fashion.

The structure of the avalanche diode is also more complicated and this increases its cost. An  $n$ -type guard ring is required around the  $p$ - $n$  junction to minimise the electric field around the edge of the junction. If an  $n$ -type guard ring weren't present, then it's likely that avalanche breakdown would occur in this region, destroying the required operation of the device.

It's also found that the current gain is dependent not only on the bias applied, but also thermal fluctuations. These devices consume considerably more current than the ordinary p.i.n. photodiodes and they need to be mounted on a heat-sink.

The devices also require relatively high operating voltages, typically they operate with a reverse bias of 30V or more. Although this may not be a problem in many applications it does prevent their use in some areas where power is limited.

## Not Widely Used

The avalanche diodes are not as widely used as their p.i.n. counterparts in view of their limitations. They're used primarily where optical gain is of paramount importance and this means that they are primarily used in communication systems.

Fig. 1: Diagrammatic structure of an avalanche photo-diode.

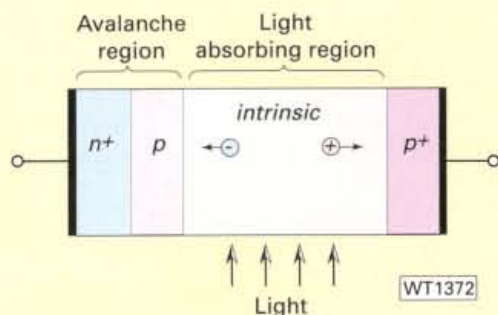
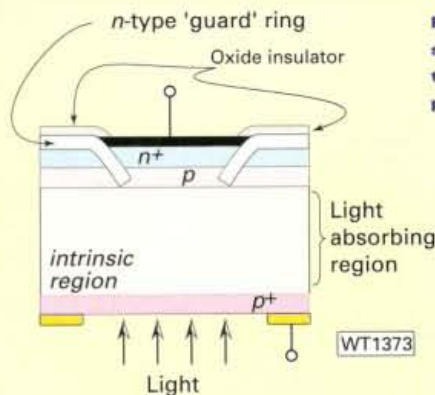


Fig. 2: Cross section of a typical avalanche photo-diode.



# Radio Basics

This month, because of the influx of new readers to the column, Rob Mannion G3XFD looks at methods and techniques for those who are just discovering the delights of building radio equipment.

Historically *Practical Wireless* used to launch a fresh series for beginners every two or three years. This was to cater for the never-ending stream of 'recruits' to our hobby. Nowadays of course the torrent of keen radio enthusiasts have reduced to a more manageable flow - but they are still arriving ...and I can tell you from first hand experience that they're just as keen!

However, even though I know - from the frequent contacts I have with readers - that there are keen new constructors joining us each month - to be fair to the majority it's not possible to 're-launch' the 'Radio Basics' series on a truly regular basis especially as many of you have followed the series from the beginning and wish to progress onwards. On the other hand it's not fair or helpful to the newcomers by not making allowances for

them every now and then.

'Making allowances' is what I intend to do now, especially as when this issue appears on the bookshelves we will be all looking ahead to the start of the new Radio Amateurs Examination course season which gets under way in September. Hopefully, by then any newcomers will perhaps have enough confidence to make contact with a local club and get themselves onto a suitable course, whether it be the RAE itself or the truly excellent Novice Radio Amateur's Examination course with its well structured 'practical' elements.

## Drawing Pin & Board

Most readers following this series will know how much I value the 'drawing pin and board' method of construction for teaching simple circuitry. I've often used the technique to encourage 'novice' constructors to 'have a go', and the results, see **Fig. 1**, can be excellent bearing in mind just how simple (crude is an alternative word although it does not pay full credit to a good idea) a technique it is in practice.

The circuit shown in **Fig. 1**

originally featured in the January 2000 issue of *PW*, page 13, and shows the MK484 'radio on a chip' i.e. The MK484 is a modern version of the famous Ferranti ZN414 tuned radio frequency receiver (t.r.f.) i.e. which provided truly amazing performance on the long and medium wave bands for an extremely reasonable price and used very few external components.

My little pin & board receiver was built using an off-cut of pine flooring board, chosen because it's relatively soft and the drawing pin can be pressed down and into place with minimum effort. Unfortunately though, several readers have brought to my attention the fact that traditional wood flooring is now increasingly making way for industrial load-bearing composite board panels (industrial 'chip board' to you and I!).

Although extremely strong, the industrial 'chip board' is still made from the same basic material as that which is found in everything from d.i.y. wardrobes to kitchen cabinets (wood chips) it has the disadvantage that because of the resin bonding it can be extremely difficult to push drawing pins into place.

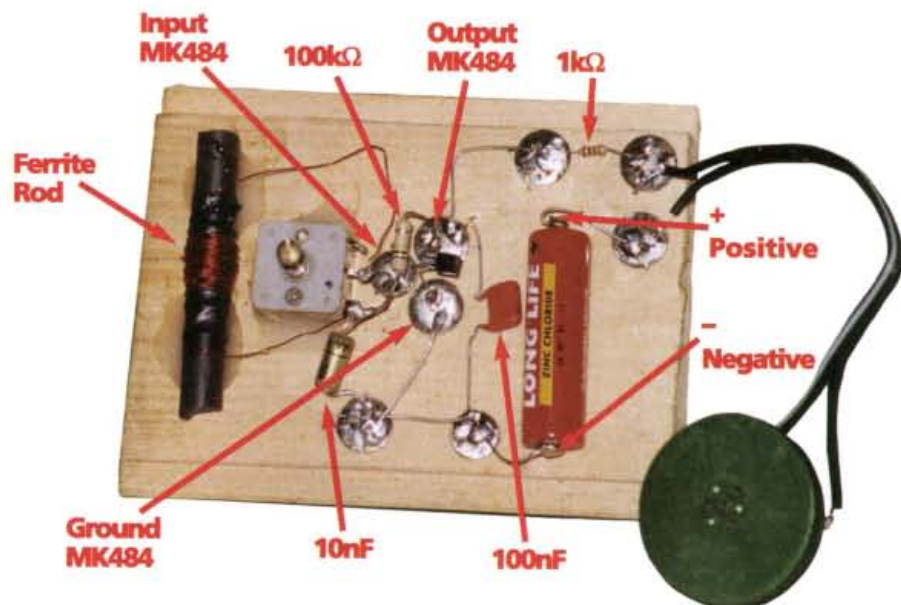
In fact you'll often have to resort to using a hammer, with many drawing pins being sacrificed when the pin bends or breaks off.

Fortunately though there's now a very convenient replacement for the ubiquitous pine floor boarding in the form of cork matting, presented in frames for use as a small office and study 'notice boards'. These are available - extremely reasonably priced (which will appeal to the ever cost-conscious constructor liked myself!) from many office supply companies, along with the heavy duty brass drawing pins needed for the terminals/soldering points.

Recently I was shopping with my wife Carol in Staples, the office equipment company who have branches throughout England, Wales and Scotland. It was there that I found a good selection of cork-composite boards with good quality softwood surrounds costing less than £5. (Readers living in the Republic of Ireland or Northern Ireland will find the cork composite notice boards available from larger stationers and office equipment dealers).

The advantage of the cork-composite boards are that they are designed for use with

● Fig. 1: Many readers will have started building using the simple 'drawing pin and board' 'breadboard' technique when building their first radio projects. And even though traditional pine flooring board off-cuts (such as was used for the project in the photograph) are getting difficult to find - Rob says that alternatives are available and they offer many advantages (see text).





drawing pins. In effect they can be used over and over again, and personally I think that they'll be most useful when used for classroom radio projects.

For example, if you're preparing a radio project for a class with several students, it could be very much an advantage if you arrange the 'overlay' to show the simple diagram beforehand. This can be pinned on the board with four drawing-pins which can then be incorporated into the circuit so as to provide a '+' positive supply line (at the top of the drawing) and the '-' negative supply line (at the bottom of the drawing) by linking them with tinned copper wiring.

## Neat & Tidy

In my constant search for ideas to encourage both new and established readers to 'have a go' at simple construction themselves I'm always looking for simple and inexpensive methods

and the cork board idea seems to be really 'neat & tidy'. However, it's not often I can find something that's as effective and cheap as the cork composite notice boards!

The really keen radio constructors could equip themselves with a reasonable size board (750 x 500mm) with brackets for controls, a loudspeaker (these can be used quite effectively mounted paper cone downwards for most applications) and a battery holder. And with care the cork composite material should last for a large number of applications of the pins, even when they've had many soldered joints made on them.

## With Care

In fact, with care, after experimenting with one of the smaller cork boards I've come to the conclusion that unless you keep a large wattage (in excess of 50W) soldering iron bit on a drawing pin pushed into

place on the board ... it will take a long time before shrinkage of the composite material around the pin takes place. In other words you'll be quite safe soldering, even if you have to re-make a joint several times to get it right as the boards are very 'forgiving'.

The next stage with this simple idea is for me to come up with some circuit ideas for you to build onto the project. And here, I can take advantage of the system's simplicity by offering some free help - with the compliments of myself and *PW* - to get you going. (The response will also help me gauge just how much interest there is in the really simple projects).

All you have to do is to write in to me sending a stamped addressed envelope with a first class stamp attached. In return I will send you a folded A4 sheet of paper with the lay-out diagram for two simple projects. All you then have to do is to mount the paper

diagram/circuit sheet out onto your cork notice board, pin it down with the drawing pins and follow the instruction also supplied.

Very simple indeed eh? All you need to supply is the time and enthusiasm, the components and the battery and earphone. The simplest circuit supplied will be for a 'crystal' set. The second will be a repeat of the MK484 i.c. radio published in the January 2000 issue of *PW* but will be presented so demonstrate that anyone can build a working radio! (**The January 2000 issue itself is 'sold out', but photocopies of 'Radio Basics' for that month are available for £1.75).**

Completely new to the hobby? Don't worry - the 'lay-out' sheets will be accompanied by names and address of *PW* advertisers who can provide all the components you need to build the projects. So, good luck and welcome to 'practical' radio and *Practical Wireless!*

*PW*

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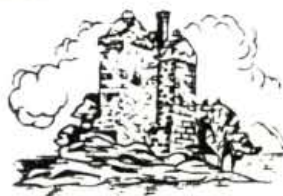
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TRADE ENQUIRIES WELCOME

# Carrying On The Practical Way

The Rev George Dobbs G3RJV explains how you can produce your very own printed circuit boards (p.c.b.s) and for him it's the 'Photo-Etch Method' and no other! First though ... there's the all important monthly quote!

**"Choose thou whatever suits the line"**  
**Samuel Taylor Coleridge.**  
**"Names"**

**W**hy do some radio constructors assume that if a project isn't built using a printed circuit board (p.c.b.), it's not a 'real' project? Of course, p.c.b.s are ideal for reproducing an electronic circuit but for most Amateur Radio home constructed projects, only one is being made, therefore, most of the little projects suggested in this column don't include a p.c.b. layout simply because there's never been a p.c.b. made.

In this column in the past I've described several alternative methods of electronic construction including 'ugly construction', perfboards and island or pad construction. The overall aim is only to ensure that some kind of connection is made between the appropriate components.

A track or connecting line has to electrically join the parts and in individual, one-off building, the constructor can "Choose thou whatever suits the line". Having said that, I'll now destroy my thesis by admitting that I actually do often make a p.c.b. for one-off projects, simply because it's so much simpler using modern techniques.

Most of my one-off boards are designed on computer software, then transferred to photo-sensitised board, exposed in an ultra-violet light-box, developed and then etched. This may sound like Amateur Radio over-kill but once the arrangement is set up, p.c.b.s are quick and easy to produce. (The method also works very well in directly converting one-to-one size p.c.b. artwork from magazines and books in to finished boards).

I won't dwell on p.c.b. computer software as not everyone reading this will have a PC and there's plenty of available software for PC users to find. Incidentally, I use **Boardmaker**, an easy program for hand-drawing (or should I say 'Mouse-



Fig. 2: George G3RJV's etching method - he leaves a small amount of unused space at one end of the board so it can be suspended vertically in the jar using a domestic clothes peg. A stiff piece of wire goes through a hole drilled in the wooden peg handle and this rests on the rim of the jar.

drawing?) circuits and p.c.b.s.

Another, very similar program from the same software author, is EasyPC. There are plenty of p.c.b. Computer Aided Design (CAD) programs around and some are available as shareware.

## First Stage

Let's start with a good black on white printed, true size, p.c.b. layout (from either a computer program or a magazine) - the first stage is to convert the image into a positive transparency. You may be able to do this direct from the computer and print it on to a transparent or translucent sheet.

If the computer software offers the option of a mirror image of the p.c.b. (the view from the component side) then I recommend that you use this option because the toner side of the image can then be directly placed on the board. A dense image is essential since we are to use a photographic method to transfer the image to the p.c.b.

There are special films available for dense laser prints such as LaserStar Film - the laser printer needs to lay down a lot of toner on the sheet. Normal Overhead Projector (OHP) acetate sheets will probably not produce a dense enough image, although I will describe a way around this later.

I've had good success when directly printing from my inkjet printer on to HP Transparency Film but this is very expensive. My usual method has been to produce a paper printout of the p.c.b. layout and what follows can also apply to artwork in a book or magazine.

The image is then photocopied on to an acetate sheet - again, special transparency sheets can be used but depending upon the copier, OHP film may be good enough.

If the image is grey or thin, use two transparencies on top of each other to produce the board. The ideal way is to produce one image on a transparency then use this transparency to copy a mirror image on another sheet of transparent film, making alignment easier as the two transparencies can be arranged toner side to toner side. The idea is to get as dense a black image as possible, with the sharpest edges possible.



Fig. 1: An example of an ultra violet (u.v.) light box used to transfer the image to photo-sensitised p.c.b. material.

## Transfer The Image

The next stage of the process is to transfer the image to photo-sensitised p.c.b. material using an ultra violet (u.v.) light-box (see Fig. 1) which isn't that expensive. I got mine in response to the annual (difficult) question from my wife: "What do you want for Christmas?"

You can make your own light box, a friend of mine has used, for many years, two UV tubes and a starter mounted in a discarded small wooden drawer! The board, then the transparency, then a sheet of glass are placed on a table and the 'UV-box' goes face down on top of them.

The process requires photo-resist p.c.b. material and the easiest way is to buy ready-prepared photo-sensitised board. Several companies sell this in small quantities but I buy mine from Mega Electronics (see end of the article for details) of Cambridge by mail order.

Photo-resist board is available in several grades and as single or double sided versions. It is also possible to 'sensitise' normal p.c.b. material by adding a layer of chemical to the board which can be obtained in spray cans and sponge applicator formats. I find the results can be variable, although perhaps the most reliable is the Seno Positiv 100 photo-resist applicator also available from Mega Electronics.

The sensitised board is cut to size to fit the p.c.b. positive film and the black plastic light proof film is first peeled from the board. The artwork is placed on the box first, with the board face down on top, the lid of the UV box is closed and the board is exposed for the required time. Most commercial UV boxes have a built-in timer and the suggested time for a small board is between three and five minutes - I tend to use the full five minutes.

When the time is completed, the board is retrieved from the box and you may be able to just see a ghost-like image of the tracks on the board. The next stage is to develop the image.

The classic method of developing is to use Sodium Hydroxide (Caustic Soda) but this can be nasty stuff and there's a safer method and for many years I've used a product called Seno SN110 Universal Developer which contains no caustic soda and is very easy and safe to use. It comes with a sponge applicator that looks rather like some types of shoe polish.

The applicator is simply wiped across the exposed surface of the board and slowly the tracks appear - as if by magic! It usually takes about 30 to 40 seconds for the image to clearly appear.

When a sharp image of the p.c.b. layout is present, the image is fixed by washing thoroughly under a running tap. The board is now ready for you to begin etching.

## Etching Boards

I etch my boards with the usual Ferric Chloride etchant which I buy in pellet form - usually the solution strength is marked on the packet. If it isn't, my rule of thumb has always been to make a stronger solution.

There are many advised techniques for etching small boards using tanks or trays or even plastic bags. I just keep a range of glass jars and etch the boards vertically in an appropriately sized jar full of prepared solution.

The etching method I use is to leave a small amount of unused space at one end of the board I can then grip this area with a domestic wooden clip clothes peg to suspend the board vertically in the jar.

A stiff piece of wire goes through a hole drilled in the wooden peg handle and this rests on the rim of the jar. (See Fig. 2).

My method has several advantages: the vertical etching means that the 'gunge' just drops to the bottom and doesn't impede the process. From time to time I can 'twirl' the peg to agitate the process and also my hands (in rubber gloves) never come in contact with the etchant.

Keeping the etchant warm, about 30-45°C, speeds up the process - I stand the jar in a small bowl of hot water for this and I've found that most small boards take about 10-20 minutes. It's essential to inspect the board frequently in the latter stages as boards can over-etch, resulting in thinning or under-cutting of the tracks. When a clear set of tracks is obtained, remove the board and thoroughly wash off all traces of the etchant.

Working with Ferric Chloride is safe if you observe a few simple rules: always wear rubber gloves, don't swallow any and keep it away from children and animals. Don't let it come into contact with useful cloth or material, like towels and clothes as it leaves terrible brown stains which can generate domestic friction! I'm lucky, I have a cellar room with an old sink and hot and cold water.

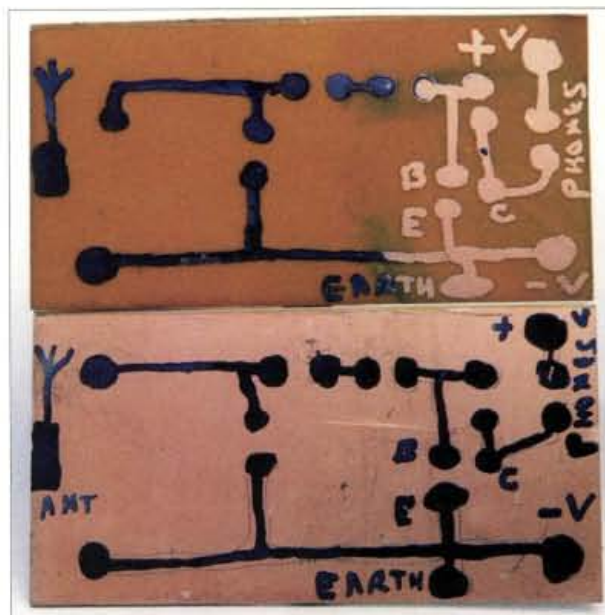
Once the board is etched, the etch resistant material has to be removed to expose the copper tracks. Again there are chemicals to do this, Seno Strip 120 works very well as does the Graffiti Remover spray we keep in the church cleaning cupboard! Another simple method is to squirt on a little washing-up liquid and a shake of Ajax powder and rub it with a cloth or sponge. (See Fig. 3).

All that remains is to drill the holes and this really does require the correct equipment. A normal hand or pillar drill will probably result in a lot of broken drill bits as p.c.b. drilling really requires a small precision high speed drill (10 000 to 20 000 rpm).

Several, reasonably priced, drills are available. The Buffalo and Dremel brand names are reliable high speed drills and both have small drill stands to match. Glass fibre p.c.b. material is tough stuff and tungsten carbide drill bits are needed for reliability. (It's possible to buy re-ground tungsten carbide drill bits from Mega Electronics at a reasonable price or look for them at radio rallies).

Commercial p.c.b.s are usually tinned and it's possible to obtain tinning chemicals or even tin the tracks manually. I simply spray my boards with p.c.b. lacquer which preserves the copper tracks and can be soldered through when the board is used - and that's how I make my very own p.c.b.s. Have a go yourself, you'll find it's quite simple if you follow these guidelines - happy etching!

PW



● Fig. 3: Not sure if you're confident to try the photo-resist method of p.c.b. production? Don't worry - why not try the 'Radio Basics' etch-resist pen method first? It's an ideal introduction for the first time p.c.b. designer which you can find on page 16 of the July 1998 PW.

Small scale p.c.b. production equipment and chemicals can be obtained from many electronic mail order companies. I use **Mega Electronics, Mega House, Grip Industrial Estate, Linton, Cambridge CB1 6NR. Tel: (01223) 893900.** Why not visit their Web site: [www.megaelect.demon.co.uk](http://www.megaelect.demon.co.uk)

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combat most needs. Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear ★ Multiple front outlets ★ Detachable IDC lead (supplied) for mains connection. SSP £149.00.

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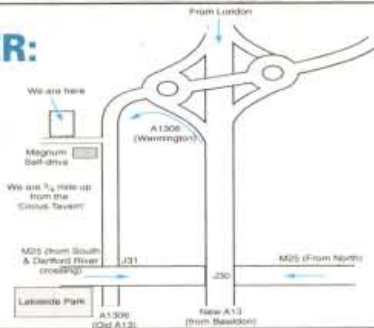
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# The MFJ-414 Classroom Morse Code Tutor

**Having worked some 'M5' stations on 7MHz - and having heard some excellent c.w. QSOs carried out by the new licensees - I think that a new breath of fresh air has entered our 'many roomed' hobby.**

Keen c.w. operator Rob Mannion G3XFD takes a look at the MFJ-414 Classroom Morse Code Tutor unit. Rob thinks it could be an ideal club investment, boosting funds by the use of a modest 'loan' fee. In fact it's extremely versatile!

In fact, the fresh air has brought some new life and enthusiasm along with it too - so much so that I think that many more holders of Class B licences may consider having a go for themselves.

I hope, no indeed I heartily encourage anyone who is tempted to take their 5w.p.m. Morse Test to 'have a go'. If you're someone who is rather tempted - please try!

My suggestion is not because I think it's necessary for anyone to have the ability to send and receive Morse before they qualify for the term 'Radio Amateur' in full (in fact it's quite the opposite). Instead it's because I think you'll enjoy using the mode. Don't be afraid that you'll not be able to find anyone prepared to have a slow c.w. QSO with you - because in practice few of us seem to exceed 10 or 12w.p.m. anyway!

With the increased activity on c.w. due to the introduction of the 5w.p.m. Morse Test for the M5 operators I think there's a good chance of increased club interest in units such as the MFJ-414. I suggest this because I feel it's just the sort of thing a club could buy, to the benefit of many. I also say this because even if you're not keen on using the

mode itself very much ... c.w. 'ident' beacons will be with us for a long time to come!

## What's On Offer?

So, what's on offer with the MFJ-414 'Morse Teacher In A Box'? To answer the question let's take a look at what MFJ have packed into their comprehensive unit.

Firstly, readers will know that although I have several items of MFJ equipment in my own shack - I've often expressed my disappointment in the often poorly finished presentation of the American-made equipment. Innovative the MFJ products may be - but well finished they usually aren't!

However, the MFJ-414 isn't too bad at all when it comes to the standard of finish and general 'looks'. It's practical, robust and easy-to-use but having said that ... it won't win any prizes for construction. And provided you accept the comparison to reasonably finished quality 'home-brewed' equipment - which I think it compares to favourably - it's best to just get on and use it!

Billed by MFJ as a 'Professional Class Room Morse Code Tutor', the MFJ-414 is a feature-packed (my words) microprocessor controlled Morse tutor, practice unit (to help an already trained operator to increase their c.w. copying speed), and iambic keyer.

On the main front panel there's a range of simple controls and

an adequately sized l.c.d. viewing screen for the c.w. read-out display. Also provided is a printer port, audio tape recording output (ideal for recording practice tapes for students to take home), a computer interface, radio inter-

face (for on the air practice) and 16 non-volatile memory banks.

The audio output is described as 'loud powerful' (I'll agree with 'loud!') and because it's sine wave - the note is pleasing to listen to, especially during a prolonged training session. Additionally, on using the unit I found there were no 'key clicks' when the unit was used 'on air' as a keyer or in 'training mode'.

## Speed Menu

The built-in speed menu allows the user/instructor to set the unit's sending speed anywhere in the range of three to 60 words per minute (w.p.m.). In their (excellent and easy-to-read and use) manual MFJ state that the w.p.m. is based on the standard word 'Paris' which is 50 units in length. The words 'Paris' is sent ten times in one minute if the set c.w. speed is 10w.p.m.

Additionally, the built-in Farnsworth menu allows the Farnsworth speed (character speed, which is always faster than the overall speed) to be selected or disabled. When the Farnsworth menu is selected, characters (dots, dashes and inter-character spaces) are sent at Farnsworth speed but the spacing between characters and words is increased, to produce a slower overall speed.

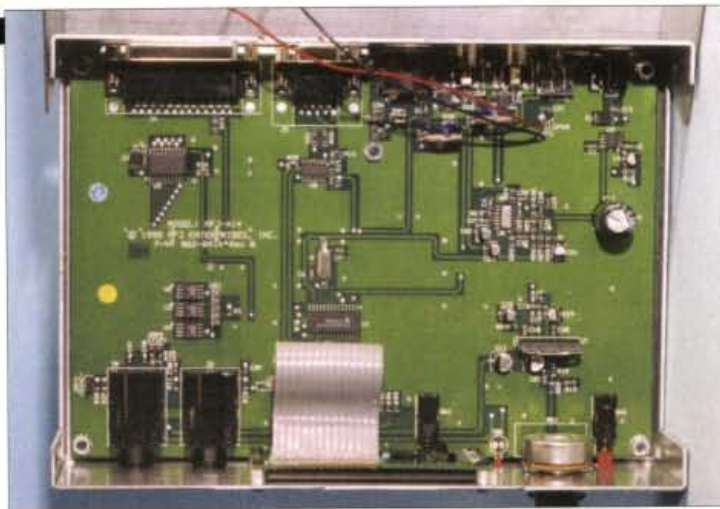
I think MFJ's approach is excel-

Rob Mannion G3XFD has been the Editor of PW for nearly 11 years. He's a keen 'portable' operator on both the c.w. and v.h.f. bands

● Rob G3XFD goes back to school to learn from the teacher in a box!







● Fig. 1: An inside view of the MFJ-414 Classroom Morse Tutor is misleading because at the first glance it doesn't look as if anything is there! But don't be misled...Rob G3XFD reports that the unit is a 'feature packed' unit which could prove useful to many clubs and individuals.

lent and works well and helps students 'absorb' the c.w. characters much easier and it's a method I've used for many years when preparing practice tapes with the Datong D70 Morse tutor unit. (The old Datong Morse Tutor has a very useful 'variable delay' facility which has helped me to teach Morse successfully for many years and I'm pleased that the MFJ-414 uses the same idea).

