practical wireless - britain's best selling amateur radio magazine

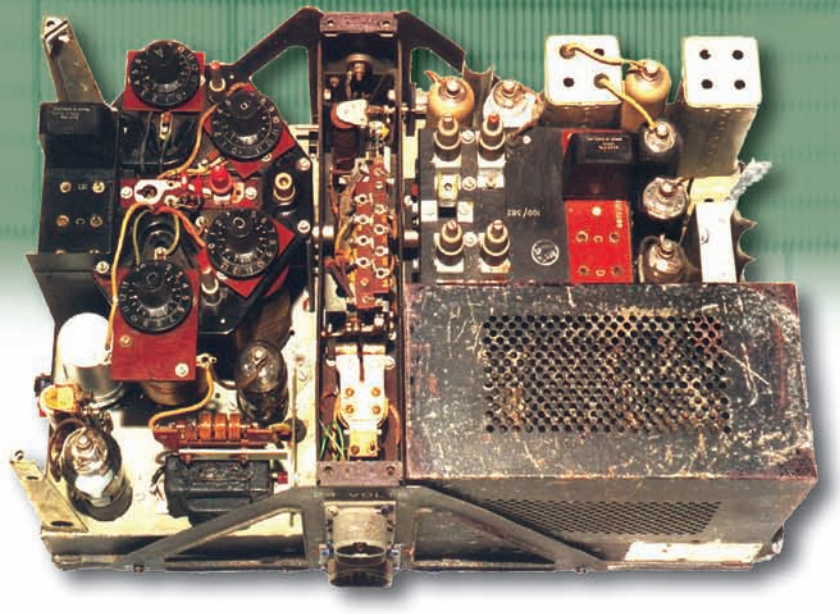
pw

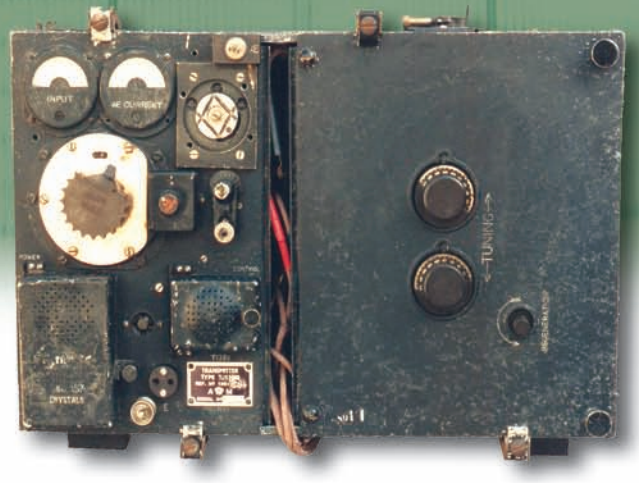
www.pwpublishing.ltd.uk

- Fun with Fones
- Antenna Workshop
- Technical for the Terrified!

TVI

beat that interference





Surplus Heaven!

12 > December 2005
£3.00

WATERS & STANTON

ZERO DEPOSIT ZERO INTEREST

Enquiries 01702 206835

HEAD OFFICE & SOUTHERN STORE • SPA HOUSE, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS ENQUIRIES: 01702 206835/204965 FAX: 01702 205843
MIDLANDS STORE • W&S @ LOWE, BENTLEY BRIDGE, CHESTERFIELD RD, MATLOCK, DERBYSHIRE, DE4 5LE ENQUIRIES: 01629 832375 FAX: 01629 580020
SCOTTISH STORE • W&S @ JAYCEE, 20 WOODSIDE WAY, GLENROTHES, FIFE KY7 5DF ENQUIRIES: 01592 756962 FAX: 01592 610451-CLOSED MONDAYS

NEW UK Radio Communications Equipment Guide 2006

£3.95 + £1.75P&P

• Free Carriage Vouchers • 400 Pages • Full Colour • Articles & Reviews • Detailed Spec on every piece of Ham Gear • Over 4000 Products

Programming Software For Your Radio

Programme Memories and all your radio's functions from your PC. Includes Windows software and serial lead with adaptor for your Radio.

ADMS-1F	Software for VX-110/1	£39.95
ADMS-1G	Software for VX-7	£39.95
ADMS-1H	Software for VX-2E	£39.95
ADMS-1J	Software for FT-60E	£39.95
ADMS-2H	Software for FT-8900	£39.95
ADMS-2I	Software for FT-8800	£39.95
ADMS-2J	Software for FT-2800	£39.95
ADMS-2K	Software for FT-7800	£39.95
ADMS-3	Programming Kit for VR-500	£39.95
ADMS-4A*	Software for FT-817	£29.95
ADMS-4B*	Software for FT-857/8	£29.95

*These items require a seperate CT-62 lead at £29.95

PRICEMATCH!

We will match or beat any UK advertised price on UK sourced and UK guaranteed stock. Items must be in stock with the competitor and brand new - not B-Stock or old stock clearance.

CALL FREEPHONE SALES 08000 73 73 88

Visit our eBay shop for more bargains!

eBay

Go to www.wsplc.com then click on the link to our eBay shop

PAY NOTHING 'TIL 2006!

BUY NOW PAY LATER AT ALL 3 STORES

AVAILABLE ON ALL SALES OVER £200

You won't find a better deal!

Proof that at W&S you get the best possible deal. On selected items it is now possible to pay nothing for a whole year without incurring any interest charge. Amazing but true. And what's more, you get probably the best prices in the business. Give us a call today or visit one of our branches.

0% APR TYPICAL EXAMPLE OF BUY NOW PAY LATER. CASH PRICE £600. PAY NO DEPOSIT AND PAY THE FULL AMOUNT BY THE DUE DATE. PAY NO INTEREST.

OR

29.8% APR REPAY £31.53 PER MONTH FOR 36 MONTHS, AFTER THE 12 MONTH PERIOD . TOTAL AMOUNT DUE £1135.08. INTEREST IS CALCULATED FROM THE DATE OF THE AGREEMENT.

ALL FINANCE SUBJECT TO STATUS WRITTEN QUOTATION ON REQUEST.

WIN AN FT-1000MK-V

FREE FT-1000MKV!

This radio could be yours FREE!

Purchase a Yaesu transceiver or receiver from any Waters & Stanton shop, or mail order or at an outside event, and you will automatically be entered into our competition for this beautiful radio.

You have a 500:1 chance of winning!
Winner will be decided after 500 cards have been issued

The first correct answer drawn will be the winner. Draw expected to take place after Christmas. Waters & Stanton staff and dealers are not permitted to enter. Yaesu UK will make draw on our behalf.

FAST SAME-DAY DESPATCH

www.wsplc.com

GREAT AFTER-SALES SERVICE

FREEPHONE ORDER LINE **08000 73 73 88**

NEW

WM-S HANDS-FREE MOBILE SYSTEM

An economical way of staying legal. Flexible boom microphone mounts under sun visor. PTT box mounts on gear changer. All powered from rig mic socket!
Includes detachable lead to match your radio.

Get Legal!

To check compatibility, download PDF "WM-S Compatibility" in leaflets section of www.wsplc.com

£39.95

Icom HF Transceivers

ICOM IC-756 PRO III

Top of its range of HF transceivers. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit. **£2099 C**

IC-7800 £6400 C
Icom' Flagship HF 200W transceiver. 200W max. The ultimate receiver - the ultimate design! AC psu built in.

IC-7800-PACK £6995 C
The superb transceiver as above plus 17" flat screen, keyboard and SM-20 base microphone.

IC-7400 *Lower Price* £1279 C
HF/VHF 160m - 2m transceiver 5 - 100W. SSB CW FM AM. 12V DC. Nice big display. Lovely price.

IC-706 MkIIGDSP £769 C
It's unbeatable. 160m - 70cm (up to 100W HF) yet so small with detachable head. The ultimate mobile..

IC-718 £449 C
This is a budget class radio HF 160 - 10m at a price that belies its performance. Beautiful display.

IC-703 *FREE IC-703 Logbook* £539 C
Take an IC-706, reduce power to 10W max and get rid of VHF/UHF. 160 - 6m of pure QRP joy!!

Going HF Mobile?

Then check out the great 80m - 6m SIDEKICK magnetic mount whip from USA. No hassel and great performance. £249.95 C

Kenwood HF Transceivers

KENWOOD TS-2000

Top-of-the-range Kenwood transceiver. The Station in a box. 160m-70cm with every feature imaginable inc. DX Cluster. Kenwood fans dream rig. HF/VHF/UHF or up to 23cm with the optional module. Built-in auto ATU, DSP and its unique TNC.
New Lower Price **£1295 C**

TS-2000X *Lower Price* £1789 C
Take the TS-2000 and add a superb 23cm module. The best 23cm we know of plus all other bands!

TS-B2000 *Lower Price* £995 C
Designed for the 21st century. You get HF - 70cm with PC software for direct PC control. It works great.

TS-570DG *Lower Price* £799 C
The best budget radio at the price. Superb 100W from 160m to 10m. As used by Peter Waters, G3OJV

TS-480HX *Lower Price* £799 C
Take the TS-480SAT, remove the auto ATU and offer a beefy 200W output. That's a really potent package!

TS-480SAT *Lower Price* £699 C
HF 160m - 6m with remote front panel. Large enough for base use, small enough for mobile. Big display

Buy a TS-480SAT & get Free Of Charge a Heil Microphone Package. To claim send a copy of invoice to Kenwood

Yaesu HF Transceivers

YAESU FT-1000 MKV

200W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC PSU. Acknowledged as one of the finest DX rigs on the market. Superb tailored audio and the ability to select Class A bias for dramatic signal purity. **£2099 C**

FT-1000 FIELD £1699 C
The HF choice for DXers. With this rigs reputation on DXpeditions what more persuasion do you need?

FTV-1000 *Lower Price* £619 C
6m 200W module for the FT-1000 range. Probably the ultimate for 6m DXing.

FT-897D £649 C
160m - 70cm self-contained portable. 100W and up to 20W from optional internal batts.

FT-857D *Limited Offer* £579 C
160m - 70cm mobile with up to 100W output. Lovely tuning control from remote head unit - and great price!

FT-847 £999 C
Complete station in a box! 160m - 70cm - up to 100W (50W 2m/70cm). Great for satellite work.

FT-840 £399 C
Is there any other radio that comes close to this price? One of our all-time best sellers. 100W 160m - 10m

FT-817ND *SPECIAL OFFER* £489 C
The ultimate QRP self-contained radio. Up to 5W output 160m - 70cm. New low price. UK warranty.

FT-817DSP *SPECIAL OFFER* £559 C
FREE CSC-83 CARRYCASE WITH FT-817ND/DSP

Warning - as a regular advertiser you can be sure all our stock is genuine UK warranted. Check serial numbers!!

Carriage Charges: A=£3, B=£6, C=£10

Natale Allegro Veselý Vánoce Frohe Weihnachten

Merry Christmas

God Jul Christmas Alegre 'n arab nadolig Vrolijke Kerstmis

Please phone our enquiry line for Christmas Opening Hours or check our website.

to all our customers

Joyeux Noël メリークリスマス Masaya Pasko Feliz Navidad

Freephone Orderline 08000 73 73 88

Icom
VHF/UHF Mobile/Base

ICOM IC-E208 *LIMITED OFFER*

VHF/UHF FM Dual Band Mobile Transceiver
*Freq range 144-146MHz, 430-440MHz Tx *55/50W (3 pwr steps each band) *Wideband Rx 118-173, 230-549 & 810-999MHz **£215 C**

IC-910H *Lower Price* **£1087 C**
2m / 70cm 100W Base station all - modes with option for 23cm module (**UX-910 £359**)

IC-910HX *Lower Price* **£1235 C**
As above but with 23cm module ready fitted and a big saving as well.

IC-2725E **£269 C**
Icom's new dual band 2m / 70cm radio. Very easy to operate and install and a lovely detachable head.

Kenwood
VHF/UHF Mobile/Base

KENWOOD TMD-700E

2m/70cm dual band mobile transceiver with APRS. Doesn't need extra high cost boards to function. Only extra if required is a compatible GPS receiver.
Lower Price **£418 C**

TM-G707E **£265 C**
Dual Band 2m & 70cm with detachable front

TM-V7E **£359 C**
Dual Band 2m & 70cm with 50/35W output

TM-271E **£187 C**
Single Band 2m FM 60W mobile transceiver

Yaesu
VHF/UHF Mobile/Base

YAESU FT-7800E *SPECIAL OFFER*

*2m/70cms Dual Band Mobile *High power 50W 2m /40W 70cms *Wide receive inc. civil & military airband *CTCSS & DCS with direct keypad mic. *Detachable front panel *1000 memories plus five one-touch
FREE YSK-7800 SEPERATION KIT **£229 C**

FT-2800M **£149 C**
*2m FM Mobile transceiver * High power 65W * Capable of VHF wideband receiver

FT-8800E *LOW PRICE* **£267 C**
*2m/70cmDualband FM Mobile transceiver * 50W 2m, 35W 70cm * Wideband receiver

FT-8900R **£339 C**
*2m, 70cm, 6m & 10m Quadband FM Mobile transceiver * Independent dial for each band

Watson
On-Glass Antenna

WGM-270

Dual Band 2m/70cm mobile whip. 2.5dB gain and 1.5:1 VSWR. 0.8m long. Complete system including 3.5m cable. No drilling involved. Antenna sticks on glass and interface assembly sticks on inside. Simple and very effective.
£29.95 B

Icom
VHF/UHF Handhelds

IC-V82 *NEW* **£159 B**
2m FM Digital Handheld 7W

IC-U82 *NEW* **£159 B**
70cm FM Digital Handheld 5W

IC-E90 *Limited Offer* **£199 C**
6m / 2m / 70cm handheld transceiver

IC-T3H **£129 C**
2m FM handheld 5.5W c/w BC-01 & BC-146

IC-E7 *DUE IN 2006*
New 2m / 70cm handy wide RX

Kenwood
VHF/UHF Handhelds

KENWOOD TH-F7E

• 144-146MHz Tx/Rx: FM
• 430-440MHz Tx/Rx: FM
Up to 6W out with Li-ion battery and **"scanner" style coverage from 100kHz to 1300MHz** including SSB on receive! This is a great radio to have at all times when you are on your travels.
£237 B

TH-D7E **£299 C**
2m/70cm dualband FM handheld transceiver with data communications

TH-G71E **£179 C**
2m/70cm dualband FM handheld transceiver

TH-K2E **£139 C**
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K2ET **£145 C**
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K4E **£139 C**
70cm FM 5W portable transceiver c/w Ni-MH battery/charger

Yaesu
VHF/UHF Handhelds

YAESU VX-7R
LIMITED SPECIAL OFFER

Totally waterproof, wide frequency coverage 500kHz-900MHz AM/FM. 132x64 dot matrix display providing easy-to-read frequencies and information plus pictorial graphics.
£209 C

***NEW* VX-6E *Offer* £189 B**
2m /70cm Submersible 5W

FT-60E 2m/70cm 5W **£169 C**
VX-2E 2m/70cms min **£119 C**
VX-110 2mhandheld **£94 C**

Alinco
VHF/UHF Handhelds

DJ-V5E **£159 C**
2m/70cm FM 5W dualband handheld transceiver

DJ-193E **£91 C**
2m FM transceiver no keypad, Ni-Cds & charger

DJ-195E **£99 C**
2m FM transceiver with keypad Ni-Cds & charger

DJ-C7E **£124 C**
2m, 7cm credit size FM handheld

Linear Amp UK
HF Linear Amplifiers

RANGER 811H

*1.8 - 29.7MHz *800W CW or SSB, 400W RTTY *Uses 4 x811A vertically mounted *Drive 10 - 100W *Toroidial AC Power Transformer *6:1 Reduction Drive on Tuning Controls *"Near Silent" Papst Cooling fan *Front-panel ALC Adjust Control *Built-in AC 230V @ 8A Supply
£945 B

CHALLENGER III **£1795 C**
HF linear amplifier 10-160m WARC 100W in 1.5kW out

W3FF
NEW Mini Buddipole

Portable 40 - 2m Ant Just 14" long packed!

£199

Comes in a case **just 14" long** yet extends to a **highly efficient 4.6m long rigid rotatable dipole.** Great for camping and back-packing. Handles 200W and band changing is just a coil tap away. Supplied with 25' of coax and balun. Centre has standard 1/2" plumbers pipe thread. Optional telescopic mast and tripod available.

SGC
HF Linear Amplifiers

SG-500 **£1399.95 C**
"Power Cube" 1.6-30MHz 500W solid state

Yaesu
HF Linear Amplifiers

VL-1000 QUADRA £3795 C
HF + 6m linear amp. 1kW comes with PSU

Super Antennas
40 - 2m Screwdriver

A very efficient portable vetical 185cm long when fully extetended approx 40cm packed down. Coil is continuously hand adjusted for resonance. Covers 80 - 10m plus 6/2/70 with just whip. Supplied with universal base table clamp and SO-239 plus radials. 100W Max. "Superb performer" says G3OJV
Order MP1-SA **£139.95 B**
Mini tripod support **£22.95 A**

NEW STOCK & OFFERS

YAESU VX-120 & VX-170 NEW

< VX-120
A 2m 5W handheld with an 8-key pad, Ni-MH batt & charger
VX-170 >
A 2m 5W handheld with a 16-key pad, Ni-MH batt & charger

£99.95 B **£109.95 B**

YAESU FT-DX9000D NEW

Top-of-the-range 200W HF + 6m Deluxe Base Station. Auto ATU, 220V AC PSU, Class 'A' operation for AM & SSB, large TFT data management unit and dual analogue meters, Main/Sub receivers, 32-bit IF DSP. Return of the FT-DX series represents the very best in high power DX-ready base stations.
£7299 D

bhi
DSP Equipment

bhi NES10-2 MkII

NES10-2 Combined speaker and programmable DSP unit. Offers dramatic noise reduction and reduces annoying hetrodynes. 8 filter settings, 12V DC.
£99.95 B

NES-5 **£79.95 B**
DSP Speaker Basic Plug & Go model

NEIM-1031 **£129.95 B**
Noise Eliminating In-Line Module with DSP

ANEM *NEW* **£119.95 B**
"NOISE AWAY" Amplified LS DSP module

NEHM *NEW* **£99.95 B**
"NOISE AWAY" Headphone DSP module

1042 **£19.95 A**
Switch box allowing up to 6 items to connect to one bhi speaker/module.

NEDSP-1061 **£89.95 B**
Small DSP PCB module for retrofitting into rigs

NEDSP-1062-PCB **£89.95 B**
Amplified DSP module to insert in speaker path

NEDSP-1062-KBD **£99.95 B**
As NEDSP-1062 but with small keyboard

NCH **£34.95 B**
ANR Noise Cancelling headphones

ANTENNAS

W-2LE	1/4 wave 2m 0.48m 200W	£9.95 B
W-285	5/8th 2m 1.33m long 200W	£14.95 B
W-77LS	2m/70cm 0.42m 50W	£14.95 B
W-770HB	2m/70cm 1.1m 200W	£24.95 B
W-7900	2m/70cm 2m/70cm 1.58m	£32.95 B
WSM-270	Dual band mini magnetic	£19.95 B

BASES

WM-08	8cm diam magnetic	£9.95 A
WM-14B	14cm diam magnetic	£12.95 A
W-3HM	Hatch mount	£14.95 A
ECH	Cable kit	£10.95 B

NOTE: All antennas have PL-259 ends. Mag mounts have cable attached. Hatch mount needs ECH cable.

Watson
Mobile Antennas

Carriage Charges: A=£3, B=£6, C=£10

WATERS & STANTON

Freephone Orderline 08000 73 73 88

Enquiries 01702 206835

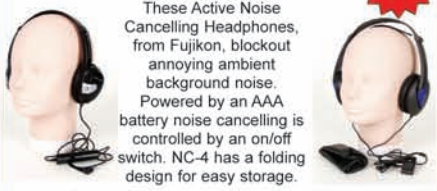
www.wsplc.com

UK'S LOWEST PRICES!

NEW STOCK & OFFERS

FUJIKON NOISE CANCELLING HEADPHONES

NEW



These Active Noise Cancelling Headphones, from Fujikon, blockout annoying ambient background noise. Powered by an AAA battery noise cancelling is controlled by an on/off switch. NC-4 has a folding design for easy storage.

FUJIKON NC-2 £18.95 B

FUJIKON NC-4 £19.95 B

POCKET MORSE READER MFJ-461

Reads CW
Just hold near receiver speaker

£79.95 B

That's right - just hold this self-contained decoder near your speaker and see the text scroll across the screen. Absolutely amazing

MFJ-936B Loop Tuner

The most amazing antenna we have seen in years. For optimum results take a wire around 1/5th wave long, bend into square loop (14ft on 20m = 3.5ft square) and attach to MFJ-936B. Result: Ultra low indoor noise and VK, ZL & W all on SSB! That's what we achieved in one day's operation! 20m loop works on 15m as well. Now In Stock. Great for QRP and portable as well.

£229.95 B

Antenna Accessories

Dipole Bits			
Kevlar	Strong 400lb strain line 200ft	£22.95	A
FW-PVC-50	50m clear PVC 2mm wire	£39.95	A
Flexweave	50m multi-strand 2mm wire	£29.95	A
HDCW	50m hard drawn 16g copper	£14.95	A
Insul-8	Black ribbed insulator	£0.99	A
WDC-50	SO-239 dipole centre insulator	£6.49	A
Egg-l	Large ceramic egg insulator	£4.99	A
Egg-s	Small ceramic egg insulator	£1.75	A
WS-2580	25pcs 3" ladder line spacers	£9.95	A
Diamond 50 Ohm Baluns			
BU-50	1:1 1.7MHz 40MHz 1.2kW	£26.95	A
BU-55	1:1 3.5MHz - 75MHz 500W	£34.95	A
Antenna Traps (pairs)			
TR-200-14	200W bands 10m - 20m	£44.95	B
TR-200-10	200W 10MHz	£47.95	B
TR-200-7	200W 7MHz	£49.95	B
TR-200-3.6	200W 3.6MHz	£53.95	B
TR-1000-14	1kW bands 10m - 20m	£59.95	B
TR-1000-10	1kW 30m	£61.95	B
TR-1000-7	1kW 40m	£64.95	B
TR-1000-3.6	1kW 80m	£73.95	B
German Made High Quality Baluns			
HB-1-200	1:1 3.5 - 30MHz 200W	£25.95	B
HB-4-200	4:1 3.5 - 30MHz 200W	£25.95	B
HB-6-200	6:1 3.5 - 30MHz 200W	£25.95	B
HB-1-1	1:1 3.5 - 30MHz 1kW	£34.95	B
HB-4-1	4:1 3.5 - 30MHz 1kW	£41.95	B
HB-6-1	6:1 3.5 - 30MHz 1kW	£41.95	B
Remote 4:11.5kW Balun			
REM-BAL	For coax to ladder line match	£45.95	B
Patch Leads			
WPL-70	V low loss 75cm PL-259	£6.95	A
WPL-50	Standard 50cm PL-259	£2.99	A
WPL-50BNC	BNC version of above	£2.99	A
HQ-66	66cm RG-213 PL-259	£4.99	A
HQ-10m	10m long PL-259	£14.99	A

SGC External Auto ATU's

SGC SG-231

1 - 60MHz. 3 - 100W pep (50W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 900mA.

£349.95 C

SG-239 £189.95 C
Mini auto ATU 1.8 - 30MHz 1.5 - 200W PEP primarily for long wires - non waterproof. 12V DC

SG-231 £349.95 C
1.8 - 60MHz 100W PEP. A great random wire tuner that you can use outdoors. 12V DC

SG-237 £299.95 C
1.8 - 60MHz 100W PEP. Great for mounting outdoors and feeding long wire. Waterproof. 12V DC

SG-230 £339.95 C
1.8 - 30MHz 200W PEP. The original design that handles end fed or coax unbalanced. Waterproof. 12V

SG-235 £749.95 C
3.5 - 54MHz. A hunky 500W PEP tuner that handles long wires. Great outdoor design. Waterproof.

Icom External Auto ATU's

AH-3 £479.99 C
1.8 - 28MHz. A hunky 120W PEP tuner that handles whips or wire longer than 2.5m. Waterproof.

Alinco External Auto ATU's

EDX-2 £289.95 C
1.8 - 30MHz 150W long wire tuner designed for use with DX-70 transceiver. Waterproof.

MFJ Internal Auto ATU's

MFJ-993

**Auto ATU with digital data display *1.8-30MHz *Long wire, coax & balanced line *300W SSB, 150W CW *Cross needle metering*

£209.95 C

MFJ-991 £179.95 C
1.8 - 30MHz auto ATU. Similar to MFJ-993 but no digital display. Works with any HF transceiver. 150W PEP

MFJ-994 £299.95 C
1.8 - 30MHz high power auto ATU. 600W PEP / 300W CW. Tunes wire, coax and balanced feed.

SGC Internal Auto ATU's

MAC-200 £259.95 C
1.8 - 60MHz 200W PEP. Wire, coax and balanced feeder. Features auto antenna switching.

SG-237PCB £279.95 C
1.8 - 60MHz 100W PEP. Same as SG-237 but without housing for building into your own housing.

SG-211 £189.95 C
1.8 - 60MHz works off internal dry cells. Zero drain wait state. 60W PEP. Ideal for portable (Min 1W).

Yaesu Internal Auto ATU's

FC-20 £249.95 C
1.8 - 60MHz 100W matched for FT-100/Ft-847. Desk top unit to match transceivers. Coax systems only.

FC-30 £249.95 C
1.8 - 60MHz 100W. Designed for use with FT-857/FT897. Coaxial input / output.

FC-40 £239.00 C
1.8 - 60MHz 100W. New waterproof ATU designed for use with FT-897 / FT-857 and mobile operation.

Icom Internal Auto ATU's

AT-180 £349.95 C
1.8 - 54 MHZ ATU designed for IC-706. Plugs directly into transceiver for seamless operation. Coax only.

Kenwood Internal Auto ATU's

AT-50 £319.95 C
1.8 - 30 MHZ 100W ATU specifically designed for use with TS-50 transceiver. Coaxial only.

Cushcraft HF Antennas

MA5V £239.95 C
Vertical 5-band 20m - 10m. No separate radials needed. 250W. Self-supporting. 4.48m tall.

A3-S £469.95 D
The classic 20, 15, 10m 3-el beam. 2kW 8dB gain. 8.45 el. Turn radius 4.72m. F/B ratio 25dB.

A3-WS £379.95 D
Dual Band 3 el. beam for 17m & 12m. 2kW. El length 7.66m. Turn radius 4.4m. Gain 8dB. F/B ratio 25dB.

A4-S £569.95 D
Tri-band 4 element Yagi. for 20m - 10m. DXers delight. 2kW . 8.9dB gain F/B 25dB. Turn radius 5.49m

R-8 £469.95 C
8-band vertical 40m - 6m. No separate radials needed. 1.5kW. Height 8.7m

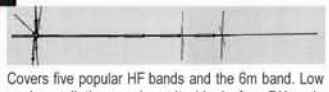
R-6000 £329.95 C
6-band vertical 20m - 6m. No separate radials needed. 1.5kW. Height 5.8m. Great small garden ant.

MA5B
£369.95 C

5-band 2 El mini beam. 20m - 10m 2kW. Elements 5.2m Turn radius 2.7m. (Dipole on 17/12m) 5dB gain

Diamond HF Antennas

DIAMOND CP6



Covers five popular HF bands and the 6m band. Low angle radiation makes it ideal for DX work. Outperforms dipoles for long distance contacts and compares favourably with beams located 10m+ above ground.

**Bands: 3.5 -50MHz *Power: 200W *VSWR: Better than 1.5:1 *Socket: SO-239 *Height: 4.6m *Radials: 1.8m rigid adjustable*

£239.95 C

Radio Works HF Antennas

CW-160 £129.95 C
8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 265ft long.

CWS-160 £119.95 C
Compact 8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

CW-80 £89.95 C
7-band 80m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

CWS-80 £109.95 C
Compact 7-band 80m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

G5RV Plus £59.95 C
Rugged 2kW balun matched G5RV with 102ft element and 31ft ladder line. Requires ATU. Made in USA

Hustler Base Antennas

6-BTV £229.95 C
80 - 6m 6-band vertical. 7.3m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

5-BTV £199.95 C
80 - 10m 5-band vert. 7.64m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

4-BTV £169.95 C
40 - 10m 4-band vert. 6.52m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

Butternut Antennas

HF-2V £229.95 C
80 / 40m high performance vertical. 1kW PEP 9.75m tall. Self supporting for ground mount use.

HF-6V £299.95 C
6 band vertical 80-40-30-20-15-10m. 2kW. 7.9m tall. Use own radials or ground mount.

HF-9V £349.95 C
9-band 80 40 30 20 17 15 12 10 6m vertical 1kW 7.9m tall. Use radials or ground mount

Buddipole Products

HF Portable at its Best

W3-BP £199.95 B
40m - 2m adjustable dipole. 250W and max length of 4.65m. Packs down to 65cm approx.

W3-MBP £199.95 B
Sames as W3-BP but packs even smaller.

W3-BS £134.95 B
40m - 2m vertical is half a Buddipole. Ideal for QRP and rucksack - as used by Peter Waters G3OJV.

Peter Waters says: *I think these products are great. Superbly engineered and very efficient.* Options include adaptor for dipole to decorators pole £6.95, Field tripod £89.95, 2.45m telescopic mast £49.95, mini tripod for Buddistick.

Super Antennas

MP1-SA £139.95 B
Screwdriver style adjustable HF QRP whip 40m - 70cm. 150W PEP. Max extended 185cm approx

MP2-SA £199.95 B
Electrically tuned version of the above. Requires around 9V - switch control box not included.

MP-80M £29.95 A
Add on 80m coil to extend the LF coverage of the MP1 and MP2.

High Sierra Mobile Whips

HS-1800/PRO
£379.95 C
The ultimate mobile whip. Electrically tuneable 80m - 6m 1kW PEP Includes switch box and 12V cable. Massive 2" coil. Made in USA. Superb!! Available in Black or Grey.

SIDEKICK As used by Peter Waters G3OJV/M
£249.95 C
Get mobile on all bands from 80m to 6m in minutes. This compact screwdriver antenna comes with cables and control box. Designed to go on our 3-way magnetic mount (£39.95 extra) it is an amazing performer and only 1.37m maximum! Available in Black Only.

Carriage Charges: A=£3, B=£6, C=£10

December 2005
On Sale 10 November
Vol 81 No.12 Issue 1184
(January Issue on sale 8 December)

Published by
PW Publishing Limited
Ar owsmith Court
Station App oach
BROADSTONE
Dorset BH18 8PW
Directors: Stephen Hunt & Roger Hall

Editorial Department
☎ 0870 224 7810
Fax: 0870 224 7850

Editor
Rob Mannion G3XFD/EI5IW
rob@pwpublishing.ltd.uk

Production Editor
Donna Vincent G7TZB/M3TZB
donna@pwpublishing.ltd.uk

Technical Editor
NG (Tex) Swann G1TEX/M3NGS
tex@pwpublishing.ltd.uk

Art Department
☎ 0870 224 7820
Fax: 0870 224 7850

Art Editor
Stephen Hunt
steve@pwpublishing.ltd.uk

Typesetting
Peter Eldrett
peter@pwpublishing.ltd.uk

Sales Department
Fax: 0870 224 7850

Advertisements
Roger Hall G4TNT
roger@pwpublishing.ltd.uk
☎ 0207 731 6222

Advertisement Administration
Joan Adams
joan@pwpublishing.ltd.uk
☎ 0870 224 7820

Book Orders
Clive Hardy G4SLU
clive@pwpublishing.ltd.uk
☎ 0870 224 7830

NEW Subscription Administration
Webscribe
Practical Wireless Subscriptions
PO Box 464
Berkhamsted
Hertfordshire HP4 2UR, UK
pw@webscribe.co.uk
www.webscribe.co.uk
☎ 01442 879097
Fax: 01442 872279

Finance Department
☎ 0870 224 7840
Fax: 0870 224 7850

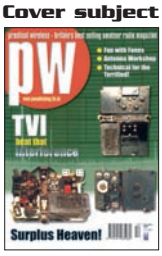
Finance Manager
Alan Burgess
alan@pwpublishing.ltd.uk

Finance Assistant
Margaret Hasted

PW Publishing Website
www.pwpublishing.ltd.uk

All our 0870 numbers are charged at the BT Standard National Rate

Cover subject

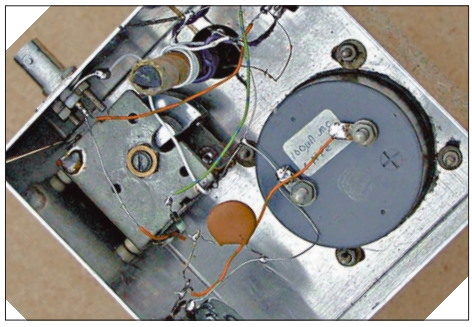


You either love it or hate it - vintage radio that is! However, **Tony Sanderson G4OEY**'s article on surplus equipment and his love of it will have all you surplus seekers thinking all their Christmasses have come at once! Special thanks to **Ben Nock G4BXD** for his help in supplying the photos of the vintage RAF 1196 and TR9 equipment. Enjoy this issue and make sure you join us as we look forward to more great radio reading in 2006!

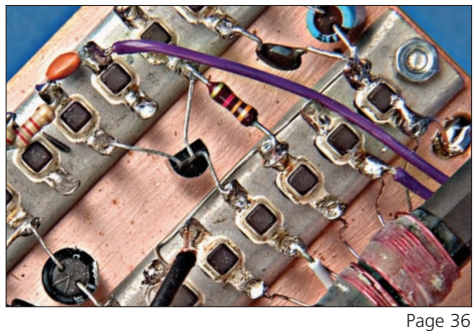
Design: Steve Hunt
Photographs: Courtesy of Ben Nock G4BXD

december 2005 contents

features



Page 32



Page 36

regulars

Copyright © PW PUBLISHING TD. 2005. Copyright in all drawings, photographs and articles publ shed in *Practical Wireless* is fully p otected and reproduction in whole or part is exp essly forbidden. All reasonable precautions are taken by *Practical Wireless* to ensure that the advice and data given to our reade s are eliable. We canno however guarantee t and we cannot accept legal esponsibility for it Prices a e those current as we go to p ess.
Published on the second Thu sday of each month by PW Publishing Ltd., Arrowsm th Court, Station Approach, Broadstone, Do set BH18 8PW. Tel: 0870 224 7810 P inted in England by Holb ooks P inte s Ltd., Portsmouth P03 5HX Distributed by Seymour, 86 Newman St eet, London , W1P 3 D, Tel: 0207-396 8000, Fax: 0207-306 8002, Web http://www.seymour co uk. Sole Agents for Aust alia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Centra News Agency. Subscriptions INLAND £32, EUROPE £40, REST OF WOR D £49, payable to PRACTICAL WIRELESS, Subscription Department PW Publishing Ltd., Arrowsm th Court, Station Approach, Broadstone, Do set BH18 8PW. Tel: 0870 224 7830 PRACTICAL WIRELESS is sold subject to he following conditions, namely that it shall not, w thout written consent of he publ she s firs having been given, be lent, e-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on he cover, and hat it shall not be lent, e-sold, hired out or otherwise disposed of in a mutilated condition or in any unau horised cover by way of Trade, or affixed to or as part of any publication or advertising, ite ary or pictorial matter whatsoever. *Practical Wireless* is Published mon thly for $50 per year by PW Publ shing Ltd., Arrowsm th Court, Station App oach, B oadstone, Dorset BH18 8PW, Royal Mail International, c/o Yellowstone Inte national, 87 Burlews Court, Hackensack, NJ 07601. UK Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/oYellowstone Inte national, 2375 P att Boulevard, Elk G ove Village, IL 60007-5937. The USPS (United States Postal Se vice) number for Practical Wireless is: 007075.

KENWOOD

Listen to the Future

High-end radio technology doesn't mean a high-end budget anymore — Kenwood delivers it today with the TS-570DG. With 16-bit DSP technology, untouchable digital filtering, heavy-duty transmitter design, a Central Frequency Control System for near-perfect stability, and a large LCD display section coupled with an ergonomically-optimized human interface, the TS-570DG provides a clean and powerful operating experience. All of this wrapped up in a compact and efficient package makes the TS-570DG the perfect choice for home or mobile operating.

● DSP voice equaliser/speech processor ● Large LCD display ● S/PWR/COMP/SWR/ALC meters ● CW auto tune ● Menu system ● 100 memory channels ● Quick memory ● 10-key direct frequency entry ● Operating guidance feature ● Mobile/station size (270 x 96mm) ● Heavy-duty design ● 5W QRP operation ● Built-in electronic keyer ● CW message memory ● CW reverse mode ● Full break-in and semi break-in ● High-speed 57600bps PC control ● Dedicated data port

HF ALL-MODE TRANSCEIVER

TS-570DG

100W Model

- 16-bit AF-stage DSP (Digital Signal Processing)
- 160m to 10m amateur band operation,
- 500kHz to 30MHz general coverage receiver
- 100 Memories plus 5 "Quick Memories"
- Digital filtering with 11 CW DSP filter widths
- NR1 &NR2 Digital Noise Reduction
- TX audio shaping and Equalizer
- Built-in auto antenna tuner
- 13.8 volts operation

Available from all official Kenwood amateur radio dealers. For full details of our dealer network and all Kenwood amateur products contact your local dealer or Kenwood Electronics UK Limited. 01923 655284
e-mail comms@kenwood-electronics.co.uk

Kenwood Electronics UK Limited

www.kenwood-electronics.co.uk

rob mannion's keylines

Looking at printing, the QRP contest and solder problems.

This issue of *PW* is the second printed on our new standard paper and by our new printers, **Holbrooks**, who are based in Portsmouth. The first issue was - in my opinion - excellently printed and produced, reports from readers seem to agree!

Although at first I had been pleased with our matt finish paper - the problems with reflected light were solved - but others surfaced. In fact, the main problem during the time we were using the matt paper was that it became obvious the matt finish allowed ink 'creep' on photographs and other colour illustrations. This left a 'fuzzy' look to some pictures and lowered the definition.

Readers will appreciate just how carefully everyone here at *PW* keeps a close eye on the presentation quality of the magazine on your behalf. Additionally, I'm always working closely with the Art Editor **Steve Hunt** (thanks for the new paper choice Steve!) to avoid problems with the paper and with colour background tints and type reversals. We'll continue to do so and as each issue comes out Steve will continue tweaking the design to get the best we can for your magazine.

Incidentally, while on the subject of our favourite magazine a number of readers have contacted me to ask what's happening to *PW*, following the merger of the legendary, much loved *Short Wave Magazine* with *Radio Active*. My vigorous reply is that *PW* is striding ahead in a class of its own and is doing very well thank you!

So, I ask for your continuing, and extremely valuable support as we forge ahead with supreme confidence into 2006. There's some great projects and even better *PW*s on the way as we help to keep the Amateur Radio hobby fizzing with enthusiasm!

The 2005 144MHz QRP Contest

Like many others I thoroughly enjoy the annual 144MHz QRP contrast originated and organised by **Dr Neill Taylor G4HLX**. This year's contest was great - even though I only managed two hours on the air!

However, it has come to Neill's attention that there were some minor problems with the final results tables as published in *PW* and on his website, although they don't alter the final results at all. However, Neill G4HLX asks readers to look on the website to see **http://www.ntay.com/contest/r2005.html**

Here's hoping for better weather for the 2006 event. Neil and everyone who reads, or is involved with *PW* look forward to meeting you next year on **Sunday 11 June**.

Leicester Show & Solder

I felt privileged to be asked to provide two talks at the Leicester Show this year. It was an extra opportunity for me to meet readers and to be asked some quite tough questions on *PW* and what we're planning. I was also asked what we're intending to publish on the impact of the new lead free solder regulations and the problems we're likely to come across as radio construction enthusiasts.

Of course, here at *PW* we're fully aware (and concerned) at the implications of the introduction of higher melting point lead-free solder and its specialist requirements. Actually, I raised the subject earlier in 2005 in a Topical Talk but was surprised by the almost total silence and lack of response from readers!

However, despite the very poor response from readers on the lead-free solder topic I've met many who are buying up as much traditional solder as possible! Of course, this approach will work in the short term but what happens when your come across a printed circuit board (p.c.b.) board that's produced using lead free solder and you have to work on it?

As this topic is of such importance, *PW* will be bringing several articles to help you overcome the difficulties. As usual we'll try to provide a help yourself approach and something for those fortunate enough to be able to buy something across the counter. Whatever happens - hobby radio construction will not be discouraged by legislation - well meaning or otherwise!

Rob Mannion G3XFD/EI5IW

practical wireless services

Just some of the services *Practical Wireless* offers to readers...

Subscriptions

Subscriptions are available at £33 per annum to UK addresses, £41 Europe Airmail and £50 RoW Airmail.

Components For *PW* Projects

In general all components used in constructing *PW* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of *PW*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. See page 59 for details.

Placing An Order

Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone **0870 224 7830**. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone **0870 224 7850**.

The E-mail address is **clive@pwpublishing.ltd.uk**

Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *PW*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

amateur radio waves

Power Levels In Decibels?

● **Dear Editor**

I'm writing to ask could either your good self, or any other poor person, who like myself suffers from 'Radioitis', enlighten me as to why the powers that be make us note (in our logbooks) power output in dbW?

I ask this because I've never heard the subject mentioned on or off the air, or heard anyone from anywhere in the world say "I'm running X number of dbW".

Neither have I ever seen a handbooks/manuals of Army, CB, or Amateur Radio two-way equipment expressing power output in dbW. How many transceiver meter read-outs display dbW?

Does any one out there in radio land know of any retailer or manufacturer of antennas or radios who would be so foolish as to say his product will handle a maximum power output of X number dbW? Could it be because few us would know what they were on about, and so would not buy the goods? Are we to note in dbW the actual output of the rig at the time of use, as one very well known G3 once told me?

Or, as a magazine pundit wrote some time ago; "That it is power transmitted by the antenna after allowing for feeder and joint losses"? Could we Radio Amateurs not get the regulator Ofcom to change the requirement? Could it changed so that it is the commonly used power output (in Watts) of the rig at the time of transmission, which is to be noted? Could perhaps the Editor ask the readers, which they use - Watts or dbW?

Arthur Roberts G7EMD (formerly M30AP)
Urmston
Manchester

Editor's comments: Arthur has flagged up a problem for many Amateurs who are not familiar with using the logarithmic based deciBel (dB) scale. Although I'm not sure why the system was adopted by the authorities for Amateur Radio, it has been used for many years in radio engineering and broadcasting work. The traditional joke was that "Radio Engineers could add and subtract okay - but they found difficulty in multiplying and dividing"! (You only need to add and subtract the logarithmic decibel system - ideal for assessing what the final radiated power was, taking into account feeder losses, antenna gain, etc.). This particular problem seems to fall neatly into the remit for Tony Nailer G4CFY's Technical for the Terrified series, so I'll ask Tony to devote a page to this topic. Once familiar with the system - you and other readers will find it much to your advantage Arthur!

Why The Interest in AM?

● **Dear Editor**

I have to question the current importance given over to the amplitude modulation (a.m.) mode in *PW* of late? Full marks for the construction side of things - bring 'em on. But, why a.m.? I don't mind a few old timers waxing lyrical about the past or, using a.m. to communicate with like-minded people on 3.5MHz for example - maybe on one frequency. But, I cannot understand why these people and their supporters would want to lure others into their folly? Other than perhaps a museum exhibit, a.m. is dead. Just a relic of bygone days. Like spark transmissions.

When c.w. (Morse) came on the scene and became the mode of preference, it took ages before spark was finally killed off. The 'spark-forever' crowd didn't want to move with the times. In fact, in America the Federal Communications Commission (FCC) had to ban it by law! A bit like today with this a.m. thing doing the rounds, looking for new converts.

There again of course, s.s.b. is the spark of the 20 century - going into the 21st. With all this new blood coming into Amateur Radio nowadays, why are some magazines still publishing construction articles, which feature museum communication modes? This is the **digital age**. Digital communications are the next step forward. If a few old-timers want to play a.m., that's fine, but please do not over-egg the pudding as far as a.m. is concerned! Digital voice communications and digital signal processing information, yes! - a.m.? No!

Incidentally, I thank Rob G3XFD for his letter to me for clarification and in answering his questions regarding my own particular interests; yes, I do construct my own various bits and bobs of ham equipment. And yes, I also operate "Ready-made Amateur Radio transceivers", too.

I should say however, regarding the construction of actual s.s.b. transceivers, I must confess that I've not been active of late. Having said that, I did build the Elecraft rigs. Cheating, I know, (a bit like painting via numbers, I suppose) but, at least it does encourage those others who wouldn't contemplate building a modern s.s.b. rig to have a go - and that's what it's all about. Having fun!

Yes, I approve of v.h.f. home-brewing. But a.m? Hmmm? There again, as I said above, encouragement to actually do something is after all, paramount. Making the process fun. And educational. So, yes, I'm all three things, home-brewer, constructor and, appliance operator, in that order.

Ray Howes G4OWY
Weymouth
Dorset

Editor's comments: I would never claim that building one of the excellent Elecraft transceivers was like 'painting by numbers' Ray! To build a kit as complex as the Elecraft is an achievement! As Ray has introduced some important topics, I've invited Tony Nailer G4CFY, the designer/author of our a.m. projects for v.h.f., to reply via the Topical Talk page to describe our standpoint on the subject. I ask that readers please join Tony and myself on page 65.

Lead Free Solder Problems

● **Dear Rob**

During the past two or three weeks I have had a difficult time having to solder with lead-free solder. The solder will not run freely, ends up with blobs, and extra heat has to be applied to make a good joint. (I hate this kind of solder!).

When checking the Sycom catalogue for transistors I noticed 5 core fluxed 60% Tin 40% Lead in 500g reels in the 18, 20 and 22s.w.g.

At once I ordered a 500g reel and when it arrived I was once again able to solder to perfection! However, **Robin G3NFV** of Sycom informed me from **July 2006** it will be illegal for him to sell this kind of solder. So, may I suggest that, all who are interested should purchase while it's available!

John Sketch GW3DDY
Cardiff
South Wales

Editor's comment: The solder situation is likely to become quite a problem John. Please see Keylines for some comment from myself on this important topic.

Back Issues of Practical Wireless

● **Dear G3XFD**

I started buying the 'modern' *PW* in 2004 - a particular review caught my eye in the newsagents and my enthusiasm for Amateur Radio was increased. I now have a regular subscription to this excellent magazine.

I have - bit by bit - been 'buying up' back issues, which *PW* has in stock (up to 3 years are held I believe). On reading one issue (*PW* August 2003) the article The Band Police reminded me of listening to one such 'policeman' on 144MHz. He was telling an M3 that he was using too much transmit power, saying that he knew the length of coaxial cable feeder the M3 was using, and had calculated the

loss. He went on at length and I believe he was right. The power allowed is the output power at the transmitter - not at the antenna. Could you enlighten us?

I would like to commend the Post Sales to newcomers to obtain recent issues (they are still a good read) and if anyone has *PW* before 2002 that they wish to dispose of, I would be interested to hear from them.

Malcolm Peake G3UIJ
Hounslow
Middlesex

We'll check it out now Malcolm. Editor

The Real Windom

● **Dear Rob**

I'm writing to you regarding the Real Windom antenna. This is because After reading **Martti Nissinen OH4NV's** article 'The Windom - Myth or Magic Antenna'?, in the October issue of *PW*, I've decided that the antenna described in his article is **not a Windom**.

The late **Loren G Windom W8GZ** first described his antenna in the September 1929 issue of *QST*. And for many years up to and after the Second World War his antenna was very popular, and was even widely used by the British Army.

There's a straightforward description of the Windom in the RSGB's *The Amateur Radio Handbook* through its many printings between 1938 and 1961, in several editions of *The ARRL Antenna Book*, Moxon's *HF Antennas for all Locations* and many other antenna books.

All the literature I have read concerning the Windom has been based upon W8GZ's 1929 design. A Windom is basically a half wave, horizontal half-wave wire fed by a single wire which connects to it at the correct impedance matching point. The half-wave wire has its length determined by the conventional formula of 468/f (MHz) feet or 143/f (MHz) metres.

Why OH4NV brings velocity factor into his calculations I cannot understand, for the velocity factor of the wire is irrelevant. His use of a half wavelength of feeder is also quite wrong. The wire used for the top and the feed line must be of the same gauge and is normally 14 or 16s.w.g.

A true Windom should not radiate from its feed line, which does not to be of any specific length. However, Martti OH4NV's antenna seems to be a half-wave vertical with some top loading.

The most critical feature of a true Windom is the feeder tap point. Along a half wave resonant wire the impedance from centre to each end ranges from below 50 to about 5000Ω. And a single wire feed will have a natural impedance against ground of about 600Ω.

If connected to the 600Ω impedance point on the horizontal wire the feeder should radiate very little. The correct tap point is not one third of the way along the half wave top, but is a critical point about 0.067 of a wavelength from the wire centre, ie. 66/f (MHz) feet. Multiply this by 0.3048 to convert to metres.

When set up correctly there will be little standing wave along the feeder (any length) and this may be checked with a small neon lamp on the end of a long cane or fibreglass pole.

The Windom was neglected through the 1950. And when carelessly set up the vertically polarised standing waves and harmonics on the feed line created havoc with the TV sets of that time operating on the 405 lines, Band I v.h.f. system.

John Heys G3BDQ
Hastings
East Sussex

Editor's note: John G3BDQ is of course one of our regular antenna authors. He's also modest in not mentioning his own antenna publications!

Letters Received Via E-mail

A great deal of correspondence intended for 'letters' now arrives via E-mail, and although there's no problem in general, 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 include your full postal address and callsign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'. **Editor**

amateur radio rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations.

November 20
MARS Rally
Contact: **Norman Gutteridge G8BHE**
Tel: **0121-422 9787** or **(07808) 078003**
E-mail: **NLgutteridge@aol.com**
The 16th Midland Amateur Radio Society (MARS) Birmingham Rally takes place at a new Venue at Alderbrook School, Blossomfield Road, Solihull. Approx 3 miles from M42 either Jctn 4 or 5. There will be separate areas for Traders to load/unload with ample adjacent car/van parking. Open to the Public from 1000 to 1500hours.