I'm not going to list all the training lessons 'built in' to the MFJ-414 other than to say that they are extremely comprehensive. Everyone from complete beginners to keen operators wishing to improve their c.w. standards will find



● Fig. 2: Comprehensive isn't the right choice of words regarding the rear panel facilities/interconnections and outputs on the MFJ-414. This unit really does offer a great deal in a small, lightweight package (see text)

suitable lessons.

The unit can be used either as a fully iambic electronic keyer (using an external paddle, connected via the front panel jack socket, or as a 'straight' key. When the single pole straight key is plugged in, the keyer automatically operates in 'manual' mode.

The Morse tutor contains words,

names and callsigns used in Amateur Radio. Importantly (this, believe me is clever and quite amusing to use!) it also has a built-in 'random QSO' generator. Very useful this facility - and I'm sure I've worked at least two or three MFJ-414s 'on air' on 7MHz from Eastern Europe, so similar are the 'rubber stamp' QSOs!

Unfortunately, although it is not a major problem, there are some differences between the c.w. abbreviations and style used by American Radio Amateurs and the non-American World. But as I said - it's not a big deal and can help you decipher a c.w. QSO you're listening into on 14MHz perhaps in the future.

## In the Classroom

Trying the MFJ-414 in a mock 'classroom' situation at home I was surprised how useful the l.c.d. read-out was. Viewing the letters/figures and procedural characters (punctuation, question marks, brackets, etc..) was very useful. No human teacher is mistake-proof and it's good to know that the l.c.d. is there as a check.

In use the front panel controls are extremely simple and effective and comprise a 0.25in stereo 'phone jack for headphones, and another 0.25in jack for the Morse key, the l.c.d. rectangular display which shows two lines of 32 characters\* (see note)

**Previous** control button: This is pressed to view previous menu or setting.

**Next** control button: On pressing this control button shows the next menu or setting.

**Select** control button: This button is pressed when the operator wishes to select the current menu

or setting.

The **PWR** l.e.d. indicates red when power is applied. This is done by the double action 'push on' and 'push off' type panel switch. The **Volume** control varies the audio output level to the loudspeaker only (including the rear mounted external loudspeaker socket), but adjustment to the level of the sidetone for headphones is achieved by using internal 'jumpers' on the main p.c.b.

**Note:** \*The two line 32 character display is obviously not large enough for the whole class to see, but is ideal for the human teacher to oversee what's going on, or the individual student to check what's being sent and other facilities - including the printer port, enable checks to be made).

## Major Features

The MFJ-414 incorporates major features such as being able to 'talk' to computers and printers - extremely useful and very helpful indeed I found. The serial port (rear panel) is used to download a text file or word list into the Tutor's non-volatile memory for playback, and any terminal program capable of loading and downloading ASCII files can be used (A cable and connector are supplied). The MFJ-414's memory bank can be sent to a computer and random word databases can be loaded in via the supplied cable and computer port. With this facility the unit becomes much more versatile, enabling lessons and practice information to be varied.

Most useful (as far as I am concerned) is the ability to download to a printer the last practice session. The correct answers can be printed out so students can check their results (any Epson compatible printer can be used).

## Buy One For Your Club!

My recommendation is that serious consideration (or even pressure!) should be given or applied to your committee to buy one for your club! I suggest this because the MFJ-414 could prove to be very useful in helping Radio Amateurs to enjoy a very simple mode, get the best from c.w. operating and pay for itself (via a reasonable 'loan charge') very quickly indeed.

## Product

MFJ-414 Classroom Morse Code Tutor

## Accessories

Power lead, 9-to-9 serial cable supplied, optional cable accessories for different manufacturer's equipment available.

## Pros & Cons

**Pros:** Great for club training sessions and the ability to download to a printer and print out the last training session.

**Cons:** The differences between the c.w. abbreviations and style used by American Radio Amateurs and the non-American World

## Summary

I thoroughly enjoyed using the MFJ-414, and with its help I'm sure I'll have the pleasure of working some more keen M5 stations on 7MHz c.w. soon!

My thanks go to **Waters & Stanton PLC of 22 Main Road, Hockley, Essex S55 4QS, Tel: (01702) 206835, FAX (01702) 205843**

RRP:  
**£189.95**  
inc. VAT

**Free delivery if you mention this review when ordering.**

## Vic G3HKQ describes his very own VK2ABQ

# THE VK2ABQ ANTENNA REVISITED

Vic Westmoreland G3HKQ describes how he designed and built his very own oblong version on the VK2ABQ antenna. He says that it's relatively simple, so why not have a go yourself?



It must be nearly 30 years since the VK2ABQ antenna, originated by **Fred Caton**, first made its appearance and during that period I've built three square ones with varying degrees of success. I already had a three-element Yagi and a 41m centre feed 'V' beam, which between them have given me excellent results, so I didn't put the time and effort into improving them.

A few years later I retired and went to live in a bungalow that had a very small garden and back on air, I used a simple indoor antenna centre feed in the attic which gave me some very good results.

After obtaining planning permission, I later bought a Tennamast that I could lift up to eight metres whilst I was operating. I built a super beam antenna for 24MHz and this, for me, was one of the best beams I ever built.

I later decided to build another beam, a

● Vic's completed VK2ABQ beam in position.

VK2ABQ to cover the 14, 17 and 21MHz bands and, at a later stage, 28.5MHz and maybe 24MHz. There was a lot more information on this type of beam than I ever imagined there would be and nearly every VK2ABQ I'd read about was built using different materials, different sizes and shapes (square ones, oblong ones and occasionally some like the XYL, pinched in at the waist) and using different methods.

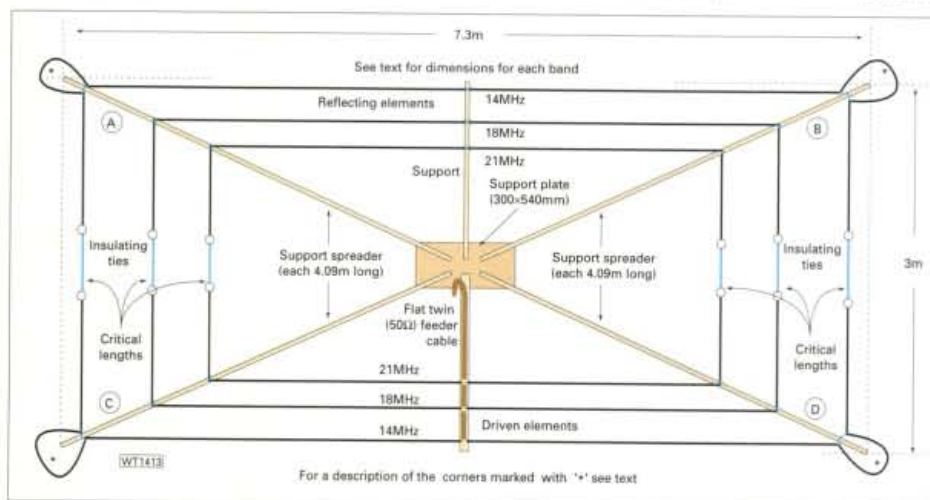
### Oblong Beam

I built an oblong beam, spending many hours designing and testing it. Again I was satisfied with the results, I could operate on three bands - 14, 18 and 21MHz and contact was made with all continents several times.

I'd tried to make the beam as sturdy as possible, using two bamboo canes in each leg, joined by hose clips. This seemed to give it an ungainly appearance which I'd tried to avoid in the first place and when the wind blew the beam would wobble all over the place. A visit to the Lincoln Rally meant I was able to obtain several hollow fibreglass army tent poles, each about a metre long. A short time later, through an advertisement in *Sprat*, I was able to obtain two more sizes of fibreglass rod, one lot hollow and the other lot solid.

The fibreglass rods would enable me to get the length required for an oblong VK2ABQ beam and the antenna would be much stronger and not as ungainly. I certainly believe that the hardest part of

● Fig. 1: Scale drawing of the VK2ABQ oblong beam.



building any fibreglass beam is getting the materials!

The previous bamboo beam had been built from a design on oblong VK2ABQ beams by Les Moxon\* and I decided to use the same design. In my opinion, an oblong beam gives slightly better results than a square one and I would just be able to get it in my garden.

\*See Les Moxon's book: *HF Antennas For All Locations*, available from the PW Book Store, priced £14.65.

Two pieces of plywood were screwed together and given several coats of ship's varnish, with provision being made to fit the underside of this to a rotator when required. I then marked on top of the plywood the place where the fibreglass poles would be fitted.

For the four lengths of fibreglass poles, I first joined two army tent poles together to give me a length of 186cm. The second fibreglass rods were cut to a length of 123cm and filed as round as I could for a length of 90mm to fit inside the tent poles.

The last four lengths of rod were solid and fitted nicely into the second rods - the three sets of fibreglass rods were very strong and had a gradual taper from the centre to the ends. I would stress that fibreglass (when filed) has many small glass splinters and as it weathers, splinters occur so it's imperative that you wear gloves at all times - I usually then rub it over with a cloth.

Finally, the rods were dismantled, given a coat of 'Fast Glas Polyester' resin (obtained from the local car store) then joined and fitted. The resin dries quickly and makes very firm joints that have never moved. (See Fig. 1).

A 1.2m piece of brushtail, after being varnished for protection, was secured to the centre of the plywood by a metal socket. Primarily this would support the fibre rods or poles as I now like to call them and secondly, at a later stage, a two metre fibreglass vertical could be fitted for local QSOs and Packet operation.

Due to my small garden which contained shrubs and a fishpond, I would be unable to build my beam on the ground. The flat plywood base was fitted to the rotator and this in turn was fitted to the mast.

Fortunately, with the Tennamast I was able to bend it over parallel to the ground at a height of 1.5m and so could stand on the ground to work. It meant, however, that I would have to keep lifting and lowering the mast as each part was completed and turning the structure round.

My fibreglass poles were fitted loosely in each of the marked sections of the plywood base by saddle clamps, then the length and width of the pole ends measured and made correct for the band measurements. Finally, the clamps were tightened to make the poles secure. (See Fig. 2).

At a height of 750mm above the plywood base, four double lengths of polythene orange garden line were fastened to the wooden brushtail and these terminated at the ends of fibreglass poles to keep the beam from drooping. The set-up was then placed in a vertical position to check all was level and that there was no droop.

Back to the nearly horizontal position again and two bamboo canes, previously varnished and covered with grey electrician's tape, were fitted with conduit clips to the plywood base. The ends were then secured to the brushtail by one length of the polythene garden line (the purpose of these being to support the 50Ω flat cable from each band and also the driven elements).

The other cane on the opposite side was to support the reflector elements. These along with the fibreglass poles would prevent sagging wires and keep the array as level and flat as possible.

My favourite band is 18MHz, so I decided to complete this first then place 14 and 21MHz on either side of it. As I'd already built a similar shaped beam, I had an idea of the amount of wire I would need for each band.

I prefer to use 16swg hard drawn copper wire, as I believe this is better than many stranded insulated wires. You can, of course, use insulated wire, but it would have to be about 3-5% less in length.

If you wanted to, you could spend a lot of time measuring each band, altering the length of the wires, altering the critical distance - I have done this in the past. Every time something was altered, all the VK2ABQs had to be tightened up or slackened off - in theory this is fine, but in practice it was a pain.

As I had been satisfied with my previous VK2ABQ oblong beam I decided to use the same measurement with just a little extra for any correction. What I finally did was adjust the driven elements to obtain the best match I could for 50Ω then adjusted the reflectors to get the best front to back (F/B) ratio.

I later adjusted the critical distance to try to get equal currents in the driven and reflector elements. Of course, there would be a slight difference as the beam was rotated when I stood on an outhouse and the beam at five metres passed over it.

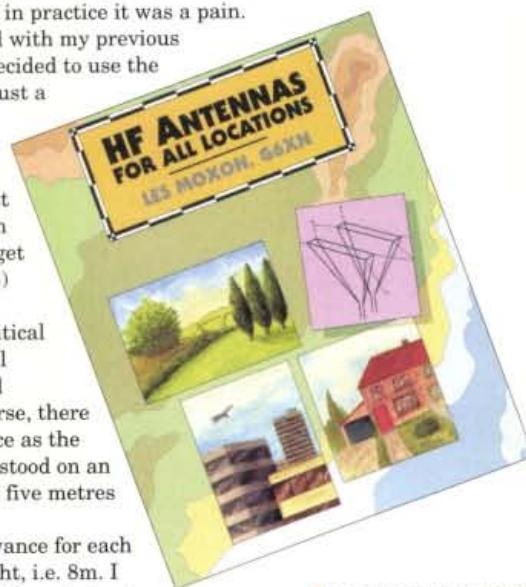
I'd made a small allowance for each band at its operating height, i.e. 8m. I wasn't sure what the breaking strain of the fishing line I used for the critical distance would be so I used three lengths and this seemed adequate.

To get a good tension at the corners of the VK2ABQs I used an insulation gap of 3mm, consisting of five lengths of fishing line into a cable strap fitted round the fibreglass poles.

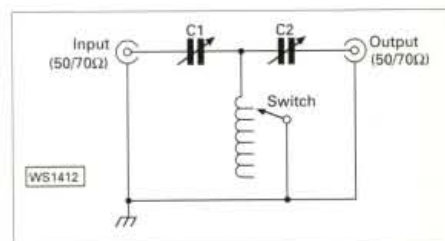
I hit a snag with 14MHz and, in order to keep this band within the confines of my garden, I did have to



● Fig. 2: Vic's fibreglass (and bamboo) poles fitted to plywood with conduit clamps.



● Fig. 3: Circuit drawing of the T-match unit used by Vic in the design of his antenna.



**Table of wire and fishing line required for each band and critical coupling**

Length of A to B & C to D = 7.3m  
 Length of A to C & B to D = 3m  
 Length of each fibre pole = 4.09m

MHz	Driven Element	Reflector Element	Critical Distance
18.1	8667mm	8642mm	275mm
21.2	7371mm	7345mm	370mm
14.2	10929mm	10903mm	480mm

Above use 16swg hard drawn bare copper wire. Critical distance uses fishing line.  
 All bands set up originally 200mm extra length.  
 Small length of 50Ω flat twin cable.  
 Plywood base, two pieces of 300 × 540mm 6mm plywood.  
 Length of fishing line.  
 Cable straps.

make a loop of 200mm at each end of the poles.  
 Even so, it only just fitted.

**Shopping list**

- 2 Variable capacitors
- 1 coil s.w.g. bare copper wire double spaced, 17 turns tapped for 6 turns from capacitors, Tu5B ceramic coil is 51mm diameter.
- 1 4 position switch
- 2 50Ω sockets SO239
- 1 metal case

When I managed to get the s.w.r. of each of the separate band's down low, the ends of the 16swg hard drawn copper wire were passed through a small terminal block previously fastened through the bamboo with a nut and screw. The wire was tensioned, the screws in the terminal block were tightened to 50Ω coaxial cable and also soldered.

The connections were wrapped with white PTFE and Duncil tape. Finally, the whole joint was covered with black electrician's tape to make it waterproof. As near as possible to the joining, the coaxial

cable was made into a coil of ten turns, 220mm diameter taped together and then on to the shack. In my opinion, a coil like this is better than a balun for TVI prevention.

**A T-Match ATU**

I decided to use a T-match a.t.u. (see Fig. 3) which consisted of two variable capacitors and a ceramic coil former of the TU5B variety. This set-up worked excellently and I was able to get zero s.w.r. with no difference in the result of different s.w.r. and more protection to my transceiver.

At this stage, the 28MHz band was in the doldrums and there was a possibility that I might have problems with 21MHz, so it was decided to leave this band until a later date. With the T-match unit, much to my surprise, I was able to have QSOs on 10 and 12MHz.

There you have it, another set of VK2ABQs - in this case of the oblong variety that will give you up to 4.6dB gain, relative to a dipole and 25 or more F/B ratio - depending on how much time you spend improving the critical distance. Better in my opinion than a nest of dipoles and a beam that can be made neat.

My QTHR height is only 23m a.s.l. and there's a large hill 229m to the east and I've had consistently good reports. In the last 32 QSOs on the three bands I had weak reports from seven stations, strong reports from ten stations and in 15 reports, both stations had the same report.

No reports were below a readability of 4 and no European stations were included and maximum power was 100W. Go ahead and give this antenna a try - I'm sure you'll be surprised.

PW

# Appendix to 'The VK2ABQ Antenna Revisited'

After submitting this article for publication in *PW*, Vic G3HKQ sent in an update to his saga with the VK2ABQ antenna that he had been building. After his success with the 14, 17 and 21MHz bands he decided to have a go at extending the range to include 24 and 28MHz (as well as the f.m. band on 29MHz). Here's how he got on...

As the conditions on 24 and 28MHz began to improve, I decided to add another VK2ABQ and make a compromise beam to try to cover the 24 and 28MHz bands as well as the f.m. band on 29MHz. I thought it would be possible to have interactions between 20 and 21MHz but decided I'd cross that bridge when (or if) it occurred.

At first, a loop was built near the ground for just below 28MHz using four vertical garden canes and 16swg hard drawn solid copper wire. Using previous measurements, I obtained a frequency readout of below 28MHz.

To measure the frequency I used another of Les G6XN's excellent ideas of using a coat hanger coil. I also made the loop slightly larger so I would have enough wire to use for securing the VK2ABQ when it was made.

Next, I disconnected the three VK2ABQs I'd already built from the 50Ω feeder cable, then fitted the loop on the inside of the 21MHz beam. I cut the wire in the loop to form the familiar oblong VK2ABQ shape and fixed it to the fibre rods using the same system as used in the previous designs.

The driven element was made up of two lengths of 2.8m wire fastened to the other 50Ω cable, the opposite ends were fastened to the fishing line 200mm long. The reflector was made up of one length of wire 5640mm long and fastened to the opposite end of the fishing line - the fishing line being the critical distance.

**For The Purists**

To the purists who would question the measurements of this VK2ABQ, I would say that I was trying to cover three bands and with my T-match a.t.u., thought it would be a good compromise. I spent a few days operating on the new bands and the results were very good without an a.t.u. I must admit, though, that the s.w.r. on the c.w. section of 28MHz and the high end of 29.5MHz were high.

I fastened and soldered the driven element ends to the remaining three VK2ABQs I'd already built and connected them all to the 50Ω coaxial feeder cables. Again, without the a.t.u., all bands (except where mentioned on 28MHz)

were below 1.5:1 s.w.r.

Using the T-match a.t.u., I was able to get unity s.w.r. easily. A further point was that there appeared to be no interaction between the 21 and 28MHz bands.

Results over the air were excellent on 14, 18 and 21MHz and, in addition, results on 24, 28 and the 29MHz f.m. section were as good. I'm not interested in DX as such and much prefer to ragchew mainly with c.w. stations.

Some of the stations I contacted on 24MHz include: N9WQ, HC5AI, VE3HTX, ZF2AF, VE7OM and K8EHE - none of whom were below 5 and 5 or 559. On 28MHz I made contact with: VA3JPM, ZS6ME, PY4PZ, LU9AFZ, KH6DX/M6, VE7VF, VE6KG, W6/G3MHV, W9PEA and 9J2BO - again none below 5 and 5 or 559. I only worked one station on the 29MHz f.m. band as I don't usually use this band, however EC8AUZ gave me a 5 and 9 report.

I'm highly satisfied now with the VK2ABQ and can now 'row out' with most, my signal reports are roughly the same as other stations that I work. All in all the VK2ABQ is an excellent beam and much under rated.

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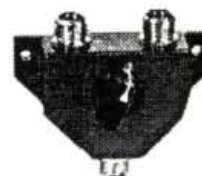
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# EURO-WAVE



With p.m.r. equipment receiving high profile status in the wake of mobile 'phone madness, Donna Vincent G7TZB finds out that licence free communication holds a fascination all of its own.

## Product

**EURO-WAVE PMR 446 Hand-held f.m. licence-free Transceiver.**

## Accessories

Remote speaker microphone, covert style earpiece/mic with in-line p.t.t., four types of protective case, dual slot rapid charger and Nickel Metal Hydride (Ni-MH) battery pack, vox headset and covert earpiece.

## Pros & Cons

**Pros:** Easy to use, small and durable with simple straight forward instructions, a truly professional radio for 'amateurs and professionals' alike! Great for getting on the air without a licence, ideal for cadet groups, rally organisers, warehouse operatives etc.

**Cons:** I had to give them back!

● Neat and compact also applies to the accessories – seen here is the dual slot rapid desk top charger and Ni-MH battery pack.

**T**he EURO-WAVE PMR 446 is described as a 'professional tool for connecting people' without the need for a licence. So, when tasked with the job of putting a pair to the test I was eager to see how well they performed. I enlisted the help of my brother-in-law Jamie Green – who as a civilian instructor for an Air Cadet group had been on the look out for some suitable p.m.r. equipment for the cadets to use on exercise.

Upon unpacking the two transceivers we were surprised at just how lightweight and compact they were, living up to the claim of being the smallest and lightest (weighing just 124g!) p.m.r. transceivers in Europe. Comprising of a very straightforward layout and large, easy to see l.c.d. display, it was immediately obvious how much appeal these radios had. So without further ado it was time to switch on....

## Raring To Go

With the batteries firmly in place we were raring to go! When you press the power button a melody

tune is heard announcing that the unit is on.

The EURO-WAVE has eight channel options so we had to select one to operate on. This is easily done using the F (function) button and the Up and Down arrow keys, with the channel selected we then had to ensure that the same tone code was selected as the EURO-WAVE offers all CTCSS and DCS tones. This is to prevent interference from other users working within range on the same channel, although you can only have one group on a channel at any one time. Checking channel availability is done by pressing the M (monitor) button.

The manufacturers, Entel, claim that the PMR 446 has a range of 3km (1.8 miles), so to test this Jamie went out and about while I stayed behind. We chatted freely and the audio proved to be clear and crisp at all times, this was over a distance of about a mile and a quarter in a built-up area.

When you press the p.t.t. a red

l.e.d. lights on the front panel to let you know that you are transmitting. The volume is easily and quickly adjusted by pressing the up and down arrows. Incidentally unless you turn it off in the function menu, keypad tones are emitted from the keys when you press them.

## Simply selectable

The other functions - scan, key lock, priority scan are all selectable as 'on' or 'off' by pressing the function key. This moves you through the menu until you reach the function required - an appropriate symbol at the top of the screen helps you to identify the functions - and then the up or down arrows followed by the enter key to confirm. One of the best things about the set is that it's all menu driven.

As there were only the two of us and we only had two transceivers to test we couldn't really test the Priority Scan (PR) function, one of two scan functions. The PR enables you to receive up to three additional channels while your transceiver is set to a different channel. Even though we couldn't test this I can see that the



# PMR 446 TRANSCIVER

## Summary

So whether you want it in practical black, distinctive blue or high visibility yellow the EURO-WAVE does what it says. It's easy to use, durable, compact with clear audio and has a great range of inexpensive accessories. Jamie liked them and so did I - in fact I had trouble convincing him that they had to be returned!

My thanks go to

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E-mail sales@entel.co.uk**

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benefits of having this facility are great, for instance in a situation with cadets on an exercise an instructor could easily monitor three separate groups whilst still keeping in touch with base.

The other scan function we were able to test. This is quite simply a scanning facility which scans all channels until it detects activity to lock onto. We tested this by me picking a channel and talking while Jamie set his transceiver to scan looking for me - it worked and very quickly too!

What more can I say, the

- Carry your EURO-WAVE PMR-446 wherever you go with the help of this innovative protective nylon case complete with shoulder strap.

EURO-WAVE is a **great** way of communicating at work or play and it's applications are endless. The choice of funky colours and tough rubberised, scratch resistant casing make it attractive and tough - I would be pleased to have a pair in my shack.



PW



**WIN**  
A Pair of  
**EUROWAVE**  
**PMR 446**  
**Transceivers**

### Manufacturer's Specifications

Channel capacity	8 (fixed for PMR446 service)
Frequency range	446.00625 - 446.09375
Channel Spacing	12.5KHz
Modulation Type	F3E
Power supply	3AAA alkaline cells or Ni-MH battery pack
Battery voltage	Alkaline/Ni-MH 4.5V/3.6V
Approval specification	RF: ETS 300 296, EMC ETS 300 279
Operating temperature	-20°C - +70°C
Battery Life	(@5-5-90 cycle) alkaline/ Ni-MH 14hr/9hr
Dimensions	50(w) x 80(h) x 22(d)mm
Weight	120g (with battery)

## EURO-WAVE PMR 446 COMPETITION

You've read the review now win! That's right Entel have very kindly given us a pair of their EURO-WAVE PMR transceivers to give away to one lucky reader. To enter simply complete the wordsearch and send it in. It's as simple as that and who knows it could be you that wins!

### Words To Find:

- Black
- Blue
- Compact
- Entel
- Eurowave
- Free
- Handheld
- Licence
- Lightweight
- PMR
- Transceiver
- Yellow

D	N	C	Y	E	L	L	O	W	R	V	I
L	J	L	E	T	N	E	P	I	E	A	D
E	Z	E	E	R	F	Z	J	N	V	C	C
H	E	U	R	O	W	A	V	E	I	B	E
D	K	K	R	I	C	N	B	E	E	J	C
N	S	C	Q	W	O	G	L	C	C	L	N
A	N	A	A	B	M	B	U	Q	S	A	E
H	Y	L	R	Y	P	A	E	M	N	A	C
V	H	B	C	L	A	M	V	U	A	M	I
Y	Y	S	X	N	C	C	R	N	R	N	L
W	W	C	P	P	T	I	D	K	T	U	X
D	L	I	G	H	T	W	E	I	G	H	T

### Wordsearch rules:

Twelve different words have been hidden in the grid. They have been printed across (forwards or backwards), up and down, diagonally, but they are always in a straight line without odd letters between. You can use the letters in the grid more than once for different words. Once you have found all 12 words, mark them on the grid and send it, along with your name and address (photocopies accepted with the corner flash) to our editorial address, marked EURO-WAVE.

Name.....

Callsign.....

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Send your entry (photocopies acceptable with corner flash) to:

**EURO-WAVE Competition, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.** Editor's decision on the winner is final and no correspondence will be entered into.