November 26
The Reddish Rally
Contact: **John G4ILA**
Tel: **0161-477 6702**
E-mail: **john@mckae.freeserve.co.uk**
The Reddish Rally takes place at St. Mary's Parish Hall, Reddish Road/Broadstone Hall Road South, Reddish, Soptckport. Doors open 1000. Admission £1. There will be refreshements available and a Talk-in.

November 27
Red Rose Winter Rally
Contact: **Steve**
Tel: **(01942) 895198**
Website: **www.wmrc.org.uk**
The West Manchester Radio Club is holding its Red Rose Winter Rally, at Lowton Civic Centre, just off the A580 East Lancs Road, this is a superb venue, all on one level, with disabled facilities and **free** parking. There will be a low cost Bring & Buy, RSGB bookstall, usual trade stands, component and special interest groups, licensed bar, excellent catering and large social area in which to mingle with fellow Amateurs. Talk-in on S22. Opening at 1000.

December 4
Bishop Auckland RAC 2005 Rally
Contact: **Mark G0GFG** or **Brian G7OCK**
Tel: **(01388) 745353** or **(01388) 762678**
The Bishop Auckland Radio Amateurs Club (BARAC) 2005 Rally will take place at the Spennymoor Leisure Centre. This venue is ideally suited for both trader and disabled visitors as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer, electronics and Bring & Buy stalls, as well as catering and bar facilities. Morse tests will be available on demand. As you can imagine, there is a lot to do for all the family within the confines of the leisure centre for those of the family not interested in radio. Doors open at 1030 (1000 for disabled visitors) and admission is £1.50, under 14s free or charge with an adult. Talk-in on S22.

2006

February 5
21 South Essex ARS Rally
Website: **www.southessex.ars.btinternet.co.uk**
The 21th South Essex Amateur Radio Society, Radio & Computer Rally will be held at the Paddocks Community Centre, Long Road, Canvey Island, Essex. (The Paddocks is situated at the end of the A130). Doors Open 1030.

March 11
Junction 28 QRP Rally
Contact: **Russell Bradley G0OKD**
Tel: **(01773) 783394**
E-mail: **russel.bradley@ntlworld.com**
The 6th Junction 28 QRP Rally hosted by the The South Normanton Alfreton And District Amateur Radio Club (SNADARC) in Association with the G-QRP Club takes place at the Village Hall Community Centre, Market Street, South Normanton, Nr Alfreton, Derbyshire.The event will be fully signed, just five minutes from the M1 Junction 28 and the A38. Open to the public from 1000. There will be Amateur Radio, electronics and related items, Bring & Buy and special interest group stalls, outdoor flea market (weather permitting), refreshments.

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.

amateur radio news & products

A comprehensive look at what's new in our hobby this month

ML&S Appointed LDG Distributor

With a range that seems to be expanding at a great rate, LDG have appointed Martin Lynch & Sons distributor for their range of products. Primarily known for automatic antenna tuners and related products. the entire LDG range is now available from ML&S including the Z-100 auto a.t.u. at only £119.95 through to their new 1kW AT-1000 Auto Tuner at only £499.95.

Chris Taylor, ML&S's Sales Director comments "We have wanted to add LDG's product line to our range for several years and are delighted that we have finally been able to cement the relationship with the US factory. LDG make quality products at very low prices and we have already purchased large quantities to ensure fast delivery".

For full details of the LDG range see **www.HamRadio.co.uk** or call **0845 230 0599**

Newhaven Fort Rally 2006

The annual Newhaven Fort Rally will take place on Sunday 18 June 2006 between the ramparts of the popular Newhaven Fort Museum. Run by members of the Worthing and District Amateur Radio Club, the event will open at 1030 hours.

Admisson to the rally will be £2.50, which will include access to all of the museum exhibits including the Signals Room. Café facilities are available on site with a good souvenir shop also. Views over the English Channel are spectacular on a good day with ample areas available for picnic parties.

Tables for the event are bookable in advance only, with additional rooms available for commercial retailers. Contact **Roy Bannister G4GPX** on **(01903) 753893** for bookings or further information.

On The Move!

Practical Wireless advertiser **John's Radio** formerly of Whitehall Works, 84 Whitehall Road East, Birkenshaw, Bradford, West Yorkshire have recently moved to **Smithies Mill, 885 Bradford Road, Birstall, Batley WS17 8NN** and can now be contacted on **(01924) 477377.**

Tregaron ARISS School Contact Successful

On Thursday 29 September 2005 at 1128UTC the Tregaron High School in Tregaron, Wales, UK had a very succesful Space Talk with US astronaut J**ohn Phillips KE5DRY** onboard the *International Space Station.* Contact was established shortly after the *ISS* rose over the horizon and John Phillips started answering the questions put by the students. When student Kaleigh asked: "If you cry in space, what happens to the tears"?, John said this was probably the most interesting question. He said he had no experience but supposed the tears would stay in the eyes or on the cheeks and evaporate.

John answered 18 questions before the *ISS* went over the horizon and contact was lost. He even answered two more questions, which were on the list and ground stations farther east could hear his answers and his signing off.

About 300 students, 30 teachers and VIPs filled the room at Tregaron High School. BBC TV covered

the event ,which was also broadcast by streaming video. The ground station was the RSGB's well known mobile Amateur Station **GB4FUN**, controlled by **Carlos Eavis G0AKI** and operated by AMSAT UK's **Howard Long G6LVB**.

Congratulations must go to Science Teacher **Chris Greenfield** who took the initiative and organised this ARISS School Contact. His students will remember their Space Talk for ever!

High-End Dual-Band Mobile

Nevada have recently announced a new addition to their range - the Alinco DR-635E. This dual-band mobile features high output power, full duplex operation and a multi-colour detachable front panel. It offers full coverage of 144 and 430MHz, plus f.m. broadcast band receive. Featuring a high-efficiency diplexer for single antenna working, the DR-635E is one of the few mobiles capable of full duplex operation.

The manufacturers state that twin alphanumeric displays, 200 memory channels and twin receivers give very versatile operation. Its unique rotatable head means the body can be mounted either way up for optimum speaker orientation.

With dual receivers, you can listen simultaneously to any two frequencies - cross band or in the same band. Packet operators will love the optional EJ-50 TNC board, which can even be connected to a GPS for APRS when mobile. Digital voice mode is also supported, using the optional EJ-47U modulator.

Other features include:

* Three output power settings - v.h.f: 50/25/5W, u.h.f.: 35/20/5W
* Large six-character alphanumeric display
* Selectable display colour illumination (Blue, Violet or Amber)
* Internal duplexer - single antenna connector
* Includes f.m. broadcast band (w.f.m.)
* Power supply voltage display
* Theft alarm feature
* CTCSS & DCS encode and decode plus four different tone bursts
* CTCSS Tone and DCS scan
* Programmable v.f.o. and memory scan modes

The Alinco DR-635E is available now priced at £295.

Nevada, Unit 1, Fitzherbert Spur, Farlington, Portsmouth PO6 1TT
Tel: 023-9231 3090. Website: www.nevada.co.uk

The New FTDX-9000 Transceiver

At the recent Leicester Amateur Radio Show, **Yaesu UK Ltd**., launched the FTDX-9000 - an h.f. and 50MHz transceiver. The FTDX-9000 really is in a class of its own with three different versions available - the FTDX-9000D, FTDX-9000 Contest and FTDX-900MP - offering a variation in facilities.

The 9000D has a 6.5in TFT display that provides a host of operating and station management information. It can show things like a world map with the Grey Line path marked or a logbook, as well as information such as the direction of the rotators or your real-time s.w.r. readings. The TFT display can also be set to show a spectrum scope that lets you watch the activity on the band. Interestingly, the meters on the front panel are inclined at an 2° angle so they face the operator directly when sat in front of the rig. This eliminates glare and the difficulty in reading the indicators. This radio can also provide full duplex operation when operating on two different bands.

The FTDX-9000 series has extensive digital noise reduction capabilities, as you would expect. Using 16 mathematical algorithms, the circuitry is capable of reducing atmospheric and other noises.

Another feature that the Yaesu team were keen to explain was the three-stage parametric equaliser. This allows very precise enhancements of three different ranges (bass, mid-range and treble) of audio frequency response allowing the operator to match the radio's response to their voice and microphone. You can adjust the centre frequency of each of the three audio pass bands, the width of each of these bands and the amount of boost or suppression you wish to engage within each of these frequency ranges. The front and rear microphone inputs may be equalised independently allowing you to focus available power where you want it. Any transceiver in the FTDX-9000 series is a very comprehensive radio with more features than we have space to mention here but Yaesu would be happy to tell you more.

Pricing of the FT-DX9000 depends on the version you choose, as a guide, the FTDX-9000 Contest is a 200W custom-configurable version that comes with two pairs of meters plus and l.c.d. window, it has a variable r.f. input preselector filter, three key jacks and dual head phone jacks and 50V/12A internal switching regulator power supply starts at £3799. These radios will be available from the beginning of January.

The FTDX-9000D is rated 200W and has the large TFT, data management unit and flash memory slot built-in, main/sub receiver VRF plus full dual receive capability, three µ-tuning modules for 160-20m and 50V/12A internal switching regulator power supply. This is priced at £7299 and orders can be placed now. Finally, the FTDX-900MP is a 400W special order version that will cost from £8299 and orders can be placed from January. Look out for a review in *PW* in the coming months!

Yaesu UK Ltd., Unit 12, Sun Valley Business Park, Winnall Close
Winchester SO23 0LB
Tel: (01962) 866667. Website: www.yaesu.co.uk

Get Kitted Out!

The **Chelmsford Amateur Radio Society** (CARS) have produced a range of CARS branded clothes for members, which was the idea of **Martyn G1EFL** who, as well as being Secretary, has taken on the role of CARS clothing sales Manager.

The clothing range has proven extremely popular with members and the club frequently has to re-order new stock to meet the demand from the 149 CARS members. The clothing also produces a consistant club image when demonstrations are given to the general public. The photograph here shows Martyn G1EFL wearing the CARS baseball cap, fleece and sweatshirt.

The Chelmsford Amateur Radio Society meets on the 1st Tuesday in each month at the Marconi Social Club, Beehive Lane, Great Baddow. Doors open at 1915 and visitors are most welcome. Car parking is free and a bar is available for refreshments.

For further information contact the Secretary:
Martyn G1EFL
Tel: (01245) 469008
E-mail: info2005@g0mwt.org.uk
Website: www.g0mwt.org.uk

Peter G7PCT with some of his Amateur Radio pupils.

Amateur Radio Enrichment Lessons

Peter Treadwell G7PCT who works as a classroom supervisor at **King Edward VII Secondary School and Technology College** in Melton Mowbray, which is a combined High School and Upper School with 2000 pupils in the age range 11-18, has managed to get Amateur Radio on the curriculum.

Peter takes up the story: "I use Amateur Radio where possible in lessons to capture the pupils' imagination, always carrying a hand-held with me. In one particular instance the school network was down for an ICT lesson, so I concentrated on the 'C' for communication and used my local repeater **GB3LE** for some contacts. On another occasion I spoke with a contact in Australia via a local Internet gateway to ask pupils questions in an art lesson (the work was on Australia)".

Peter continues: "To promote an interest in radio, the school radio club was started with the callsign **M0MKE**, meeting once a week and getting a regular attendance of over 15 pupils. Following a successful Foundation course held during the last week of the summer term, run by **Geoff Griffiths G3STG**, a **Melton Mowbray Amateur Radio Society** colleague. I was able to make the suggestion that radio would make a good subject for the 'enrichment' lessons that were going to be introduced for the new intake of 14 to 15 year olds. The purpose of these lessons is to give the pupils additional skills and interests that will help them when choosing a career, and of course from the Radio Amateur point of view, to make it fun, and hopefully give them a hobby that they will take up! These lessons are in addition to the national curriculum.

Making the case for radio, with the subject of Amateur Radio in particular, I stressed its curriculum links, particularly in Physics, Maths and Electronics. In addition it would have an impact on Humanities and Modern Foreign Languages. This was agreed and I was asked to take two classes twice a week for the academic year. Each class has over 20 pupils. To validate the work I registered with the RSGB as a Foundation Licence instructor.

The first term's work is based on the Foundation syllabus, the second term will look at broadcast radio, looking at what the job prospects will be and building links with Melton's new community radio station. We will script a programme and intend to produce it as a downloadable podcast. The third term we will re-visit the Foundation work in preparation for the exam. In addition I will be taking material from the Intermediate syllabus and will look at model engineering. I am trying to make the course as practical as possible and we have now started building Slinky Hula antennas, as featured in *PW*.

Peter concludes "I was in the right place at the right time, being licensed and working with pupils but not being a teacher as such; it was easier for me to take on the responsibility of the enrichment lessons. I would like to thank the Head, Deputy Head and the Assistant Head who set-up the enrichment programme for their support, as well as the Melton Mowbray Amateur Radio Society, who have supplied me with some equipment, as well as advice".

The pupils seem to enjoy the practical element of Peter G7PCT's teaching.

White Stick Log

Don Ward G0MDO, after updating his *Easilog* program from DOS to *Windows,* was surprised to find it in use with members of the St. Dunstan's Amateur Radio Society. They had previously been using the DOS version but found that newer versions of screen readers such as HAL, JAWS and WIN-EYES were no longer compatible with DOS programs. They contacted Don with suggestions for changes to the new Windows Easilog to make it easier for them to use, which led to Don, writing a new logging program specifically for their use and so *White Stick Log(WSLog)* evolved.

Don says: "It's not easy for a sighted user to appreciate the needs of the visually impaired but with the use of all the screen readers mentioned and the advise of the St Dunstan's members I think I have been able to produce a program that should satify their needs. I have sent copies to the Radio Amateur Invalid and Blind Club (RAIBC) who have evaluated it and have written a review for their magazine *Radial*". The *WSLog* is available **free** to all visually impaired Amateurs from Don's website at **http://come.to/g0mdo** A Morse Tutor program version for the visually impaired, *WSMorse*, also available free. Don't forget that all users of any version of *Easilog* are entitled to free copies and updates of *Easilog* for Windows.

Women Only!

A new website has been set up for women Radio Amateurs. The brainchild of **Jackie Bosworth M3JTO**, the website – Ladies on the Air – provides female Amateurs with a place to discuss their hobby.

Jackie gained her foundation licence in May and launched the website with the aim of encouraging more women to participate in Amateur Radio. She said: "After noticing that there aren't too many women in this hobby, I decided to create a forum just for the ladies. It's still in the early days but we already have members from Malaysia and USA!"

Ladies on the Air is open to any woman who is interested in Amateur Radio. Membership is free. The site includes a discussion area, hints and tips section, advice on solving Amateur Radio problems and a place where members can post pictures. Take a look at **www.ladiesontheair.proboards37.com**

Nevada Scoop Best Industry Initiative Award

Nevada, is delighted to announce that it has scooped a second prestigious Award this year, this time for Best Music Industry Initiative, at an awards ceremony recently held at The Savoy, London in September. The Award recognises the best innovation of the industry's top individuals and organisations.

The Award was presented to Nevada following their 'Schools' Initiative that was launched, initially, to Hampshire Secondary Schools in April 2005. The initiative was created to inspire school children to take up a musical instrument and Nevada awarded free vouchers to pupils, an Awards programme recognising special achievers, visited schools and hosted school visits.

Mike Devereux G3SED, Nevada Managing Director, who collected the Award said "I am thrilled that the efforts of the Nevada Team will inspire local school children, and that the efforts of the Nevada staff have been recognised. We will now see if this can be rolled out to the radio side of our business introducing children to Amateur Radio".

Ringing in Morse

Andy Booth is a ringtone programmer for one of the largest wholesalers of ringtones in the UK, as well as being a musician and composer with 20 years experience. In his spare time, he is also to be found surfing the high frequencies using the oldest of digital communication systems - Morse Code.

Although, mobile phones have had Morse alerts programmed into them since the early days, there has never been an easy (or free) way to get personalised ringtones in Morse Code until now. Andy turned his attention and his love of the medium to the problem and has created a completely free web resource (**www.planetofnoise.com**) that generates Morse Code ringtones playable on most mobile 'phones from whatever the user types in.

Andy says "The site is less than a month old but its already been getting more than 5000 hits a day on average and the feedback and thanks I've had is fantastic, which shows the broad love affair people still have with Morse. Whether its a genuinely useful tool to them, something that has a 'romantic appeal' from the first half of the last century or just something thats cool or just a novelty - people love it!". It's a bit of fun, but why not try it out for yourself?

Icom UK Ltd Support Rapid Chariots

Bob Stockley, Sales and Marketing Director of **Icom UK Ltd** recently took part in a gruelling 24 hour endurance race at Silverstone. Bob is one of three drivers for the Canterbury based motorsports team Rapid Chariots. This was the first time Bob took part in such a race and the team achieved a highly respectable 21st place overall and 6th in their production class.

Conditions for the weekend were less than perfect with torrential downpours and low visibility for most of the 24 hours. This made driving very difficult and dangerous. Rapid Chariots started in 40th and continuously moved up the field throughout the 24 hours to finish in 21st place overall.

Bob said, "Considering we would've been happy just completing the race the whole team were delighted to finish so high up the table. The weather was appalling and driving was extremely difficult, at times you could barely see in front of you with all the spray coming up from the track. I think if the weather had been a little better we would have finished even higher".

The Icom team was supported by friends, family and work colleagues. Bob found support from many of the Icom employees who made the journey from Kent to Northampton to watch the racing over the weekend. Bob said, "I was thrilled at the number of supporters from Icom who came up for the weekend, especially since the weather was so bad. I'd like to say a huge thank you to all of them".

Icom provided Rapid Chariots with six IC-F22SR hand-held radios, two IC-F25 hand-held radios and two IC-F110S mobile radios to help with the communications between the pit crew and the driver. Icom dealer Talking Headsets provided earpieces and noise cancelling mics for the drivers' helmets the crew in the pit with headsets.

Book Review

By Phil Cadman G4JCP

With Christmas approaching, you're probably looking around for stocking fillers. Something that would be ideal for a beginner interested in valved radios is a 'CD book' entitled *Valve Radio Construction - A Safe And Practical Introduction* by **Robert A. Wilson FRSA.** The 'book' is supplied on CD in Adobe's Portable Document Format (PDF), and the intention is for the purchaser to print out chapters as required. This is a cheaper and more flexible option than supplying the book in printed form. However, access to a computer (with Acrobat reader installed) and a colour printer is required. Reading the book on screen is possible, but studying a printed copy is much better.

The author, Robert Wilson, was for many years a ship's radio officer and is actually better known for his traditional ship models. But it's his interest in radio, which has prompted him to produce this work, which is specifically aimed at beginners to both valves and radio construction. That said, the book contains several ideas that even experienced constructors may find interesting.

Each chapter is complete in itself, so it's not necessary to print out the entire book at once. The first chapter covers the provision of an antenna and earth, and that's followed by a simple crystal set design.

The remaining chapters cover three single-triode receivers, a pentode receiver and a dual-triode receiver. The author wisely uses modern valves, except for the one used in a mock vintage-triode design, which allow the use of a rechargeable 6V l.t. battery and a stack of PP3 batteries for the h.t. supply. The book finishes with descriptions of various components and a list of component suppliers. There are many annotated photographs and a small amount of theory is included.

All the designs are constructed on wood, so there's no chassis bashing involved. But rather than mount all the components directly on a baseboard, the author often uses a printed-circuit approach when mounting small components. A paxolin - or acrylic - sheet is drilled to take the components which are then connected using point-to-point wiring underneath. So as to present a vintage appearance, the vintage-triode design uses modern components fashioned to look like vintage components, and these are then mounted directly on a baseboard.

Every step of the construction is described in detail, but what really impresses with this book is the number and quality of the photographs. There's a photograph showing each stage of construction for every design, plus photographs of individual components and how the wooden chassis and 'printed circuits' are prepared. Even raw beginners should have no trouble building sets, which work first time and that also look good. All the valves the author has chosen, in particular, the 6C4 and EF95, are known to work well at low anode voltages.

The CD 'Book' is available direct from the author:
R. A. Wilson, 53 Woodcroft Close,
Penwortham, Preston,
Lancs PR1 9BX
The price **is £11 inc. P&P world-wide.**
Sterling cheques only please.

MOONRAKER

Manufacturers of radio communication antennas and associated products

Log Periodic

MLP32 TX & RX 100-1300MHz one feed, S.W.R. 2:1 and below over whole frequency range p ofessional quality (leng h 1420mm) **£119.95**
MLP62 same spec as MLP32 but wi h increased freq. range 50-1300 Leng h 2000mm..... **£189.95**

Mobile HF Whips (with 3/8 base fitting)

AM-PRO 6 mt *(Length 4.6' approx)*..... **£16.95**
AM-PRO 10 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 17 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 20 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 40 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 80 mt *(Length 7' approx)*..... **£19.95**
AM-PRO 160 mt *(Length 7' approx)*..... **£49.95**
AM-PRO MB5 Multi band 10/15/20/40/80 can use 4 Bands at one time *(Length 100")*..... **£69.95**
SPX-100 'plug n go' multiband 6/10/12/15/17/20/30/40/80mtrs. Band changing is easy via a flylead and socket and adjustable telescopic whip section 1.65m when fully extended..... **£49.95**

Slim Jims

SJ-70 430-430MHz slimline design wi h SO239 connection. Leng h 1.00m..... **£19.95**
SJ-2 144-146MHz slimline design wi h SO239 connection. Leng h 2.00m **£24.95**

VHF/UHF Mobile Antennas

MICRO MAG Dual band 2/70 antenna complete with 1" magnetic mount 5mtrs of mini coax terminated in BNC **£14.95**
MR700 2m/70cms, 1/4 wave & 5/8, Gain 2m 0dB/3.0dB 70cms Leng h 20" 3⁄8 Fitting..... **£7.95**
SO239 Fitting..... **£9.95**
MR 777 2 Metre 70 cms 2 8 & 4 8 dBd Gain (5⁄8 & 2x5⁄8 wave) (Length 60") (3⁄8 fitting)..... **£16.95**
(SO239 fitting)..... **£18.95**
MRQ525 2m/70cms, 1/4 wave & 5/8, Gain 2m 0 5dB/3 2dB 70cms Leng h 17" SO239 fitting commercial quality..... **£19.95**
MRQ500 2m/70cms, 1/2 wave & 2x5/8, Gain 2m 3.2dB/5 8db 70cms Leng h 38" SO239 fitting commercial quality..... **£24.95**
MRQ750 2m/70cms, 6/8 wave & 3x5/8, Gain 2m 5.5dB/8.0dB 70cms Leng h 60" SO239 fitting commercial quality..... **£39.95**
MRQ800 6/2/70cms 1/4 6/8 & 3 x 5/8, Gain 6m3.0dB /2m 5.0dB/70 7 5dB Length 60" SO239 fitting comme cial quality **£39.95**
GF151 Professional glass mount dual band antenna. Freq: 2/70 Gain: 2 9/4 3dB. Length: 31"..... New low price **£29.95**

Single Band Mobile Antennas

MR 214 2 metre straight stainless 1⁄4 wave 3⁄8 fitting ..**£4.95**
SO239 type..... **£5.95**
MR 258 2 Metre 5⁄8 wave 3.2 dBd Gain (3⁄8 fitting) (Leng h 58") **£12.95**
MR 268S 2 Metre 5⁄8 wave 3.5dBd gain Leng h 51" S0239 fitting..... **£19.95**
MR 290 2 Metre (2 x 5/8 Gain: 7.0dBd) (Length: 100"). SO239 fitting, " he best it gets"..... **£39.95**
MR 625 6 Metre base loaded (1/4 wave) (Leng h: 50") commercial quality..... **£19.95**
MR 614 6 Metre loaded 1⁄4 wave (Leng h 56") (3⁄8 fitting)..... **£13.95**
MR 644 6 Metre loaded 1⁄4 wave (Leng h 40") (3⁄8 fitting)..**£12.95**
(SO239 fitting)..... **£15.95**

Single Band End Fed Base Antennas

70 cms ½ wave (Leng h 26") (Gain: 2.5dB) (Radial free)..... **£24.95**
2 metre ½ wave (Length 52") Gain 2.5dB) (Radial free)..... **£24.95**
4 metre ½ wave (Leng h 80") (Gain 2.5dB) (Radial free) **£39.95**
6 metre ½ wave (Length 120") (Gain 2.5dB) (Radial free)..... **£44.95**
6 metre ⅝ wave (Leng h 150") Gain 4.5dB) (3 x 28" radials)...**£49.95**

Mini HF Dipoles (Length 11' approx)

MD020 20mt version app ox only 11ft **£39.95**
MD040 40mt version app ox only 11ft **£44.95**
MDO80 80mt version app ox only 11ft **£49.95**
(slimline lightweight aluminium construction)

Vertical Fibreglass Co-Linear Antennas

New co-linear antennas with specially designed tubular vertical coils that now include wide band receive! Remember, all our co-linears come with high quality N-type connections.