Entries to reach us by **Friday 25 August 2000**

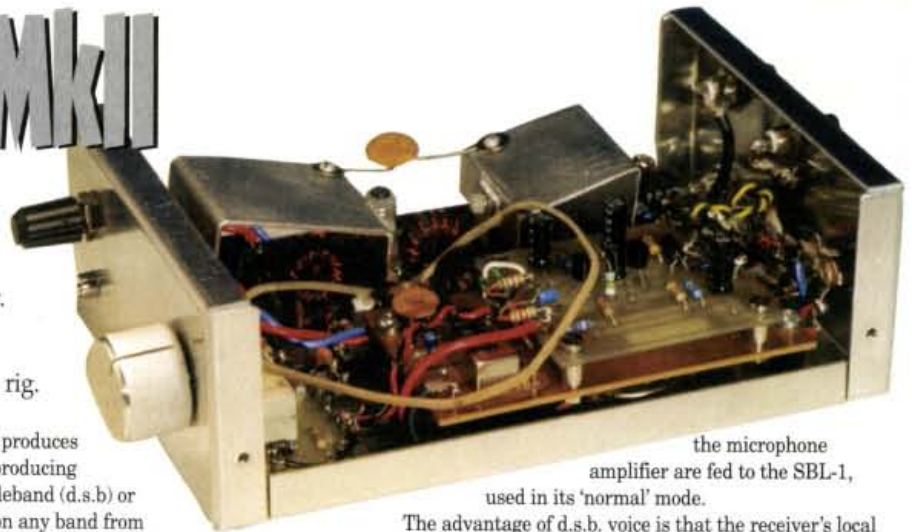
If you do not wish to receive future mailings as a result of entering this competition please indicate here.

● PLEASE MENTION THE PW REVIEW WHEN CONTACTING ENTEL

# PW Gadget MkII

The idea of PW Gadget MkII, like its earlier (MkI) form, is to provide an affordable flexible system that will convert any small c.w. transceiver (or even a direct conversion [d.c.] receiver) with a stable v.f.o. into a 'phone/c.w. rig.

**John Seager**  
**G0UCP** presents  
 the MkII version  
 of a universal  
 receiver add-on  
 that can turn a  
 direct conversion  
 (d.c.) h.f. receiver  
 into a transmitter  
 for the same  
 band, capable of  
 producing both  
 c.w. and double  
 side band



**T**he Gadget MkII produces up to 5W of r.f. producing either double sideband (d.s.b) or 'plain' r.f. (c.w.) on any band from 3.5-18MHz. It's a module based on the Gadget which first saw the light of day in *Sprat*, the G-QRP Club journal.

But nothing under the sun is new and the present design owes just about everything to designs by **George Dobbs G3RJV** and the late **Doug DeMaw W1FB**. But there are many others whose circuits have been 'transplanted' in too!

This variant, the MkII Gadget, has been upgraded for the millennium with a relay for automatic change-over. As a further refinement, in its c.w. mode, the side-tone amplitude can now be varied from a bat's squeak for midnight DX to a raucous howl for the great outdoors.

Double sideband (reduced carrier) signals have the advantage of being easily received on a simple d.c. receiver. They may also be received on an s.s.b. rig using either sideband. If you have never used d.s.b. on the h.f. bands don't worry - most people don't notice (and when told, some have even failed to find the second sideband).

## The Circuits

Look at the main circuit diagram of the PW Gadget (**Fig. 1**), it's cheap and cheerful and the individual circuits can be altered to suit the user and whatever is to hand. It allows operation with home-brew gear on most h.f. bands without the need to turn out separate keyers, microphone amplifiers, sidetone or linear amplifiers.

In my circuit, to produce Morse signals, a *npn* switch transistor keys a voltage level which drives a current that unbalances the audio input line to the SBL-1 modulator. For voice signals using the d.s.b. mode, audio signals from

the microphone amplifier are fed to the SBL-1, used in its 'normal' mode.

The advantage of d.s.b. voice is that the receiver's local oscillator (l.o.) and modulator both work at signal frequency. So, all that is needed is a pure and steady r.f. signal to feed the r.f. input ports. For several of my prototypes, this has generally been provided by a small home-brew 1W c.w. transceiver that has a synthesised v.f.o.

The r.f. signal source need not be complicated, even using a variable ceramic resonator oscillator to feed a d.c. receiver gave me a transceiver with good results on 24MHz. I also imagine that a signal generator could form the basis of a very versatile system.

After the mixer, the modulated r.f., after passing through the p.a. stage, goes to the antenna via a low-pass filter. The filter is designed for the highest frequency in use, but additional filters for lower bands can be added as required.

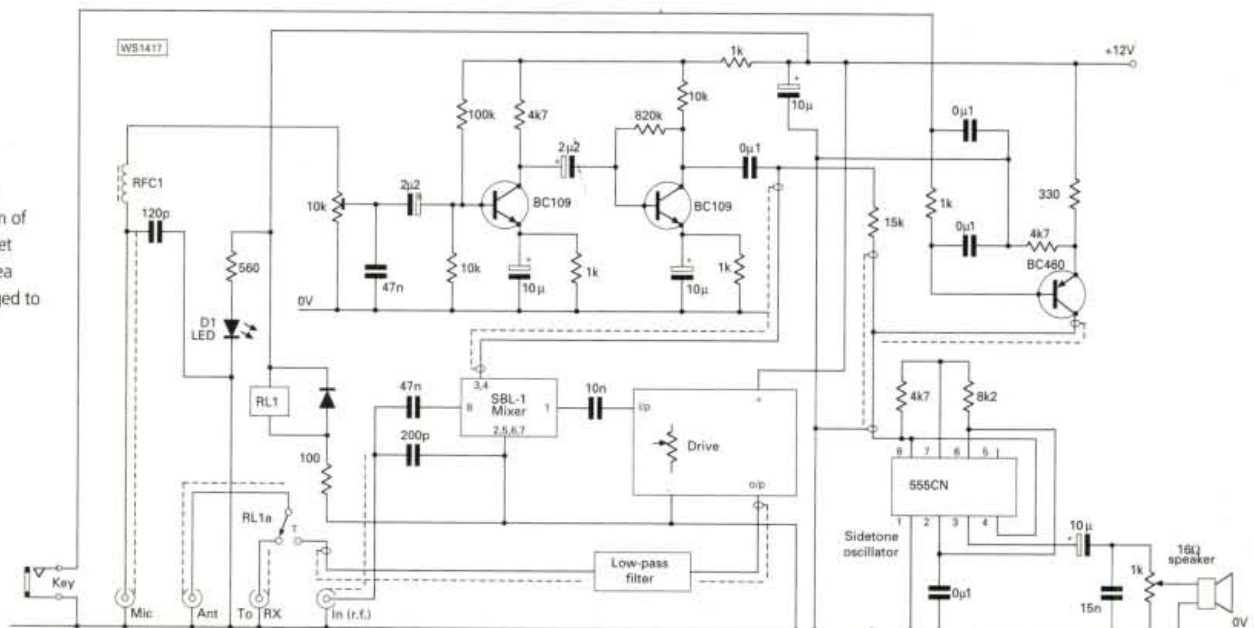
## Change-over Simple

The change-over system is extremely simple and is illustrated in **Fig. 2**. The station antenna (via an s.w.r. meter or power meter and a.t.u. if required) plugs into the socket 'Antenna' on the rear panel of the Gadget. On 'receive', this is connected via RL1, directly to the receiver antenna socket ('RX' on the rear panel).

On 'transmit', the Gadget receives 12V from the transceiver power supply and RL1 clicks the antenna across to the output from the linear amplifier. The r.f. input is taken from the driver stage of the transceiver and so changeover function is controlled completely by the original transceiver 'R/T' switch.

*Continued on page 33*

● Fig. 1: overall circuit diagram of the PW Gadget MkII. Each area may be changed to suit what is available.





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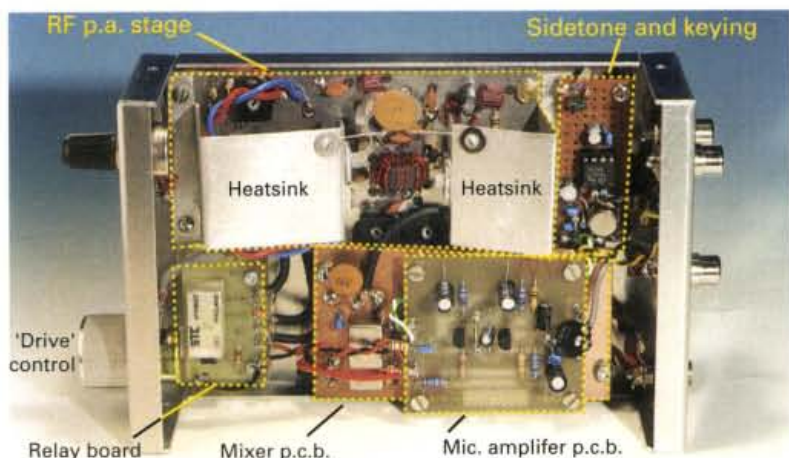
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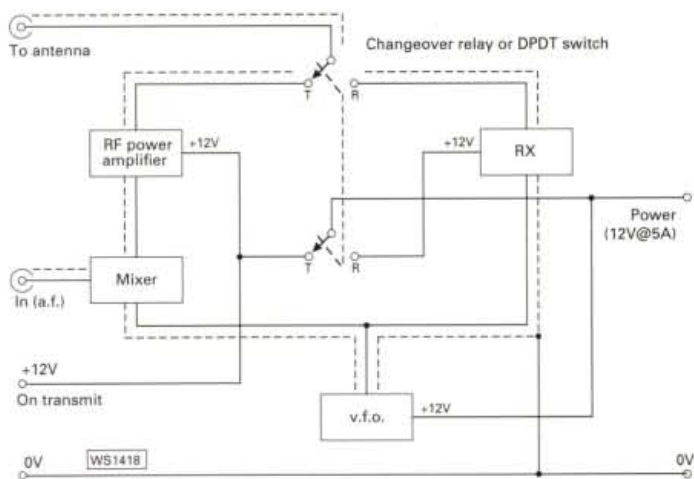


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● Pic 1: The layout of various modules used in the prototype PW Gadget MkII.



● Fig. 2: A simple concept provides c.w. or d.s.b. capability. See the text for the way that the mixer is driven in each mode.

**Sources For Linear Amplifier**  
 Hands Electronics, Tegryn, Llanfyrnach, Dyfed SA35 0BL.  
 Communication Concepts Inc, 508 Millstone Drive, Beaver Creek,  
 Ohio 45434-5840 USA.

## Standard

The version of the PW Gadget shown in the photographs sits in a standard 150x100x50mm aluminium box. Apart from using shielded connecting links, no special screening seems necessary. In this version the modulation amplifier is a module from the PW Marland transmitter, a project by George Dobbs G3RJV, but many other microphone amplifiers would do and a small automatic 'voice operated gain adjusting device' or v.o.g.a.d. amplifier has also been used.

The mixer and the keying/sidetone stage are built on perforated strip board or 'ugly' fashion on single sided copper board. The linear amplifier shown is the 'Omega QRP' p.a. stage which was marketed by Cirkit. A kit that seems to be no longer available, but the original Gadget p.a. (Fig. 3) could be used.

An alternative p.a. stage is the AMP3 amplifier from Sheldon Hands (which comes with a relay and a low pass filter attached) and should adapt well. Another alternative 'macho' (and expensive!) device in the Motorola range is the 20W, 55dB gain high performance driver/p.a. stage could be used.

This 'block' from Motorola, which uses the ingenious broad band hybrid MHW 591 at the front end, should still be obtainable from CCI in the USA. Although the Motorola block is well over the top for QRP, the temptation to acquire one "while stocks last" was too great and an order has been placed!

## Operation On Air

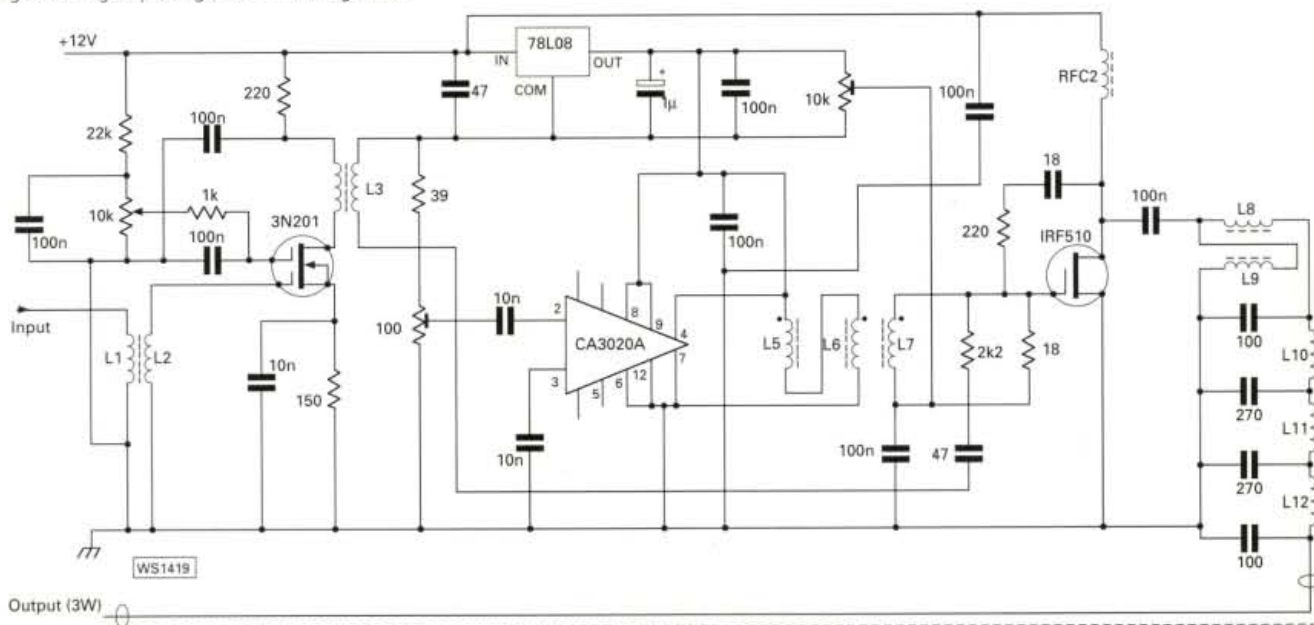
For operation on air, the main antenna I've used is a 3.5MHz dipole which resonates at 3.62MHz. Using coaxial cable feeder and 3-5W p.e.p., I've had solid 'phone contacts with areas around the UK and Europe on this band. The 3.5MHz dipole also loads equally well on 17m where the five half wavelengths present a 50Ω load and there is a very effective low angle radiation. This band has produced surprising results with four continents worked on phone.

Many Saturday mornings sessions have seen 'Five & Nine' reports from St Petersburg and Moscow. And surprisingly, in April 1999, my 3W p.e.p. call got a '53' from VK7GK in Tasmania and an indoor dipole raised call area EA6 on 7MHz.

Building this project should bring back some of the fun of putting together bits and pieces from various sources to make a station of your own. It would be nice to 'meet' a few PW Gadgets on the air!

PW

● Fig. 3: The original p.a. stage, used in the Gadget MkI.





## BREAKING NEWS

### Kenwood Developing an All-Band, All-Mode Transceiver

Kenwood is currently developing an all-band all-Mode transceiver that features a smart metallic-grey design with large LCD and represents a breakthrough in HF performance. It creates an immediate impression of being sophisticated, solidly reliable and superbly suited for the new millennium.

This one transceiver covers the HF/50MHz/144MHz/440MHz/1200MHz bands (SSB, CW, FSK, FM and AM modes), with output of up to 100 watts (440MHz: 50 watts, 1200MHz: 10 watts). Since it is equipped with independent 144/440MHz sub-band reception (AM/FM modes only), simultaneous reception on two bands is possible!

The transceiver is equipped with an IF DSP for main-band use (AF DSP for sub-bands). TS 870 technology has thus been adopted for all-mode applications - VHF and UHF as well as HF.

Packet cluster information, so vital for HF operations, can be displayed on the LCD. Moreover, this data can be used for automatic tuning, though it is not possible to connect with a node station using the internal modem.

When's it due? We'll let you know soon!

For more information, call today or see our web site [WWW.hamradio.co.uk](http://WWW.hamradio.co.uk)

## Diamond GSV-4000

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## Samlex SEC-1223 PSU

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## ICOM IC-756Pro



### Save £370

The IC-756PRO contains new and improved features of great interest to serious HF operators and DX enthusiasts.

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## ICOM IC-2800H



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*Steve Mahoney VK5AIM's Memories of Traeger...*

# WIRELESS & WOOMERA

Bringing a vintage Traeger a.m. transceiver back to life brought back memories for Steve Mahoney VK5AIM of his days at Woomera, South Australia. Here he recounts the tale of how it all came flooding back...

When I was offered a 'Vintage Flying Doctor Transceiver' at the Electronics and Amateur Radio class I was instructing it instantly brought back memories of my radio workshop days at the Woomera rocket launching station in 1957. Then, we used the Traegers to talk to the cattle stations and advise them of impending launches. After all, you didn't want a rocket casing landing in amongst the stock!

The vintage transceiver was designed and built in South Australia some 40 years ago and which were still being manufactured up until the 1980s. The name Traeger is well known in Australia, as it was **Alf Traeger** who (in the 1920s) designed and built the famous 'Pedal Wireless' (see Fig. 1a/b) for the **Rev. John Flynn** of the Australian Inland Mission. The Rev. John Flynn visualised a 'Mantle of Safety' for the people of Outback Australia and he came up with the idea to combine wireless and aviation in order to link these people.

Although the unit looked as though it was in good condition, complete with coil boxes and microphone, the set measured about 400(w) x 200(h) x 300(d)mm and weighed 10kg. The receiver covered from 1.5 to 3.5MHz.



The coil boxes are similar to the HRO coil boxes - only two bands in each box. Unplugging them and turning them over 180° makes the receiver tuneable over part of the broadcast band - 1.5-3.5MHz and 3.7-10MHz.

Each box has a Bakelite top and bottom, with three rows of small 1/8th brass 1/2 round rivet heads as contacts. These make contact with 'D' shaped springy contacts in the bottom of the chassis which has a wipe and self cleaning action.

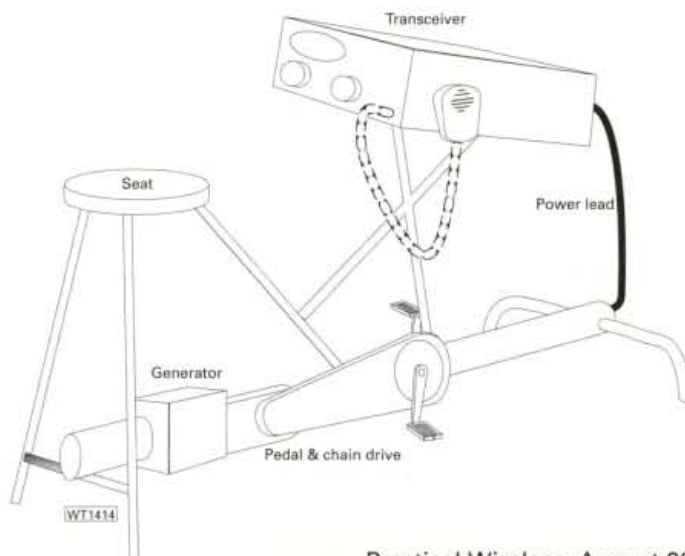
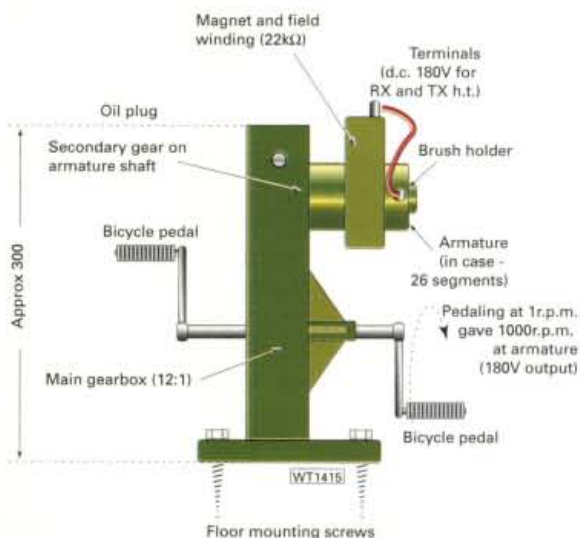
## Single Conversion

The Traeger's a single conversion superhet with a 455kHz i.f. - the small narrow Phillips type. The valves of the receiver are of the 9-pin Noval series, the r.f. amplifier's a 6N8, the mixer/oscillator a 6AN7, the i.f. amplifier a 6N8, and 7-pin 6AL5 as either a detector/a.g.c. or as a series noise limiter.

The a.f. output is a 6M5 and the tuning gang one of those delightful Phillips types with the fine brass plates/vanes, 3-gang of course. A 2in brass disk with a spring loaded friction drive acts as a tuning dial.

Tuning calibration is an etched aluminium disk - 0 to 100 on one half and wavelength, i.e. 200-80m on the other half. A Perspex disk with an ink filled scribe line was the reference - nothing

Fig. 1: (a) Traeger's Pedal Radio had a small electrical generator used to make the d.c. to power the transceiver, this was deemed to be more reliable than batteries. (b) a later (post-war) pedal wireless.



## On Air Schooling

Children of the cattle or sheep stations received their schooling via the vintage wireless systems, this was known as the 'School of the Air'. Each day, at a set time, the base station at Alice Springs or Broken Hill would call up its students and class would begin. It was the only education they got until they went to secondary school in the city. Some of the children had better radio procedures than some of the amateurs you hear on the air today! The 'School Of The Air' system still goes on today, but uses s.s.b.

Another group to use the wireless, was the 'Australian Inland Mission'. This enabled the church to be taken out to the people via aviation and wireless. Some of the diocese were larger in area than all of the UK! You could arrange for a wedding or a christening to be carried out when the Padre next flew out your way. It had been known for the wedding ceremony and the christening to be all on one day!

The other interesting use of the wireless was for the station wives' chat session, known as the 'Galah' session. There was no privacy and the subjects discussed were many and varied.

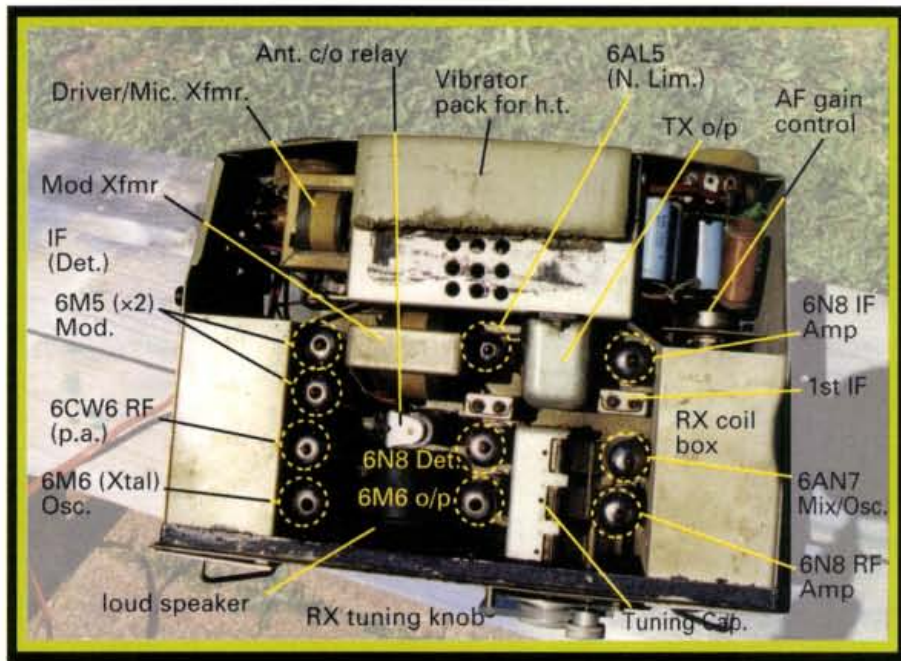


Fig. 2: Annotated photograph showing the internal (top) view of the Traeger transceiver given to Steve VK5AIM for his Electronics and Amateur Radio class.

complicated, all very basic.

Crystal 'locked' receiver coil boxes can also be plugged in for fixed frequencies. I can remember little wooden boxes with six to eight compartments for different channels, i.e PT Augusta, Broken Hill, or Alice Springs, all clearly labelled, actually stamped into the front panel and colour coded blue for receive and red for transmit, making it easy for non technical operators to identify.

### The Transmitter

The transmitter is amplitude modulated (a.m.) with a pair of 6M5s in push/pull, driven by a carbon microphone. Another 6M5 acts as the crystal oscillator, on the desired frequency capacity coupled to a 6CW5 as a plate modulated p.a.

A similar coil to the receiver, contained the crystal tuning coil along with the p.a. coil, a separate small single gang capacitor - BC type (100 to 400pF) - is used to tune the p.a. for maximum r.f. along with a tapped coil in series with the antenna. Maximum r.f. output is indicated by a small 6V 50mA lamp on the front panel.

All the operator has to do is to 'Tune for a brightest lamp' - the r.f. out was about 5W. Real QRP and it worked! (See Fig. 2 and Fig. 3).

### Various Antennas

Various antennas were used on the vehicles with many using the ex 'Tank Whips', about three metres long, with rubber mounts. Some of the Land Rovers had an extra a.t.u., band switched and mounted on the front right mudguard. (See Fig. 4).

For portable operation, a long wire was used against ground. As trees of a decent height were often scarce in the outback, the long wire was often only two or three metres off the ground, with the counterpoise running along underneath it.

The transceiver had three antenna terminals, antenna, counterpoise and earth and some portables had multi-band dipoles. These consisted of a dipole cut for the longest wavelength used. At the lengths required for the other channels, there were small insulators breaking the wire. These had two brass screw terminals and a small metal link which were engraved with the frequency or channel. The centre of the dipole was fed with a length of ordinary figure eight mains type flex - easily replaceable! These antennas were used where there were taller trees!

The base stations had a more permanent

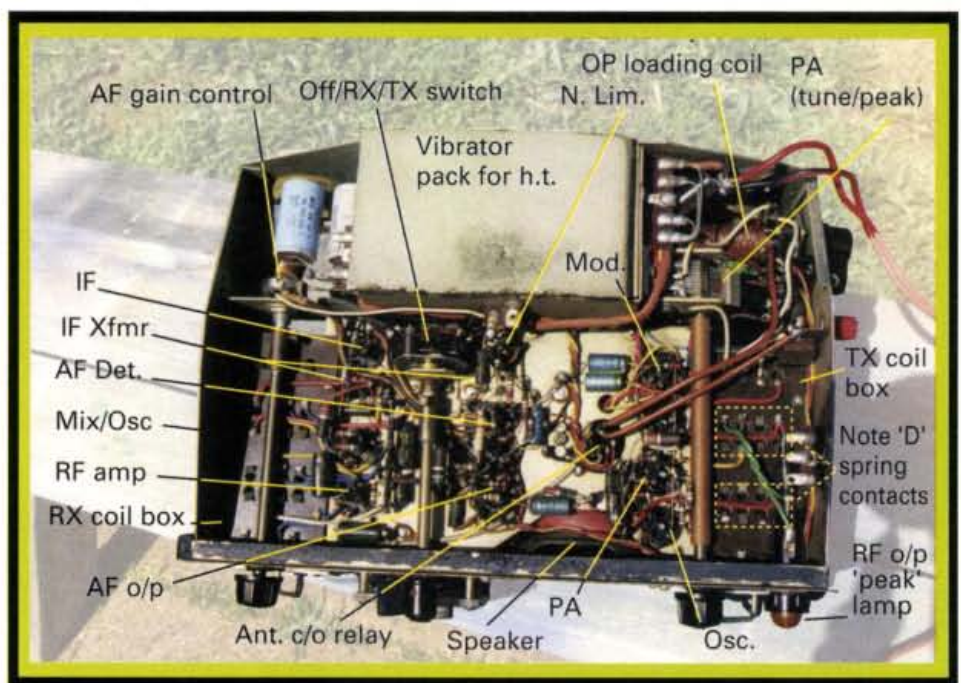
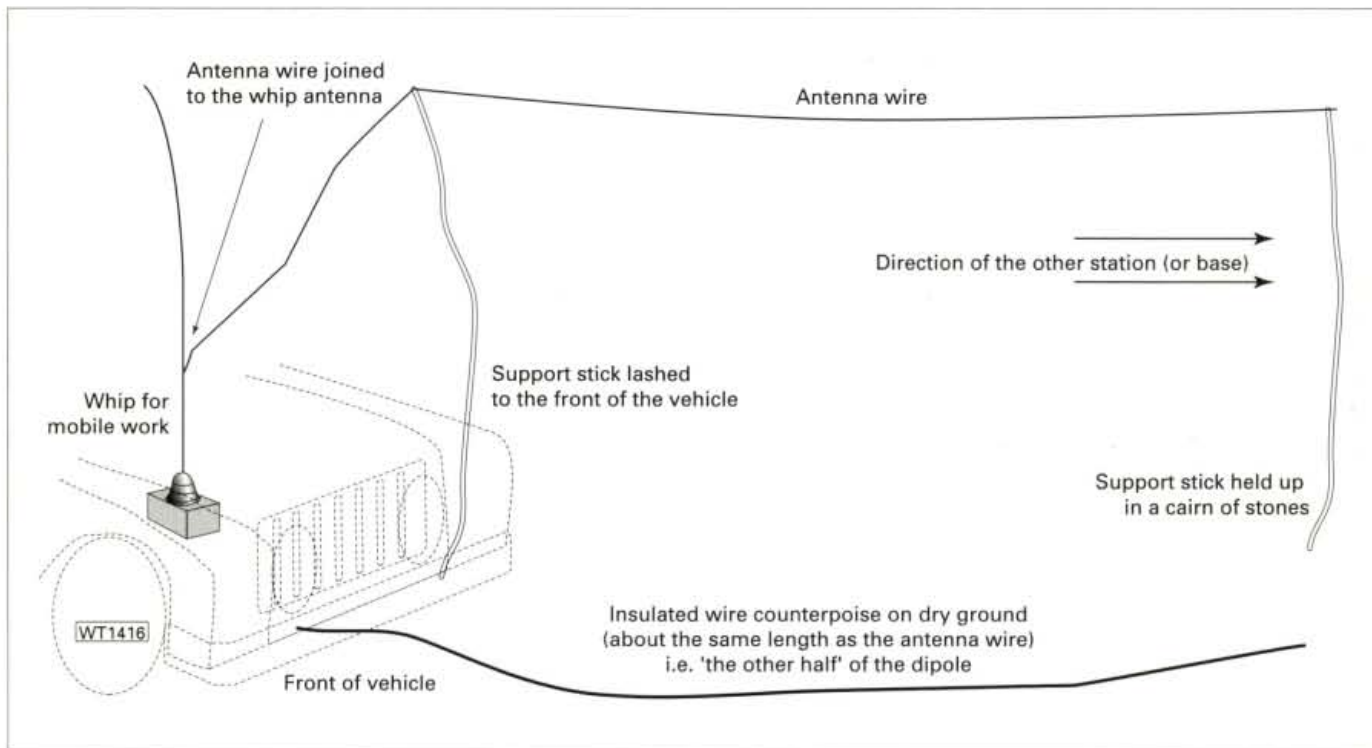


Fig. 3: Annotated photograph illustrating the internal (underneath) view of this vintage transceiver.



● Fig. 4: A long wire was anchored to a rather crooked mulga stick lashed to the vehicle, and the other end was then attached to a similar 'stick', supported in a cairn of stones. If necessary it was supported in the middle with a forked stick - true improvisation!

system, consisting of a multi-band dipole fed from a common point and fed with open wire line (about 150mm spacing). Sometimes the dipoles were at right angles to each other.

The whole system worked well. Some of the base stations that had 240V a.c. or 32V power, had transceivers of 25W r.f. out made by Traeger. With the right frequency/channel and good h.f. propagation conditions, contact could be maintained across Australia.

## Clean Up

After removing the covers of the Traeger, I brushed and blew out the dust, gum leaves and

spider webs. I removed the valves and gave the sockets a squirt with alcohol-based cleaner. The valve pins were brushed with an old toothbrush and the vibrator that supplied the high tension (h.t.) was cleaned up.

There appeared to be two electrolytic capacitors, one for the receiver and one for the transmitter. There

were no dead shorts ... fortunately!

With the vibrator back in, I decided to connect it up to the 12V d.c. But the resistance of the valve heaters/filaments when cold was too much for a 13.5V 10A regulated power supply. It just shut down with the surge and I had to resort to a 12V car battery!

Up came all the valve heaters, no h.t. and no vibrator buzz. But a little tap on the case, away it buzzed and up came 175V of h.t. The audio volume control was noisy but a squirt of cleaner fixed that.

With the 1.5 to 3.7MHz coil plugged in and an antenna connected, the set burst into life with broadcast stations - nobody was more surprised at this than me. The coil box was changed to 3.7 to 10MHz and it worked up to about 5MHz so I suspected that either the r.f. amp or the mixer was the problem.

On investigating, and with the coil box apart I noticed that the brass rivet heads that meet with the spring contacts on the chassis weren't in a line and a check on the receiver coil box showed the same thing. Then it dawned on me to turn the transmitter coil box around and check the pin alignment and yes, the connections matched up. Someone had changed the front and back plates around!

With the plates the right way around I tried again - a dummy load and r.f. watt meter connected to the antenna showed 5W and the r.f. output lamp lit brightly. On transmitting the lamp increased in brightness with a.m. being heard in a monitoring receiver. Not bad for a 40 year old piece of equipment!

With a 3.5MHz crystal in the 4MHz transmitter I could demonstrate it on 80m (3.5MHz) in my Amateur Radio class. As the receiver tunes, an 80m a.m. 'cross town' QSO may be possible! I really enjoyed getting the old unit going. It was amazing how quickly all the technical information came back to me!

PW

## Flying Doctor Network

The Royal Flying Doctor network had a wonderfully simple system for prescribing the various medicines via the wireless. Each station had a big medicine box and a chart of the body marked in squares and in each square a number.

In each box there were various compartments, each contained a particular drug or medicine or the like and each compartment had a number. If the station had an injured or sick person there the doctor or nurse could tell them which medicine to use by the compartment number.

Some horrific injuries were treated quite successfully in this way and if the patient got too bad then the Flying Doctor would come out and treat or evacuate the patient. Here was this 'Mantle of Safety' that the Rev. John Flynn had visualised which is still going today with much improved aviation and communications.



**July 16:** The McMichael Rally and Car Boot Sale takes place at the Haymill Youth Community Centre, 112 Burnham Lane, Slough, its regular venue, close to J7 on the M4. It is Berkshire's premier event with many traders present and the ever popular car boot sale, it makes it a good rally to visit. Various local radio clubs and organisations will be present. Bar, food and refreshments will also be available. Talk-in on S22 (145.550MHz). Rally opens at 0930 and admission is just £1.50. Further information from **Dave Chislett G4XDU** on (01628) 625720, E-mail: [g4xdu@amsat.org](mailto:g4xdu@amsat.org) or for trade enquiries and bookings, contact **Min Standon G6JMS** on 0118-972 3504, E-mail: [mins@mstanden.freeserve.co.uk](mailto:mins@mstanden.freeserve.co.uk) You can also visit the McMichael 2000 Web site at <http://come.to/mmr99>

**July 23:** The Colchester Radio Amateurs large Radio & Computer Rally is to be held at St. Helena School, Sheepen Road, Colchester, from 1000-1600. Admission is just £1.50. There will be three large halls, large outside boot sale, Bring & Buy, refreshments, talk-in on S22, disabled access and free parking. For further details look at their Web site at <http://www.g3co.ccom.co.uk> for full information and map.

**August 11:** The 2000 Cockenzie & Port Seton ARC's 6th annual radio junk night takes place from 1830-2130 Venue at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian. Bring along your own junk and sell it yourself. Tables will be provided on a first come, first served basis and there will be no charge for the table. Raffle at approximately 2100. Refreshments available, disabled access. Entry Fee: £1, all money donated to the British Heart Foundation.

**August 13:** The 11th Great Eastern Radio & Computer Rally is to be held at the Park High, Queen Mary Rd, Gaywood, Kings Lynn, Norfolk. Refreshments will be available all day. Talk-in on S22, free parking, Bring & Buy and lots more. Contact telephone number is (01553) 841189. For latest, please see [www.qsl.net/G3XYZ](http://www.qsl.net/G3XYZ)

**August 20:** The Leeds & District ARS are holding the second of their twice yearly car boot sales at the Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. Please contact **J.A. Mortimer M1CAI** on (01943) 874650 for details. It will be a general car boot sale but with Amateur Radio, electronics and computer sections. Sellers' cars (inc. small trailer) will be £5 with vans/large trailers being charged £10. Refreshments and plenty of free parking will also be available.

**August 27:** The Milton Keynes ARS will be holding their 14th fayre and car boot at Bletchley Park Museum. Open to Traders from 0700, £7 in advance, £10 on the day. Doors open to buyers at 0900 and entrance is just £1. Talk-in on 145.550/433.550MHz, refreshments, Morse tests, museum open. For more details contact **Dave G3ZPA** on (01908) 501310 or E-mail: [m0bzk@bletchley.madasafish.com](mailto:m0bzk@bletchley.madasafish.com)

**August 27:** The Coleraine & District ARS will be holding their annual rally at

the Bohill Hotel, Coleraine. Usual traders and Bring & Buy present, doors open at 1200, all welcome. Further details are available from **Brian G18LTB** on Tel: 0287-035 8664 or **Jim G14ORI** on Tel: 0287-035 2393.

**August 28:** Huntingdonshire Amateur Radio Rally takes place at Ernulf Community School, St. Neots, Cambridgeshire (near Tesco Superstore on A428). Open 1000-1400, admission £1.50. Hot and cold refreshments available, features hall and car boot sale on handstanding. Talk-in on S22. Details from **David Leech G7DIU** on (01480) 431333 (between 0900-2100).

**September 3:** The Andover Radio Amateurs' Radio Rally takes place at the Middle Wallop Airfield, near Andover. More information from **Jack G0UJW** on (01264) 391383.

**September 3:** The Bristol Computer & Radio Rally will take place at the Brunel Centre, Temple Meads Station, Bristol. Doors open 1030 (disabled access from 1015) and close at 1600. Admission is £1.50, accompanied children under 12 free. There will be 250+ tables, table hire, £15 each, large Bring & Buy, under £30 Bring & Buy and refreshments. More details from **Muriel Baker, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG** or tel (01275) 834282 (24-hour answerphone).

**September 10:** The Lincoln Short Wave Club are holding their Hamfest at the Lincolnshire Show Ground, on the A15, five miles north of Lincoln. There will be extensive parking, talk-in on 2m (144MHz), catering and refreshments, trade stands, Bring & Buy, car boot sale, flea market, Morse tests and other attractions. Admission is £2 per person (under 14s free). Contact **John G8VGF** on (01522) 525760

**September 10:** The Telford Radio Rally moves to a new unique location at RAF Museum Cosford, Shropshire - 3.2km south on A41 off J3 M54, 32km NW Birmingham. Buy, sell and browse amongst the aircraft. There will be traders, a Bring & Buy, flea market, Morse tests, RSGB & Special Interest Groups, refreshments, disabled facilities and a talk-in on S22. Further details from **Bob M5BWQ** (01952) 770922 or E-mail: [bob@somrob.u-net.com](mailto:bob@somrob.u-net.com) Trader enquiries to **Jim G8UGL** (01952) 684173 or E-mail: [jim@tweedale5.freeserve.co.uk](mailto:jim@tweedale5.freeserve.co.uk) or visit their Web site at: [www.telford-rally.co.uk](http://www.telford-rally.co.uk)

**October 1:** The Great Lumley Amateur Radio & Electronics Society are holding their rally at the Great Lumley Community Centre, Front Street, Great Lumley, near Chester le Street, County Durham, just off the A1(M). There will be free parking, plus easy access, good, inexpensive food and drink, radio, hobbies, electronics, computer, satellite and component stalls, Bring & Buy in two sections - junk and good buys. Doors open 1100 (1030 for disabled visitors). Admission is £1, under 14s free if accompanied by an adult. Talk-in. Further details on 0191-384 2803 or 0208-937 2772 or from Rally Organiser **Nancy Bone G7UUR**, 49 South Street, Durham City DH1 4QP.

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If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.

The Editorial Staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. - Editor

# Electronics-In-Action

Hello and welcome to Electronics-in-Action (EiA). In this session, I ask for help for someone who has lost Edwina Curry, present another method of calculating the inductance of coils and, continue with the design of a simple, cheap power supply unit using a single cheap i.c.



## Can you help?

I've had a 'cry-for-help' from Jim Mulligan who needs some help to either replace, or repair, his Aiwa HR-RS15 headphone radio (see Fig. 1) that has suffered 'storm damage'. He writes "I took my acrylic 'fleece' off over my head while listening to late-night *Radio 5 Live* on a.m. Suddenly, no Edwina Curry (some would say I've done myself a favour). Anyway there's no a.m. reception now, although f.m. is fine". If any reader can help Jim to receive Edwina Curry again late in the evening then please contact me at the office by letter,

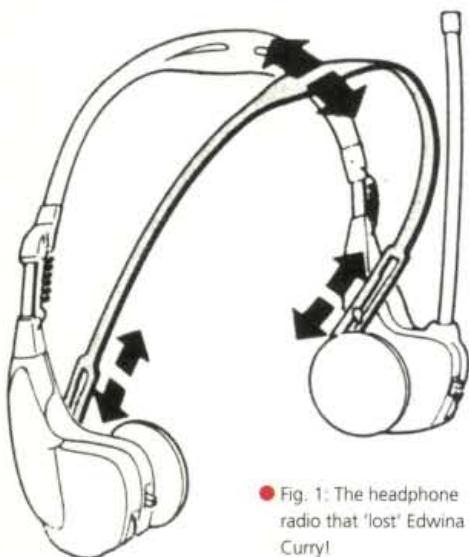


Fig. 1: The headphone radio that 'lost' Edwina Curry!

telephone or E-mail, and I'll let you have Jim's address.

Back in the December 1999 EiA column I mentioned about some of the items I had 'found' at the Leicester show. One of the items was a tuning unit with some rather splendid well made silver plated coils as shown in Fig. 2. At the time, while looking for a formula to determine the inductance of the coil, I mentioned that I had only found Wheeler's formula, an imperial version, when looking through my library.

$$L = \frac{a^2 \times n^2}{9a + 10L} \text{ (}\mu\text{H)}$$

where:  
L coil length (in)  
a coil radius (in)  
n number of turns

Original formula

---

'Metric' formula

$$L = \frac{(a^2 \times n^2)}{25.4(9a + 10L)} \text{ (}\mu\text{H)}$$

where:  
L coil length (mm)  
a coil radius (mm)  
n number of turns

Wheeler's original formula for calculating the inductance is shown above, along with the 'metric' version suggested by several readers. The modification was explained in simple terms in the June EiA column so, I won't elaborate any further. But since then I've had a letter from Ed Chicken G3BIK who says that

some time ago he developed another formula because: as he says in his letter "Earlier formulae by Wheeler et al were notoriously difficult to use, even in their imperial era, hence my article 'RF Coil Dimensions The Easy Way' published in the the December 1994 issue of *RadCom*".

The article by Ed in *RadCom*, contains a 'new' formula as shown below. The article is well worth trying to get hold of

a copy to read. The four page contains tables of pre-calculated coils dimensions, making it easier for those of who aren't confident with algebra. Also, Ed explored the reverse problem that many of us have, and that is: we know the inductance value - but how many turns do we need on a particular former?

$$L(\mu\text{H}) = \frac{(DN)^2}{500(D+2S)}$$

Where:  
D is the inner diameter of the coil (in mm)  
N is the number of turns  
S is the span (or length) of the windings (in mm)  
S is assumed to be at least D/2 in length

Applying Ed's formula, as shown above, to the coils shown in Fig. 2 where the dimensions are: D=28mm, N=12.5 and S=35mm, gave a nominal value of 2.5μH, which agrees reasonably well with the values arrived at by two other methods (one mathematical - one by resonance methods).

## Magazines On CDROM

One of the best parts about having a computer, is that it's possible to have archives of magazines on CDROMs and I've just got hold of the 1999 version of *QST* and *QEX* together on the latest CDROM from the ARRL. If you haven't come across either of these periodicals before then I can thoroughly recommend getting them to read in this way. And from the viewpoint of a very tolerant 'better half', these

Fig. 2: I found two of these coils in an ex-military tuner, picked up at the Leicester show last year.



'magazines' take up far less space.

The monthly magazine *QST* contains news and views of the American Amateur Radio hobby, along with technical articles about antennas and electronics. But *QEX* is the technical and practical side. Billed as 'The Forum For Communications Experimenters', there are many projects, from h.f. to s.h.f., to be found in the six issues of 1999. We will be stocking this CDROM in our Bookstore, but I cannot at present say what the cost will be. But - it's not to be missed at any price!

## Simple Power Supply

In the June 2000 EiA column I mentioned that I would be bringing you a simple variable power supply design suitable for many experimenters. So, as the instructors, during my military days, used to say "Taking you a stage further in .....", well the design I have settled on is a very simple but effective single i.c. design that can be expanded as I'll show you later on. The i.c. that

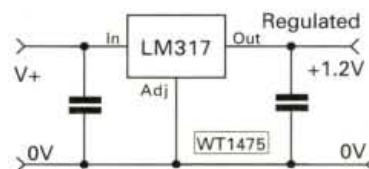
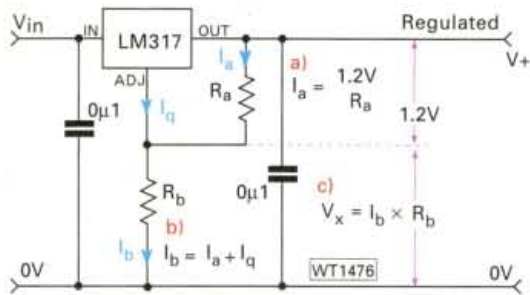


Fig 3: Minimal circuit for a simple 1.2V regulated p.s.u. (see text for more detail).

I shall be using is the LM317T, that has a 1.5A current capability and can withstand a 35V input to output difference.

As I showed in the June EiA, making a variable supply is surprisingly easy, requiring in essence only two resistors. But



● Fig. 4: How to increase the output voltage - see text for an explanation of the terms.

firstly if you have never met the LM317 i.c., it's a regulator i.c. that has a fixed output voltage, as in the skeleton circuit of Fig. 3, but is optimised to be used in the type of circuit shown in Fig. 4. In Fig. 4, you can see that the i.c. still has its fixed output voltage between the 'Out' and the 'Adj' terminals, but now, due to current flowing through the resistor between the 'Adj' terminal and the 0V line, the output voltage of the circuit is higher.

It's easy to calculate the values needed for a simple fixed voltage output which I'll show you how to do first. Forget for a moment what effect the resistor  $R_a$  will have on the circuit, and consider only 'normal' operation as outlined in Fig. 3. A small, but reasonably constant current flows between the 'Adj' terminal and the 0V line. The value of this current seems to be a manufacturer design value rather than a more random thing. I've found values between 500µA and 2.1mA. If a loading resistor is

● Fig. 5: The circuit of the regulator part of a simple cheap p.s.u. See text for resistor values.

placed between the 'Out' terminal and the 0V rail, the value of the small current doesn't seem to change much. So, now we are ready to take these values into consideration.

Look again to the circuit of Fig. 4. The resistor  $R_a$  has a nominal 1.2V across it. (measurements that I've made suggest that 1.25V is more usual) so, a known current  $I_a$  flows through  $R_a$  to join the quiescent current ( $I_q$ ) of the LM317, both flowing through  $R_b$  as the current  $I_b$ . If we know the value of  $I_b$  and  $R_b$  then we know what voltage is across it, and if we know this voltage, then the voltage between 0V and the 'Out' terminal is also known (shown as  $V_x + 1.2V$  in Fig. 4).

### Ladder Network

Rather than use one different resistor for each of the required output voltages, I used a ladder network of resistors, each adding a little to the output voltage, but making it simpler to build as there are only two connections needed for the network. Making it easier to place the switch almost anywhere in the p.s.u. box. The complete circuit of my design, for which I make few claims of originality, is shown in Fig. 5.

But how did I work out the various combinations of resistors

needed? Well I cheated rather and created a 'spreadsheet' on the computer so, that I could make changes and watch what would happen when they were made. The spreadsheet will work on most common computers, but was developed in *Microsoft Excel* on a Macintosh. It will be available as a 'download' from our web site, or from the editorial address if you send in a formatted (Mac or PC) disk to me.

V (nom)	R (calc.)	R (real)	V (real)	Error (V)	Error (%)
1.25	0		1.25	0.00	0.00
1.50	17.48	18	1.51	0.01	0.49
2.00	34.97	33	1.98	-0.02	-1.04
3.00	69.93	68	2.95	-0.05	-1.61
4.50	104.90	100	4.38	-0.12	-2.63
5.00	34.97	39	4.94	-0.06	-1.21
6.00	69.93	68	5.91	-0.09	-1.47
8.00	139.86	150	8.06	0.06	0.71
9.00	69.93	68	9.03	0.03	0.32
12.00	209.79	220	12.18	0.18	1.46
13.20	83.92	91	13.48	0.28	2.09
15.00	125.87	120	15.19	0.19	1.28

● Table 1: Values of R1 to R11 to give known output voltages. See the text for how this table was created using a spreadsheet program on a computer.

For those of you who would like to work out values for other output voltages as shown in Table 1, the steps to take are as follows:

- 1) Choose a value for  $R_a$  that will give a current large enough to 'swamp' out any minor changes in  $I_q$ . I chose a value of 100Ω, but other values will work as well, but may give rather more difficult mathematics (hence the spreadsheet). Measure or calculate the value of  $I_a$ . Set  $R_b$  (both calculated theoretical and the 'real' ones) to 0Ω
- 2) Add  $I_a$  and the measured  $I_q$  of the particular LM317 together and note it down as  $I_b$ .
- 3) Divide 1 by the value of  $I_b$ , to give a constant value (call it 'X') in Ω/V.
- 4) Write down the basic output voltage of the LM317 as shown in the first row of values in Table 1.
- 5) Decide what the next value of voltage is to be (1.5V say) and take it away from the voltage in the row above (1.25) - giving a difference of 0.25V.

- 6) Divide the voltage difference value by the constant 'X' (Ω/V) noted in Step 3. You will have a theoretical value of resistance to be added to the old  $R_b$  (calculated) value to become the new  $R_b$  (calculated).
- 7) Choose the nearest standard value resistor and add this value to the previous  $R_b$  (real) become the new  $R_b$  (real).
- 8) Calculate from the real  $R_b$  the actual output voltage and if it is suitable go to Step 5 and repeat as needed. If it's not suitable try another resistor value and carry on!

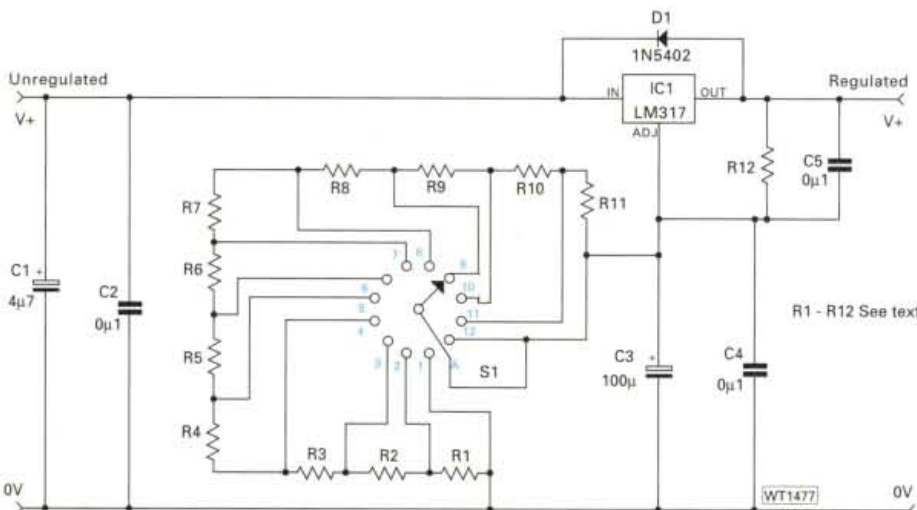
My values of resistors R1 - R11 are 18, 33, 68, 100, 39, 68, 150, 68, 220, 91 and 120Ω respectively, but your values may be very different!