SBQBM100 Mk.2 Dual Bander **£39.95**
(2m 3dBd) (70cms 6dBd) (RX:25-2000 MHz) (Leng h 39")
SQBM110 Mk.2 Dual Bander (Radial FREE!) ...**£49.95**
(2m 3dBd) (70cms 6dBd) (RX:25-2000 MHz) (Leng h 39")
SQBM200 Mk.2 Dual Bander..... **£49.95**
(2m 4.5dBd) (70cms 7.5dBd) (RX:25-2000 MHz) (Leng h 62")
SQBM500 Mk.2 Dual Bander Super Gainer..... **£64.95**
(2m 6.8dBd) (70cms 9.2dBd) (RX:25-2000 MHz) (Leng h 100")
SQBM800 Mk.2 Dual Bander Ultimate Gainer..... **£119.95**
(2m 8.5dBd) (70cms 12.5dBd) (RX:25-2000 MHz) (Leng h 5.2m)
SQBM1000 MK.2 Tri Bander **£69.95**
(6m 3.0dBd) (2m 6.2dBd) (70cms 8.4dBd) (RX:25-2000 MHz) (Length 100")

Single Band Vertical Co-Linear Base Antenna

BM33 70 cm 2 X 5⁄8 wave Length 39" 7.0 dBd Gain...**£34.95**
BM45 70cm 3 X 5⁄8 wave Leng h 62" 8.5 dBd Gain....**£49.95**
BM55 70cm 4 X 5⁄8 wave Leng h 100" 10 dBd Gain...**£69.95**
BM60 2mtr5⁄8 Wave, Leng h 62", 5.5dBd Gain..... **£49.95**
BM65 2mtr 2 X 5⁄8 Wave, Length 100", 8.0 dBd Gain..... **£69.95**

MFJ Products

New lower prices on ALL MFJ Tuners. See our website for full details.

Automatic Tuners
MFJ-991 1.8-30MHz 150W SSB/100W CW ATU.... **£179.95**
MFJ-993 1.8-30MHz 300W SSB/150W CW ATU..... **£209.95**
MFJ-994 1.8-30MHz 600W SSB/300W CW ATU..... **£299.95**
Manual Tuners
MFJ-16010 1.8-30MHz 20W random wire tuner **£46.95**
MFJ-902 3 5-30MHz 150W mini travel tuner..... **£65.95**
MFJ-902H 3 5-30MHz 150W mini travel tuner with 4:1 balun **£89.95**
MFJ-904 3 5-30MHz 150W mini travel tuner wi h SWR/PWR..... **£99.95**
MFJ-904H 3 5-30MHz 150W mini travel tuner with SWR/PWR 4:1 balun..... **£109.95**
MFJ-901B 1.8-30MHz 200W Versa tuner..... **£72.95**
MFJ-971 1.8-30MHz 300W portable tuner **£89.95**
MFJ-945E 1.8-54MHz 300W tuner wi h meter **£99.95**
MFJ-941E 1.8-30MHz 300W Versa tuner 2 ..... **£109.95**
MFJ-948 1.8-30MHz 300W deluxe Versa tuner..... **£119.95**
MFJ-949E 1.8-30MHz 300W deluxe Versa tuner with DL..... **£135.95**
MFJ-934 1.8-30MHz 300W tuner complete wi h artificial GND..**£159.95**
MFJ-974 3.6-54MHz 300W tuner with X-needle SWR/WATT **£159.95**
MFJ-969 1.8-54MHz 300W all band tuner **£169.95**
MFJ-962D 1.8-30MHz 1500W high power tuner..... **£249.95**
MFJ-986 1.8-30MHz 300W high power differential tuner **£299.95**
MFJ-989D 1.8-30MHz 1500W high power roller tuner..... **£329.95**
MFJ-976 1.8-30MHz 1500W alanced line tuner with X-needle SWR/WATT mater..... **£429.95**

HB9CV 2 Element Beam 3.5dBd

70cms	(Boom 12")	**£19.95**
2 metre	(Boom 20")	**£24.95**
4 metre	(Boom 23")	**£34.95**
6 metre	(Boom 33")	**£44.95**
10 metre	(Boom 52")	**£69.95**
6/2/70 Triband	(Boom 45")	**£64.95**

Halo Loops

2 metre (size 12" approx)..... **£14.95**
4 metre (size 20" approx)..... **£24.95**
6 metre (size 30" approx)..... **£29.95**
These very popular antennas square folded di-pole type antennas

Guy Rope 30 metres

MGR-3 3mm (maximum load 250 kgs)..... **£6.95**
MGR-4 4mm (maximum load 380 kgs) **£14.95**
MGR-6 6mm (maximum load 620 kgs) **£29.95**

Crossed Yagi Beams (fittings stainless steel)

2 metre 5 Element
(Boom 64") (Gain 7.5dBd) **£89.95**
2 metre 8 Element
(Boom 126") Gain 11.5dBd)..... **£109.95**
70 cms 13 Element
(Boom 83") (Gain 12.5dBd)..... **£79.95**

Yagi Beams (fittings stainless steel)

2 metre 4 Element
(Boom 48") Gain 7dBd) **£29.95**
2 metre 5 Element
(Boom 63") (Gain 10dBd) **£49.95**
2 metre 8 Element
(Boom 125") (Gain 12dBd) **£69.95**
2 metre 11 Element
(Boom 185") (Gain 13dBd)..... **£99.95**
4 metre 3 Element
(Boom 45") Gain 8dBd)..... **£59.95**
4 metre 5 Element
(Boom 128") (Gain 10dBd)..... **£69.95**
6 metre 3 Element
(Boom 72") Gain 7.5dBd)..... **£64.95**
6 metre 5 Element
(Boom 142") (Gain 9.5dBd)..... **£84.95**
70 cms 13 Element
(Boom 76") Gain 12.5dBd)..... **£49.95**

ZL Special Yagi Beams (Fittings stainless steel)

2 metre 5 Element (Boom 38") (Gain 9.5dBd)...**£39.95**
2 metre 7 Element (Boom 60") (Gain 12dBd)....**£49.95**
2 metre 12 Element (Boom 126") (Gain 14dBd)**£74.95**
70 cms 7 Element (Boom 28") (Gain 11.5dBd)..**£34.95**
70 cms 12 Element (Boom 48") (Gain 14dBd) **£49.95**
The biggest advantage with a ZL-special is that you get massive gain for such a small boom length, making it our most popular beam antenna

G5RV Wire Antenna (10-40/80m) (Fittings stainless steel)

	HALF	FULL
Standard (enamelled)	**£19.95**	**£22.95**
Hard Drawn (pre stretched)	**£24.95**	**£27.95**
Flex Weave (original high quality)	**£29.95**	**£34.95**
Flexweave PVC (clear coated PVC)	**£34.95**	**£39.95**
Deluxe 450 ohm PVC	**£44.95**	**£49.95**

Double size standard (204ft) **£39.95**
TS1 Stainless Steel Tension Springs (pair) for G5RV **£19.95**

G5RV Inductors

Convert your half size G5RV into a full size with just 8ft ei her side. Ideal for he small ga den..... **£19.95**

Reinforced Hardened Fibreglass Masts (GRP)

GRP-125 1.25" OD leng h: 2.0m Grade: 2mm **£14.95**
GRP-150 1.5" OD Length: 2.0m Grade: 2mm **£19.95**
GRP-175 1.75" OD Leng h: 2.0m Grade: 2mm **£24.95**
GRP-200 2.0" OD Length: 2.0m Grade: 2mm **£29.95**

Mobile Speaker

PMR-218 Small extension speaker **£8.95**
PMR-250 Medium extension speaker **£10.95**
PMR-712 Large extension speaker..... **£14.95**

Portable Telescopic Masts

LMA-S Length 17.6ft open 4ft closed 2-1" diameter **£59.95**
LMA-M Leng h 26ft open 5.5ft closed 2-1" diameter **£69.95**
LMA-L Leng h 33ft open 7.2ft closed 2-1" diameter..... **£79.95**
TRIPOD-P Lightweight aluminium tripod for all above **£39.95**

Rotative HF Dipoles

RDP 3B 10/15/20mtrs leng h 7.40m **£119.95**
RDP-4 12/17/30mtrs leng h 10.50m **£119.95**
RDP-40M 40mtrs length 11.20m **£169.95**
RDP-6B 10/12/15/17/20/30mtrs boom leng h 1.00m. **£239.95**

CHECK ON-LINE FOR ALL UPDATES, NEW PRODUCTS & SPECIAL OFFERS

www.amateurantennas.com

★ Postage is a maximum of £7.00 on all orders ★
(UK mainland only)

CALL MAIL ORDER 01908 281705

FAX 01908 281706

Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com

www.amateurantennas.com

Mounting Hardware (All galvanised)

6" Stand Off Bracket *(complete with U Bolts)*.....**£6.00**
9" Stand off bracket *(complete with U Bolts)* **£9.00**
12" Stand off bracket *(complete with U Bolts)*..**£12.00**
12" T & K Bracket *(complete with U Bolts)*.....**£14.95**
18" T & K Bracket *(complete with U Bolts)*.....**£17.95**
24" T & K Bracket *(complete with U Bolts)*.....**£19.95**
36" T & K Bracket *(complete with U Bolts)*.....**£29.95**
Chimney lashing kit.....**£12.95**
Double chimney lashing kit.....**£24.95**
3-Way Pole Spider for Guy Rope/ wire.....**£3.95**
4-Way Pole Spider for Guy Rope/wire.....**£4.95**
1" Mast Sleeve/Joiner.....**£6.95**
1.25" Mast Sleeve/Joiner.....**£7.95**
1.5" Mast Sleeve/Joiner.....**£8.95**
2" Mast Sleeve/Joiner.....**£9.95**
Earth rod including clamp (copper plated).....**£9.95**
Earth rod including clamp (solid copper).....**£14.95**
Pole to pole clamp 2"-2".....**£4.95**
Di-pole centre (for wire).....**£4.95**
Di-pole centre (for aluminium rod).....**£4.95**
Dog bone insulator.....**£1.00**
Dog bone insulator heavy duty.....**£2.00**

5ft Poles Heavy Duty (Swaged)

20ft Heavy Duty Swaged Pole Set
These heavy duty aluminium (1.8mm wall) have a lovely push fit finish to give a very st ong mast set
1.25" set of four 5ft sections.....**£24.95**
1.50" set of four 5ft sections.....**£34.95**
1.75" set of four 5ft sections.....**£39.95**
2.00" set lof four 5ft sections.....**£49.95**

Cable & Coax Cable

RG58 best quality standard per mt.....**35p**
RG58 best quality military spec per mt.....**60p**
RGMini 8 best quality military spec per mt.....**70p**
RG213 best quality military spec per mt.....**85p**
H100 best quality military coax cable per mt.....**£1.10**
3-core rotator cable per mt.....**45p**
7-core rotator cable per mt.....**£1.00**
10 amp red/black cable 10 amp per mt.....**40p**
20 amp red/black cable 20 amp per mt.....**75p**
30 amp red/black cable 30 amp per mt.....**£1.25**
Please phone for special 100 metre discounted price

Connectors & Adapters

PL259/9 plug (Large entry).....**£0.75**
PL259 Reducer (For PL259/9 to conv to PL259/6).....**£0.25**
PL259/6 plug (Small entry).....**£0.75**
PL259/7 plug (For mini 8 cable).....**£1.00**
BNC Screw type plug (Small entry).....**£1.25**
BNC Solder type plug (Small entry).....**£1.25**
BNC Solder type plug (Large entry).....**£3.00**
N-Type plug (Small entry).....**£3.00**
N-Type plug (La ge entry).....**£3.00**
SO239 Chassis socket (Round).....**£1.00**
SO239 Chassis socket (Square).....**£1.00**
N-Type Chassis scoket (Round).....**£3.00**
N-Type Chassis scoket (Square).....**£3.00**
SO239 Double female adapter.....**£1.00**
PL259 Double male adapter.....**£1.00**
N-Type Double female.....**£2.50**
SO239 to BNC adapter.....**£2.00**
SO239 to N-Type adapter.....**£3.00**
SO239 to PL259 adapter (Right angle).....**£2.50**
SO239 T-Piece adapter (2xPL 1XSO).....**£3.00**
N-Type to PL259 adapter (Female to male).....**£3.00**
BNC to PL259 adapter (Female to male).....**£2.00**
BNC to N-Type adapter (Female to male).....**£3.00**
BNC to N-Type adapter (Male to female).....**£2.50**
SMA to BNC adapter (Male to female).....**£3.95**
SMA to SO239 adapter (Male to SO239).....**£3.95**
SO239 to 3/8 adapter (For antennas).....**£3.95**
3/8 Whip stud (For 2.5mm whips).....**£2.95**
Please add just £2.00 P&P for connector only orders
PLEASE PHONE FOR LARGE CONNECTOR ORDER DISCOUNTS

Baluns

MB-1 1:1 Balun 400 watts power **£24.95**
MB-4 4:1 Balun 400 watts power **£24.95**
MB-6 6:1 Balun 400 watts power **£24.95**
MB-1X 1:1 Balun 1000 watts power **£29.95**
MB-4X 4:1 Balun 1000 watts power **£29.95**
MB-6X 6:1 Balun 1000 watts power.....**£29.95**
MB-Y2 Yagi Balun 1.5 to 50MHz 1kW.....**£24.95**

Tri/Duplex & Antennas Switches

MD-24 HF or VHF/UHF internal duplexer (1.3-225MHz) (350-540MHz) SO239/PL259 fittings **£22.95**
MD-24N same spec as MD-24 but "N-type" fittings.**£24.95**
MX2000 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz).....**£59.95**
CS201 Two-way di-cast antenna switch. Freq: 0-1000MHz max 2,500 watts SO239 fittings.....**£14.95**
CS201-N Same spec as CS201 but wi h N-type fittings.....**£19.95**
CS401 Same spec as CS201 but4-way **£39.95**

Antennas Rotators

AR-31050 Very light duty TV/UHF **£24.95**
AR-300XL Light duty UHF\VHF.....**£49.95**
YS-130 Medium duty VHF.....**£79.95**
RC5-1 Heavy duty HF.....**£349.95**
RG5 3 Heavy Duty HF inc pre set cont ol box.....**£449.95**
AR26 Alignment Bearing for the AR300XL.....**£18.95**
RC26 Alignment Bearing for RC5-1/3 .....**£49.95**

Complete Mobile Mounts

All mounts come complete with 4m RG58 coax terminated in PL259 (different fittings available on request).
3.5" Pigmy magnetic 3/8 fitting **£7.95**
3.5" Pigmy magnetic SO239 fitting.....**£9.95**
5" Limpet magnetic 3/8 fitting.....**£9.95**
5" Limpet magnetic SO239 fitting **£12.95**
7" Turbo magnetic 3/8 fitting.....**£12.95**
7" Turbo magnetic SO239 fitting.....**£14.95**
Tri-Mag magnetic 3 x 5" 3/8 fitting **£39.95**
Tri-Mag magnetic 3 x 5" SO239 fitting.....**£39.95**
HKITHD-38 Heavy duty adjustable 3/8 hatch back mount **£29.95**
HKITHD-SO Heavy duty adjustable SO hatch back mount **£29.95**
RKIT 38 Aluminium 3/8 rail mount to suit 1" oof bar or pole **£12.95**
RKIT-SO Aluminium SO rail mount to suit 1" roof bar or pole ...**£14.95**

Antenna Wire & Ribbon

Enamelled copper wire 16 gauge (50mtrs).....**£11.95**
Hard Drawn copper wire 16 gauge (50mtrs)..**£13.95**
Equipment wire Multi Stranded (50mtrs) **£9.95**
Flexweave high quality (50mtrs).....**£27.95**
PVC Coated Flexweave high quality (50mtrs) **£37.95**
300Ω Ladder Ribbon heavy duty USA imported (20mtrs).....**£15.00**
450Ω Ladder Ribbon heavy duty USA imported (20mtrs).....**£15.00**
(Other lengths available, please phone for details)

Miscellaneous Items

CDX Lightening arrestor 500 watts.....**£19.95**
MDX Lightening arrestor 1000 watts.....**£24.95**
AKD TV1 filter.....**£9.95**
Amalgamating tape (10mtrs).....**£7.50**
Desoldering pump **£2.99**
Alignment 5pc kit.....**£1.99**

Telescopic Masts (aluminium/fibreglass opt)

TMA-1 Aluminium mast ★ 4 sections 170cm each ★ 45mm to 30mm ★ App ox 20ft erect 6ft collapsed **£99.95**
TMA-2 Aluminium mast ★ 8 sections 170cm each ★ 65mm to 30mm ★ App ox 40ft erect 6ft collapsed.....**£189.95**
TMF-1 Fibreglass mast ★ 4 sections 160cm each ★ 50mm to 30mm ★ App ox 20ft erect 6ft collapsed **£99.95**
TMF-2 Fibreglass mast ★ 5 sections 240cm each ★ 60mm to 30mm ★App ox 40ft erect 9ft collapsed.....**£189.95**

HF Yagi

HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts.....**£399.95**

ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM
FREQ:10-15-20 Mtrs GAIN:8 dBd
BOOM:4.42m LONGEST ELE:8.46m
POWER:2000 Watts **£329.95**

ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m
POWER:2000 Watts.....**£599.95**
40 Mtr RADIAL KIT FOR ABOVE.....**£99.00**

HF Verticals

VR3000 3 BAND VERTICAL
FREQ: 10-15-20 Mtrs
GAIN: 3.5dBi HEIGHT: 3.80m POWER: 2000 Watts (without radials)
POWER: 500 Watts (wi h optional radials).....**£99.95**
OPTIONAL 10-15-20mtr radial kit.....**£39.95**

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN: 3.5dBi HEIGHT: 6.50m POWER: 2000 Watts
(wi hout radials) POWER: 500 Watts
(wi h optional radials).....**£119.95**
OPTIONAL 10-15-20mtr radial kit.....**£39.95**
OPTIONAL 40mtr radial kit **£14.95**

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (wi h optional radials).....**£169.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**
OPTIONAL 40mtr radial kit.....**£14.95**
OPTIONAL 80mtr radial kit.....**£16.95**

EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 5.00m RADIAL LENGTH: 1.70m(included) POWER: 800 Watts.....**£299.95**

EVX8000 8 BAND VERTICAL FREQ:10-12-15-17-20-30-40 Mtrs (80m optional) GAIN: 3.5dBi HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included)
POWER: 2000 Watts **£319.95**
80 MTR RADIAL K T FOR ABOVE.....**£89.00**
(All verticals require grounding if optional radials are not purchased to obtain a good VSWR)

Trapped Wire Di-Pole Antennas
(Hi grade heavy duty Commercial Antennas)

MDT-6 FREQ:40 & 160m LENGTH: 28m POWER:1000 Watts.....**£59.95**
MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts..**£49.95**
MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts.....**£59.95**
MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts.....**£99.95**
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts.....**£44.95**
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts.....**£89.95**
(MTD-5 is a crossed di-pole with 4 legs)

Patch Leads

STANDARD LEADS
1mtr RG58 PL259 to PL259 lead.....**£3.95**
10mtr RG58 PL259 to PL259 lead **£7.95**
30mtr RG58 PL259 to PL259 lead.....**£14.95**
MILITARY SPECIFICATION LEADS
1mtr RG58 Mil spec PL259 to PL259 lead **£4.95**
10mtr RG58 Mil spec PL259 to PL259 lead.....**£10.95**
30mtr RG58 Mil spec PL259 to PL259 lead.....**£24.95**
1mtr RG213 Mil spec PL259 to PL259 lead.....**£4.95**
10mtr RG213 Mil spec PL259 to PL259 lead **£14.95**
30mtr RG213 Mil spec PL259 to PL259 lead **£29.95**
(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

ALL PICTURES ARE FOR REFERENCE ONLY

Callers welcome. Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com

UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD
WOBURN SANDS, BUCKS MH17 8UR

MOONRAKER

Manufacturers of radio communication antennas and associated products

Scanner Base Verticals

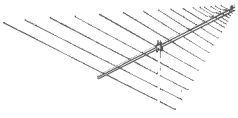
SUPERSCAN STICK I (WIDEBAND) **£29.95**
FREQ: 0-2000MHz LENGTH 100cm SOCKET SO239 £7.00 P&P
RADIALS: 3 x 17cm
SUPERSCAN STICK II (WIDEBAND) **£39.95**
FREQ: 0-2000MHz GAIN: 3.00dB OVER SSSI £7.00 P&P
LENGTH: 150cm SOCKET: SO239 RADIALS: 3 x 50cm
These two superb fibreglass external wideband antennas have capactor loaded trapped coils to give maximum sensitivity to even the weakest of signals. No wonder they are best selling verticles!
AR-30 (AIR BAND) **£39.95**
FREQ: CIVIL & MILITARY AIR GAIN: 3.0/6.0dB £7.00 P&P
LENGTH: 100cm SOCKET: SO239 RADIALS: 3 x 17cm

AR-50 (AIR BAND) **£49.95**
FREQ: CIVIL & MILITARY AIR GAIN: 4.5/7.0dB £7.00 P&P
LENGTH: 150cm SOCKET: SO239 RADIALS: 3 x 50cm
These dedicated fibreglass external antennas are pre-tuned for both air band frequencies. Get the gain and don't miss take off!
X1-HF VERTICAL (DEDICATED HF) **£49.95**
FREQ:1-50MHz LENGTH: 200cm SOCKET: SO239 £7.00 P&P
RADIALS: NONE
This HF vertical antenna incorporates helical traps and is an ideal alternative to long wire.

Discone Base Antennas

STANDARD DISCONE (WIDEBAND) **£29.95**
FREQ: 25-1300MHz LENGTH 100cm SOCKET: SO239 £7.00 P&P
RADIALS: 16
SUPER DISCONE (WIDEBAND) **£39.95**
FREQ: 25-2000MHz GAIN: 3.00dB OVER STANDARD £7.00 P&P
LENGTH: 140cm SOCKET: SO239 RADIALS: 16
HF DISCONE (WIDEBAND/HF SENSITIVE) **£49.95**
FREQ: 0.05-2000MHz LENGTH: 180cm SOCKET: SO239 £7.00 P&P
RADIALS: 16
ROYAL DISCONE 2000 (WIDEBAND – STAINLESS) **£49.95**
FREQ RX: 25-2000MHz FREQ TX: 50-52, 144-146, 430-440 £7.00 P&P
900-986, 1240-1325MHz LENGTH: 155cm GAIN: 4.5dB OVER
STANDARD SOCKET: N TYPE RADIALS: 16
ROYAL DOUBLE DISCONE 2000 ..... **£59.95**
FREQ RX: 25-2000MHz FREQ TX: 130-175/410-475MHz £7.00 P&P
GAIN: 5.5dB LENGTH: 150cm SOCKET: N-TYPE
The discone has been around for over 40 years and is generally recognized as the original and probably the best all round scanner antenna. Choose the best one for your station or call us for advice.

Beam Antennas

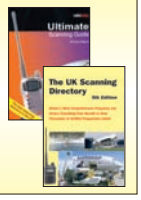


MLP-32 (LOG PERIODIC) **£119.95**
FREQ: 100-1300MHz TX & RX ..... £7.00 P&P
GAIN: 11-13dB LENGTH 140cm
SOCKET: N TYPE
MLP-62 (LOG PERIODIC) **£189.95**
FREQ: 50-1300MHz TX & RX ..... £7.00 P&P
GAIN: 10-12dB LENGTH: 200cm
SOCKET: N TYPE
These two beam antennas are sold mainly to our military & commercial customers. With an SWR 2:1 or better over the whole frequency, for performance it just doesn't get better.
AR300XL Rotator for both antennas ..... **£49.95** £7.00 P&P

Getting Rigged Up

We have a massive stock of all mounting hardware products, brackets, poles, cables & connectors, etc. Phone, e-mail or check the web-site for details! Remember we can make up any cable leads. Fitted with connectors of your choice at your request.

NEW SCANNING BOOKS AT LAST!



The Ultimate Scanning Guide. £19.50 plus £4.00 P&P.
Frequency 30-1000MHz, including a FREE CD!

The UK Scanning Directory 9th Edition. £19.75
plus £4.00 P&P.
Frequency 26-2500MHz. The most famous scanner book is back, an enthusiasts must have publication.

Visit **www.scannerantennas.com**
for all updates, new products and special offers

Going Mobile

G.SCAN II MOBILE (WIDEBAND) **£29.95**
TYPE: TWIN COIL FREQ: 25-2000MHz £7.00 P&P
LENGTH: 65cm BASE MAGNETIC CABLE: 4m
WITH BNC
SKYSCAN MOBILE (WIDEBAND) **£19.95**
TYPE: 4 TUNED WHIPS FREQ: 25-2500MHz £7.00 P&P
LENGTH: 65cm BASE MAGNETIC CABLE: 4m
WITH BNC
Don't loose those signals while on the move. Get high performance reception wherever whenever.

Portable Antennas

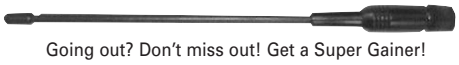
SKYSCAN DESKTOP (INTERNAL/WIDEBAND) **£49.95**
TYPE: DISCONE STYLE FREQ: 25-2000MHz £7.00 P&P
LENGTH: 90cm CABLE: 4m WITH BNC
TRI-SCAN III DESKTOP (INTERNAL/WIDEBAND) **£39.95**
TYPE: TWIN COIL FREQ: 25-2000MHz £7.00 P&P
LENGTH: 90cm CABLE: 4m WITH BNC
SWP-2000 (GLASS MOUNT/WIDEBAND) **£29.95**
TYPE: SUCTION MOUNT FREQ: 25-2000MHz £7.00 P&P
LENGTH: 55cm CABLE: 4m WITH BNC
SWP-HF30 (GLASS MOUNT/DEDICATED HF) **£39.95**
TYPE: SUCTION MOUNT FREQ HF: 0.05-30MHz £7.00 P&P
LENGTH: 80cm CABLE: 4m WITH BNC
MAX-5 ACTIVE (INTERNAL/EXTERNAL/WIDEBAND) **£49.95**
TYPE: ACTIVE PRE-AMP FREQ: 25-1800MHz £7.00 P&P
GAIN: 14dB LENGTH: 140cm CABLE: 4m WITH BNC
Get the most from your scanner by using one of our portable antennas and enjoy great performance without the need to erect an external one.