### Made Easier

The whole series of steps is made much easier, by using a spreadsheet, and since Sun Microsystems has recently been giving away *Star Office v5.1a* for *Windows 95/98*, away on several computer magazine front-cover moulder CDROMs, there's no reason for anyone not to have a good spreadsheet program now. I use *Star Office* on my portable PC rather than *Microsoft Office*, which still has a rather high price tag. The files seem to be perfectly interchangeable too.

Well once again, I've come to the end of my space for this session. The p.s.u. project will be taken further next time, where I'll discuss the transformer and smoothing capacitor requirements, and I'll show you how I keep the LM317 i.c. cool with only a small heatsink. Until then - take care!

TESS





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Walter Farrar G3ESP describes his...

# 'WEIRD WIRELESS' MEMORIES

Walter Farrar G3ESP recounts his 'Weird Wireless' memories for your amusement. Perhaps some of them ring a bell with you?



● "His next door neighbours had been out for the day and on returning they sat around the fireplace chatting, when they heard Ron's voice coming from the cold cinders in the grate ...".

**N**o! the title isn't a misprint of 'wired wireless' (now there's a contradiction in terms!) The following notes do, however, describe some strange events which have come to my notice or which

I've experienced over the past half century or more, both in and out of Amateur Radio.

A wartime colleague of mine had previously been working at Moorside Edge, the BBC's North Regional transmitter near Huddersfield. One day, as he approached the entrance gate, he was surprised to clearly hear the radio programme!

Being of a curious disposition he proceeded to investigate. He found that the sound was loudest near the gate hinges which, being rusty, acted as a detector (coherer principle) and the resulting audio frequencies caused mini-vibrations, producing the sound which he heard.

One evening in the 1950s, my friend and near neighbour, **Ron G3US** (unfortunately now a Silent Key), decided to have a go on 1.8MHz 'phone (a.m. in those days). His next door neighbours had been out for the day and on returning they sat around the fireplace chatting, when they heard Ron's voice coming from the cold cinders in the grate. I wonder if the soot in the chimney acted as an antenna?

## Another Occasion

On another occasion, Ron was tuning round on the 28MHz 'phone when he heard our friend **Eric G3GXB** (a Silent Key for many years) calling CQ. Although the distance was only about eight kilometres, the signals weren't too strong, so Ron swung his beam around to get the best signal.

When the QSO was over, Ron glanced at his beam-heading indicator and found that his beam was pointing north-east, whereas Eric was south-west of Ron. Ron then turned his beam to point towards Eric, but could hear nothing, even though Eric was still operating. It appears, therefore, that these two stations (which were so close to each other) made contact the long way round rather than 'off the back of the beam' and 'ground wave'!

Around 1970, my friend **Ray LX1RB** - an engineer at Radio Luxembourg's long wave (l.w.) station had bought a new BMW car with a Bosch electronic engine management system. When he drove it into the station precinct his engine cut out!

Likewise, he found that he couldn't use his 144MHz mobile while on the move, because that

also stopped his engine. Obviously the radio emissions were interfering with Bosch's electronics and it took quite some time before Bosch managed to cure it with filters and screening.

## Holiday In France

In May 1981 I was on holiday in France, as F0DQC/M with my 10W FT-7 transmitter and a base loaded whip antenna. One evening, on a campsite, I was tuning 14MHz when I heard a couple of VK2 mates having a good ragchew.

I waited until one stopped and gave a quick call. One of the stations said he thought someone was trying to 'break in' and invited a further call. This I did and received reports of 55 from each of them. I still fail to fully understand the marvel of how a 10W transmission to a whip antenna two and a half metres long radiating in all directions can break into a conversation so far away (17 000km)! Must have been due to the active sunspots at the time!

Also in the late 1950s I was told that someone was using my callsign on the 7MHz band. One day, tuning around I heard this 'pirate'. Using the club callsign

G3FYQ I made contact with him, but only briefly as he soon disappeared. I've heard of people who talk to themselves, but talking to your own callsign is ridiculous!

Finally, to prove that an army marches on its communications, I recount an incident when I was in the Home Guard in Bournemouth. We were involved in an exercise and we went off to the start in a hired double decker bus.

Being a radio expert (?) I was left at base (the bus) with a WS38 (Wireless Set No. 38) while the others marched off, with the communication in progress. This continued until they went over the brow of a slope, when the signals ceased.

I dashed on to the top deck of the bus and held the little transceiver out through a window, but still no result. I spent a pleasant morning doing nothing until the troops came into view again, when communication by radio sprang into life again. Perhaps a good old megaphone would have been better than the WS38!

I've certainly seen some weird goings on in the world of wireless over the years - but then, that's why we love the hobby so much!

PW

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# Value & Vintage

Ben Nock  
G4BXD returns  
to the *PW* pages  
this month with  
news of an 'On  
The Air'  
birthday 'bash'  
for the T1154  
transmitter as  
well as news of a  
new addition to  
his Eddystone  
collection -  
"What another  
one"? We hear  
you cry!

**H**ello once more and I hope you're all enjoying a great summer, remember, I am writing this in May! This time around there's a birthday party, some classic receivers and the odd military set. The T1154 transmitter was one of the most popular of the war time surplus sets to be used by Radio Amateurs. The set saw its 60th birthday in April and research by **Ray G3IFF** discovered that its earliest use, along with the R1155, was with a flying boat squadron in the Far East back in 1940.

I have several versions of the T1154 but there were actually 13 different versions made, differing in steel or aluminium cases and frequency coverage. But all use basically the same circuit, m.o. (master oscillator) stage, twin p.a. output stage and a modulator stage - four valves in all.

In connection with its 60th birthday a 'T1154 On The Air Day' was organised and to take part I dug out one of my sets, a T1154 model J (see Fig. 1). I'd used this one before so knew it worked OK, again I powered it up and a good output was achieved with the very familiar note on c.w. and the slight drift of the oscillator.

Sacrificing the sacred lamb of originality on the evil altar of stability, I did perform a modification to crystal control my set. With my modification fitted, which entailed placing the crystal in series with the feedback capacitor to g1 of the m.o., the c.w. note was perfect and no drift was evident. The best DX worked during testing was to UA9FLP in Perm, Russia, with a 579 report.

There was an official RAAF (Royal Australian Air Force) modification which allowed the T1154 to be used on crystal control (again discovered by Ray and confirmed by another **Ray VK2ILV**), using Crystal Drive Unit Y10D/500,550. Both Ray G3IFF and I would be interested in hearing of any other known "official" modifications and uses of the T1154 in crystal operation.

The 'T1154 On The Air Day' on April 30th, saw something like 15 sets being activated. Stations in France and Holland, also using the T1154, were contacted, the station at Duxford, GB2IWM, fired up



● Fig. 1: The T1154 in operation for the birthday bash. The 1000V h.t. and 6V l.t. supplies are underneath the set, the RAF 'Ground' or mains supplies couldn't be lifted into position as they weigh too much!

their T1154 and many stations in the UK were worked also. It was a very interesting day and thanks must go to Ray G3IFF, for bringing it about.

If anyone has suggestions for a similar 'Set' On The Air Day' using other military sets then do let me know. I'll be happy to participate in publicity and operation.

## The Eddystone 659/670

Another Eddystone followed me home the other day. I don't know what it is about me but I do tend to get a lot of receivers following me.

This time it was the Eddystone 659/670 version, a rather simple superheterodyne, produced for general listening rather than any "communication" type use. The set even has a position on the bandswitch marked 'G', this stands for 'Gram' and there's a socket on the rear wall where you can plug in a feed from your gramophone.

The set has an odd coverage, 250-550kHz, 1.2-2.75MHz and 6-30MHz in a further two bands. The a.c./d.c. set has seven miniature valves, a push/pull audio output stage and a built-in loudspeaker.

Produced from 1948 onwards, the 659/670 set is housed in the 'A' style case (see Fig. 2), central square tuning window and has only tuning, band, volume and tone with on/off controls. No b.f.o. is provided, even though the set does cover some amateur bands, these are even marked on the tuning scale in blue with broadcast bands being marked in red.

Reception of c.w. or s.s.b. is not possible with this Eddystone, though the i.f. of 450kHz does mean a simple oscillator circuit would solve that problem. The similar 659 receiver used octal valve types and the addition of a magic eye tube and the 659/B had an built-in 6V vibrator p.s.u.

The later Eddystone 670A receiver is a different 'fish'. Now housed in the 'B' style of cabinet, the style that introduced the famous long slide rule type scale. The set still only has four controls, but now covers



● Fig. 2: The Eddystone 659/670 receiver in its 'A' style cabinet.



150-350kHz, 550-1500kHz and 4-30MHz in a further two bands (see Fig. 3).

Produced from 1964, the 670A set has six valves, a magic eye tuning valve, the same 450KHz intermediate frequency, a built-in speaker but is still a transformerless a.c./d.c. set. The tuning scale is again marked for the broadcast sections of the tuning with red lines but now there are no markings for the amateur bands.

Presumably, by the 1960s, there was so little a.m. on the amateur bands that Eddystone designers must have thought we (Radio Amateurs) wouldn't be interested in the set. The 659/670 was also described in Eddystone's advertising as a "Cabin Receiver", used on passenger ships for in cabin entertainment.

The 'baby' series, the 870 and 870A in style 'D' cabinets, were produced for a similar function but at a quarter of the size of the 670 and were far more suitable as 'cabin receivers' (see Fig. 4). This set was also a.m. only, broadcast reception and a.c./d.c. operation, many ships of the period used a d.c. supply of electricity around the boat. (The 870 is from 1956 and the 870A from 1960).

## Embassy Set

Some time back, a reader sent in a picture of a set which, at the time, I didn't know about. Since then I've not only found out about the set but have acquired the various units to complete my own station.

The Mk 119 transmitter and receiver was used in one role as an emergency station for Embassy use. The RX, TX and p.s.u. could be supplied in both air and waterproof containers which could then be buried within an embassy compound say and, in the event of the Embassy being overrun by hostile forces, the sets could be retrieved and assistance called.

I'd acquired a very nice example of the TX and p.s.u., housed in the original test case that was used during development, but it was only recently that I found the right receiver. I then proceeded to manufacture a replica wooden housing for the set, though I do have the burial container for the receiver.

The finished set looks and works very well (see Fig. 5). The transmitter runs about 8W or so, crystal controlled and the single conversion superhet receiver is quite good too.

I later obtained a second transmitter and power unit, from the same source as the first. This TX though has the quite rare option of a.m. with a small modulator being squeezed into an already tight enclosure.

## Telford Rally

The very popular and, up to now, well run **Telford Rally** is moving to **RAF Cosford** for this year's event which takes place on the **10th September**. I hope to put on another display of military related items so I look forward to seeing you there - the added attraction of all that Cosford museum has to offer should make this a very enjoyable day indeed.



● Fig. 3: The Eddystone 670A receiver, modern 'B' styling but the same basic controls.



● Fig. 4: The baby Eddystone 870A (left) and the 870 receivers.



● Fig. 5: The Mk 119 transmitter (top) receiver (central) and (bottom) in the reproduction wooden case.

Well, that's all I have space for this time around. As always I can be contacted at **62 Cobden St, Kidderminster, Worcs DY11 6RP**, or via **E-mail: G4BXD@qsl.net** Or why not have a look at my Web pages at: **www.qsl.net/g4bxd** or **http://ourworld.compuserve.com/homepages/G4BXD/**

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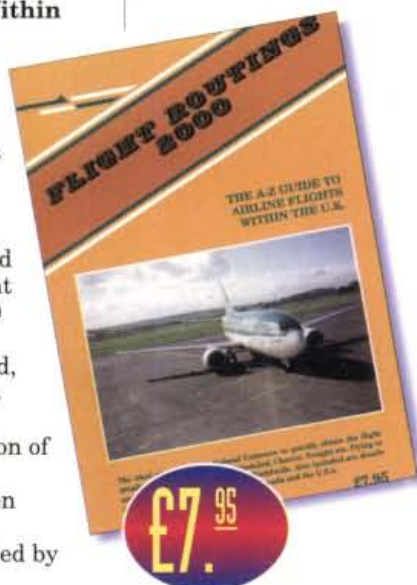
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T. T. & S. J. Williams of use everytime you tune in. *Flight Routings 2000* is highly recommended as a 'must have' book for die-hard enthusiasts.

## Personal Computers in the Ham Shack Paul Danzer N111 & Richard Roznoy K1OF

If you thought this book sounded American in origin - you'd be right, it is in fact published by the American Radio Relay League (ARRL). Compiled as a complementary book to the hobby of 'Ham' radio, *Personal Computers in the Ham Shack* explores the ways in which radio and computers can work in harmony to enhance one another.

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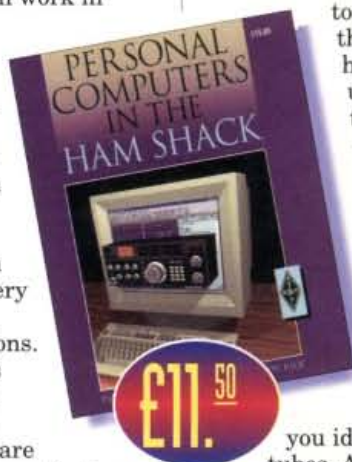
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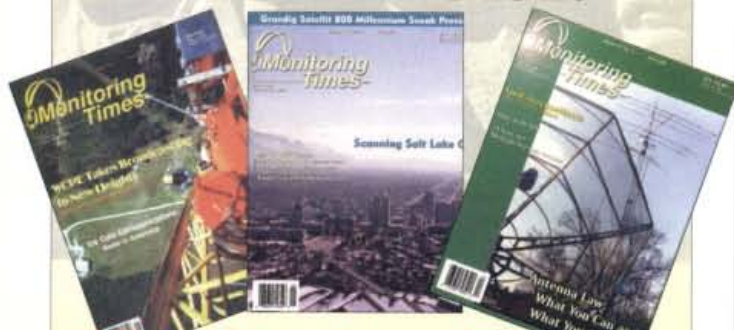
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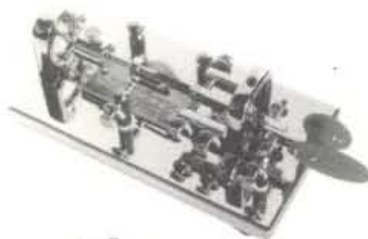
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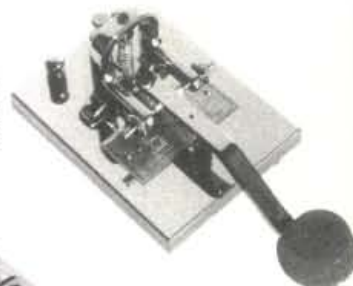
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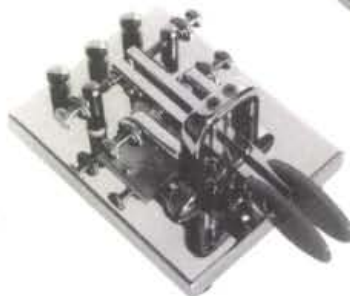
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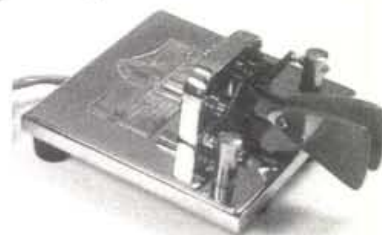
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**AOR 8000 scanner**, boxed, as new, manual, soft case, NiCads, £190. Realistic PRO 204 boxed, as new, £100. Tel: Jim GMB0VF on (01576) 300869.

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**AVO MkIII** valve tester with manual, £50 or offers. 300 plus radio, TV service manuals and circuit diagrams, 1957 onwards, offers. Tel: Harlow (01279) 861125.

**Bargain TX-RX FT-757**, Yaesu 21A p.s.u., Welz SP220, s.w.r. meter, 80m (3.5MHz), home-brew earth tuner, frequency meter F50, 455kHz-30MHz, FET Dip oscillator mag-loop home-brew 7-14MHz, mag-loop home-brew 14-30MHz 3-way antenna s.w., desk speaker, radio tech books. Buyer collects. Tel: North Devon (01271) 343779

**Codar AT5** mains p.s.u. mobile p.s.u. with control switch and Codar T28 receiver, £150. Also Eddystone EC10 (Marconi Marine Seaguide) special model with DF facilities, £150, all working, nice condition. Tel: Staffs (01543) 685694, anytime.

**Collectors items:** Reel-to-Reel tape recorders with tapes. Sanyo portable MR101, handbook. F1 Cord portable in leather case. Philips twin track

EL3541, handbook. Open to offers. Tel: (01625) 260232.

**Cross field antenna** that is, a development from it, the Electromagnetic Delay Line Radiator, model EMDR-1. Can be thrown over a roof or used nearly anywhere, v.g.c. Tel: Stockport (07974) 953018 weekdays after 6pm or pot luck at weekends.

**Cushcraft R5 vertical** 14-30, 1800W, gain 3dB s.w.r., 2.1, 17 feet, 8.7lbs, box, instructions, clean, servicable, no earth, no guys, £100. Tel: G3BWW (01647) 440223, X-Hayes, Moretonhamstead, Newton Abbot TQ13 8NW.

**Dual-band 62in vertical fibre glass antenna**, v.g.c., £25. Wide band pre-amplifier OK for scanner, as new, £25. M/S flight simulator 98 with pilot's handbook in box, £30. Tel: (01709) 850517.

**Eddystone 770R**, 1004A, 990R, 640, 730/4, 870A, Kenwood R1000. GPO u.h.f. radio receiver type 34A. Yaesu FT-221R multi-mode 2m (144MHz), Trio TR-2400 2m hand-held with charger and external microphone. Tel: Newport (01633) 423904.

**Eddystone 830** variant, nice example, £200. Sailor marine synthesised transmitter, power amplifier, £150. Matching g.c. receiver, £150. DX-394 receiver, £80. PRO-2006. Tel: Tony on Worcester (01905) 641759.

**Eddystone 840A**, very nice condition, £75, also 770R MkII and 770U MkII both in good condition, £95 each. KW Viceroy TX, £50. Codar AT5 and p.s.u., £50 also CR70A receiver, £45. PR30 preselector, £28. Tel: (01274) 824816.

**Fairmate HP2 scanning receiver** - v.g.c. boxed with all accessories present, £95 o.n.o. Tel: J. Roberts (01226) 244124.

**Ferograph RT2 test set**, g.w.o. with manuals, classic tape recorder test system, £200 o.n.o. Tel: David Liscombe on (01792) 771579.

**FT-1012D** plus FC-901 a.t.u., plus FY-101Z remote v.f.o., plus desk mic and all manuals. Tel: GMOLYH on (01294) 554141.

**FT-290R** multi-mode, works fb ?? with NiCads, case, spare antennas, packing,

charger, £135 inclusive P&P. Tel: Dave G4EZF on Cheshire (01457) 762799.

**Heathkit HW101 h.f. TX/RX** in v.g.c. with matching HP23A p.s.u., also fist mic, bargain price £90. Buyer collects or pays carriage. Tel: Mike on 0191-389 2822 or (07960) 137617 anytime.

**Heathkit Mohican receiver** 1962 model GC-1U, mint condition. Complete with original manuals, purchase invoice and battery eliminator. Open to best offer or maybe exchange for other radio equipment. Tel: Alan on South Wirral 0151-355 7426.

**Hewlett Packard HP54501A** 100MHz, 4 channel, digitising oscilloscope, g.w.o. with calibration history. No probes or manuals hence £95. Tel: Stuart 0161-973 8876.

**IC-736** h.f. and 6m (50MHz), 100W, the rare model built-in a.t.u., p.s.u. 28V p.a. 1996 used for tests only, as new. Boxed, manuals, inspection welcome, £575 inc carriage. Contact: G3GYE, Westmoors, Trezelah, Gulva, Penzance TR20 8XD.

**Icom IC-725**, £255 with Icom PS55 power supply, Icom AT-100 a.t.u., £140. Chelcom HFV1 80m (3.5MHz) helical vertical 7.2m fibreglass multi-band with a.t.u., £80. All manual Daiwa s.w.r. meter 140-450MHz, £25. Tel: Telford (01952) 251478.

**Icom IC-726** h.f. plus 6m (50MHz), as new, £475. Kenwood TR-9500 70cm (430MHz) mobile/base multi-mode, mobile bracket included, £250. Both transceivers come boxed with manuals, etc., both in g.w.o. Tel: Alan on South Lincolnshire (01507) 6004473.

**Icom IC-728** h.f. transceiver, Watson W-30 a.m. 38A p.s.u., MFJ-9450 a.t.u., £580 o.n.o. Tel: (01376) 324808.

**Icom IC-746 transceiver** in mint condition, £995 o.n.o. Or swap for WHY? With cash adjustment either way. Prefer buyer to collect or pay fuel cost and I will deliver. Tel: Barry M0APO on Bradford (01274) 880895 or (07720) 729308 (mobile).

**Icom IC-07E** unused with box and instructions, £100. Tel: Leamington Spa (01926) 421028, evenings.

**Icom IC-R7000** communications receiver, immaculate condition with remote and manual, fully operational, 30ft cable with colinear antenna, fibre glass scanner books, £300 o.n.o. Tel: Len G0UGZ on Plymouth (01752) 261269.

**Icom IC-R7000**, brand new condition with manual, antenna and scanner books, price £300. Tel: Len G0UGZ on Plymouth (01752) 261269.

**Icom PCR-1000** with PC pentium 333 plus radio software, £500 o.n.o. or exchange trans/receiver g.c. h.f. Tel: (01905) 756472.

**Icom SM8** desk mic, £57. Icom 5L5LA 500Hz filter, £75. Icom FL-100 500Hz filter, £40 or swap for Yaesu FC-757 auto a.t.u. prices include postage. Tel: G4SNC on 0287 776-8250.

**JRC receivers** type NRD-1EL and NRD-3D, these are marine receivers main and auxiliary, both in v.g.c. with manual, £150 o.n.o. for both. Yaesu FR-400SDX receiver, v.g.c., boxed, £75. Tel: Pete on Bristol (01454) 882465.

**Kenwood MC435** mic, new, boxed, unused, £16. Kenwood DFC-230 digital frequency control with manual, £20. Collins TCS TX unit, original as removed from service (no leads or p.s.u.), best offer. Tel: Clacton-on-Sea (01255) 435700.

**Kenwood TH-78E** 2m/70cm (144/430MHz) hand-held with extended receive and DTMF messaging, boxed, charger, spare battery and antenna, £100. Tel: Tim G7KGM on Swindon (01793) 740786.

**Kenwood TM-255E** multi-mode 40W, 100 memories, CTCSS, 1200/9600 Packet, auto-mode change, i.f. shift, RIT, NB, AIP, dealers price £350, first £200+ offer accepted, buyer collects. Tel: Burnham-on-Sea (01278) 786134.

**Kenwood TS-140S** with original packaging/manual/box plus an MC-60 and Yoga 184 light-weight headset with microphone boom, v.g.c. tests are welcome, £400 - may part exchange for a colour PC monitor with cash adjustment. Tel: (07790) 948971 (mobile), East Fife, Scotland.

## FREE ADVERTS

Now's your chance to send in a photograph of your equipment (a good idea if it's really unusual) to accompany your advert. Please note that all photos will only be published at our discretion and are non-returnable.

When sending in your advert, please write clearly in BLOCK CAPITALS up to a maximum of 30 words, plus state your contact details. Please use the order form provided.

**Kenwood TS-51E** all-mode transceiver with mobile bracket, manual, £250, Trio SM220 with pan adapter and manual, £250 o.n.o. Tel: (01482) 603489 day or (01482) 896471 evenings.

**Kenwood TS-570DG**, new October 1999, mint condition, fitted with narrow s.b. filter, £625. Tel: Douglas on Norfolk (01263) 512664.

**Kenwood TS-820** transceiver, g.w.o., manual, very good first rig, £250 o.n.o. Tel: Rich G4ZDG on Coventry 0247-660 2835 after 5pm please.

**Leak stereo** 20 valve amp, £195. Troughline tuner, £65. KT88 valves from £25. 80m (3.5MHz) Command set with p.s.u., £39. Tel: (01274) 824816.

**Linear Amp UK Ranger** 811H, 18 months old, little use. Four spare valves, £700 o.n.o. Buyer collects, can be seen working. Tel: (01874) 623434.

**MFJ-8100K** world band radio. Five tuneable bands 3.5-22MHz. Twin earphone or L/S outlets. Built from kit in excellent working order, s.s.b. and a.m. £60 ideal for beginner. Tel: John on Kent (01634) 401159.

**One valve receiver**, slow drive, denco books, coils, spare valves, p.s.u., £60. PV vintage wireless pilot issue, £5. CW1308 cable 78m, 20 pair £60. 94m, 10 pair, £40, v.g.c. o.n.o. Tel: Phil on West Midlands (01902) 843447.

**Pye 131 MBQ radio**, tidy, working, also Q3 transceiver Hacker Herald. Bush v.h.f. 80c chassis with valves, working, any reasonable offers, buyers to collect please. Tel: Chester (01244) 310267.

**RAF h.f. a.m./c.w. transmitter** T1509 approximately 1948 in magnificent gleaming original condition. Used regularly and complete with control unit and airfield candlestick microphone. 2 x 813 p.a. and 2 x 813 in modulator. Transmitter measures five feet tall on castors. Ready to use, £550 or consider suitable swap. Tel: Jim G4XWD, QTHR, (01692) 630285.

**Receivers:** Icom IC-R70, £240. Yaesu FRG-9800 plus v.h.f., £250. Drake SW2 d.c. p.s.u. remote control bright 15mm l.e.d., £230. Tel: Richard G3JAX, QTHR, (01243) 574210.

**Shack pre-voice cleartalk!** Items from June reduced, s.a.e. for lists, mention any item sought. Details of two bed hilltop QTH (with planning permission) and adjacent house needing d.i.y. modernisation, by post. No dealers or developers! Tel: Stockport (07974) 953018 weekdays after 6pm or weekends.

**Silent key G0LLK safe:** Two magnetic loops with control box, £125. FRG-7700 communications receiver with memory unit converter x2, £249 99. TR-9130 2m (144MHz) all-mode transceiver box,

£249.99. Ten-Tec OmniV with power supply £1150. Hameg oscilloscope HM2035, £125. All in good working order. Tel: Bicester (01869) 44166 or (0403) 893433.

**Silent key sale G4RGJ:** FT-902DM, FC-902, SP-901, IC-2E, TR-9000, FT-730R, Datong FL3, telescopic antenna mast, various antennas, 1000s of junk box items, p.s.u.s and miscellaneous units. Tel: G6FRB, QTHR, on Worcester (01905) 421182.

**Standard C528** 2m/70cm (144/430MHz) hand-held transceiver/scanner to 900MHz, hardly used, £120. Kenwood RZ1 wideband 500kHz-900MHz digital scanner a.m./f.m. all-mode scanner 5, 12.5, 20, 25, 25kHz steps, as new, boxed, £150. Tel: John on Dorset (01258) 830688.

**Strumehc Versatower** three section, 8.2m mobile antenna with built-in lister diesel generator, 12V and charger on galvanised chassis, landrover wheels built-in amplifier, only used once, is brand new, serious offers only. Tel: Notts area (01623) 836787, after 5pm.

**Target HF3** communications receiver, boxed, with handbook, v.g.c., £60 plus postage. Tel: Ray Barnes GOVZF (01684) 299420.

**Tower Western Electronics** heavy duty 120ft Westower 3 section tilt-over with

rotator, winches, 4-element tri-bander, £950 o.n.o. Also Hewlett Packard 10Hz-18GHz frequency counter 5340A, £100. Tel: (01507) 527086.

**Trio TR-7500** 10W, 2m (144MHz) transceiver, good order, £65. SEM QRM eliminator, new, £50. Palstar AT300 a.t.u., £60. Yaesu FT-707 a.t.u., £65. Tel: (01663) 744087.

**Trio TS-700** multi-mode base rig for 2m (144MHz), £150. Cushcraft R7000 vertical antenna, £180. Trio AT-180 a.t.u., £130. Morse Matic memory keyer, £40. Tel: G4FIF on West Midlands (07941) 265896.

**Trio TS-811** 70cm (430MHz) u.h.f. multi-mode transceiver, £300 with drivers, manual. Microwave modules MMT 50/28S transverter 10m (28MHz) to 6m (50MHz), £150. Tel: Lanarkshire (01698) 748616.

**TS-711E** 2m (144MHz) multi-mode base station (built-in power supply), perfect condition, as new, £310 plus postage. Tel: Mark G4YRY on Bournemouth (01202) 418801.

**Two vintage** household receivers. Invicta model No 31, all-band. Pye P75A, £15 each. Tel: David on South Birmingham 0121-427 1788.

**World receiver Yachtboy 400**, boxed, antenna, manuals, two months old, £85

including postage. AR-108 air band scanner boxed, manual, as new, £35 including postage, hand-held. Tel: John (01634) 401159.

**Yaesu 736R**, 6/2m/70cm (50/144/430MHz), new October 1997, excellent condition and includes three element 6m and eight element 2m beams, manual and boxes, collect please, all inclusive at £875 o.v.n.o. Tel: Keith M1ADQ on Derby (01332) 728926.

**Yaesu 840** v.g.c., £475, would take £300 and an FT-290 as Part Exchange. Also model Engineer Lathe, old but works well, 15" centre 4.5 swing 3 and 4 Jaw Chucks screw cut reversing, £250. Tel: Dave Clifford G0NVF on Merseyside 0151-639 5922.

**Yaesu FRG-7** analogue h.f. RX, 1 s.b., u.s.b., c.w., a.m. manual and a.t.u., £120. JFAX demodulator for ACARS, POSAG, PACKET, SSTV, etc., receive on 486 PC, £30 all include postage. Tel: (01608) 682488.

**Yaesu FRG-7** communications receiver, digital readout, not original box, instructions, circuit instructions, p.w.o., £185 - this includes postage and insurance. Tel/FAX: Bill (01524) 833748.

**Yaesu FRG-7700** 150kHz/29.9MHz plus FRT-7700 antenna tuner, instruction manual, v.g.c., £175. Tel: Chesterfield (01246) 568541.

**Yaesu FT-290R** MkII with 25W clip on amplifier, boxed and recently serviced, good condition, £240. Tel: Colin (01932) 789517.

**Yaesu FT-51R** dual-band with air band, £230. Yaesu FT-690Rii all-mode with Amp, £295. Alinco DR-150E mobile, 50W, £190. DX394 short wave receiver, £99 all boxed and mint. Tel: South Lakes (01524) 761657.

**Yaesu FT-726R** 2/6m (144/50MHz) and 70cms (430MHz) multi-mode base transceiver with sat board, mint condition, £525. FT-990 100w h.f. TCVR, auto a.t.u., mint condition, Rolfs Royce of h.f., £725. FT-290 MkII multi-mode 25W linear, mint

condition, box, manual, £200. Tel: Grant MIMOCUG on (01224) 712370 or E-mail: cug@clara.co.uk

**Yaesu FT-736R** v.h.f./u.h.f. transceiver, 6m (50MHz), 2m (144MHz), 70cms, (430MHz), MuTek front-end on 2m and 70cm all-mode, shack use only, v.g.c., £575 o.n.o., buyer collects. Tel: Bob M0BOB on Romford (01708) 703865.

**Yaesu FT-901D** all modes 100W transceiver, 80-10m, (3.5-28MHz) excellent condition, £230. Sommerkamp 480R, all modes, 2m (144MHz) transceiver, £150. Both rigs very light use. Tel: MOBEV on Liskeard (01579) 344935.

**Yaesu FV-707DM** external v.f.o., mint, boxed, plus instructions, £50. Tel: (01495) 757221 or E-mail: bev.west@virgin.net

**Yupiteru MVT-3300** in box, professionally built, includes earpiece, stand and warranty, only out of box twice, reason for sale: lost interest, £130 o.v.n.o. E-mail: s surgeon@compuserve.com

## Exchange

**Altai KDM-6** dip meter, new, boxed with all coils and instruction manual. Plus metal detector exchange for multiband h.f. vertical antenna or Shure 444 desk microphone, etc. Tel: (01254) 832350.

**Nitro radio controlled buggy** New in box, complete with radio control, Thunder Tiger Twister exchange for dual-band hand-held transceiver, value £299 approx. Tel: Warwick (01926) 450664.

**Racal 1792** mint condition, value £1000 for Leica M6 or Contax G2, must be new. T. P. McClelland, 17 Thompson Davis Street, Inchicore, Dublin 8, Ireland.

**Sealey 150A MIG welder**, two large bottles of CO2, regulator and wire, ready for work worth £300 will take Yaesu FT-101ZD or TS-770E multi-mode. Tel: (01254) 832350.

**Yaesu FT-23R** 2m (144MHz) hand-held, good condition, two NiCad packs, one dry cell case and charger. Icom IC-2H, 25-40W mobile 2m transceiver, exchange for goof h.f. transceiver. Tel: Greg on London 0207-336 0622.

**Yaesu FT-726R** h.f. module for 50MHz module. Tel: Leeds 0113-250 0975 or mobile (07720) 733705.

Northern Ireland BT51 3ES. Tel: 0287-034 3793.

**Heathkit kit HW8**, QRP TX/RX in good condition please. Tel: (01474) 833982 or E-mail: maurice.baldwin@talk21.com

**I am after any test cards** for a Mullard high speed valve tester. Write to Mr Greenway at 47 Lincoln Green, Bushbury, Wolverhampton WV10 8HW.

**Manual or photocopy** for Grundig Sat 3400 and Sony CRF 160, also wanted *SV Receivers Past and Present* 1st or 2nd edition and manual for Akai M7 reel-to-reel. Tel: (01626) 872508.

**Manuals for Grundig Sat 3400** and Sony CRF-160, photocopies OK, also s.w. receivers past and present, 1st or 2nd edition. Tel: Devon (01626) 872508.

**Newly formed Suffolk Club** requires donated Top Band transmitter hollow state (valve) or transistorised, as teaching aid, circuit diagram/notes would be very useful. Postage refunded. Please write to V & L Club (Bungay), 85 Hill Side Road West, Suffolk, NR35 1RH.

**Pye or Philips DF85** batteries and charger also any old Pye equipment, PF2/PF8/reporter, etc. Tel: (07979) 337175.

**Quad II amplifier** mains trans and choke, 110V or 230V a.c. input. Also information on Resto 510/3 amplifier, circuit diagram or manual. Tel: Bill on Glasgow 0141-562 4571.

**R1155** a.m. identification serial number plate from below dial tuning knob. Ron, 175 Englands Lane, Loughton, Essex IG10 2NS. Tel: 0208-508 2306.

**Separation kit** for Icom IC-706 MkII G, MB63, OPC-581 i.f. (available MB65) but not important, also UT-102 voice synthesiser unit. If you can help Tel: Bill (01684) 295770 or (0794) 6103383.

**Trio R820** cash waiting. Tel: Mike on 0161-681 3209.

**Valve test unit**, prefer Mullard but will consider others, must be working condition. Tel: Steve G8EBM, QTHR, on (01335) 360755 or E-mail: G8EBM@compuserve.com

**Very good quality**, v.g.c. mains battery, twin deck, auto reverse cassette player. Tel: Mr Grayton (01474) 359560 8am-8pm.

**Yaesu FC-707** a.t.u. to match my FT-707 TX/RX. Must be in good working condition. An FC-700 would be OK, but prefer type FC-707 if possible. Tel: Peter G3TZV, QTHR, on Stockport 0161-442 5901.

**Yaesu FT-1000** and ATAS100 a.t.u. & ATBK100 base kit. Selling Yaesu FT-757GX1 and FC-757 auto a.t.u., £350 the pair o.n.o. Yaesu FRG-9600 with u.h.f. conversion, just serviced, mint, £250. Tel: (01903) 859712, anytime.

**Yaesu YM-40** hand-held mic part M3090028 for FT-70R. Icom SM5 or HM-10 mics for IC-2900 or standard Icom hand mic, also original Trio mic fro TR2300. Tel: Richard Perzyna G8ITB, QTHR on Bromley (01689) 602948.

**Yaesu YVM-1** video monitor 70TV 4m (70MHz) module for FTV-901R transverter. Also wanted non-working Yaesu FT-980 for spares, please help. Tel: Bob (01667) 455338 or E-mail: gm7boc@tinyworld.co.uk

## Wanted

**70MHz transverter** 144 or 28 drive. Tel: (01983) 296924 or E-mail: g7svf@qsl.net

**Air band scanner** quality g.w.o. unit to upgrade from my Air 7 quality scanner up to AR-8200 fine portable preferred please. Tel: Graham on Bracknell (01344) 427881 or E-mail: graham.long@hitachi-eu.com

**AM filter YF112A** for Yaesu FT-840 and perhaps other rigs. Tel: Tony G3PTD on Stretford 0161-865 9398.

**Any military type** sets to add to collection, have tiny amount of space left so need to fill it! WWII or later, can swap sets or will purchase such. Tel: Ben G4BXD, on Worcs (01562) 74325 or E-mail: G4BXD@qsl.net

**Collector seeks** all teleprinting related items, eg: Hellschreibers, Teletypewriters, terminal units, auto transmitters, reperforators, distortion sets TD110 TDM56, coders TDA-10, spares, Jones/Painton connectors, rolls, tape, operating manuals, books etc, all considered. Tel: (01482) 887938.

**Collins 'S' line receiver**, must be in mint condition. 18 Set transmitter and case or full set. 19 Set power supplies and variometers. Tel: (01274) 824816.

**CR100** to complete restorations. I need front ID plates for 828, CR100/4 and CR100/2 versions, also complete CR100/8 in good condition. Colin Waters G3TSS, 1 Chantry Estate, Corbridge, Northumberland NE45 5JH. Tel: (01434) 633125.

**CTCSS unit** for Rexon RL102 v.h.f. hand-held transceiver part no RTN100. Tel: Steve G7CAF, QTHR (01524) 416711 or (07773) 607409.

**CW filter Y3395C** for Trio TS-520. Tel: (01427) 611160.

**Eddystone 680** with half moon dial NDT 608X. Also 710 'All world Six', 859 not 659/670, 888 not 888A (see serial plate). Can you help? WHY? Tel: Simon

G8POD, QTHR, (01434) 633913 or E-mail: simon@nomis.co.uk

**Eddystone 888A** and EA12, mint condition preferred but willing to look at any condition, will pay top price for mint. Also want Icom EX-627 antenna switch and Icom SP-20 speaker. Tel: Steve G8EBM, QTHR (01335) 360755 or E-mail: G8EBM@compuserve.com

**Eddystone EC10**, must be v.g.c. and f.w.o. Tel: G3XBE (not QTHR) on Notts 0115-970 4184 (leave message if answerphone).

**Eddystone models 504, 556, 659** or other early models, any condition. Please call with price and details. Also wanted dial for S840, handles for 680, any scrap chassis. Tel: St. Albans (01727) 839908.

**Farnell DTC 12** oscilloscope. Mains transformer and service manual required. Will consider non-working 'scope with serviceable transformers, reasonable price and postage paid. Tel: Harlow (01279) 420969.

**FT-225RD**, any condition considered. Also copy of the repair, maintenance manual for this rig. Original or photocopy OK. All expenses paid plus. Tel: Geoff G4DED, QTHR on (07931) 528269.

**Good ex government** 50uA flanged meter preferably water resistant about 3in dia. Contact John Liming, Great Green Farm Bungalow, Rectory Lane, Bunwell, Norfolk NR16 1QU.

**Grundig** old valve table radio, model New Marlborough No 3365 with triple speaker made approx 1965. Also wanted, Philips mains radio l.w./m.w. short v.h.f. stereo transistor, model No. 561AT teak cabinet. H. McCaillan, No8 Strathard Close, Coleraine, Co. Londonderry, Northern Ireland BT51 3ES. Tel: 0287-034 3793

**Grundig short wave** radio, model 300 satellite made 1984. Also Pye valve radio model international No 3042 or Pye seafarer model no 1112 or Bush VHF 64. H. McCaillan, No8 Strathard Close, Coleraine, Co. LDerry,

# RadioScene

## VHF REPORT

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

DAVID BUTLER G4ASR  
YEW TREE COTTAGE  
LOWER MAESCOED  
HEREFORDSHIRE HR2 0HP

TEL: (01873) 860679

E-MAIL: g4asr@btinternet.com

THIS MONTH DAVID BUTLER G4ASR HAS REPORTS OF SOME MARVELLOUS SPORADIC-E OPENINGS ON THE 50 & 144MHz BANDS.

DAVID BUTLER G4ASR  
SAYS THERE WERE  
SOME MARVELLOUS  
SPORADIC-E OPENINGS  
ON THE BANDS IN MAY.

Conditions on the v.h.f. bands were quite good during May - there were a number of days when tropospheric propagation was sufficiently enhanced, allowing contacts to be made from the UK into central and southern Europe. Sporadic-E (Sp-E) and trans-equatorial propagation (t.e.p.) was also prevalent on the 50MHz band with numerous contacts being made around Europe, Africa, Asia, South America and North America.

Towards the end of May there was a three day period when the Sp-E ionisation was very intense indeed and many UK stations were able to make DX contacts on the 70 and 144MHz bands with stations in excess of 2000km away. For some very lucky stations, s.s.b. contacts were also made with Albania on the 144MHz band - exceedingly rare indeed!

First let's take a look at what's been happening via tropospheric propagation, first report is from David Dodds who was active as GM4WLL/P (IO85) during the RSGB 144MHz contest held on May 21-22. Running a Trio TR-9130 transceiver, a Microwaves Modules 200W solid-state amplifier and an 8-over-8 Slot Yagi, he made 174 contacts with stations in nine countries.

David GM4WLL/P mentions that the propagation conditions seemed rather variable with one solitary tropospheric opening being encountered around 0715UTC on May 22. This was the only time during the weekend that he heard, or worked any continental stations.

Amongst David's furthest distance contacts were the stations of DG6JG/P (JO33) at 703km, DL1EJA (JO31) at 747km and best DX of the contest, ON4PSP (JO20)

at 778km. He was also pleased to hear activity from some of the UK islands including GD4GNH on the Isle of Man (IO74), GU3EJL on Alderney (IN89), GM3WOJ on the Black Isle (IO77), GM0HTT on the Orkneys (IO89) and MM0CCC/P on the island of Tiree (IO66).

Coincidentally, John MM0CCC has also sent in a report of the contest and he mentions that the Cockenzie & Port Seton ARC has for the past two years established the Isle of Tiree (IO66) as a venue for the Islands on the Air (IOTA) h.f. contest held in July. Each May, members of the club visit the island to confirm that the h.f. site is still available and this year John decided to take some portable 144MHz equipment for the contest weekend.

The equipment had to be lightweight as it was all carried over on the ferry in a backpack or strapped on his bicycle and included a Trio TR-751E transceiver, a Tokyo Hi-Power HL110V solid-state amplifier, a Morse keyer and paddle, 35m of Westflex-103 feeder and an 8-element Jaybeam Yagi. Fortunately, Tony GM3PGY, the island's only resident amateur, provided the battery and portable mast!

Conditions during the contest were slow going, after the local station of GM4WLL/P (IO85) was contacted at a distance of 258km, other stations proved more difficult to attract. A total of ten QSOs were made in the first three hours, reaching a final count of 22 by the end of the 24-hour event.

Tiree is a long, long way from any significant v.h.f. activity and even contacts into central England are approaching a path of some 600km! Due to the very low signal levels, the majority of contacts were

made on c.w. - the most practical mode to use in this case.

The best DX contacts included G0VHF (JO01) at 701km, G0KPW (JO02) at 710km and G4MJS/P (IO90) at 754km. Keep your beams to the north later in the year as John expects to be active from the Isle of Mull (also in IO66) for the RSGB 144MHz Trophy contest in September.

## THE 50MHz BAND

Turning to the 50MHz band and after many months of spasmodic conditions, things have finally taken a permanent turn for the better. During most days in May, the band was open via Sp-E propagation enabling contacts to be made with stations throughout Europe - some of the more interesting included C31HK, OX2K, TF3MLT and ZA/N7BHC.

On occasions, multi-hop paths existed into the Middle East and other parts of Asia with stations such as OD5PN, JY9NX and 4X1IF being worked. Trans-equatorial propagation (t.e.p.) was also observed on many days during the period allowing contacts to be made into Africa and South America.

The number of countries worked was quite spectacular, among the African DX was FH/TU5AX, FR5DN, TR8CA, ZD7VC, Z22JE, 5A1A, 5R8EE, 7Q7RM, 9J2BO and numerous ZS6 stations. From South America and the Caribbean area were CE3SAD, CX1CCC, J37LD, KP4EIT, LU8MB, PY5CC, VP8CMT and ZP5AA and that's just a snippet of the DX available.

Twelve-year old Christopher Young 2W1HUK (IO81) has written in with a report of activity from his QTH in Swansea. He's using a Yaesu FT-847 transceiver and a 5-element Yagi and within two months of receiving his Novice licence, he had contacted 18 countries on the 50MHz band.

Christopher's contacts include Argentina (LU), Bulgaria (LZ), Jordan (JY), Malta (9H), Namibia (V51) and many of the more common countries throughout Europe. By the time you read this he expects to have an A/B licence call sign as he took the RAE in May and is hopeful of a pass.

Over to the 'Emerald Isle' now and this report came from Martin Power EI5FDB (IO62) who has just become active on the 50MHz band. He's using an Icom IC-756 transceiver and a 4-element Yagi at 15m above ground level (a.g.l.).

On Sunday May 14 Martin called "CQ" on what seemed to be a dead band but within a two hour period he had worked 47 new locators squares in IM, IN, IO, JO, JP and KO fields. A total of 11 new countries (DL, EA, EI, ES, G, GW, I, OZ, PA, SM and SP) were worked with reports of up to 59 both ways!

Also active on the 50MHz band is Howard M1EOL (IO81) who mentions that he's using an Icom IC-706 MkII G transceiver running 50W into a Halo antenna (constructed by G0WJR) located in the loft space. (A

Halo, by the way, is an antenna that can be likened to a dipole formed in a circle - it gives omni-directional coverage with horizontal polarisation but doesn't exhibit any gain).

On May 27, during an excellent Sp-E opening, Howard made s.s.b. contacts with ten stations in DL, I, OK and SP. On the following day he decided to operate portable from a local hilltop close to his QTH near Bristol using the same equipment and the Halo antenna he discovered that the band was open again allowing contacts to be made into southern Europe. Howard's s.s.b. contacts included twenty Italians, a Croatian contest station, 9A0C, and 9H1XT on the island of Malta for his best DX at 2194km.

Andrew G8GNI confirms that the Bank Holiday period, May 27-29, produced some excellent Sp-E propagation on the 50MHz band. From his QTH (IO92) many contacts were made with stations located in Austria (OE), Croatia (9A), Czech Republic (OK), France (F), Germany (DL), Italy (I), Poland (SP), Slovakia (OM), Slovenia (S5), Spain (EH) and Switzerland (HB9).

As an experiment, Andrew turned his transmit power down to 5W output (into a 3-element Yagi) and successfully contacted ten countries with genuine 59 reports. He mentions that, on a number of occasions during the period, the skip distance on the 50MHz band shortened considerably enabling contacts to be made from his QTH in central England to stations in Scotland, central France, northern Spain and northern Italy.

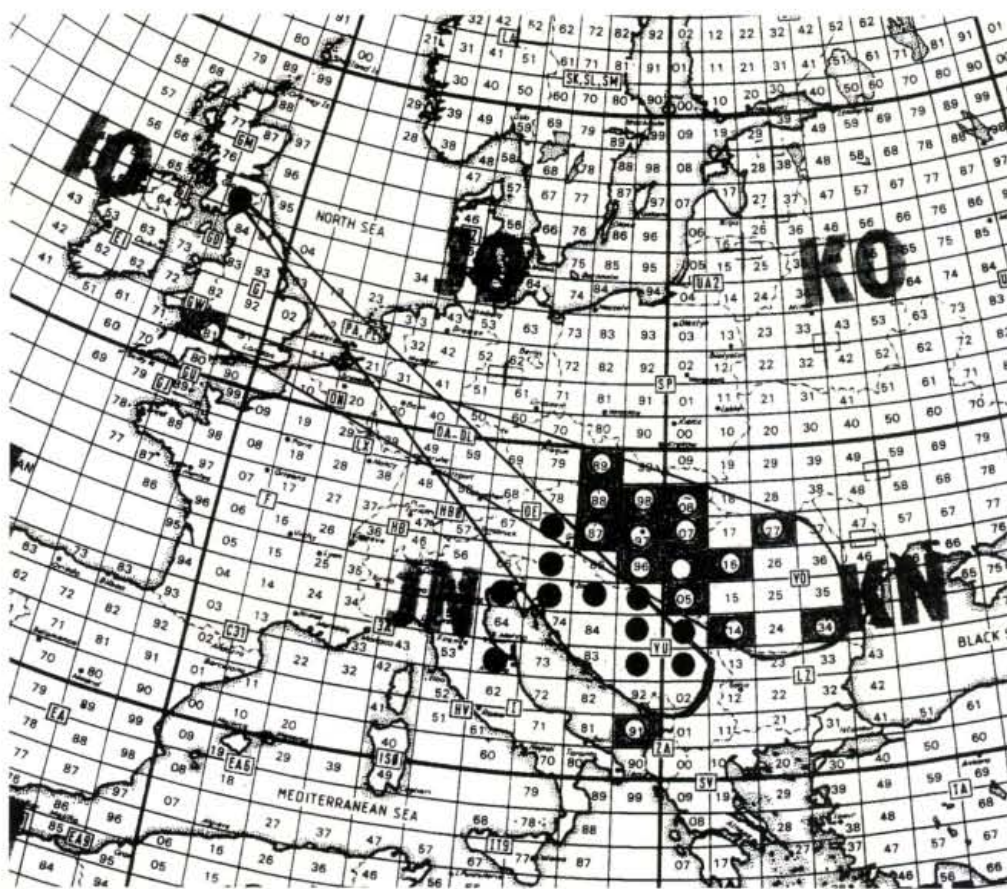
A shortening of the skip distance is a good indication that the maximum usable frequency (m.u.f.) is rising with the possibility of Sp-E contacts being made on the 70 and 144MHz bands. Indeed, Andrew was very pleased to work OY9JD crossband, G8GNI transmitting on 70MHz and OY9JD replying on the 50MHz band. (Andrew was running 25W on the 70MHz band into a 3-element Yagi and received a 55 report.)

Another station making crossband 70/50MHz contacts was Bill McDowall GW6ZMN (IO81). On the 70MHz band he uses a Yaesu FT-707 transceiver, an RN Electronics transverter and a 100W Microwave Modules amplifier running into a Sandpiper dual-band (3-elements on 50MHz/4-elements on 70MHz) Yagi and recent s.s.b. contacts have included OY9JD on May 29 and IK0OKY on May 31.

## THE 144MHz BAND

Because of the intense Sp-E ionisation over May 27-29, Sp-E contacts were made from the UK on the 144MHz band, a relatively rare occurrence. It's good that these openings took place during the Bank Holiday weekend as more operators were able to enjoy them.

Three openings took place on May 27, the first being between 1200-1230UTC to Bulgaria (LZ), Greece (SV), Romania (YO) and Yugoslavia (YU). The second



**Fig. 1: Map illustrating Sporadic-E contacts on the 144MHz band from the QTH of David G4ASR (IO81) and Ray GM4CXM (IO85).**

opening was between 1530-1600UTC with contacts being made into Poland (SP), Romania and Ukraine (UR).

The third event of the day (and the most intense) occurred between 1630-1830UTC (depending where you were located). This time there were contacts made into Croatia (9A), Czech Republic (OK), Greece, Hungary (HA), Italy (I), Macedonia (T9), Poland (SP), Romania, Slovakia (OM), Slovenia (S5), Switzerland (HB9) and Yugoslavia.

Last month I mentioned that **James 2E1EMK** (a Novice callign for the benefit of our non-UK readers) found it difficult to make auroral contacts on the 144MHz band with low power. He uses a Trio TR-9130 transceiver running 10W into a 9-element F9FT Yagi at 10m above ground level.