Shortwave Wire Antennas

MWA-HF MkII (EXTERNAL DELUXE HF ANTENNA) ..... **£49.95** £7.00 P&P
TYPE: WIRE BALUN MATCH FREQ: 0-40MHz
LENGTH: 25m CABLE: 10m WITH PL259
MD37-SKYWIRE (EXTERNAL STANDARD HF ANTENNA) ..... **£39.95** £7.00 P&P
TYPE: WIRE BALUN MATCH FREQ: 0-40MHz
LENGTH: 25cm CABLE: 10m WITH PL259
LONG WIRE BALUN (ON ITS OWN) ..... **£19.95** £2.00 P&P
Get the best from your HF receiver and get a long wire. Our own ferrite baluns give up to 2 "S" points greater signal then other similar baluns with a smooth match over 40MHz.

Hand-held Antennas

MRW-100 (SUPER GAINER BNC) **£19.95**
FREQ: 25-1800MHz LENGTH: 40m FITTING: BNC £2.00 P&P
MRW-210 (SUPER GAINER SMA) **£22.95**
FREQ: 25-1800MHz LENGTH: 40m FITTING: SMA £2.00 P&P



Going out? Don't miss out! Get a Super Gainer!

Something Extra

TURNSTILE 137 (DEDICATED WEATHER SATELLITE) **£39.95**
FREQ: 137.5MHz LENGTH: 100cm SOCKET: SO239 £7.00 P&P
RADIALS: 4
For use with receiving weather satellite pictures.
MRP-2000 (ACTIVE WIDEBAND PRE-AMP) **£49.95**
FREQ: 25-2000MHz GAIN: 14.0dB POWER: 9-15V £4.00 P&P
CABLE: 1m BNC-BNC
AT-2000 ANTENNA TUNER **£99.00**
0-30MHz : LOW PASS FILTER : SO239 SOCKETS £7.00 P&P
Just simply adjust both controls for maximum signal, probably the best tuner available.

www.scannerantennas.com

CALL MAIL ORDER 01908 281705
Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com
UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD
WOBURN SANDS, BUCKS MH17 8UR

Record Breaking Website

On Thursday 13 October there were a record breaking 2,695 visitors to the **Southgate Amateur Radio Club's** website and they used 354,112Kb of bandwidth. This broke the club's 250Mb daily download allowance and the webmaster **Richard G4TUT** had to purchase increased bandwidth from their Internet Service Provider. The Southgate club also provide an Amateur Radio RSS News Service, which has been supplying Amateurs with up-to-date news bulletins every single day for the last 18 months.

To view Southgate's 'award winning' website go to **http://www.southgatearc.org/** and to find out more about how to receive the RSS news service on your computer take a look at **www.southgatearc.org/rss/newsreader.htm** For more information about the club and their activities either call **(07867) 806768** or E-mail: **editor@southgatearc.org**

Coming Soon!

The latest radio from the Icom stable will soon be sitting on the radio dealers' shelves. Keep an eye out for the new IC-E7, a 144/430MHz dual-band radio

Features of the IC-E7 include:

* Long time operation, 20 hours at 5-5-90 duty cycle with standard 1800mAh Li-Ion battery pack.
* 1.5W v.h.f., 1W u.h.f. r.f. power combined with 0.5 - 1GHz wide-band receiver
* Compact and lightweight
* 500 memory channels
* Large, high contrast back-lit l.c.d.
* Ergonomic design, large knob

At the time of going to press (October 2005) the price of the IC-E7 had not been announced. Keep an eye on these pages for details as they become available. For more information contact Icom UK Ltd direct on: **(01227) 741741** or via E-mail at: **info@icomuk.co.uk** Website **www.icomuk.co.uk**

Annual BWFB Station

The **Braintree Amateur Radio Club** ran its annual station for the British Wireless for the Blind Event over the weekend of 24/25th September. The society has a link with this event as their club callsign - **GX3XG/P** - was 'donated' by **Alan Robinson G3XG**, a long time member of the society, who has sadly lost his sight.

This year the Braintree club operated form a new location, the old USAF airfield at Gosfield in Essex, with kind permission from the landowner. The station was set-up in the club tent on the Friday afternoon and very soon the contacts were being made.

Over the weekend, 28 club members visited and operated the station making a total of 109 contacts on h.f. and 144MHz. Members always enjoy these events as they make for good social occasions and at the same time are able to help, in some small way, others less fortunate.

Find out more about the Braintree Club at **www.badars.org.uk**

The ML&S Christmas Hog Roast & Boot Fair - Saturday 3rd December

With over 500 people attending last year, the success of Lynch's Open Days just seems to get stronger. Once again, the Big Three (Yaesu, Icom & Kenwood) are sponsoring the Hog Roast and promoting the new FT-DX9000, IC-7000 and the rest of their product range. Special prices and extra savings across all of the ML&S product range will be on offer.

Also on site is the Boot Fair (with Talk-In on S22) managed by the Whiton Amateur Radio Club. Admission is FREE - just turn up and set your own tables up.

The ML&S Christmas Hog Roast & Boot Fair starts at 0900 through to 1600 hours.

amateur radio clubs

Keep up-to-date with your local club's activities and meet new friends by joining in!

ESSEX

Clacton Radio Club
Contact: G4AQZ
Tel: (01255) 429117
The Clacton Radio Club have moved their meeting venue to The Kingscliff Hotel 55 Kings Parade, Holland-on-Sea. Meetings take place on the first Wednesday of the month at 1930 for a 200) hours start. The Committee would like to remind members that the AGM takes place on January 18th 2006 from 2000. The club welcomes anyone interested in Amateur Radio, past, present or new members.

HAMPSHIRE

Andover Radio Amateur Club
Contact: Terry Cull.
Tel: (01980)629346
Website: www.arac.co.uk
Meetings of the Andover ARC take place at the Village Hall Wildhern (Just North of Andover) on the first and third Tuesday of each month at 1930hours. Forthcoming meetings include: **December 6:** Andover Radio Amatuer Club AGM and **13th**: Christmas Dinner.

NORTHERN IRELAND

Bangor and District ARS
Contact: Michael Stevenson GI4XSF
Tel: (02842) 772383
Website: www.bdars.com
The Bangor and District Amateur Radio Society meet on the first Wednesday of every month in 'The Stables', Groomsport at 2000hours. On **December 7** the club are hosting two talks on QSL subjects. 'The QSL Bureau' by **Harry GI4JTF** and 'Electronic QSLs' by **Pete GI4VIV**. New members and visitors are most welcome.

NORTH WEST

Macclesfield Wireless Society
Contact: Ron G0WUZ
Tel: (01625) 430433
E-mail: gx4mws@gx4mws.com
Website: www.gx4mws.com
The Macclesfield Wireless Society meets every Monday at 2000 hours, at the Pack Horse Sports & Social Club, Abbey Road, Macclesfield. The weekly club net operates each Wednesday from 2000 on 145.550MHz +/- QRM. Forthcoming meetings and events include: **November 14:** Antenna construction activity; **21st:** On-air activity evening and 28th: Talk on PSK31 by **Andy 2E0LUX.**

STAFFORD

Stafford & Districts ARS
Contact: Graeme Boull G4NVH
Tel: (01785) 604534.
E-mail: graeme.boull@ntlworld.com
Website: www.g3sbl.org.uk/
The Stafford & Districts Amateur Radio Society meet on Thursday at 2000 hours. The shack is located in the AREVA T&D UK Ltd., factory in St. Leonards Avenue, Stafford. Why not go along and join in with the club activities? The next meeting takes place on **December 15:** Shack Night & Committee Meeting.

Technical FOR THE TERRIFIED!

This month Tony Nailer G4CFY looks at the biasing needs for transistors. He offers a straightforward and practical approach and aims to solve mysteries on the way!

In the October *PW* Technical for the Terrified (T4T) I described how to calculate supply rail resistors and the method of using a transistor as a series regulator. Continuing onwards from that theme I will now take you through the calculations to bias a single transistor amplifier stage.

Transistor Amplifier Biasing

The diagram, **Fig. 1**, shows an *npn* transistor amplifier with a good biasing arrangement. The biasing components are R1, 2 and R5.

The collector load resistance, R4, is chosen to achieve the required gain and to set the collector at the correct d.c. level when no signal is present. The resistor, R3, working in conjunction with C2 provides decoupling for the amplifier from unwanted signals on the supply rail.

Despite many rumours to the contrary, a negative terminal of a battery or power supply has a surplus of electrons and the positive terminal a deficiency. When a circuit is connected across a d.c. supply the electrons flow from negative to positive.

In the *npn* transistor, base current flows up through the emitter and out through the base. The collector current also flows up through the emitter but out through the collector. This means that the emitter current is the sum of the collector and base currents. I_e $I_b + I_c$.

The base to emitter junction acts like a regular silicon diode and when conducting has a voltage drop of about 0.65V across it. Only a tiny amount of leakage current will flow in the collector circuit until the base is forward biased by about 0.65V with respect to the emitter.

Transistor Construction

A transistor is constructed so that when the base emitter diode is forward biased and a small current flows out of the base, a much greater current flows out of the collector. This is how the device achieves gain. Small changes of current in the base circuit give rise to large current changes in the collector. Gain I_c / I_b.

Commonly used transistors like BC108 or BC548 have very wide spreads of gain. Selected versions are grouped BC108A (110 to 220), BC108B (200 to 450), BC108C (420 to 800).

Calculation Of Values

Good rules of thumb for calculation of values are as follows; The voltage across R3 is chosen to be about 0.5V. The voltage across R4 is half way between the top of R4 and the top of R5.

The voltage across R5 is about 0.65V. The voltage across R2 is 1.3V. The current I_B through R2 is 10 times I_b.

Consider using a BC108B or BC548B with a collector current of 2mA and a 9V supply rail.

Base current I_b is then 2mA/200 10µA. The bias current through R2 will be 100µA. The rest is just Ohm's Law and simple arithmetic.

If R2 has 1.3V across it and 100µA (0.1mA) through it. R2 $1.3 / 0.1*10^3$ 13kΩ.

If R3 has 0.5V across it so the top of R1 and R4 will be at 8.5V. The base is at 1.3V so R1 has 8.5V 1.3V 7.2V across it. The current flowing through it is $I_B + I_b$ 110µA or 0.11mA.

R1 $7.2 / 0.11*10^3$ 65.45kΩ.

The values of R1 and 2 have worked out to be non standard values, so I'll choose the nearest values and check the result. Let R1 68kΩ and R2 15kΩ.

The voltage across R2 in relation to the voltage at the top of R1 is the same ratio as the value of R2 to the total resistance R1 + R2. Hence V_b/Vs R2/(R1 + R2). Taking this one step forward V_b R2 * Vs/(R1 + R2).

V_b 15K * 8.5 / (68kΩ + 15kΩ)

V_b 127.5K / 83K 1.536V.

The base to emitter voltage is 0.65V so the voltage across R5 will be 1.536 0.65 0.886V.

The emitter current is: Ib + Ic 2mA + .01mA 2.01mA. R5 $0.886 / 2.01*10^3$ 440Ω. (Use 470Ω).

Now V2 is 8.5V and the top of R5 is 0.886V, the difference is 7.61V. For the collector to sit at the mid point of this requires 3.8V across R4. Collector current is 1mA so R4 3.8V/2mA 1.9kΩ. (Use 1.8kΩ).

Finally, R3 needs about 0.5V across it and it has $I_B + I_b + I_c$ (0.1 + 0.01 + 2)mA 2.11mA. R3 0.5/2.11mA 237Ω. (Use 220Ω).

Frequencies 30Hz to 30kHz

At frequencies 30Hz to 30kHz capacitors C2 and C3 should be electrolytic, with values in the region of 10 to 47µF. Capacitors C1 and C4 polyblock or mylar 100nF or 1µF electrolytic.

At frequencies of 30kHz to around 300kHz capacitors C2 and C3 are 1µF to 4.7µF and capacitors C1, 4 are 10nF to 100nF polyblock or ceramic.

For frequencies between 300kHz to 3MHz, C2 and C3 may be 100nF, C1 and 4 around one to 10nF.

The Amplifier

The amplifier, **Fig. 2**, will run at maximum gain of approximately the ratio of R4 to the internal emitter resistance of Tr1, which is 26Ω. Gain 1800 / 26 75.

To control the gain to a lower level R5 is split into R5 and R6 as shown in Fig. 2. Then, if I want a gain of about 20 then the value of R5 plus 26Ω must be a twentieth of R4.

So, R5 + 26 1800/20 90Ω. So R5 90 26 64Ω.

Note R5 as calculated originally was 440Ω. The new R5 can be 68Ω and R6 and 390Ω.

Provided R5 and 6 always total around 440 to 470Ω the a.c. gain can be adjusted without significantly affecting the d.c. bias conditions.

Not Too Demanding?

Finally, I hope that the calculations included in this article have not been too demanding! If so, perhaps you might not be too terrified to give them a try yourself? There really isn't a mystery about bias requirement!

If you wish to correspond regarding this article or previous ones subscribe to the list **pw g4cfy on@pwpublishing.ltd.uk** by sending a blank E mail with the word subscribe in the subject box. When you receive confirmation from the server you can send an E mail to **pw g4cfy@pwpublishing.ltd.uk** and your comments will be answered by myself or the *PW* team.

PW

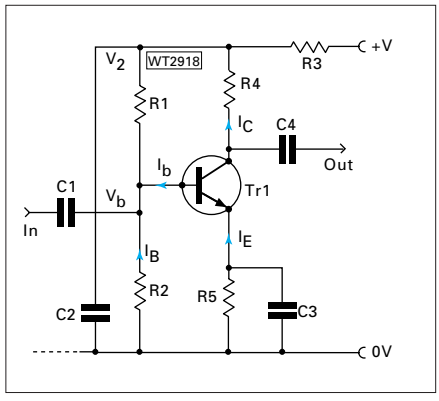


Fig. 1: The diagram shows an *npn* transistor amplifier with a good biasing arrangement. The biasing components are R1, 2 and R5.

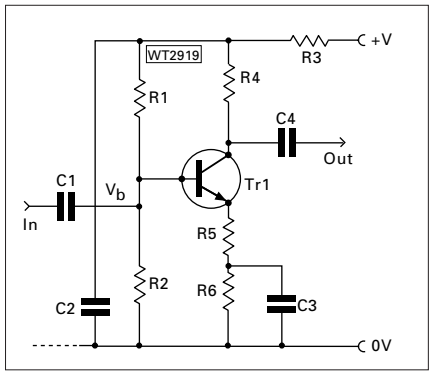


Fig. 2: The amplifier (for reference in this article) will run at maximum gain at approximately the ratio of R4 to the internal emitter resistance of Tr1 (see text).

RADIO ACTIVE is CHANGING!

From the January 2006 issue onwards, **Radio Active** and its sister title **Short Wave Magazine** are merging to bring you an

exciting new magazine:

RA covers all aspects of radio communications, scanners, cb, PMR446, sw listening and much more.

The UK's authoritative magazine dedicated to all types of radio spectrum monitoring.

radioUser

incorporating the very best of short wave magazine & radio active

Combining the very best of both Radio Active & Short Wave Magazine, RadioUser is set to become the UK's favourite radio magazine.

- News & reviews of the latest equipment
- Short Wave Listening
- Scanning
- Monitoring the Military
- Amateur
- DAB
- Utility Receiving & Decoding
- Broadcast Stations
- Airband
- Info in Orbit
- CB
- Cellular
- Satellite
- TV
- PMR 446

...and lots more each month!

With all the best features, articles, news and reviews from two superb magazines together in one place, RadioUser will not only be a terrific read but also marvellous value for money.

On sale 22 December 2005.

Price £3.25

PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, UK

Don't Create An Electromagnetic Disturbance!

Stan Brown G4LU looks at the fraught topic of interference (for the newcomer and old hand alike) that makes setting up the station and living with neighbour problems difficult for the Radio Amateur. Stan uses his 74 years of practical experience in radio to advise us!

This article is primarily intended for the newcomer to Amateur Radio and not the person who has held a Licence for some time. I'm assuming that the latter is conversant with the terms of their Licence and conforms with it, so that they can operate in peace without an irate neighbour banging on the front door! Or, as in one case known to me, having a half brick thrown through the window!

On the other hand, we can always learn something new. I'd be pleased if my advice helped anybody in the hobby because knowledge of such extremes fills the new Radio Amateur with trepidation. The difficulties may deter newcomers from using the new-found hobby to its fullest extent. The idea of this article is to help solve the problems and encourage everyone to have a go and fully enjoy our wonderful hobby.

Exams Passed - What Now?

So, you've passed your exam(s) and have your Licence and, if you've (wisely) joined the local club and hob-nobbed with old-timers, those not so old, and those a year or so ahead of you, you may know what to expect.

Also a lot depends on your domestic situation. You may live in a row of houses, an urban or rural housing estate, or you may even be lucky enough to live way out in the country without another house for miles around. All these things will form your attitude to the hobby and how you may react if your signals are picked up by other people's equipment.

Note that I've not used the phrase 'causing interference' - for in many cases that's not the true situation. Let me explain it in the following way. Frequently you are in the same situation as the car driver travelling leisurely down the road and a jay walker comes out immediately in front of him. Poor driver, despite the best efforts to stop, it's impossible to avoid hitting the pedestrian. Likewise, there are many TV sets and transistor radios about, which will respond to any electromagnetic disturbance and the Amateur's transmitter is not primarily to blame.

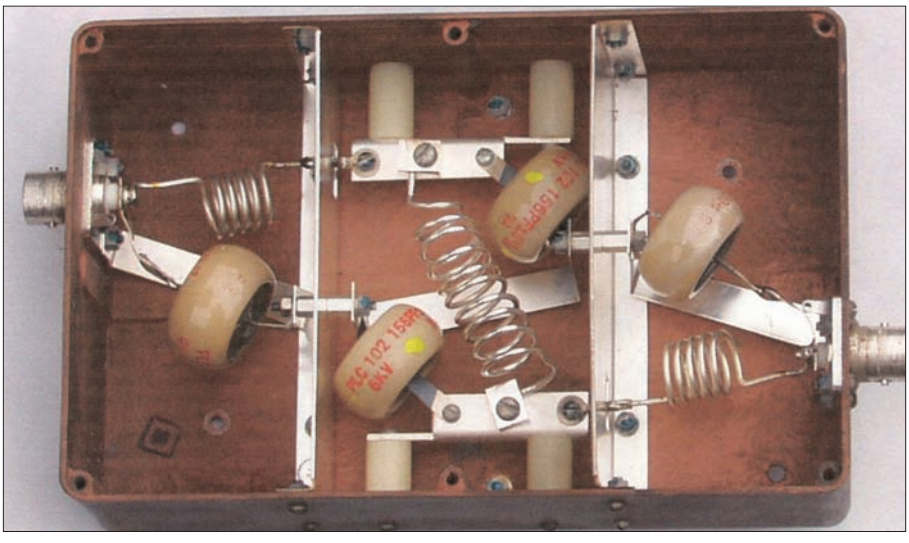


Fig. 1: Photograph of the low-pass filter (l.p.f.) in use at G4LU, built into a die-cast box and heavily copper-plated. Wound using 18s.w.g wire, the coils are of half inch internal diameter. The capacitors are 40pF at the end positions and 156pF at the centre and all have one terminal earthed.

Valuable Library

To start, you should indulge yourself with any books and establish a library - an extremely valuable resource - on setting up a station and its problems. You'll find suitable books in *PW*'s Book Store or similar sources and be able to learn from other Amateurs' experiences and technical solutions.

Always be on the look out for book and information sources on antenna, matching systems and specific manuals on avoiding television interference (TVI) and broadcasts interference (BCI, normally applied to radio reception), etc. And if you have been sensible enough to join your local club - they may well have an extensive library. You can also assist by helping the library to become even larger and even more useful!

Where Do We Start?

So where do we start? Do we buy a transceiver, do we build one or do we erect a suitable antenna first and await reactions when we're transmitting?

Let's take a look at some answers. Firstly, and speaking personally, I think that for the new Amateur (unless they've been professionally engaged in radio) building your own transmitting equipment these days is not a very good idea! Hands may be raised in horror by old timers at this suggestion, but to conform with licence conditions you really do need sophisticated test equipment.

My advice would be to obtain a transceiver from a reliable source such as a recommended retailer, or a fellow member of the club who will confirm its reliability, or even a sale at a rally if you can obtain its previous history. Whatever you do, ensure that you can take it back to source if it is not satisfactory.

Right, let's now assume you have your transceiver. And if you've been wise, you'll have also obtained or made a suitable dummy load with which you can test the rig. Using the load you can become conversant with all its 'bells and whistles'.

The probability will be that there will be sufficient leakage from the transceiver and dummy load set-up to enable you to see if your own TV set or radio, particularly if you can site them alongside, is responding to your signals whether they be speech or keying. If they do respond, move the equipment further away and see if that mitigates the response. There is every likelihood that it will and your equipment is behaving properly and the TV or radio was just being overloaded by a strong signal.

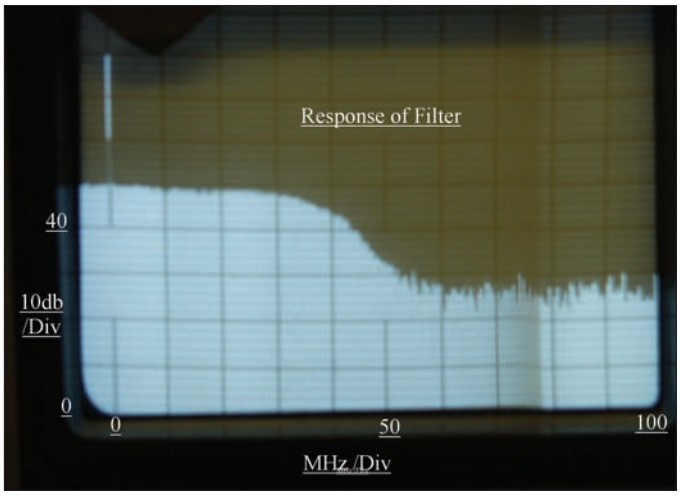


Fig. 2: The response of the filter shown in Fig. 1, reasonably flat to 30MHz, with the attenuation increasing to 25dB at 60MHz.

Antenna Next Step

Having become conversant with all the knobs and switches on the rig, the next step will be to erect your antenna. You have two choices here: you can be single-minded, with all the righteousness of the world behind you, and adopt the attitude that you now have a legal right to transmit and to blazes with any opposition!

So, go ahead and dig a big pit (metaphorical along with the physical!), put you mast base in, and then fill it with concrete. After it has cured you can erect your mast with a big tri-bander on top. Don't forget the other antennas for the v.h.f. bands as well and then start to enjoy the hobby!

If you adopt the 'bullish' approach you can bet your boots there'll be problems. If you have near neighbours (even if they haven't noticed them already) you can be sure that every flash on their TV screen, and every crackle on the sound or on their radio will be laid at your door!

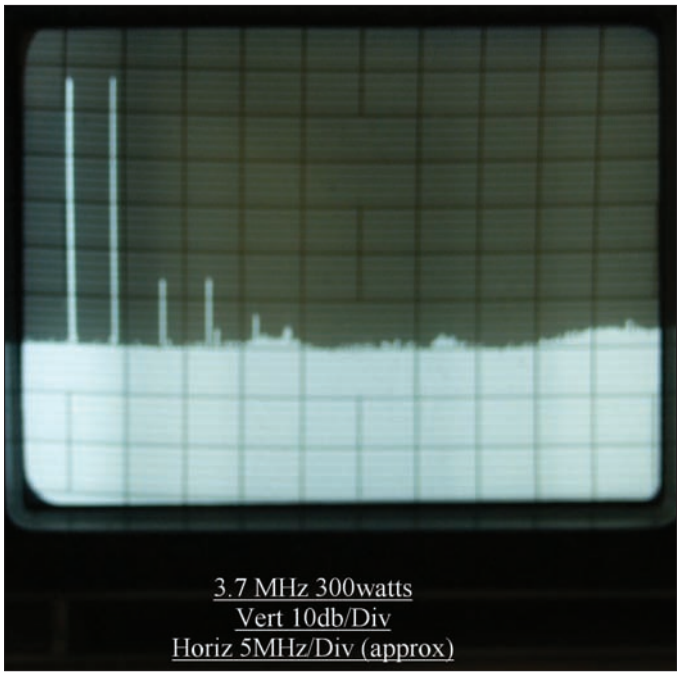
Oh, by the way, I've not mentioned planning permission. Well, you might consider you haven't committed a really serious offence erecting your mast without permission. However, in return the local Planning Officers will only serve you with a notice to take it down and, if you don't you'll then be up before the Bench!