During the auroral opening on April 6, James called a number of stations but failed to get any replies. There's probably two reasons for this: firstly, the effective radiated power (e.r.p.) from a 10W transmitter and a 9-element Yagi is very marginal for this type of weak back-scatter propagation.

The use of c.w. is much more effective than s.s.b. during auroral openings, however, the opposite is true when making contacts during Sp-E openings. Signal strengths can be enormous and it's possible to make many long distance contacts when using low power - also, the use of s.s.b. will be much more effective as it will speed the completion of the QSO and that's exactly what you want with signals that can disappear very quickly.

During the opening on May 27, James was very pleased to make

contact with three countries with his low power 144MHz equipment and his s.s.b. contacts included the stations of HG9MET, IK7UXY and OK2PTC/P. He mentions that during Sp-E openings his low power equipment achieves much better results on lower frequencies on the 50MHz band, he uses an FT-650 transceiver running 10W into a 3-element Yagi and recent contacts on the band have included OX2K (Greenland) at 59 both ways, ZD7VC (St. Helena) and 9H1XT (Malta).

"This is the best Sp-E opening I've caught since first becoming licensed" exclaimed **Jamie GW7SMV** (IO81). He uses an Icom IC-275H transceiver into an amplifier running 400W from a pair of 4CX250R tetrodes and a 10-element Yagi.

During the afternoon event Jamie worked a number of stations, the best DX being UR5BAE (KN29) at 2020km and YO5BEU (KN27) at 2050km. The evening event, from 1700UTC, was phenomenal with many s.s.b. contacts being made with stations located in HA, I, OK, OM, SP and YO.

Was your favourite v.h.f. columnist on the air? Yes, I was and I'm pleased to report that I was active for most of the Sp-E openings on May 27.

At my QTH in Herefordshire (IO81) I heard UK stations on the south coast calling SV and YU stations from around 1200UTC. However, I couldn't hear anything at this time and had to wait 15 minutes before I got a whiff of the propagation.

I then made four s.s.b. QSOs with the stations of LZ1QB, LZ3CQ

and LZ5UV (all in KN12 around 2220km) and YT1VV (JN94) before signals faded out. Later in the day from 1720UTC, the propagation returned and in a 50 minute period I made a total of 41 s.s.b. contacts.

I contacted six stations in OK, OM and YU but the vast majority of QSOs were made into HA and YO. Many of these were over 2000km away, the longest distance being YO3JW (KN34) at 2300km.

Right at the end of the opening I was called by what I thought was an HA station but the operator came back with the callsign ZA/OK1JR (JN91) - this was unbelievable but true, it really was a station in Albania! This is very, very rare as there's minimal activity on any band from that country.

By coincidence, on the following morning I heard the same station on the 50MHz band. We exchanged E-mail addresses and in a reply I was confirmed as being the first 'G' station he had contacted on the 144MHz band.

In the same two minute period he also contacted GM4JJJ (IO86) for the first GM to ZA contact, G3JHM (IO91), G3NVO (IO91) and G0NFA/P (JO00). **Stan ZA/OK1JR** explained that he's working with the Embassy of the Czech Republic in Tirana and is active on both the 50MHz and 144MHz bands and uses an Icom IC-706 transceiver into a 2-element Quad on the 50MHz band and a 4-element Quad antenna on the 144MHz band.

The Sp-E propagation on May 27 also extended north into Scotland and **Ray James GM4CXM** (IO75) reported a total of 29 s.s.b. contacts on the 144MHz band in a one hour opening commencing

around 1700UTC. Running 400W into a 9-element Vargarda Yagi he worked stations in I, OE, S5, T9, YU and 9A.

Ray's longest distance contacts included those with YZ7NOU (JN94) at 1933km, T94KU (JN94) at 1981km, T97M (JN93) at 1991km and YU1EV (KN04) at 2030km. Best DX of the event was YU1CF (KN03) at 2174km.

The locator map, shown in **Fig. 1**, depicts the contacts made in the period between 1700-1800UTC from the stations of G4ASR (IO81) and GM4CXM (IO85). It shows that the Sp-E cloud can support communication on different paths at the same time which is a different situation from tropospheric openings where contacts are normally made between two geographical areas only.

**David Anderson GM4JJJ** (IO86) was also active on the 144MHz band during the Sp-E event on May 27 and between 1712 and 1849UTC he worked 27 stations located in HA, HB9, I, SV, S5, T94, YU, ZA and 9A. His best DX was SV1RK (KM17) at 2858km and ZA/OK1JR (JN91), both of which are believed to be firsts from GM on the 144MHz band - congratulations David!

One observation that he made during the opening was that some stations were better copy on vertical polarisation, although all the extreme DX was best on horizontal. David uses an array of four six metre long Yagis with elements for both horizontal and vertical polarisation and is able to switch between them to assess which polarisation is best at any particular time.

Normally, David uses his antenna set-up on earth-moon-earth (e.m.e.) communication where Faraday rotation often causes a shift in polarisation. He was also active in another Sp-E opening on the following day.

Between 2003-2100UTC on May 28 he contacted LZ2FO (KN13), OE3IWC (JN77), 3 x 9A stations and 19 x YU stations. Eighteen contacts were made over the magic 2000km mark with the Bulgarian station LZ2FO being the best of the event at 2288km!

## DEADLINES

That's it again this time. Next month I'll give you details of the openings that occurred on the v.h.f. bands during June. (As I write this in early June there's already been some good tropospheric, auroral and Sp-E events on the 144MHz band!)

**THANKS FOR YOUR LETTERS AND GOOD LUCK WITH THE DX. SEE YOU NEXT MONTH.**

73 David G4ASR

# HF FAR & WIDE

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**THIS MONTH CARL MASON GW0VSW BRINGS YOU SOME MORE HF AND DX NEWS AND HE HAS AN INTERESTING REPORT ON THE NEATH & DISTRICT SEA CADET UNIT'S NEW CLUB CALLSIGN. HE'S ALSO HOPING TO INTRODUCE A NEW ITEM TO HIS MONTHLY COLUMN - QSL CORNER. READ ON TO FIND OUT MORE.**

Following on from last month, I am pleased to report that quite a few of you were able to work the A52A DXpedition in Bhutan. I copied them here on several bands with excellent signals at 59 plus, both on s.s.b. and c.w.

Judging by the size of the pile-ups they had no shortage of callers! When I looked at the Web site last they had made just over 82 000 QSOs, pushing Bhutan well down the 'most wanted' DX country list.

## SEA CADET UNIT

Somewhat closer to home, the **Neath & District Sea Cadet unit, Training Ship TS Encounter**, enjoyed a busy few days when they used their new club callsign for the first time. Operating on the 7MHz band with a Kenwood TS-850SAT and very low dipole, MC0NSC worked all over Europe.

Highlights of the day included calls from permanent special event stations GB2RN Royal Navy (HMS Belfast) in London, GB2PLY HMS Plymouth in Birkenhead and GB3RN the Royal Naval Amateur Radio Society's club station at HMS Collingwood, Fareham. The Commanding Officer of TS Encounter Lt. Cdr Mike Hulonce RNR, was very pleased with the interest shown in the new club station and hopes that it won't be long before the first cadets complete their communications training and become regular station operators.

The 'MC' prefix did cause some confusion though. It can replace the 'MW' in a Welsh callsign if the licence has been granted to a club, providing the club uses this prefix, it is able to pass greetings messages and operate simultaneously on more than one band.

Another advantage is that any suitably licensed and authorised club member may operate the club station - obviously this prefix changes depending where in the UK you are and the type of licence your club holds. You can find further

information on club calls and special event stations in the *RSGB Yearbook* available from the *PW Book Store*.

## SOME DX NEWS

Some DX news for you now and **Chris G0WFH** plans to be active from the Island of Jersey between 12th and 22nd August using only s.s.b. QRP. He will be using his K2 transceiver and full-wave vertical on 14 - 28MHz and a quarter-wave centre loaded vertical on 3.5 and 7MHz.

Chris will use the club callsign of the **International Short Wave League (ISWL), GH4BJC/P** and QSL will be via the bureau. Further information can be had from [chris@g0wfhrp.freemove.co.uk](mailto:chris@g0wfhrp.freemove.co.uk)

**Peter 9V1PC** works 21MHz c.w. most Saturdays around 1600UTC and band conditions are good for him into Europe and the USA at this time. Peter runs 5W into a long wire antenna and is particularly keen to work European QRP stations.

**Mal VK6LC** is operating as 3W2LC from the Port of Vung Tau in Vietnam until November this year, QSL via the bureau or direct to **9 Abinger Road, Lynwood, WA 6155, Australia**. Mal will deal with all the QSL cards when he returns home.

## YOUR REPORTS

I was pleased to receive an E-mail from **Leighton Smart GW0LBI/GW-20049**. He told me that he has been "relaxing and getting back to normal" after all the excitement of the past few months.

"Despite having no transceiver I have managed to listen to the h.f. bands with a newly acquired Sangean ATS-909 portable short wave (s.w.) receiver which is now hooked up to my 70m long wire. I was amazed at how small the receiver was and my first thoughts were to send it back - it couldn't work surely.

"During my first evening's listening I nearly fell off my chair when I heard VK6APZ (Australia) on 3.5MHz s.s.b. at 2232UTC - he was not strong but clearly readable at 4/4! Other stations heard on the band included LU1IV (Argentina) 5/5 at 2242UTC with a large pile up of Europeans and PU9AAF (Brazil) 5/4 at 0016UTC - with results like this I definitely decided to keep it.

"In 1985 I used a Grundig Satellite 1400 portable for all my s.w. listening, followed in 1988 by a Matsui

MR4099, however, the ATS-909 has exceeded all my expectations. It just goes to show how technology has moved on". Thanks for the information Leighton and good luck with your s.w. listening.

Next off is **Richard Evans G0VCW** in Wellingborough, Northamptonshire, who says: "I first reported to Leighton some five years ago but shortly after ceased to operate on a regular basis. Now married and settled down with a family I have managed to convert our garage into a radio shack. "Commitments permitting (Richard has recently become the father of twins!) I hope to be operating on a more regular basis. First licensed as a novice, I was introduced to QRP operating and have stuck with it ever since.

"My station consists of a Yaesu FT-920 which feeds two antennas, a 40m delta loop and a 20m doublet which, with the aid of an a.t.u., tunes up on all bands. My preferred power output is 6W on s.s.b. and 3W on c.w. milliwatt where possible".

Richard worked HP9CRX (Panama) 2xQRP on 3.5MHz at 2018UTC using just 500mW. Welcome back Richard and best wishes from us all to you and your new family.

## THE 7 & 14MHz BANDS

On to the 7 & 14MHz bands now and **Jayne Richardson M5ASR** in Milton Keynes has been very active using her new callsign. On 7MHz Jayne worked GKB (Portsmouth Radio) at 0924UTC and CU8F (Azores) at 0004UTC using an Alinco DX-70 and 30W of c.w. into a indoor G5RV. Her 14MHz contacts include HV5PUL (Vatican) at 0955UTC and 8Q7LA (Maldives), V31OM (Belize), ZP5KO (Paraguay) A52A (Bhutan) and DU1ODX (Philippines) all around 2230UTC.

**Brian Parsons GW0KZK** in Skewen made just one contact on the band with H50/K4MRH (Thailand) at 2053UTC using an FT-1000MP and 200W of s.s.b. into a 4-element beam.

Richard G0VCW used 500mW of c.w. to bag RW3AI (European Russia) 2xQRP at 2050UTC and only 3W of s.s.b. to work 4N4KP (Yugoslavia), 3Z0MM (Poland) both around 1230UTC and R1AP (European Russia) at 2205UTC.

Leighton GW0LBI heard ZL1ACE (New Zealand) working

M0ANC at 1012UTC and VU2RTF (India) working RW3QFY at 0028UTC.

## THE 17 & 21MHz BANDS

The 17 & 21MHz bands saw a bit of activity again this month and despite feeling a "little under the weather", **Ted Trowell G2HKU** on the Isle of Sheppey, managed to be very active on these bands. He found "Tremendous static at times and variable conditions".

Ted's log includes c.w. contacts with CO8LY (Cuba), 3B8DB (Mauritius), V31OM (Belize) and PP1500RR (Brazil) all between 0900 and 1900UTC using Ten-Tec Omni-V and 70W. I hope you're feeling better soon Ted.

Over now to **Sean Gilbert G4UCJ** in Milton Keynes who has been very busy again this month. Despite some r.f. problems in his shack, Sean was still able to work the A52A DXpedition on five bands. Well done Sean - I'm glad the ferrite ring did the trick!

Sean used 30W of s.s.b. to work BV4VE (Taiwan) at 1622UTC, J3/AA1ON (Grenada) and PJ4/HB9BCK (Netherlands Antilles) followed a little later at 2100UTC and then at 2200UTC, 7O1YGF (Yemen), DL3NM/T16 (Costa Rica) and 9M2TO (Malaysia). For Brian GW0KZK, 4X1MK (Israel) was a new 17MHz country at 2026UTC using 200W of s.s.b. and his 4-element beam.

On to 21MHz now and Richard G0VCW was pleased with his bag of s.s.b. QRP contacts. His 3W reached out to ZY500Y (Brazil), UR6MX (Ukraine) and BV4VE (Taiwan) with all contacts being made around 1900UTC.

Listening on this band was Leighton GW0LBI who was very surprised to hear a strong signal from 4S7EA (Sri Lanka) at 2230UTC calling CQ go unanswered!

## THE 24 & 28MHz BANDS

On 24MHz band now and Ted G2HKU was also one of the lucky ones to get A52A in his log. He also logged YV6AZC (Venezuela) and both contacts around 1600UTC.

Most of our reporters have spent a lot of time on the 28MHz band. Jayne M5ASR used 30W of c.w. and worked ZC4RAF (UK Sovereign Bases on Cyprus) at 1306UTC, ZP6CW (Paraguay) and HF0POL (South Shetlands) both around 1504UTC and finally L47AWP (Argentina) at 1634UTC.

Sean G4UCJ reports all s.s.b. contacts with 8Q7LA (Maldives) at 1053UTC. Later in the day, around 1730UTC, he worked 9Y45F (Trinidad) and CX2AV (Uruguay). His QSOs made using c.w. include JF5HVI (Japan), 3W7CW (Vietnam) and YB0AZ (Indonesia) all made between 1200 and 1300UTC.

Also on 28MHz was Ted G2HKU who spent a few afternoons chasing DX. Ted found JW/DL3NRV (Svalbard), 5B4/G0UHK (Cyprus), CO8TW (Cuba), FR5FD (Reunion Island), 3CA/K0CO (Equatorial Guinea) and 6D2X (Mexico) all

CARL MASON GW0VSW HAS SOME MORE HF NEWS FOR YOU THIS MONTH AND HE SAYS THAT THERE'S PLENTY OF DX OUT THERE TO BE HAD.



Fig. 1: 'HF Far & Wide' author, Carl Mason GW0VSW, in his shack.



between 1500 and 1800UTC.

Finally, over to new reporter **Owen Williams G0PHY** in Biggleswade, Bedfordshire, who used s.s.b. and 100W into a dipole cut for 14MHz to work 3DA0WPX (Swaziland) and ZD9BV (Tristan de Cunha) both around 1700UTC. Glad to have you on board Owen!

## QSL CORNER

I know that QSL information can be very hard to find at times and so, space permitting, I will try to include a short list at the end of this column each month starting with: 4L26MAY via 4L1DA; 6Y5WJ via GONAN; 8P9JO via N0JK; 9M2TO via JA0DMV; AP2JZB via K2EWB; CE0Y/LX2LX via LX1NO; CO8TW via EA3FQV; EA8BH via OH2BH; ED55MA via EA5URR; EO55UK via UT4UO; EO55FI via UX3FW; FG5FR via F6FNU; HC8N via AA5BT; HV0A via IK0FVC; OD5/OK1MU via OK1TN; SU1ER via WA3HUP.

## SIGNING OFF

Well, that wraps it up for another month. Many thanks to all our reporters for their efforts and to **Peter Barville G3XJS** and **Tedd Mirgliotta KB8NW** for the DX information. Remember that the DX is out there. It's just a case of being in the right place at the right time.

AS USUAL REPORTS, INFORMATION AND PHOTOGRAPHS TO ME PLEASE BY THE 15th OF EACH MONTH. DETAILS AT THE TOP OF THIS COLUMN.

73. Carl GW0ISW

## FOCAL POINT

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**GRAHAM HANKINS G8EMX HAS NEWS OF A CHANGE IN PERSONNEL AT THE BATC. AS WELL AS DETAILS OF THE NEXT ATV CONTEST IN SEPTEMBER THIS YEAR.**

Amateur TV (ATV) contests may come back into the ATV calendar again now that a new name has volunteered to help the **British Amateur Television Club (BATC)**. **Richard Parkes G7MFO** has offered to be the club's 'Contests Organiser', taking over from **Richard Guttridge G4YTV**, who had asked for someone to take over the task back in 1996!

Contests were a regular part of the BATC activities calendar for

many years and under a variety of titles: Summer Fun, International, Winter Cumulatives, fixed station, portable, all stations, all bands, microwave only - to name but a few! The objective was to have fun (yes, OK then, its nice to win, hi!)

**Richard Guttridge G4YTV** boosted the number of ATV contests to 14 a year, but the quantity of contest stations was dropping, so only three contest dates appeared in the ATV calendar of 1997 and he considered it was time for someone else to take over. Will the next 'Richard' (G7MFO) manage to revive the ATV contests scene?

Here's how **Richard Parkes** introduces himself: "I first got into Amateur Radio and ATV ten years ago after going to a local rally and seeing a demonstration of ATV from **Clive G8EQZ** and **Richard G4YTV**, the previous Contest Manager. Soon after that I joined **Hornsea Amateur Radio Club** which both of them belonged to and took my Radio Amateur Examination".

Richard has always been a keen ATV contests operator: "I participated in several ATV contests with **G8EQZ/P** and **G4YTV/P** under the callsign of **G8EQZ/P** and have also operated contests from my home QTH. The main reason why I've volunteered to take on the position of the BATC contest manager is that I have missed participating in the contests in the last few years. I also like the friendly atmosphere you get from other ATV stations while they try to see your numbers".

## NEXT ATV CONTEST

The next ATV contest will be the International, on the **9th & 10th September 2000**. The rules can be found on the web at: [www.cmo.ch/swissatv/1arue.htm](http://www.cmo.ch/swissatv/1arue.htm) or read **Richard Parkes'** article in the next edition of the BATC's magazine CQ-TV. Richard has some new ideas for ATV contest scoring and is keen to move away from a simple exchange of number additions: "I hope to encourage contest stations to use a camera, rather than relying on number and callsign generators".

## CHANCE ENCOUNTER

A chance encounter at a rally led to this report of 10GHz (3cm) activity in the Derbyshire area from **Dave G8TNE**: "I have a reliable full duplex link from my QTH in Littleover, Derby to **Stan G3VJK** in Castle Donington, a distance of 13km. Stan uses 10.315GHz, I operate on 10.425GHz, so you can see there is plenty of spacing between frequencies to allow full duplex operation".

The essence of Amateur Radio and ATV is about experimenting, the 10GHz link between Dave and Stan was very lossy, despite the 20dB horn antennas. A major car

manufacturer had just finished building its new test facility - a large concrete structure which was straight in the path of the 10GHz signals and picture quality varied between P3 and P4 (ideal is a P5) with a lot of variation in levels both ways.

"Then", says Dave, "I tried making the horns twice the focal length, which made all the difference to our link! Stan and I now achieve good P5 pictures both ways and fully quieting sound."

"We would like to work other stations and would like to arrange possible skeds with anyone interested in having a go. If anyone would like to contact me they can on E-mail:

**dave.g8tne@virgin.net** and I would be only too pleased to arrange a sked".

## SOME REPEATER NEWS

Now some repeater news and the **Coventry ATV repeater, GB3RT**, has had its transmitter repaired again. A reduction in power around two years ago was solved with a new coaxial link - this time it was the power amplifier that had failed. The repeater will be returned into service with one of its four ident EPROMs updated.

Meanwhile, Birmingham continues to wait for a 24cm (1.3GHz) ATV repeater. The problem here is finding a site that is not 'line-of-sight' to Clee Hill radar, or has an acceptable path loss to

that installation.

A member of the Beacons Repeater Group has volunteered his house in Erdington for the repeater, so it remains to be determined what the path loss from there is calculated to be.

## 'ENIGMA' RALLY

The BATC's 'Enigma' Rally at the Cryptography Museum, Bletchley Park in May enjoyed a sunny day, substantial attendance (despite the date clash with the Drayton Manor Rally in the Midlands) and an absolutely fascinating venue. It's thought that around 500 visitors came along, so the BATC has 'booked into' Bletchley Park for **May 6 2001!** Put that into your diaries now!

**Ian Waters G3KKD** was at the 'Enigma' Rally, demonstrating his 1.3GHz (24cm) mobile ATV set-up which he later took to North Wales. Ian reports: "I operated static mobile from the Great Orme Head near Llandudno and enjoyed excellent two-way vision contacts, via the GB3TM ATV repeater in Amlwch, with **John GW3MEO** in Presttyn and **Brian GW6KFH** in Pensiarnau."

"The powerful professional radio equipment on the Great Orme totally blocked my 2m (144MHz) and 70cm (430MHz) receivers, but duplex audio was achieved with incoming sub-carrier sound on 24cm and my transmitted talkback on 2m". John is thinking of returning to North Wales later in the year, going to the south side of the Lleyn Peninsular to work through the new **GB3GW** repeater at Pentrefelin.

Finally, for this month, come and meet the BATC at the **RSGB Hamvention at the end of July**, the **Leicester Show in September** and, once again, the **London Amateur Radio & Computer Show (Picketts Lock) in November!**

UNTIL THE NEXT TIME MY COLUMN'S IN PRACTICAL WIRELESS ... KEEP UP THE GOOD ATV!

Graham



Fig. 1: On the subject of ATV contests (see text), these are the antennas used for contest operation by the Severnside Group in Bristol.



# Howes Kits

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## DATA SCAPE

NEWS, VIEWS & PICTURES TO ME PLEASE:

ROGER COOKE G3LDI

TEL: (01508) 570278

PACKET: G3LDI@GB7LDI

E-MAIL:  
rcooke@g3ldi.freemove.co.uk

ROGER COOKE G3LDI IS BACK WITH A REQUEST FOR HELP IN BRINGING 'NEW BLOOD' INTO THE AMATEUR RADIO HOBBY AND HE ALSO HAS SOME MORE INTERESTING RADIO RELATED WEB SITES FOR YOU.

"Use it or lose it" is a phrase that has been used for quite a considerable amount of years regarding our frequency allocations. Of course it's extremely relevant to our bands and even more so following the "sell-off" of frequencies by the government.

Making sure that we maintain our rightful use to our frequencies is something that we should all make sure we do in order to maintain our status quo. If we lose frequencies it's highly unlikely that we should ever regain them, especially with regard to the v.h.f., u.h.f. and s.h.f. allocations - much underused by amateurs and are looked upon by the commercial telecoms companies with great relish.

Also, some of our repeaters might suffer closure, following the enormous increase in rental charges imposed by NTL (the multi-national company who now own the former IBA transmitter sites). For an amateur repeater group to meet these charges the user base has to be substantive, as obviously proportional charges to users tend to discourage payment, a reduction in user base and eventually repeater closure.

The invasion of 28MHz by the CB fraternity, to use a friendly description of these (mostly) foreign pirates is already massive. Take a listen to that band while beaming East, in the mornings and you will see what I mean.

Licensing to these intruders means nothing and they seem to be able to operate with impunity. Included on that band are the 'Russian parrots', several operate as single frequency f.m. repeaters - great fun can be had by calling CQ for lengthy periods. However, we are actively encouraging this intrusion by not making more use of the band.

A similar thing is now happening to the data modes, some 15 years ago, Packet radio came onto the scene, at a standard data-rate of 1200 bauds. This was a great new mode that was going to revolutionise Amateur Radio. Bulletin boards at that time were



Fig. 1: The Antennex Web site can be found at [www.antennex.com](http://www.antennex.com)

unheard of and the standard telephone line data rate was 300 bauds!

At the time, the only way to get onto the Packet mode was to build the TNC-1 - and I still have mine by the way! The circuit board had to be imported from the USA, bits bought and lots of time spent in building the board, a very satisfying project as it happens. By the way, even then (1984), it cost us over £250 to build - all this is history of course, but still relevant to this discussion!

The Internet was unheard of by the average amateur and Packet radio exploded. However, since then, although progress has been made in some quarters, we have essentially stagnated.

User access speed has stayed at 1200 bauds in the main, with a few exceptions at 9k6 and the national backbone is also at 1200 bauds in the main, after 15 years! In the meantime, the Internet has appeared along with free ISPs and there's talk (it's still talk!) of free local telephone calls for Internet use.

With a modem, anybody, from the age of five to 95 can use the Internet without worrying about a licence and can access it at speeds in excess of 40kb! This has discouraged the Packet user and has drawn lots of people toward the Internet.

E-mail is so fast and easy to use, that lots of amateurs have sold their TNCs and bought a modem. They're giving up on Amateur Radio and becoming what **WORLI** (a Radio Amateur who first put BBS on the air way back in 1983) euphemistically called 'Land-Line Lids'.

The Internet is nothing whatsoever to do with Amateur Radio, although the two mediums are now becoming more and more interlinked. There's nothing fundamentally wrong with this, but it seems to be at the expense of our main hobby, radio communication.

You need no licence, no knowledge of radio and it costs less,

all fully agreed. You can talk and communicate with most of the DXCC list now via E-mail, or even voice.

Some Packet operators are even advocating doing their forwarding via E-mail! It ain't Amateur Radio though, so give some thought to supporting the data network before it finally disintegrates through lack of interest.

Whilst all of this is bound to happen, you are probably saying "Well, he's an old G3, what do you expect"? Very true, but to some extent, this is the very reason that youngsters are no longer attracted to Amateur Radio.

When I was 12 (I was once - honest!) I built my first crystal set and heard an amateur operator. Listening to this was mystery and magic to me, but all that has disappeared.

There's no longer any magic about talking to somebody from Australia, to 'phone or E-mail is so fast and cheap. In my young day, this was impossible!

We desperately need young blood coming in to the hobby, technically orientated and not just the black box button pusher type. Young engineers are needed to forge ahead with an imaginative re-

thinking of the Packet network, possibly introducing differing protocols with a view to gaining back those data buffs that have lost interest.

Oh sure, there is still a network, but a stagnant one. It needs a 'kick up the pants' and a complete re-design, real high-speed backbone with a system possibly utilizing a broadcast type protocol similar to that used on the Satgate Network. It could also use HTML to make the text look more attractive, with differing fonts and text size and colours.

The Satgate Network is also suffering from a lack of user traffic. This system involves a considerable amount of work to engineer - steerable antennas (automatically controlled in azimuth and

elevation), two transceivers for 144 and 430MHz (or a later dual-band transceiver), networked computers, one for the Satgate and one for the BBS, with a control unit to adjust the transceivers to allow for Doppler shift.

All of this equipment is for tracking Low Earth Orbiters (LEOs) and your mail can be sent to most parts of the globe. All the user has to do is use the Reqsat server to direct the mail to GB7SAT or GB7LDI, the two UK Satgates.

Try sending your Amateur Radio traffic via the radio link instead of the landline - you'll be pleasantly surprised. There really isn't that much difference and you will be helping to use our frequencies that we desperately need to keep. If you need more information on how to use the Satgate Network, both UK Satgates have the necessary help files.

With the support so necessary from the users, we might be able to resuscitate the poor old network and pour some new life-blood into it. Without your support we are on a hiding to nothing! Think before you link!

## RECENT BATTLES

The recent battles between processor giant **Intel** and its nearest rival, **AMD**, have been well documented. It revolves around AMD's release of the Athlon processor which I reported on a month or two back.

One of the two, AMD, managed to impress everybody by releasing a processor that was quicker than its Intel equivalent, in this case the **Pentium III processor**. This had never happened before, Intel had always managed to stay in front in this battle, however, Intel is far from a small company and has returned to the fight with the **Coppermine** technology to try to wrestle the crown back!

Coppermine isn't a new technology, but more of an update and refinement of the Pentium III processor - its features appear in processors of speeds greater than 600MHz! The first feature comes through the way the chip is manufactured.

Intel has managed to scale down the manufacturing process to use 0.18-micron technology. Current processors on the other hand - including the Athlon - are manufactured using 0.25-micron technology. The smaller manufacturing process means that the processor core uses less silicon, lowering the production costs.

The second feature means the Coppermine now requires less power to run and less power means a cooler processor, allowing notebooks to take advantage of the superior power consumption. These factors have come together to enable Intel to immediately release a 733MHz processor, compared to the Athlon from AMD at 700MHz.

It's not just the manufacturing process that has had a major overhaul, several of the Pentium III's

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key components have been updated to suit the faster speeds. The most important of these is the Level 2 cache.

Level 1 cache sits on the processor and runs at the same speed. In the case of the Pentium III, there's 32Kb of cache, split into two 16Kb sections, one for data and one for instructions. Should the processor need the same information again, it can retrieve it from the cache, somewhat quicker than performing the same task again.

In the same way, Level 2 cache sits between the processor and main memory, no matter how fast memory gets, the central processor is still quicker and ends up waiting for it to respond. The solution is to fit a secondary cache to help alleviate this problem.

The L2 cache is often called the external cache because it sits off the processor. However, the Coppermine moves the L2 cache to being on-die, i.e. the whole processor, plus cache, is just a single chip and slices the amount down to 256Kb from 512Kb from the earlier Pentium III models. This doesn't make the Coppermine worse than the Pentium III.

The older external cache versions of the Pentium III only had the L2 cache running at half core speed, so immediately, you have twice the bandwidth available to you. This extra width actually means that the cache is now faster than before which is partly why Celeron processors became very popular; their onboard L2 cache meant that once you started to over-clock them, they could out-perform their Pentium III rivals.

Other innovations have also been introduced, such as increasing the data path width to 256-bit, whereas the standard Pentium III is only 64-bit. In all, Intel has addressed certain issues with its processors and managed to increase speed thanks to changes throughout their system.

It will be interesting to see what the next round is like in this battle of the chip. The ball is now in AMD's court.

### INTERESTING WEB SITES

Here's some interesting Web sites



Fig. 2: Try the Dogpile Search Engine at [www.dogpile.com](http://www.dogpile.com)

for you to try. If you're looking for an interesting site for antennas, then try the **Antennex** site at: [www.antennex.com](http://www.antennex.com) (see Fig. 1). You can subscribe to the Newsletter

and also send your own ideas as well - sites like this can be very useful for interaction of ideas.

Need yet another search engine? This one is more specific for



Fig. 3: The DXsoft Group's Web site can be found at: [www.dxsoft.com](http://www.dxsoft.com)

### Web Watch:

**Antennex** Web site: [www.antennex.com](http://www.antennex.com)

**Dogpile** Search Engine: [www.dogpile.com](http://www.dogpile.com)

After some software? Try: [www.hunting.com/index.html](http://www.hunting.com/index.html) or [www.dxsoft.com](http://www.dxsoft.com)

certain subject matters. Try **Dogpile**, at [www.dogpile.com](http://www.dogpile.com) - see Fig. 2. Are you looking for software? Then try the following site - it might be just what you're looking for: [www.hunting.com/index.html](http://www.hunting.com/index.html) Note the double 't' in hunting, it's easy to mistype!

Another interesting software site from a Russian Amateur: **RZ4AG**, is [www.dxsoft.com](http://www.dxsoft.com) See Fig. 3. There are several useful programs for contesters here, including a digital voice processor, logging programs and c.w. programs. Check it out!

Don't forget to let me have details of any sites that you've found, that way we can pass the information to a wider audience. You can send them via Packet, E-mail or even snail-mail if necessary - although post is the expensive option these days.

Regarding my E-mail address, I now have two reflectors that are easier to remember, they are [g3ldi@qsl.net](mailto:g3ldi@qsl.net) and [g3ldi@amsat.org](mailto:g3ldi@amsat.org) I look forward to the deluge of E-mails bulging with information!

### AND FINALLY ...

And finally ... German scientists dug 50m underground and discovered small pieces of copper. After studying these pieces for a long time, Germany announced that the ancient Germans (25 000 years ago) had a nationwide telephone network.

Naturally, the British government wasn't that easily impressed, they ordered their own scientists to dig even deeper. At 100m down they found small pieces of glass and they soon announced that the ancient Brits (35 000 years ago) already had a nationwide fibre net.

Not to be outdone, Israeli scientists dug 50, 100 and 200m underground, but found absolutely nothing. They concluded that the ancient Hebrews (55 000 years ago) had cellular telephones!

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# THE PW PERSONAL ORDER FORM

*Roger Hall G4TNT – PW's Advertising Manager – describes how we're launching the PW Personal Order Form service to help readers buy with extra confidence from advertisements in this magazine.*

**M**any readers will have noticed how the battle for their custom has become more intense as the popularity of the hobby has declined. Fewer amateurs buying less equipment means there are now some great deals to be had but it also means that some dealers may try to cut corners when it comes to honouring their commitments. Also, as the real cost of Amateur Radio equipment has fallen and the competition for your custom has increased, some of the smaller shops have either gone out of business or been swallowed up by the bigger companies. In some areas, it's almost impossible to find a local shop and now the trend is towards mail order purchasing.

This, in itself, is not a bad thing but it does mean you'll probably be buying from a shop you've never visited and from a salesperson you've never met. So, how do you know who to trust with your money? You could go on air and ask about the dealer you're thinking about buying from, but the risk is that there may be one or two vociferous individuals who will be happy to tell the world about their grievances while the majority of satisfied customers just keep quiet. The same is true of the Internet. The various radio related newsgroups are a good place to ask but, again, you may not get a representative (or honest) selection of answers.

The truth is, there is no real way of telling beforehand how your transaction will be handled, how well the equipment will perform or whether it will go wrong. All you can do is to take reasonable precautions before you buy and know what to do if the worst happens. This is where we aim to help. First of all, take a look at the Top Ten Tips in the Buyer's Guide box. If you follow those guidelines before you buy, you'll have minimised the chance of something unforeseen cropping up and you'll be prepared should the worst happen and you have to return the goods.

## Top 10 Tips

- 1: Telephone first to confirm the price and details are as in the advertisement. Dealers often have to send in copy up to 8 weeks before the magazine is published and prices and availability can change in that time.
- 2: Ask if it's a parallel/gray import or if it came from the authorised UK importer.
- 3: Ask if it is the full UK specification and if it has CE approval.
- 4: Ask about extra charges (delivery, VAT etc.) and find out the final, all-inclusive price.
- 5: Ask about their return/refund/repair policy for faulty goods and if they have a restocking fee for the return of non-faulty items.
- 6: Ask for a written quotation if it's a large order.
- 7: Make a note of all calls and who you spoke to and keep copies of all paperwork.
- 8: Pay by personal credit card whenever possible as the card company has insurance to cover all transactions above £100 and you will almost certainly get your money back from them should something go wrong.
- 9: Check everything as soon as it arrives. Open all the boxes and check that you have been sent everything exactly as ordered. If there is a problem, contact the supplier immediately.
- 10: If a problem develops later, write the supplier a concise and accurate letter outlining the problem and asking them how they intend to rectify it. If that fails, write to us with copies of all relevant paperwork and we'll take it from there.

## THE PW PERSONAL ORDER FORM

Use this form when ordering by mail, FAX or for telephone order confirmation

### PLEASE SUPPLY THE FOLLOWING ITEMS:

QUANTITY	DESCRIPTION	UNIT COST	TOTAL £

### TO THE ADVERTISER

Company \_\_\_\_\_  
 Sales contact \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_  
 Date & time of telephone order \_\_\_\_\_  
 Order reference number (if quoted) \_\_\_\_\_  
 Despatch reference number \_\_\_\_\_

### CUSTOMER DETAILS

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_  
 Daytime telephone number \_\_\_\_\_  
 FAX number \_\_\_\_\_

### DELIVERY DETAILS

Delivery address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Postcode \_\_\_\_\_  
 Agreed delivery date \_\_\_\_\_  
 Terms of warranty/money back/returns policy \_\_\_\_\_

### PAYMENT DETAILS

- Tick method of payment
- Credit card
- Cheque
- Debit card
- Postal Order

### CREDIT CARD DETAILS

Credit card company \_\_\_\_\_  
 Card number \_\_\_\_\_  
 Start date \_\_\_\_\_  
 Expiry date \_\_\_\_\_  
 Signed \_\_\_\_\_  
 Date \_\_\_\_\_



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SUB TOTAL \_\_\_\_\_  
 DISCOUNT \_\_\_\_\_  
 CARRIAGE \_\_\_\_\_  
 SURCHARGES \_\_\_\_\_  
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**PLEASE ACKNOWLEDGE RECEIPT OF THIS ORDER**

Don't forget to keep a photocopy

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**DISCLAIMER**  
Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. Practical Wireless advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of Practical Wireless wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

## For Sale

**TECHNICAL MANUALS**, AR88, CR100, R210, HR0. £5 each. Circuits £1.50. Hundreds available. SAE list. Bentley, 27 De Vere Gardens, Ilford, Essex IG1 3EB. Tel: 0181-554 6631.

**VINTAGE SERVICE DATA**. Radio, Audio, Electrical, TV & Cinema - 1900 to 1970s. Complimentary Newsheet. 50 Meddon St, Bideford, Devon, EX39 2EQ. Tel/Fax 01237 424280.

E-mail: savoy.hill@virgin.net  
Web Site: <http://freespace.virgin.net/tudor.gwilliam-rees> Visa & Mastercard.

**THE RF-KIT CATALOGUE**. send 2x 2nd class stamps or browse [www.rf-kits.demon.co.uk](http://www.rf-kits.demon.co.uk)  
Hands Electronics, Tegryn, Llanfyrnach, Pembro SA35 OBL. Tel 01239 698427.

**QUARTZ CRYSTALS** 1kHz-250-MHz, >20,000 stocked. 32.768kHz/£1.65, 38kHz/£1.65, 400kHz/£3.95, 455.2kHz/£1.50, 3.2768MHz/£1.95, 7.03MHz/£3.95, 10.106MHz/£3.50, 10.7MHz/£1.75, 11.0592MHz/£1.60, 21.06MHz/£3.95 etc. SPXO/TCXO/VCXO devices from £2.50. Ceramic filters & oscillators. 26 page list. Circuits & applications booklet/£5.00. IQ-Electronic Design. Tel: 020-8391 0545. Fax/Msge 020-8391 5258.

## Aerials

**E-TYPE DIPOLE** 10-160m fits 28ft garden. Full sized anti-TVI models, traps, baluns. Info SAE, Aerial Guide £2. G2 DYM, R Holman, Uplowman, Devon EX16 7PH. Tel: 01398 361215 anytime.

## Holidays

**NORTH WALES HOLIDAYS** - Caravan - bunkhouse - camping. Elevated rural site, two miles from beach, use of shack and antennas, open all year. Tynrhos, Mynytho, Pwllheli. Tel: 01758 740712. Packet address: GW4VAG@GB7BAY#55.GBR.EU

## Wanted

**WANTED FOR CASH** Valve or solid state communication receivers Pre-1980. Preferably working and in good condition. Non working sets considered also domestic valve radios. Items of Government surplus wireless equipment and obsolete test equipment. Pre-1965 wireless and audio components and accessories. Pre-1975 wireless and TV books and magazines. Also, most valves wanted for cash. Must be unused and boxed. CBS, 157 Dickson Road, Blackpool, FY1 2EU. Tel: (01253) 751858 or Fax: (01253) 302979. E-mail: chevet@globalnet.co.uk

## Valves

**VALVES GALORE** Most valves available from stock. Otherwise obtained quickly. Please send SAE stating requirements or telephone. **VALVE & ELECTRONIC SUPPLIES** Chevet Books, 157 Dickson Road, Blackpool FY1 2EU. Tel: (01253) 751858 or Fax: (01253) 302979. E-mail: chevet@globalnet.co.uk

**VALVES:- OVER 50000 STOCKED** Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, (Jim Fish G4MH), 28 Banks Ave., Golcar, Huddersfield, West Yorks HD7 4LZ. Tel: 01484 654650. Fax: 01484 655699. E-mail: wilsonvalves@surflink.co.uk Visa etc. Fast & personal service.

**CASH FOR VALVES**. ECC32 £10. ECC33/35 £6. ECC83/EF86 £3.50. KT66 £35. KT88 £55. EL34 £20. EL37 £18. PX4 £70. PX25 £130. GZ34 £8. GZ32 £8. DA100 £150. 4212E £150. PT15 £10. Ask for free wanted list. Colomor (Electronics) Ltd, Unit 5, Huffwood Trading Estate, Bookers Road, Billingham, W. Sussex RH14 9RZ. Tel: 01403 786559. Fax: 01403 786560. E-mail: giacomelli@colomor.demon.co.uk

**VALVE ENTHUSIASTS:** Capacitors and other parts at attractive prices! Ring for free list. Geoff Davies (Radio). Tel: (01788) 574774.

**VALVES WANTED FOR CASH** ECC83, KT88, PX25, VALVE TESTER VCM163. ALL TYPES CONSIDERED - ask for wanted list. We stock one million valves, CRT. 4CX250B, 4CX350A, 4CX1000A, 300B - ask for free catalogue. Billington Export Ltd., Unit E1, Gillmans Trading Estate, Billingham, Sussex RH14 9EZ. MINIMUM ORDER £50. Tel: 01403 784961. Fax: 01403 783519.

E-mail: sales@bel-tubes.co.uk  
Visitors please phone for appointment.

**VALVES AND ELECTRONIC COMPONENTS** Large stocks. Send for list to: Stuart Scott, 19 Portway, Steying, W. Sussex BN44 3QF. Tel/Fax: 01903 815118. E-mail: triumph.76@btinternet.com

## TOP PRICES PAID

for all your valves, tubes, semi-conductors and ICs.

**Langrex Supplies Ltd.**  
1 Mayo Road, Croydon Surrey CR0 2QP.  
TEL: 0181-684 1166. FAX: 0181-684 3056.

## Exchange

**ICOM IC-Q7E** Unused exchange for good condition Icom IC-2SET. Telephone Peter, Leamington Spa 01926 421028.

## Miscellaneous

**I BUY, SELL & P/EXCHANGE** Amateur radios old or new. Cash waiting 9am - 8pm daily. Phone Dave G3RCQ on 01708 374043 or E-mail g3rcq@easynet.co.uk Please visit my web site [www.g3rcq.co.uk](http://www.g3rcq.co.uk) for further information, or write to G3RCQ, 9 Troopers Drive, Harold Hill, Romford, Essex RM3 9DE.

**INTERESTED IN VINTAGE TECHNOLOGY?** Send 2 x 1st class stamps for catalogue of books, bits & pieces, etc. Old Time Supplies, P.O. Box 209, Banbury, Oxon OX16 7GR.

## Job Vacancies

**WANTED!**  
**Full and Part Time Sales and Administration Staff**  
**Sales**  
The likely candidate must be confident, smart and customer focused, already working in a sales environment. An abundance of energy and the ability to offer a high level of service are pre-requisite.

**Administration**  
To assist sales and workshops, the individual must be accurate and organised and be able to cope with a busy schedule. Some Customer support involvement will be required.

*Excellent remuneration is on offer for either full or part time positions.*

**Martin Lynch & Sons**  
CV 10: Martin Lynch, ML&S - Martin Lynch & Sons, 140-142 Northfield Ave., Ealing W13 9SB. Or e-mail [martin@MlandS.co.uk](mailto:martin@MlandS.co.uk)

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Please insert this advertisement in the ..... issue of Practical Wireless (if you do not specify an issue we will insert it in the next available issue of PW) for ..... insertion/s. I enclose Cheque/P.O. for £..... (42p per word, 12 minimum, please add 17.5% VAT to total).

Name: .....

Address: .....

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.....

Telephone No.: .....

Box Number @ 70p: Tick if appropriate

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# IC-718 HF Transceiver

## The Most Practical Rig You Could Ever Own!

Icom are pleased to announce the IC-718 HF transceiver. Aimed as an entry-level product, the IC-718 continues all the traditions of top quality engineering that you expect from Icom. Conveniently sized and easy to operate, the IC-718 utilises all the latest RF and digital technology and is designed to be one of the most practical rigs ever.

### Forward Facing Speaker

The IC-718 offers an excellent overall specification coupled with ease of use. The first thing that strikes you about the IC-718 is the loudspeaker mounted on the front panel of the transceiver, facing the operator, making the audio more clearly heard.

### Superior Performance

The IC-718 features a 100 watt transmitter for SSB and CW and 40 watts output on AM. A general coverage receiver is also built-in covering 30kHz-29.999 MHz across most modes. A newly designed PLL circuit has been adopted to improve signal/noise ratio characteristics. This, combined with a 4-element system mixer ensures truly superior performance.

### Easy to operate

For ease of use, the IC-718 is equipped with a minimum number of switches and controls.

The 10-key pad on the front panel allows you to directly enter an operating frequency or access a memory channel. All popular operating modes are offered; USB, LSB, CW, RTTY (FSK) and AM. In addition there is a level adjustable noise blanker, a variety of scanning functions, a hand microphone and electronic keyer as standard.

### Auto-tuning

The auto-tuning-steps function speeds up tuning but only activates when the dial is turned quickly. The band stacking register ensures that you always return to the last used frequency when changing bands.

### Interference Buster!

To reject interference, the IC-718 has an IF shift function that shifts the centre frequency of the IF passband electronically to reduce nearby interference. A microphone compressor ensures really punchy audio, getting your signal through in difficult operating conditions.

The compression level is easily adjustable from the front panel making a big difference when propagation conditions are poor.

### Maximum Response

RF gain control is combined with the squelch control. The RF gain adjusts minimum response receiver gain and improves reception on the noisier bands. An electronic keyer with a variable dot/dash ratio control is built-in. The CW pitch is variable from 300-900Hz and the keyer speed goes up to 60 wpm! Full break-in capability is available with an adjustable delay. Also, the IC-718 has a total of 101 memory channels to store operating frequencies and modes.

### Try the NEW IC-718 Transceiver...

Pop down to your authorized Icom dealer today. The 718 was not designed to disappoint!



Icom (UK) Ltd. Sea Street, Herne Bay, Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.  
or visit our website: [www.icomuk.co.uk](http://www.icomuk.co.uk) e-mail: [info@icomuk.co.uk](mailto:info@icomuk.co.uk)

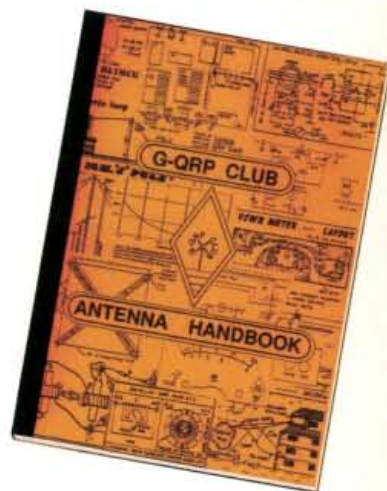
# Book Store

**BUY**  
**of the**  
**MONTH**

## G-QRP Club Antenna Handbook

This month's book of the month will appeal to antenna enthusiasts everywhere. Comprising of a collection of antenna and other related circuits taken from the G-QRP Club's journal, *Sprat*, the *G-QRP Club Antenna Handbook* contains circuits aimed at low-power and general use alike. Although not intended as a text book it offers good all-round practical advice.

Order now at the special price of **£7.50 post free** (UK only, overseas orders add £2.50 P&P). Offer closes **9 August 2000**.



To order either use the form on page 66 or please call Shelagh or Jean on (01202) 659930 and quote **PW 8**

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# WINRADIO®

## TAKING THE EUROPEAN RADIO MARKET BY STORM

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*Receive a FREE Mini-Cone Antenna With Every WR-3100 order!\**

### JOIN THE TRUNKED RADIO REVOLUTION WITH YOUR WINRADIO RECEIVER!

1. Enjoy multiple, major trunk tracking modes
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3. Take comfort in the automatic volume control
4. Single & dual receiver modes
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7. Full XRS™ - compliant technology

#### The WINRADIO Trunking Option\*

Trunking systems are used by public safety, transportation, business, law enforcement, government, military and other organisations. This software includes major trunking modes: Motorola SmartNet® and MPT1327.

**ONLY £81.07 inc vat**



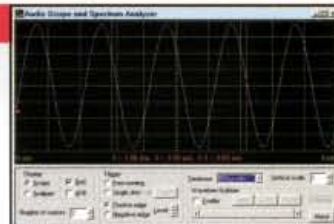
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2. Packet Radio for HF and VHF
3. Aircraft Addressing and Reporting System (ACARS)
4. Audio Oscilloscope, real time Spectrum Analyzer with calibration cursors
5. Squelch-controlled AF Recorder
6. DTMF/CTSS decode and analyse

The DSP applet provided with the WR3100i spectrum monitor ISA card (£995+VAT) allows continuous control of audio bandwidth and other signal conditioning functions.

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(requires SoundBlaster 16 compatible sound card)



### WINRADIO® PC RECEIVERS

Available as either an internal ISA card that slips inside your PC, or as an external (portable) unit. WINRADIO combines the power of your PC with the very latest in synthesised receivers.

#### YOU CAN USE WINRADIO™ SCANNING PC COMMUNICATION RECEIVERS FOR:

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### NEW EXTERNAL MODELS

#### EXTERNAL WINRADIO™

We are now able to offer you a complete range of stand-alone WINRADIO comms systems:

- **WR1000e** - £359 inc vat
- **WR1550e** - £429 inc vat
- **WR3100e** - £1169 inc vat

Each stand-alone unit connects to your PC through either the basic RS232, or through an optional PCMCIA adapter (for high speed control).

The units are powered through either your existing 12v supply, or through an (optional) NiMH rechargeable 12v battery pack.

"It's software is excellent.. more versatile and less idiosyncratic than that of the Icom IC-PCR1000"

**WRTH 1999 Review**

"Five stars for its mechanical design"

**WRTH 1999 Review**

"Most Innovative Receiver"

**WRTH 1998 Awards**



Model Name/Number	WR-1000i & WR-1000e	WR-1550i & WR-1550e	WR-3100i & WR-3100e
Construction of internals	WR-1000i/WR-1550i-3100iDSP- Internal full length ISA cards	WR-1000e/WR-1550e- 3100e - external RS232/PCMCIA (optional)	
Construction of externals			
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)

PPS NiMH 12v Battery Pack & Chrg:

£99 inc vat when purchased with 'e' series unit (otherwise: £139 inc vat)

The WINRADIO Digital Suite:

£74.99 inc vat when purchased with a WINRADIO receiver (otherwise: £81.05 inc vat)

For your free (no obligation) info pack & WINRADIO demo disk go to: <http://www.broadercasting.com>. If you don't have access to the internet then by all means feel free to phone/fax us. \*Trunked radio transmissions should only be received & decoded with permission of the originator of the transmission.

Please send all your enquiries to: [info@broadercasting.com](mailto:info@broadercasting.com) or Telephone: 0800 0746 263 or +44 (0)1245 348000 - Fax: +44 (0)1245 287057  
Broadercasting Communication Systems, Unit B, Chelford Court, Robjohns Road, Chelmsford, Essex, CM1 3AG, United Kingdom

# EARTH STATION FT-847

## HF/50/144/430 MHz All Mode Transceiver

"Compact, too—great for our next 'rover' operation."

"HF, VHF/UHF, and satellite, all-in-one!"



"Looks like Yaesu did it again!"

"And the DSP helped me hear my first moonbounce signal ever!"



The FT-847 changes base station operation forever. Now, three radios in one—HF, VHF/UHF, satellite; technology in its finest application, from the world leader in amateur communication.

With its unequalled combination of features, like DSP filters—notch, NR and BPF, built-in 6-meter, voice monitor, separate sub-band dial, Shuttle Jog dial, Smart Search, and digital meter, the FT-847 is the only radio of its kind! Exclusively for satellite work, 19 memories exceed any other radio. For performance, power-up with 100W for HF/6-meter, and 50W for 2-meter and 430 MHz. Additional "must-haves" include cross-band full duplex, normal/reverse tracking, CTCSS and DCS encode/decode, and direct keypad frequency entry. Plus, the FT-847 is 1200/9600 bps packet-ready.

Take the next step in all-band performance and take home the FT-847 today!

**Only one transceiver gives you all mode operations on HF/50/144/430 MHz with full Satellite capability.**



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#### Active Tuning Antenna System

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