How did the Planning Department find out? Simply answered - if you had applied for permission - your neighbours would have been notified and they could have objected. And if they weren't notified and they are 'clued up' in such things, they'll have been round to the council offices and have 'blown the gaff'.

You can't win in such situations, all you can do is to apply for retrospective permission, which only lifts the order temporarily. You then have to wait for the application to come up before the Development Committee where the application should be decided on aesthetic grounds, on whether your mast fits in with the neighbourhood, and whether refusing it limits the reasonable use of your property.

The possibility of adjacent receivers being affected by your transmissions (commonly called interference) is not a planning consideration but some ignorant councillors will try it on. So, it's important to go to the meeting as your local Council may let you address the Committee, with the same courtesy being provided for the objectors.

When you're speaking to the Planning Committee be concise and to the point and don't try to read them all the chapters from



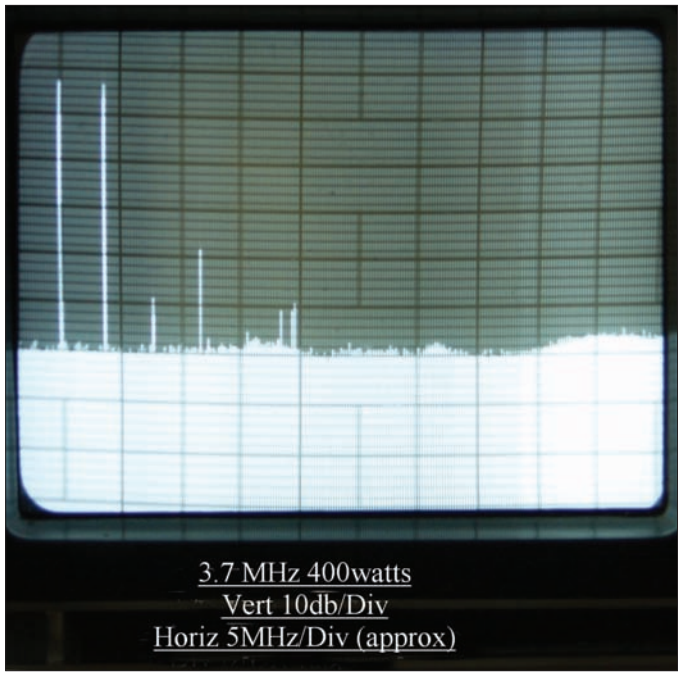


Fig.s 3 and 4: Showing the output (taken off air) from G4LU Icom IC2KL linear amplifier. Looking at Fig. 3, which shows a 3.5MHz signal, the left hand ordinate is the zero marker, the second shows the fundamental frequency. The 2nd, 3rd, 4th possibly the 5th harmonics are shown, all slightly more than 45dB below peak signal. Fig. 4 shows a similar response at higher power, and the 3rd and 5th harmonics have increased and the 2nd and 4th show a decrease.

the Amateur Radio Manual. It's a gamble; you may get permission, or you may not and if you don't, you can always appeal (and it's then that the RSGB will help). The appeal's ruling is final - except for a costly judicial review!

Discreet Approach

So what's the second approach? To adopt and start the second approach you should be discreet!

Begin your Amateur Radio activities on the low bands with an almost invisible wire antenna. You can have lots of fun and Americans and New Zealanders can be worked on 3.5MHz and even on the 1.8MHz band if you catch them at the right time.

Not many people will notice a slim wire - but that doesn't mean you're fireproof. You may still get complaints when you're 'discovered'.

So what do you do if your signals are coming through on a neighbour's radio? Firstly, you have to determine whether you or the other equipment is to blame. And if you are completely new to radio, the best course will be to enlist the help of an Amateur friend, or club member.

Possibly your friend will have a full coverage communications receiver that they can lend you. Preferably it will have a radio frequency (r.f.) stage and be a valved model which is less susceptible to overload.

Using the receiver check to see if your signals are picked up at the neighbour's house on the offending frequency. If your signal is not received - then clearly it's the other apparatus to blame. There's nothing you can do in such a situation especially if the radio has an internal antenna.

Don't, under any circumstances offer to modify the receiver unless you are fully competent and experienced to do so. The neighbour may argue that it was alright before you started transmitting but that's no argument.

Using the car analogy again, if jay walkers didn't walk out in front of cars - none would be killed or injured, whatever rights they think they have on the Queen's Highway! If the neighbour is not satisfied refer him/her to Ofcom to settle the problem – they are the body now handling such issues on behalf of the Government.

Television Problems

So, what if the unit involved is a TV receiver? If this is the case, the best criterion is your own TV set. If that's clear and no interference (no patterning, no picture break-up and no audio break-through), being closer to your equipment, there's a high probability that your transmitting equipment is not to blame.

Other factors may be involved such as: nearness of your Amateur Radio antenna to your neighbour's TV antenna, which may make it more likely that he will pick up your signals. If that's the case, and you can site your antenna further away, you may wish to co-operate. But in doing so make it clear that you are admitting no liability. The blame is still with your neighbour's equipment.

Trying A Filter

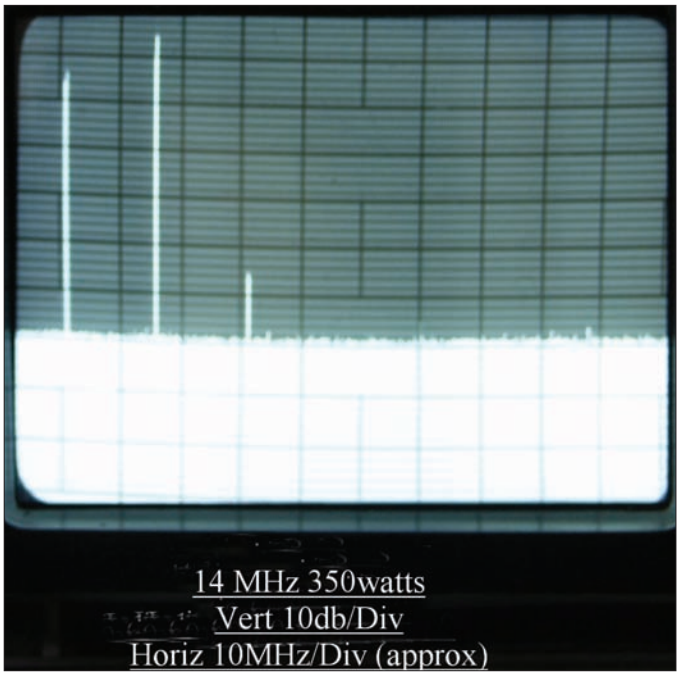
There are things that can be tried - with your neighbour's permission - such as braid breakers or filters, which can be plugged into their antenna downlead. There also mains lead filters but again never suggest going inside the set.

Such preventive types of apparatus are easily constructed and details will be found in Amateur Radio books and periodicals or they can be bought. If all else fails reference to Ofcom is the only answer. At one time the controlling body supplied filters and other devices at a moderate charge – they may still do so and you could co-operate by paying if you wish to stay friends with your neighbours.

Telephone Breakthrough

There's one aspect of interference, which is not very common in my experience but can occur in your own home - breakthrough on the domestic telephone. Bear in mind that your wife/partner, parent or landlord is not going to take kindly to your hobby if you interrupt their conversations to the favourite friend or relations (here I speak from experience!).

Today, all modern telephone instruments (should be!) are more immune to pick-up, so you may have to provide a new instrument for a birthday or Christmas present. So what, if it makes life easier on the domestic front - hang the expense!



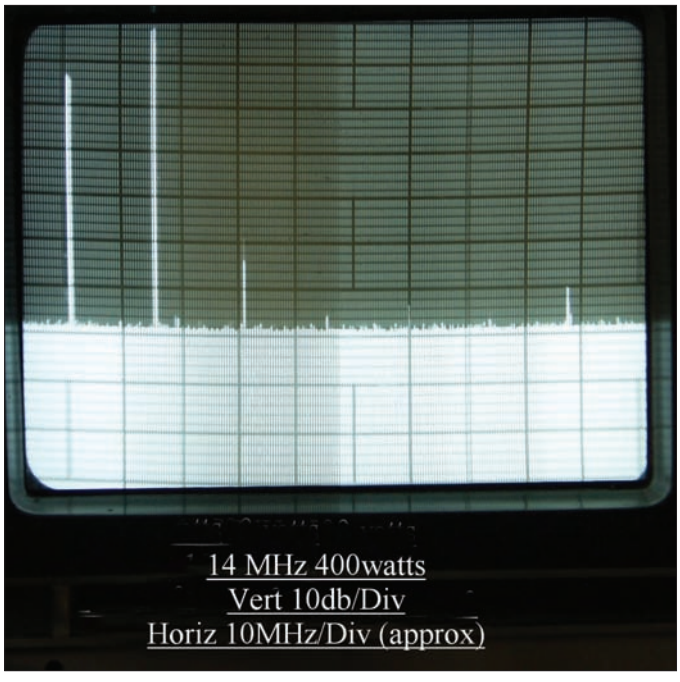


Fig.s 5 and 6: Showing a similar effect at 14MHz. At the lower power only the 2nd harmonic is predominant and at the higher power there's a slightly larger 2nd harmonic, increases in the 3rd and 5th are just beginning to show. Both pictures show a somewhat higher than expected 6th harmonic. The general difference between the 3.5MHz response and the 14MHz response could be due to the fact that, as well as the l.p.f., a complex tuning arrangement is used, together with the auto-a.t.u.

Lately, people have been finding that the Asymmetric Digital Subscriber Line (ADSL) filters provided for broadband Internet working are useful in this respect. If you have a spare one (I was sent two by BT) try it out and see.

Not Always Innocent

However, not all Amateur Radio equipment is as white as the driven snow. They can, and most do, emit spurious signals. It's all a matter of degree.

According to Regulation 4(1) an amateur apparatus must be "as free from unwanted emissions as the state of development for amateur radio apparatus reasonably permits", it is then followed by Regulation 4(1)b, which is somewhat incredible, if its fore-runner is complied with, by requiring that not more than 1% (20dB) of the mean power of the transmission, excluding the power in spurious emissions, falls outside the frequency band.

If the last two words mean the particular band allocated to the Amateur Service (as it does in other definitions) it will not be too onerous: if it means the bandwidth of the transmitter then it puts a different complexion on the matter. Thus on a two tone test, or a c.w. (continuous wave) signal keyed with a 50% mark space ratio the mean power would be approximately 200W, when running at full licensed power, and the spurious signals should not exceed 2W, which can still be a nuisance to the Amateur in the next street and even that level of power on h.f can go round the world when conditions are right.

There are further constraints in that no undue interference shall be caused to any wireless telegraphy (an all embracing term, which includes telephony and other forms of communication). Furthermore, if such undue interference is caused, then unwanted emissions and/or the signal itself shall be reduced to the satisfaction of Ofcom.

Spurious Emissions?

What form do the spurious emissions take? - you may ask. In answering, those most likely to interfere with other signals are harmonics of the fundamental frequency. Normally, as far as high frequency (h.f.) transmissions go, it's sufficient to have a low-pass filter, with a cut-off just above 30MHz, in the output lead of the transceiver or any associated power amplifier. This, however, should not blind the licensee to the fact that harmonics of 14MHz and lower frequencies fall within the pass band of such a filter and interference, though unlikely, may be caused to other low level signals.

Another source of spurious emission is the inter-modulation of the components of the wanted signal. In its simplest form, perhaps, considering the usual two-tone test for a single sideband suppressed carrier signal (s.s.b.) signal, it will take the form of twice one frequency plus and minus the other. This can result in in-band distortion and spurious frequencies appearing in the unwanted sideband spectrum.

Considering the multitude of frequencies in a voice signal, the possibility of inter-modulation is legion. Intermodulation appears as a band of signals in the unwanted sideband, and distortion in the wanted one. In a good transmitter such spurious signals will be better than 20db down on a single tone or 26db on peak power. Adjustment of the transmitter stages, biasing and not over-running associated amplifiers all contribute to a cleaner signal.

Obviously, such signals can be seen on a spectrum analyser, but these are expensive. In the early days of s.s.b., here at G4LU I made do with a receiver having a very selective c.w. filter. The spurious inter-modulation frequencies from the two-tone test could be detected, and a rough measurement made on the S-meter.

Feeder SWR

One thing needs to be said now - and that is that the standing wave ratio (s.w.r.) on the feeder, in itself, has no bearing on interference or spurious signals - except in so far as eliminating it may alter the adjustment of the transmitter or amplifier. Spurious components are caused by non-linearity and the antenna is a completely passive device and cannot do any damage.

However, there is one exception to the dogmatic statement I've just made! The exception is when non-linear elements exist in the antenna circuit (or so close to it) that induction from the current in the antenna can take place. In this situation bad joints in the antenna wire proper, or corrosion in tubular clamps of beam elements and bad joints in metallic troughing on nearby roofs can all generate spurious signals. These should be looked for as a last resort.

Something akin to the situations I've just discussed, occurred in my own shack when the 3.5MHz signal started breaking through on a 144MHz receiver. Some tests had been carried out the previous day using an Icom R80 receiver, the antenna was still connected to it. The antenna was removed and the breakthrough was cleared, it presumably being caused by the diode band switching in the receiver. (This effect could have been radiated locally as well).

One further precaution - don't just think that spurious signals arise only in the shack. When all else has failed look outside and assess the situation to see if anything on the other side of the wall to your equipment could be the culprit!

In Band Interference

One final word now, and it's about in-band interference. To understand the term let's look at it more closely.

The response of the filter in equipment is rather like the trunk of a tree, shorn of its branches and somewhat rounded at the top. The sides have a slight slope on them, and at the bottom the roots spread out.

Commonly, the width before the response broadens out is about 2.8kHz. In short, the plot of amplitude against frequency is not a rectangle with vertical sides. Neither, if your dial indicates a single frequency, does it mean that your signal is confined only to that spot. This may seem obvious, but time and time again, particularly if you're is running a net, you'll find other stations tuning up or putting out calls within a kiloHertz or less of your frequency.

Clearly the offender has not listened first before transmitting, or they are a complete unbeliever of bandwidth. To avoid causing problems yourself, a good criterion is to stay away from other signals by at least 3kHz and you will have, nor cause, any problems. Now go and enjoy your hobby and don't upset the neighbours or Ofcom! **PW**

Fig. 7a: A practical 'braid breaker' design (in reality a choke filter). This is only one version! The coaxial cable could be wound as a solenoid and could be just as effective. There are many designs and G4LU recommends a good read of the many Amatuer Radio manuals to find the design that suits your needs!

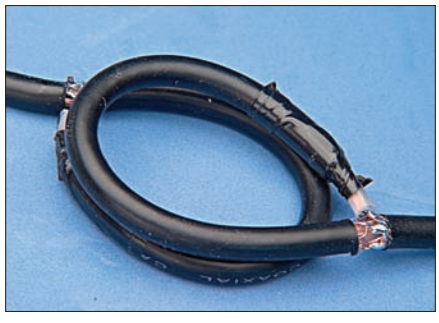


Fig.7b: A true 'braid breaker' filter before taping the loops together.

All Kenwood products include a 1 year Kenwood (UK) Guarantee.
All Yaesu products include a 2 year Yaesu (UK) Guarantee.

HAYDON Communications

TO SEE OUR ON-LINE CATALOGUE & ORDER SECURELY, VISIT:
www.haydon.info

Unit 1, Purfleet Industrial Estate, Off Juliette Way, Aveley, South Ockendon, Essex RM15 4YA
TEL: 01708 862524 FAX: 01708 868441 Open: Mon-Fri, 10.00am - 4.00pm.

NEXT DAY DELIVERY TO MOST AREAS, £10.00 *E & O E*

PSUs

NISSEI PS-300

Features:
★ Over voltage protection
★ Short circuit current limited

TRUE 'LINEAR' PSU

£99.95 Del £10.00

Professionally made 30A (3-15V) PSU (256 x 135 x 280mm)

DIAMOND GZV-4000

DIAMOND QUALITY - RARELY BEATEN

GZV-4000 (40 amp) ...£119.99
GZV-2500 (25 amp).....£89.99

Superb switch mode PSU with built-in speaker

NISSEI MS-1228

Professional compact 28A (12V) PSU (57/174/200mm)

£69.95 Del £10.00

FULLY VOLTAGE PROTECTED & FITTED WITH ADDITIONAL POWER SOCKETS AT REAR + CIGAR SOCKET AT FRONT

AMATEUR RADIO TRANCEIVERS

YAESU FT-817 ND

INCLUDES FREE HEADSET

100kHz-440MHz (with gaps). All mode transportable. Includes NIMH battery/ charger. Latest 2005 spec.

Additional NiMh battery £30
Optional Yaesu carry case ...£15.00

£449.99

FT-817 ND + MS-1228 PSU.....£499.99

YAESU FT-857D DSP

Includes free complete headset

The ultimate HF excitement in a small package. HF + 6m + 2m + 70cm. Incl's digital signal processor unit.

DTMF Mic £59.99

£569.99

FT-857D + ATAS-120 Package Price £789.99

YAESU FT-897D

HF + 6m + 2m + 70cm all mode. An amazing DSP Tcvr for base/mobile or portable use. Very little has been left out!

INCLUDES FREE HEADSET

PRICE £639.99

FT-897 + PS-300 bundle £729.99

KENWOOD TS-570DGE

INCLUDES ATU

In our opinion, the best HF transceiver below £1200.

OUR PRICE £749.99

PS-53 matching PSU.....£169.99
SP-23 matching speaker £69.99
MC-60A compression microphone.....£119.99

GO LARGE: TS-570DGE + PS-300 .....£839.99

KENWOOD TS-2000

New all mode multibander: HF/50/144/430 optional 1200MHz.

TS-2000 + PS-300 PSU £1379.00

OUR PRICE £1299.00

Matching PSU.....£169.99 Matching speaker.....£69.99

YAESU FT-1000MP MkV

Optional extension speaker £119.99

200 watts of shear delight from a radio that is without peer when it comes to performance and innovation. Limited stock available. Latest 2005 spec.

FREE MATCHING SPEAKER £1949.00

Yaesu FT-1000MP (Field) MkV (100W) £1599.00

YAESU FT-7800

FREE IN-CAR KIT

2m/70cm. Includes Rx:- 108-520/700-1000MHz

BEST BUY £219.00

YAESU FT-8900

10m+6m+2m+70cms. FM Mobile. £329

INCLUDES FREE DTMF MICROPHONE

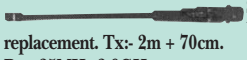
YAESU VX-7R

Yaesu heavy duty tribander 50/144/ 430MHz. (Lithium ion battery) high power (5W).

INCLUDES FREE HOLSTER CASE AND BDY HARNESS

£209.99

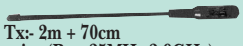
SUPER-GAINER RH-9090



SMA 40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm. Rx:- 25MHz-2.9GHz

OUR PRICE £26.95 P&P £1.50

SUPER-GAINER RH-9000



Tx:- 2m + 70cm gain. (Rx:- 25MHz-2.9GHz).

BNC 40cm flexible whip for the ultimate in

OUR PRICE £21.95 P&P £1.50

NISSEI PWR/SWR METERS @ LOWER PRICES!

RS-502 1.8-525MHz (200W) .....£69.95 P&P £5
RS-102 1.8-150MHz (200W) .....£49.95 P&P £5
RS-402 125-525MHz (200W).....£49.95 P&P £5
RS-3000 1.8-60MHz (3kW) Incls mod meter £39.95 P&P £5
RS-40 144/430MHz Pocket PWR/SWR .....£24.95 P&P £2
DL-30 diamond dummy load (100W max) ...£29.99 P&P £3

YAESU VX-2E

INCLUDES FREE WATERPROOF BAG

Tx:- 2m/70cm. Rx:- 0.5-999MHz. Includes battery (Li-/on) + charger.

OUR PRICE £115.00

Optional speaker microphone.....£27.99
Optional plastic case £12.99

ALINCO DJ-596

2m + 70cm Handie. Includes: (NIMH) Battery/Charger. Wide + narrow switchable. High power (4.5W) OP as standard. Alpha Numeric channeling.

Now includes free remote mic

£129.95

Optional case £16.99
Cigar lead.....£19.99
Optional headset (Boom mic) £24.99

KENWOOD TH-F7E

Transceiver & scanner 2m/70cm Tx (5W). Rx:- 0.1-1300MHz, all mode (incl SSB). Incls:- Lithium ion battery & charger.

Incl's free remote mic

OUR PRICE £229.99

Optional case.....£19.99
Optional cigar lighter lead.....£19.99
Optional headset (Boom mic) £24.99

YAESU BARGAINS

FT-2800M...£149.99 incl's FREE antenna - mount req'd

ACCS

MFJ-993

NEW INTELLITUNER 300W, fully automatic. Will tune wires G5RVS, verticles, trapped dipoles, you name it.

NOW £209.99

MFJ-259B

UK VERSION

HF digital SWR analyser + 1.8-170MHz.

NOW £169.99 P&P £7.00

Optional case.....£22.99

MFJ-259Z	Analyser	Now £184.99
MFJ-269B	160-70cm analyser	Now £259.99
MFJ-269B	Optional Case	£22.99
MFJ-66	DIP Coils (for analysers)	£24.99
MFJ-901B	Superb versitile ATU	Now £72.99
MFJ-902	Travel tuner (10 - 80m)	Now £59.99
MFJ-1610	Random wire tuner (HF)	Now £45.00
MFJ-264	(0-600MHz) 1.5kW dummy load	£49.99
MFJ-260C	(0-600MHz) 300W dummy load	£30.00
MFJ-1118	Multiple DC outlet board	Now £49.99
MFJ-1117	High current outlet unit	Now £35.00

MFJ-949E

SPECIAL £110

- 1.8-30MHz 300W ATU
- Large cross needle meter
- 30/300W PEP power meter
- VSWR ● 3-way antenna selector
- Internal balun

MFJ-969

The world's only 300 Watt Aircore™

Roller-Coaster Inductor A.T.U.

(covers 160 meters to 6m). Handles almost any antenna + wires.

NOW £159.99

SGC-230

200W remote weatherproof ATU. Connect a wire and simply go! (Minimum length applies.)

£299.99

Smart Lock Special Offer (for SGC-230) £39.99
SGC-239 Mini Tower (1.8-30MHz) £169.99
SGC-231 HF + 6m £299.99

YAESU G-450C

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

OUR PRICE £299.99

G-650C .....our price £359.99
G-1000DXC.....our price £449.99
G-5500 (azimuth/elevation) rotator.....our price £499.99
GC-065 thrust bearing.....£48.00
GC-038 lower mast clamps.....£25.00

AR788 *NEW MODEL*

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable 50p per mtr.

OUR PRICE £44.99

AE-201 thrust bearing £14.99

UBC-180XLT

A brand new state-of-the-art scanner with 8.33kHz spacing on airband. Covers 25-960MHz (with gaps). Includes battery and charger. 8.33kHz tuning. Back-lit display along with alpha-numeric tagging.

RRP ~~£129.95~~ OUR PRICE **£99.95**

GRE PSR-225

25-550/760-1300MHz. AM/FM/SF. VFO tuning/direct frequency entry/direct-limit search/auto frequency storing/anttenuator 240V or 12V. Was ~~£199.00~~

NOW **£149.99** Del £10.00

D-308B DELUXE DESK MIC

(with up/down). Many amateurs using this mic (over 4000) have expressed extreme pleasure with it's performance. Includes 8-pin round Yaesu mic lead.

£49.95 P&P £6.00

Yaesu	8 pin round to modular adapter (8 pin)	£19.99
Yaesu	8 pin round to 6 pin modular adapter	£19.99
A-08	8 pin "Alinco" round	£9.95
K-08	8 pin "Kenwood" round	£9.95
I-08	8 pin "Icom" round	£9.95
IM-08	Modular phone "Icom"	£9.95
KM-08	Kenwood modular lead	£9.95

HUNTER

Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.

OUR PRICE **£39.95** P&P £6

Optional padded case £7.50

CUSHCRAFT BARGAINS

Delivery £12.00

MA5B	Mini beam 10, 12, 15, 17, 20m	SPECIAL OFFER	£315.99
A4S	4 ele beam (10 - 20m)	~~£500.95~~	£425.00
R-8	Vertical (40 - 6m) "special"	SPECIAL ~~£400.95~~	£299.99

CAROLINA WINDOM P&P £8.50

CW-160S	(160-10m) 40m long	NOW £110
CW-80	(80-10m) 40m long	NOW £79.95
CW-80S	(80-10m) 20m long	NOW £99.95

FIBRE GLASS POLES

Del £10.00

	1 1/2"	1 3/4"	2"
1m	£8.50	£10.50	£12.50
2m	£16.00	£20.00	£24.00

Longer lengths available – phone

HHC-2 Police style holster

A unique "stretch case" designed to fit atatched to your belt or fixed to your body via the 3-point body harness (supplied). (Ideal for hand-held/mobile phones).

£10.00 P&P £2.50 2 for £15.00

New station log books (A4) £2.99 P&P £2.00
5 Logbooks £12.00 P&P £6.50

MFJ-126

Superb 12 hour quartz wall clock with 24 hour time line,

WAS ~~£29.99~~ Now **£14.99** P&P £5.00

TH-887 Icom/Kenwood

Superb headset for most handhelds. Supplied complete with an Icom or Kenwood 8-pin modular (specify) adaptor to fit Icom & Kenwood mobiles.

WAS ~~£48~~ Now **£25.00** P&P £3.50

COPPER ANTENNA WIRE ETC

Enamelled (50m roll)	£16.95	P&P £5
Hard drawn (50m roll)	£16.95	P&P £5
Multi-Stranded (Grey PVC) (50m roll)	£13.95	P&P £5
Flexweave (H/duty 50 mtrs)	£30.00	P&P £5
Flexweave H/duty (18 mtrs)	£15.95	P&P £5
Flexweave (PVC coated 18 mtrs)	£18.95	P&P £5
Flexweave (PVC coated 50 mtrs)	£40.00	P&P £6
Special 200mtr roll PVC coated flexweave	£99.00	P&P £10
Copper plated earth rod (4ft)	£13.00	P&P £6
Copper plated earth rod (4ft) + earth wire	£19.99	P&P £6
New RF grounding wire (10m pack) PVC coated	£12.50	P&P £5

COAX SWITCHES (P&P £4.50)

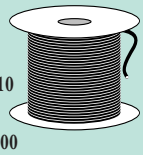
2 way CX-201 (0-1GHz) SO239 ..... £19.95
2 way CX-201 'N' (0-1GHz) 'N' £24.95
4 way CX-401 (0-500MHz) SO239 .... £69.95
4 way CX-401 'N' (0-500MHz) 'N' £79.95

LOW LOSS PATCH LEADS

£3.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	£5.99
PL-259 - PL-259	4m	£9.99
BNC - BNC	1m	£6.99

COAX BARGAINS



RG-213 Mil spec x 100m.
£59.99 or 2 for £100.00 P&P £10

RG-58 Mil spec x 100m.
£29.99 or 2 for £50.00 P&P £10.00

Coax stripping tool (for RG-58) ..... NOW £2.00

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc. *Simply close shut over cables and notice the difference!* Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for £10.00 or 6 for £25.00 (P&P £3.50)

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/OD35mm. 6 for £12.00
12 for £20.00 P&P £3.50
50 for £40.00 P&P 7.00

BARGAIN WINCH

500kg brake winch.
BARGAIN PRICE
£59.95 Del £8.50

Winch wall bracket £19.99

MAST HEAD PULLEY

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

£8.99 + P&P £3.50

30m pack (4.4mm) nylon guy rope £12.50

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

£8.99 + P&P £3.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on

WALL BRACKET **£2.99** P&P £1.00

MOBILE ANTENNAS

P&P £8.50

DB-770M	2m/70cm (3.5 - 5.8dB) 1m PL-259 (SO-239)	£24.95	
DB-7900	2m/70cm (5.5 - 7.2dB) 1.6m PL-259 (SO-239)	£39.95	
DB-627	6m/2m/70cm (2.15 - 4.5 - 7.2dB) 1.6m (SO-239)	£39.99	
DB-285	2m/5/8ths (3.4dB) 1.3m (SO-239)	£10.00	
PL-62M	6m + 2m (1.4m) PL-259	£21.99	
PLT-20	20m mobile whip (56" long)	£24.95	
PLT-40	40m mobile whip (64" long)	£24.95	
PLT-259	Converter for PLT Range (PLT-40/20)	£5.95	

ALL 'DB' ANTENNAS HAVE FLIP OVER FACILITY

METAL WORK & BITS

P&P available on request

Phasing Harneses Now In Stock.

2.4m/2"	alloy poles	£19.99	
2"	Mast base plate	£12.95	P&P £5
6"	Stand off	£6.95	P&P £5
9"	Stand off	£8.95	P&P £5
12"	T&K Brackets	£18.00	P&P £8
18"	T&K Brackets	£22.00	P&P £8
24"	T&K Brackets	£26.00	P&P £8
U bolts (1½" or 2")		£1.20	each
8 nut universal clamp (2" - 2")		£5.95	
2" - 2" cross over plate		£10.95	
3-way guy ring		£3.95	
4-way guy ring		£4.95	
2" 3-way rotary guy ring		£29.99	
2" mast sleeve		£9.95	
Heavy duty guy kits (with wire)		£29.95	P&P £6
Ground fixing spikes (3 set)	powdered coated	£24.00	P&P £8
30m pack nylon guy 4.4mm/B/load 480kg		£12.50	P&P £3
132m roll nylon guy (4.4mm)		£40.00	P&P £7.50
Self amalgamating tape (roll)		£6.50	
'Nylon' dog bone insulators		£1.00	each
PL-259 plugs (large or small entry)		£1.10	
N-type plugs (large or small entry)		£3.95	

DIAMOND CP-6

A superb (diamond quality) 6 band trap verticle antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m

SEND SAE FOR DATA SHEET

OUR PRICE **£219.99**

Q-TEK PENETRATOR

"WE'VE SOLD 100S ALL OVER EUROPE"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

ONLY **£179.95** Del £10.00

SEND SAE FOR LEAFLET

DELUXE G5RV

P&P on either full/half size £6.50

Multi-stranded heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings.

Double size - 200ft (160-10m)	£84.95
Full size - 102ft (80-10m)	£42.95
Half size 51ft. (40-10m)	£36.95

Inline (SO-239) line isolator (a must for G5RV's).. NOW £29.99

STANDARD G5RV

Full size	102ft	(now includes heavy duty 300Ω ribbon)	£28.95 P&P £6
Half size	51ft	(now includes heavy duty 300Ω ribbon)	£24.95 P&P £6

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end) ..... £25.00 P&P £4.00 (a pair)

G5RV PARTS

Open wire dipole centre	£5.99
SO-239 dipole centre	£5.99
SO-239 to 300Ω joiner	£9.99
300Ω ribbon (Extra heavy duty)	50p/mtr

Q-TEK COLINEARS (VHF/UHF)

P&P £10.00

X-30 GF 144/70, 3/6dB (1.1m)	£39.95
X-50 GF 144/70, 4.5/7.2dB (1.7m)	£54.95
X-300 GF 144/70,6.5/9dB (3m) ... SPECIAL OFFER	£45
X-510H GF 144/70, 8.5/11dB (5.4m)	£120.00
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m)	£79.95

BALUNS & TRAPS

1.1 Balun			£25.00 P&P £4
4.1 Balun			£25.00 P&P £4
6.1 Balun			£25.00 P&P £4
40 mtrs	Traps	(a pair)	£25.00 P&P £4
80 mtrs	Traps	(a pair)	£25.00 P&P £4
20 mtrs	Traps	(a pair)	£25.00 P&P £4

1kw Handling

TELESCOPIC MASTS

6 section telescopic masts. Starting at 2 1/2" in diameter and finishing with a top section of 1 /4" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 8 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs **£109.95** 12 mtrs **£149.95** *Carriage £12.00.*

Tripod for telescopic masts £89.95

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF £20.00
DC-2 Standard 2-pin/15A fits most VHF/UHF £10.00

BARGAIN ALUMINIUM POLES

2.4m x 2" aluminium pole. £19.99 each
(del £10.00) or 4 for £50 (del £15.00)

BARGAIN MAST SET

5 section 16ft long (1⅛") mast set **£15.00**
Del £10 (2 sets £25.00)

TWO FOR £25

NEW 20' SLEEVED MAST SET

A heavy duty-sleeved, mast set that will tightly slot together. 4 x 5' (2" dia) 16 guage heavy duty aluminium tubes. (Dimensions approx).

£49.99 Del £10.00.

THREE FOR £100 DEL £150

ALUMINIUM POLE CLEARANCE

We have sets of 4 (2") poles (3 of which are swaged) that slot together to make a (approx) 20' pole. Each section is approx 5' long – some have small dents in – some have been swaged slightly off centre – hence the price.

3 FOR £40.00 DEL £15.00 **£15.00** Del £10.00

Radio Basics

This month in Radio Basics Rob G3XFD takes a look at antennas for the beginner, following feedback from readers at the Leicester Show. And it looks from his advice that a good antenna is the heart of success!

For the first time this year at the Leicester Show I was provided with a facility to meet readers. It came about because I was invited to provide a *PW* 'State of the Nation' talk at the event. The first talk on the Friday was reasonable for a first effort. However, the Saturday talk provided myself and other people working on the magazine with a great deal of feedback from the most important people of all the *PW* readers.

During the talk there were some interesting general questions directed at me as *PW* Editor! Later on though, some other questions and ideas came forward when readers joined me on the *PW* stand. A number of the people coming to chat were Radio Basics (RB) readers who were asking the same sort of questions, namely; "What's the best antennas to use with simpler home brewed equipment", and "how do I manage in a small garden"?

So, with the readers' questions and concerns in mind I've decided to devote a larger than usual RB slot entirely to antennas and associated projects.

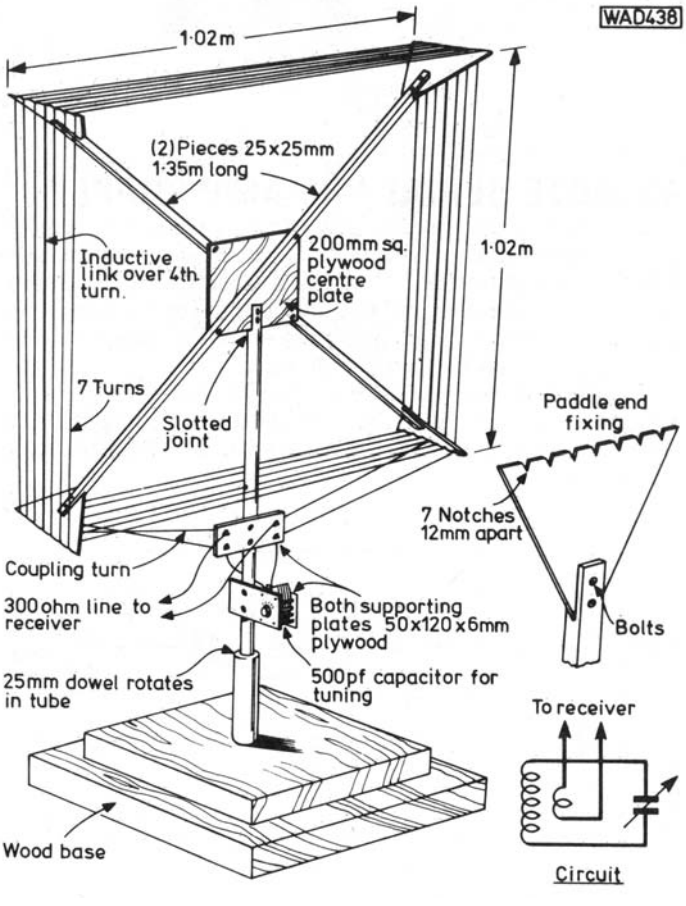


Fig. 1: The loop shown is one of the designs favoured by Charles Molloy G8BUS. The design (it features in the *Out of Thin Air* reprint) is for medium-wave DXing, but is easily re-scaleable for 1.8MHz and above (see text).

Big Antenna Secret?

If there is a big secret regarding high frequency (h.f.) antennas it has to be; "Put the greatest amount of wire you can into the air, as high as possible and as far always from buildings and electrical noise sources as you can"! The problem is that most of us can't do that every easily!

Even when I lived in the beautiful Hampshire Downlands northeast of Winchester, near Alresford I had problems! Yes, we were in the country and a G5RV antenna was no problem but due to the shape of our cottage garden the antenna ran parallel with overheard electrical cables feeding the local farm's dairy unit and grain driers. Both used high power three phase motor driven equipment!

Additionally, during the time my family and I lived in Wester Ross in the Scottish Highlands despite the fact our nearest neighbours were 200 metres away my antenna choices were restricted and we had the usual overhead line problems! However, despite these problems I managed quite well, as you can in your own situation! So, let's now look at some ideas to help get the best signal in and (if you're a transmitting Amateur) out of your main station.

Part Of The Problem

Part of the problem seemingly shared by a number of RB readers is that along with having fairly simple receivers, many live in small houses or flats with extremely difficult antenna restrictions. But despite these difficulties, I can assure readers they can be overcome in most situations

Some readers tell me they've used the TV antenna feed within their blocks of flats as an h.f. antenna. They've often achieved good results, but the more sensitive the receiver, the more likely you are to pick up the many spurious signals that seem to abound in amplified distribution systems! So, unless you have no alternative I suggest you avoid using anything other than your own wire antenna it will improve safety and reception.

One reader tells me he lives high up in a tower block. He using a lightweight 2m long cane (to take the antenna away from the side of the building) to permit a 6m length of wire to dangle from the end. Fed into his portable h.f. receiver via a good antenna tuner, the system provides good reception. Additionally, because of the constant breeze such buildings attract the wire blows in the wind and it's horizontal much of the time!

If you can have a short wire antenna in my opinion it's certainly the best, especially if you can get it clear from any building, wiring (with switch mode power supply interference and TV time base signals). Antennas of this type can be fed into an active pre selector unit. This can be made up from a simple switched inductance (coil) unit with variable capacitors to provide matching, followed by a simple field effect transistor (f.e.t.) r.f. amplifier, using my favourite, cheap MPF102. As a receiving only system it will prove excellent results for little effort.

However, bearing in mind the idea of this article is to help those RB readers who don't have much space, I'll be providing as much information on compromise antenna systems as I can. And some of those

Fig. 2: Richard Marris G2BZQ is a keen user of loop and table top antennas. This transmitting 3.5MHz antenna was published in the August 2001 issue (see text).

compromise antennas can provide superb results!

Vertical Antennas

One of most versatile antennas I use nowadays is well known to *PW* readers. The 10m long 'roach pole' fibreglass fishing rod antenna has proved incredible reliable and versatile. The photographs of the system have appeared many times in *PW,* literally every time I've written about my /P operations because I wish to encourage others to try the same system. Because of this I'm not going to waste space in publishing them again! Just look back at your *PW*s and you'll find a photo of the system several times in the last two years or so.

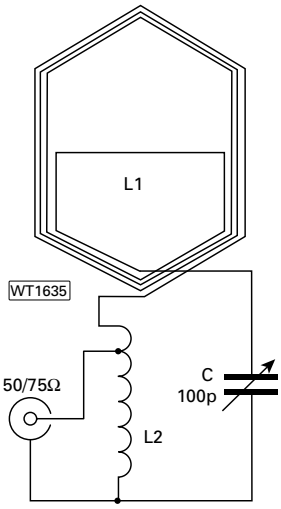
With the mast extended to its full length and used in conjunction with the **Tennamast (Scotland) Ltd.**, Tenna Tourer drive on mast base it's a simple vertical system that can be used temporarily or be left erected throughout the year. They cope with the weather extremely well, and I've only lost one in the south coast gales here in Dorset.

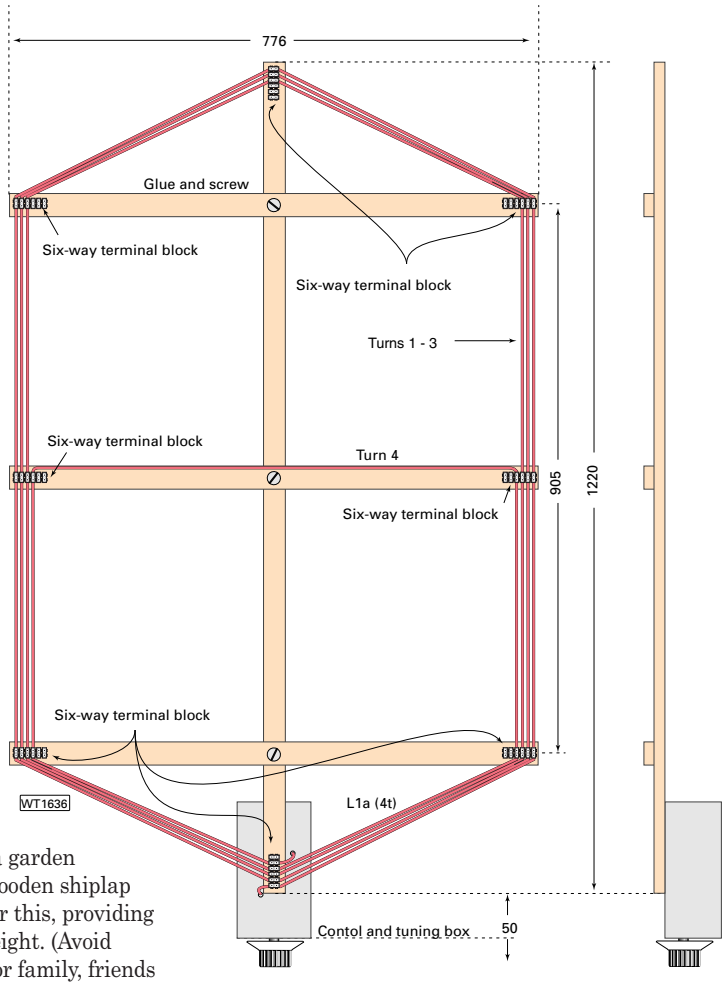
On inspecting the mast I found that I'd over tightened the metal base clamp and the fibreglass (extremely tough at the base) had split. The replacement has done well over the last three years or so. Incidentally, **Robin Sykes G3NFV** of Sycom (who supplied the fibreglass pole to me) told me that he has a customer in the far north east of Scotland who also leaves his 'mast' erected over the winter. They're certainly tough!

I use the mast with pvc insulated wire anchored to the top with tape and then spiralled round the erected pole (making about five complete turns). When used with an earth system of 'floating radial' (the radial wire is trailed across the ground but not actually earthed) I've worked the world on low power (not quite QRP) c.w. and s.s.b.

At the moment at home I've got two antenna systems up and working. The main system is based on the fibreglass mast and it works so well I've decided to have it as a permanent set up when I eventually have my Tennamast Adaptamast assembled and ready to go.

Of course, if you have trees in your garden you can utilise them as anchor points for antenna especially short wires. However, you have to ensure you provide movable counterweights for when the trees sway in the wind.





You can also run a wire round the top of a garden fence. The thin wooden shiplap fencing is ideal for this, providing it's about head height. (Avoid providing traps for family, friends or pets!).

Loop Antennas

Although I'm not a keen exponent of the non full wave loop antenna, they certainly have a big following. They can be extremely effective for the keen short wave listener (s.w.l.) who has limited antenna space facilities.

I prefer the full wave loop. Examples of these are the quad loop (four sided) and the delta loop (three sided). I'll be discussing these later in this article.

The loop antenna in its many forms favoured by some of our specialist authors including **Richard Marris G2BZQ** attracts a large number of users. Those who are keen on them often report just how effective they are for specialised reception in noisy conditions with QRM and QRN (interference form other stations and electrical interference/noise, direction finding and perhaps most importantly where there's not much space.

The loop shown, in **Fig. 1**, is one of the designs produced by **Charles Molloy G8BUS** in *PW*. The design (it features in the *Out of Thin Air* reprint) is for medium wave DXing, but is easily re scaleable for 1.8MHz and above.

And of course, the same design antenna can be used for transmitting purposes one of the methods so much favoured by G2BZQ. However, if you are interested in trying a loop antenna for yourself, I strongly advise that you read one of G2BZQ's articles in *PW* on the subject, **Fig. 2** (a 3.5MHz loop).

There are many things to consider with home made transmitting loops flashover of variable capacitor tuning plates is the most obvious. Any attempt at using small plastic cased polyvaricon variable capacitors will easily lead to something melting, possibly catching fire and a damaged transmitter. So, take very great care to follow the directions provided by any of our experienced authors such as Richard G2BZQ.

Resonant Loops

Once armed with the knowledge that the quad loop requires each side to be a quarter wavelength for the frequency on the band being used it's simple to make a single band system. In practice I've found that if you keep all sides the same length the loop will work very well even when it's very much offset in shape.

To convey the quad loop shaping possibilities, let's imagine there's an empty cardboard box about to collapse sideways, and into itself as it folds flat. All the sides are the same length but it's certainly not a square! The flexibility of wire quad loops means that many of us could probably squeeze a loop of some sort into our gardens, resonating on 14, 18MHz and the

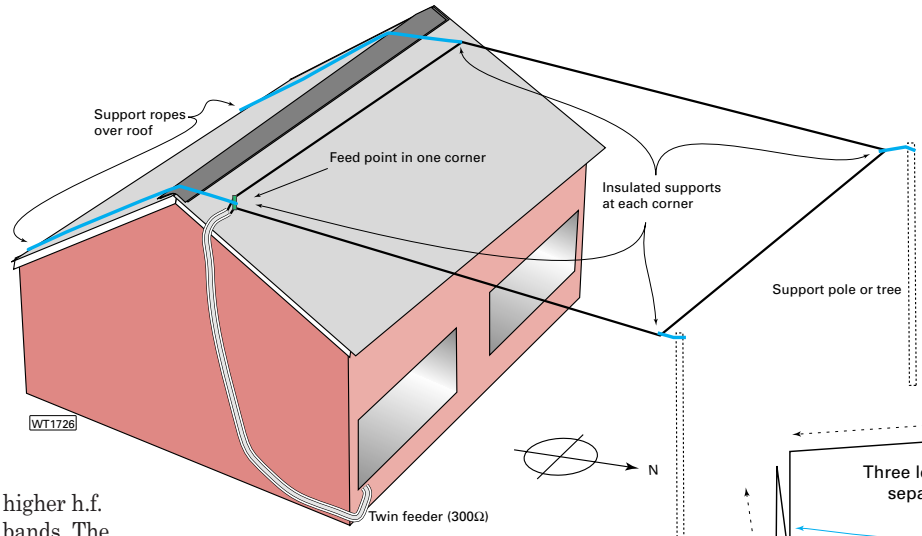
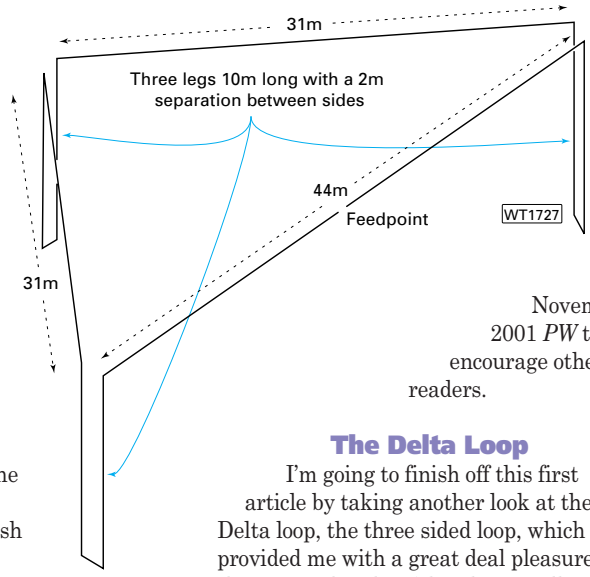


Fig. 3: The diagram shows an interesting horizontal loop system used by Robin Trebilcock GW3ZCF. Robin had a very successful time with this system, and the article was originally published in the November 2001 *PW*, which includes more details of Des M0APK's loop shown below.

higher h.f. bands. The higher in frequency you go the shorter the loop sides!

Hung from a tree or by using supporting ropes and perhaps even garden canes, the loop can be extremely effective. All the Amateur radio manuals and antenna books carry much detail. The one book I can thoroughly recommend (a must for your library) is the truly superb *ARRL Antenna Book*. This continually growing publication is all you'll ever need on antennas. Once purchased you'll never regret buying it the section on loops and the large number and variety of designs is particularly good.



Finally, before leaving resonant quad loops, did you know you can actually have a horizontal loop in the garden for working and listening to inter G and Irish stations? This form of antenna can be disguised on a low fence (perhaps round a lawn) or perhaps around the garden at above head height.

The horizontal loop antenna literally 'fires' upwards. And the angle of propagation is such that although you won't work much DX you will work stations within the UK, Ireland and the near Europe at very good signal levels.

One of the keenest advocates of the horizontal loop antenna is my friend **John Tait EI7BA** from Midleton in County Cork in Ireland. John has had some excellent results working in EI and G with his ground based resonant loops on 3.5MHz. His signal strength has to be heard to be believed. I've been working hard on John (he's a busy chap) to write some articles on the subject, but when he reads this perhaps he'll find time to share some ideas with *PW* readers!

The diagram, **Fig. 3**, shows an interesting horizontal loop system used by *PW* author **Robin Trebilcock GW3ZCF**. Robin had a very successful time with this system. and produced the article in the November 2001 *PW* to encourage other readers.

The Delta Loop

I'm going to finish off this first article by taking another look at the Delta loop, the three sided loop, which provided me with a great deal pleasure on the 18MHz band with only a small outlay in energy and cash! The delta loop is shown in **Fig. 4**, and readers will no doubt remember the article (on portable operating portable) published on page 54 of the September 2002 Issue of *PW*. It's a real DX chaser antenna.

Obviously, the Delta loop as shown is not huge, but it's on the other hand it's not pocket sized! With the three sided loop hanging from the top of the bamboo pole, the system can rotate around the pole itself, taking advantage of the directional properties of the antenna. The shape of the delta loop is maintained by the bamboo pole (I used garden canes from our local garden centre). The rigidity provided by the bottom cane allows the easily erected system to rotate easily.

Of course, it's possible to make the loop system for 7MHz, but it will be quite big! The 14MHz band delta loop is a bit more manageable. It's my ambition to make a delta loop for 7MHz and when I do I promise to share the results with readers. If it's as successful as the 18MHz version it will be superb!

Next month, I'm planning to chat about other antennas, including verticals, mobile antennas and some ideas for antenna tuning. Cheerio until then.

PW

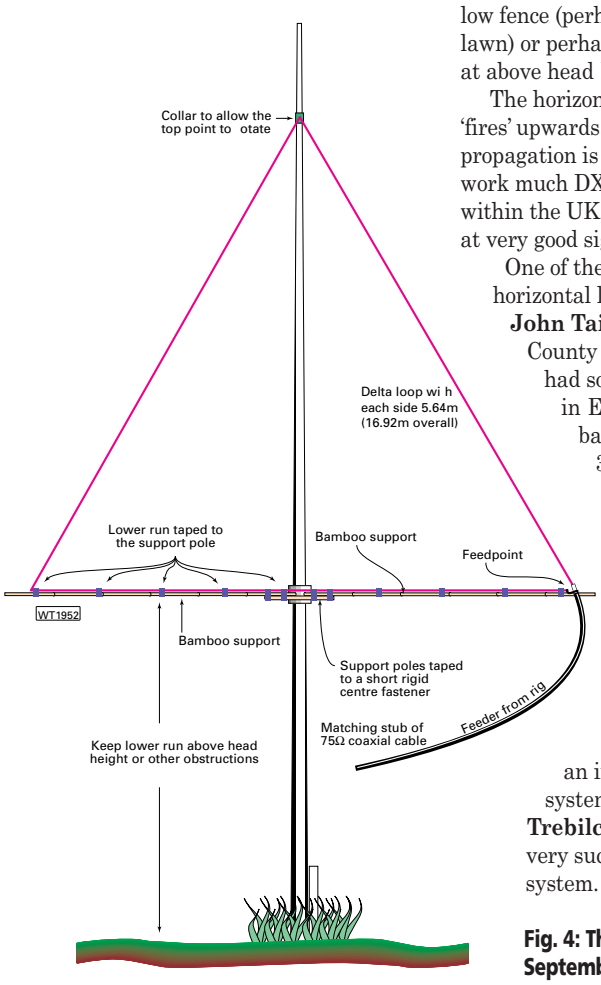
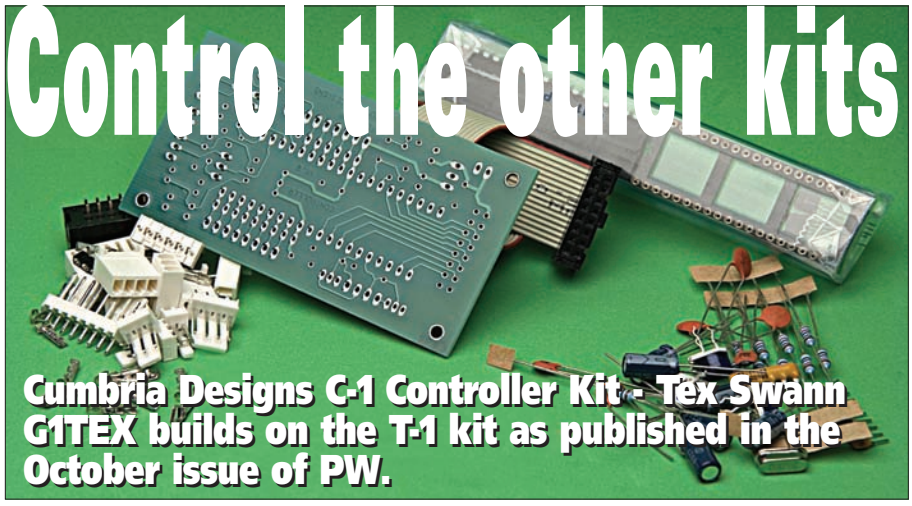


Fig. 4: The portable delta loop for 18MHz. Originally published on page 54 of the September 2002 issue of *PW*, Rob G3XFD says it's a real DX-chaser antenna.

Control the other kits



Cumbria Designs C-1 Controller Kit - Tex Swann G1TEX builds on the T-1 kit as published in the October issue of PW.

A couple of months ago, I looked at the T 1 high performance transceiver sub system. And in that review I inadvertently gave the impression that the filter kit was included in the T 1 kit, it is in fact a separate kit and is needed in addition to the T 1 kit itself. The T 1 kit is a sub system that forms the heart of a transceiver, from the front end mixer to the audio amplifier, from the microphone to the low level output signal to the r.f. power amplifier. The C 1 kit is a controller add on to make some facilities available on the T 1 easier to control.

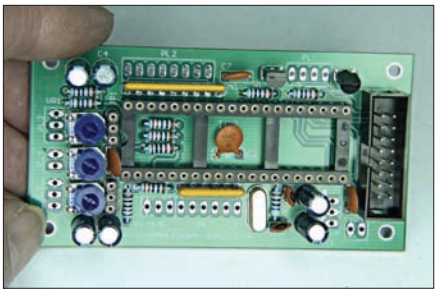


Fig. 1: The board about half way through the assembly, most of the electronic parts have been fitted at this stage.

For example, in Morse code (c.w.) working, many good operators find it useful to have the transceiver switch back to receive in the inter character or inter word pauses so, they're able to hear activity on the same frequency before keying the next character. This timing called 'break in', switching back and forth, can be set to suit the individual's needs.

Using voice with single side band (s.s.b.), the speed and way that the receiver's automatic gain control (a.g.c.) follows the changing signal strength can be varied. This facility, called the 'hang time', can be set 'long' when a strong, clean signal is received, or shorter, when weak, rapidly fading signals are found on the band.

Both the above controls can take either a pre set value or they may be fully variable from front panel controls. Other facilities of the main transceiver system may be controlled with the C 1. Functions such as filter bandwidths, transmission mode and sideband selection., p.t.t. functions and sequencing, as well as the control of a.g.c. and hang time control all operate via individual control lines.

In addition there are also additional signals lines available to drive either logic chips or small relays or indicators. These lines could be used to control the switching in of pre amplifiers on receive and power amplifiers on transmit, without all the hassle of extra circuitry.

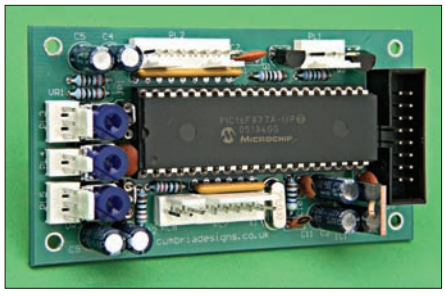


Fig. 2: A fully assembled p.c.b. after fitting the connectors and the micro-controller i.c.

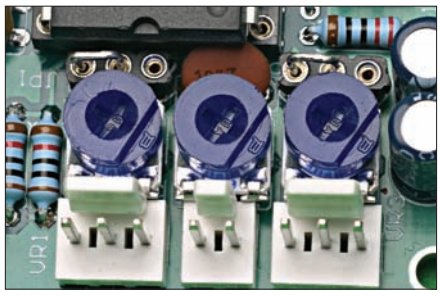


Fig. 3: A closer look at the area around the break-in and hang-time adjustment controls. See text for more details.

Kit-Building

But enough of what it's intended to do, let's look at the kit building itself. The kit is supplied in typical Cumbria Designs style, with a professional quality p.c.b. and all the plugs, sockets and components needed to complete the kit. Apart from the instruction sheets, the contents of the packages can be seen in the heading picture.

A certain level of construction capability has been assumed, in that there's no explanation of soldering or building techniques in the instructions. Just a well laid out logical and sequential series of assembly steps to complete the module. As with any electronic kit, it's an idea to begin by cross checking that you have all the components and parts as specified on the packing list. This list is to be found detailed in the comprehensive instructions on double sided A4 sheets. These instructions contain both circuit description and diagram.

After fitting many of the electronic components, capacitors, resistors and semiconductors, the board is populated as in **Fig. 1**. A comparatively short time later, after I'd fitted the various p.c.b. mounted pin connectors, I was left with only the microcontroller itself to fit. The completed board is shown in the photograph, **Fig. 2**.

The photograph, **Fig. 3**, shows the interesting area around the variable controls for break in and hang time. The outer connectors with three pins accept a fully variable control voltage from panel mounted potentiometers or, from the small blue topped preset resistors 'behind' the connector. The small wire links are to set the control source.

By moving the links to join the right hand two sockets, the presets are brought into circuit. By replacing each link with a small panel mounted switch, it's possible to have either fixed or variable controls. The central two pin connector takes an audio input and is part of the a.g.c control.

Communications and power for the C 1 unit are all passed through the 16 way flat cable that can be seen connecting the C 1 unit to the Cumbria Designs Main T 1 transceiver sub system in **Fig. 4**. Now all I need is some more time to finish tying all the sections together into that super duper rig that I've been promising myself for a little while!

The C 1 Controller kit, for the T 1 High Performance Transceiver Sub System kit, is available from Cumbria Designs at **The Steading, Stainton, Penrith, Cumbria CA11 0ES**.

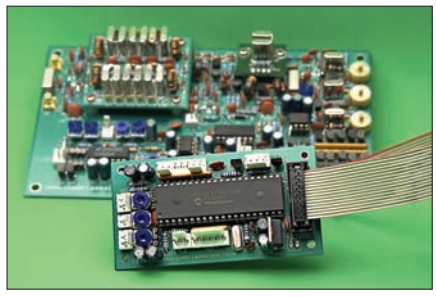


Fig. 4: The C-1 unit shown connected to the main Cumbria Designs T-1 Transceiver Sub-System board via its 16-way flat cable.

The kit costs **£24.95 (£21.23 +VAT) + P&P** when ordered direct from Cumbria designs by post, or via a secure ordering system over the Internet at: **www.cumbriadesigns.co.uk**

PW

Fun With Fones

Once equipped with his new shack, Rob Mannion G3XFD needed a communication system to keep in contact with the house. Although the project took a few months of experimentation, and much fun with the grandchildren, to complete it also turned out to be a very educational process for everyone involved.

Although my workshop-cum shack and study centre is quite close to the back of our house, it's on a terraced area of the garden above the rear, requiring the climbing of three steps. I take great care when mounting the steps because of my arthritis, and to minimise the trips (deliberate pun!) I thought that an intercom would be a good idea for when I was called for lunch or to collect a cup of tea halfway.

As our grandchildren only live two doors away I'm often joined by **Freddy** (6) and his sister **Georgia** (9) to assist and discover my Aladdin's Cave. Both children are very helpful, especially when I'm sorting stuff out and they're both fascinated by what they see in the shack! (Their questions are endless).

My experiments with a simple telephone system started after I quickly found that the new cordless digital 'phone system just didn't have the range to reach the shack. A mains intercom - the type that uses radio frequencies (r.f.) signal linking via the mains wiring - proved unusable because of the interference they caused on the h.f. bands and up onto v.h.f. too!

Fun Fones

The fun aspect in my search for a simple system came about because I quickly found that Freddy and Georgia were both fascinated by simple telephones. They'd already enjoyed using plastic cups and twine 'string 'phones' and knew the concept. I then introduced them to the sound-powered telephone using simple telephone earpieces.

Using long lengths of twin core speaker cable I first made a very basic system using one earpiece at one end, which the user alternately spoke into and then transferred it to their ear, to hear the reply. This worked well with the older grandchildren but **Louis-Paul** (three in December 2005) got frustrated because he couldn't get it right! He tended to speak while the earpiece was at his ear and tried to listen when talking. Something else had to be tried.

To get over the problem of a single earpiece I made up some wooden handsets, fixing the earpieces into place with hot melt glue. The earpiece was arranged in series with the unit acting as the mouthpiece. The twin core wire then led to the other handset at the other end (I'd made up about 15m of wire) where the unit was similarly wired.

The new system worked well in the relative silence of the garden, and the children enjoyed using the 'phones. However, as all four of the earpieces were in series the relatively small current output of the mouthpiece was much weakened by being shared by three other earpieces (a good exercise in looking at losses in an electrical circuit!).

Although, for simplicity, I'd intended to only use two wires I ended up employing four wires (two pairs). One pair connected the mouthpiece of one handset to the earpiece of the other handset. The problem was that although the received speech at the far end was much louder - the person speaking could not hear their voice in their earpiece. This was because it was an entirely different circuit, only connected to the mouthpiece at the far end! (More about this later).

Despite the disadvantages Freddy thoroughly enjoyed the 'Fun Fones'. So, I assembled a wooden carrying frame for the 'phones so he could take them home to use and he soon told his friends at school about the 'phone system, and took them into show everybody in his class at the request of the teacher.

Unfortunately, the general noise level in Freddy's school made it appear as though the 'phones weren't working! To get over this I then made a set of 'phones using a carbon microphone and earpiece circuit - this worked well and proved useful. It was then I remembered a circuit I'd seen in *PW* and also in the reprint *Out of Thin Air*. It was to prove absolutely ideal for the purpose!

Simple Amplified System

The circuit and details of the amplified intercom or 'Field Telephone' system is shown in **Fig. 1**. Originally, published in *PW* the project, written and printed by **E. A. Parr** and **J. Wallace**, proved extremely useful to me during the time I ran the radio club at **Clayesmore School** near Blandford Forum in Dorset. Most of the club members went on to build this system after they'd discovered simpler home-made telephones.

The original authors used the traditional old Post Office telephone handset, with a magnetic earpiece and carbon microphone. The circuit in Fig. 1 makes allowance for the polarising current required for the carbon microphone.

The carbon microphone insert isn't as common nowadays as it was, but it's worthwhile taking a look at it in detail. Basically, it's very simple indeed, being a resistance varied by acoustic pressure. It's formed from carbon granules, loosely packed, that enable a current to pass through (the polarising voltage, sometimes called a biasing supply). One side of the carbon granule resistance unit is arranged to be either directly in contact with, or moved by a pivot attached to the diaphragm, which is vibrated by the air pressure pulses forming speech. The varying pulses shake the carbon granules and the resistance varies, this in turn producing a varying current, producing an electrical facsimile of the speech.

The process can be observed (it makes a good demonstration for school students) by connecting a multimeter in series with the polarisation power supply and the carbon microphone insert. Once the circuit is established you'll only need to give the microphone a tap with a fingertip to see the meter's pointer move (it's best

to use a moving coil instrument for this demonstration) move.

Once set-up you can get your enthusiastic audience (they usually are by this time!) to speak into the carbon microphone insert. They can see their voices 'changed into' electrical pulses. Don't forget to remind them that the electrical current they're observing via the meter - is only a facsimile - and it's not a real 'change' into an electrical voice!

Unfortunately though, unless you've got several carbon microphone inserts in your junk box - it's unlikely a source can be found unless BT's dump can be located! However, the circuit can easily be modified to uses another form of microphone/transducer.

Moving Coil Inserts

In the original design, Fig. 1, the authors provided R1 to provide a polarising supply, with the components C1 and R4 providing the necessary components for the audio input to the 741 integrated circuit (i.c.) acting as an audio amplifier. By removing R1 I found that a magnetic earpiece/insert would work extremely well as a microphone. The authors suggest that some adjustment of the values of R4 and 5 may be required, although I didn't find this necessary

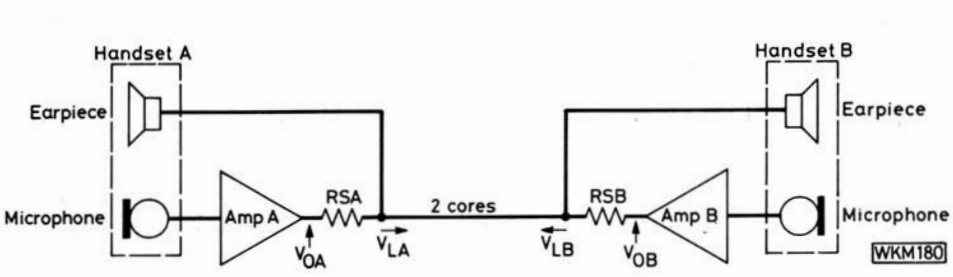
Note: miniature loudspeakers are **not suitable for this purpose** as they're not sensitive enough. Only use a moving coil/balanced armature type of insert of the type found/ removed from surplus telephones (available from a number of *PW* advertisers for less than £1).

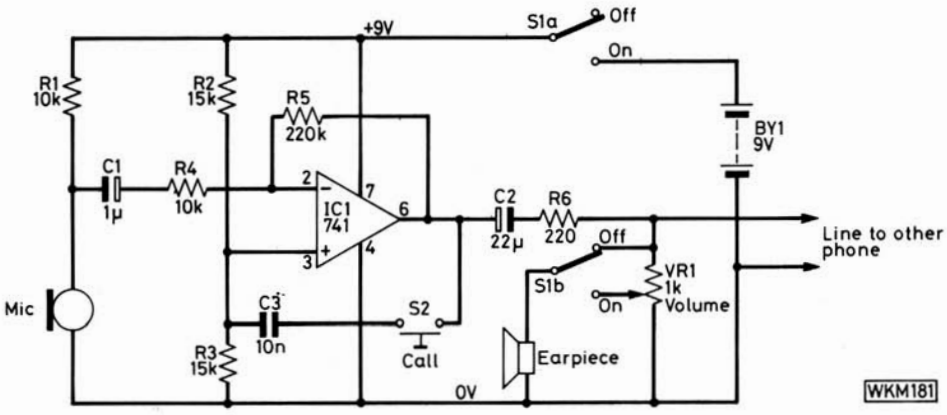
The circuit uses a clever - and very simple method - of one end alerting the other that they wish to speak. With only the calling unit switched on, the call button, S2, is closed and provides a feed back pathway for the amplifier, and it oscillates, producing a piercing sound.

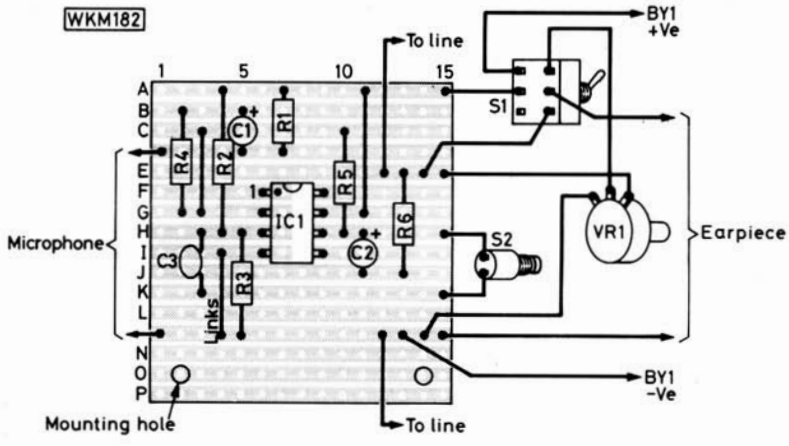
The signal from the audio oscillator is received at the far end as the earpiece is permanently in circuit. It's loud enough to be heard within 4m or so, and to start talking the operator at that end only has to switch on to communicate. (Normally both units are switched off until required).

The original project was published using Veroboard but there's nothing to stop the unit being built onto a small p.c.b. Indeed, it would make an interesting construction project to build directly into a modern lightweight telephone handset - they have much more room than the older Bakelite types.

This project has proved extremely useful and enjoyable - both for my grandchildren and the school radio club members before them. They seem very capable of working near Amateur Radio transmitters too! (Ideal for the shack).







★ components

THIS LIST COVERS ONE AMPLIFIER AND HANDSET

Resistors
¼W 5%

220Ω	1	R6
10kΩ	2	R1, 4
15kΩ	2	R2, 3
220kΩ	1	R5

Potentiometers

1kΩ	1	VR1

Integrated Circuits

741	1	IC1 (8-pin d.i.l. version)

Capacitors
Disc ceramic

10nF	1	C3

Tantalum bead, 16/35V

1µF	1	C1
22µF	1	C2

Miscellaneous
S1 Min. toggle d.p.d.t.
S2 Min. push-to-make
Veroboard 0·1 in pitch, 42 × 42mm
8-pin d.i.l. socket (optional but recommended)
Diecast box 114 × 64 × 30mm. PP3 battery and connector. Post Office-style handset and cable (available from surplus shops, etc.). Jack plug and socket, or crocodile clips (see text)

Note: If you don't have the original circuit and article, a photocopy is available from the *PW* offices. Please send an A5 (half A4, the magazine page size) stamped, address envelope with a 50p stamp. Address your letter as: **Shack Telephone Project, (Attention of Clive Hardy), *Practical Wireless*, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW.** **PW**

Fig. 1: The Simple Field Telephone circuit (first published in *PW* and then in *Out of Thin Air*). This circuit was first used by G3XFD in the early 1990s, and provided much interest, education and fun for his grandchildren and their friends at school.

Antenna Workshop

A Tuneable RF Field Streng

Peter Dodd G3LDO presents a tuneable r.f. field strength meter and current probe for the h.f. bands.

The tuneable f.s.m. and current meter. This instrument, built in a 100×100×65mm aluminium box, is calibrated with just some of the amateur frequency bands. It is shown with a plug-in antenna that allows it to be used as an f.s.m or absorption wavemeter.

The tuneable r.f. field strength meter instrument is used to measure the field strength of the electric and magnetic components of an electromagnetic field in the vicinity of an antenna. The circuit diagram is shown in **Fig. 1** and it is simply a tuned circuit with a diode detector and a meter; it is based on the design published in all recent editions of the *ARRL Antenna Book*.

As a field strength meter (f.s.m.) for measuring the electric field, it can be used for comparing the relative efficiency of h.f. mobile antennas. When used as an r.f. current probe it's a useful instrument for assessing antenna environment problems. In the average Amateur location there may be substantial currents flowing in guy wires, masts and towers, coaxial-cable braids, gutters, water and gas pipes, and perhaps even drainage pipes!

Current may be flowing in telephone and power lines as well. All these r.f. currents may have an influence on antenna patterns or can be of significance in the case of radio frequency interference (r.f.i.). The principal advantage is this instrument, when used as a current probe, is that it may be used near a conductor to measure the current flow without cutting the conductor.

The instrument is mounted in an aluminium enclosure. This provides screening to make it insensitive to the electric field when used as a current meter. A slot is cut in the enclosure to prevent it forming a shorted turn. When used as an f.s.m. a plug-in antenna is used.

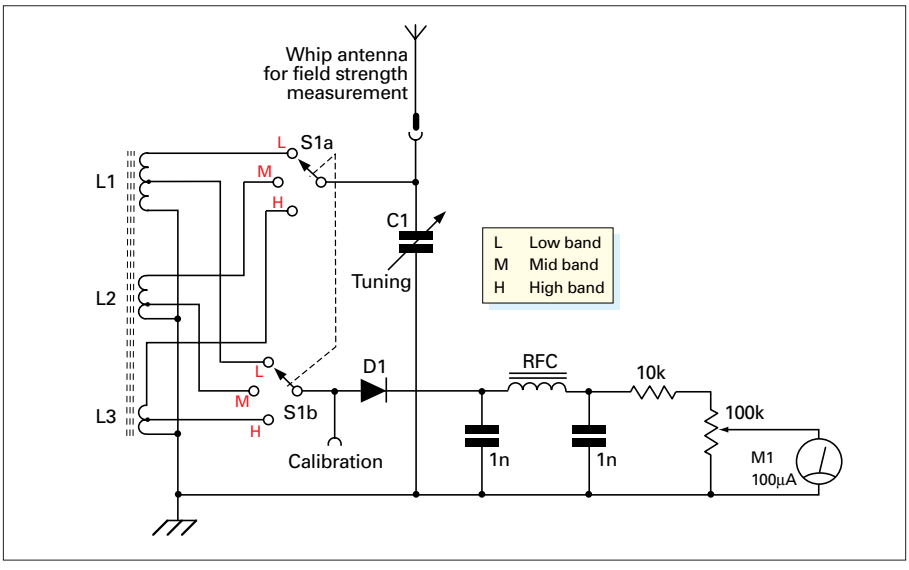


Fig 1: Tuneable f.s.m. and current meter, circuit diagram. The 'calibration' point is used if the instrument is calibrated by direct connection to a signal generator.

Construction

The basic layout and construction is shown in the heading photograph, while **Fig. 2** shows additional internal constructional details. This useful little instrument is truly a junk box project where the main components can be salvaged from an old transistor radio. The main component is the variable capacitor and the air spaced capacitor from an older transistor radio is very suitable.

If the variable capacitor has a built-in slow-motion mechanism it's even better. **Note:** I have not tried the polyvaricon type of variable because they are more difficult to mount in a metal container. The other component is the ferrite rod. The original windings are removed from the rod although the cardboard coil former can be retained.

As can be seen in Fig. 2 the ferrite rod is supported by rubber grommets fitted in holes in the metal enclosure at the ends of the slot. This slot must be cut with a hacksaw from the front to the back of the

gth Meter

box, and a thin file may be used to smooth the cut.

The instrument shown in the illustrations was enclosed in a 100×100×65mm aluminium box. The size of the box is not at all critical as long as it contains all the components in a convenient manner. The length of the ferrite rod must be long enough to be conveniently supported by the grommets and this will be determined by the size of the metal enclosure.

A ferrite rod length 20mm longer than the box support dimension will be fine. Breaking the ferrite rod to the correct length can be achieved by scoring a groove around the ferrite at the appropriate length using a file or fine grindstone. The ferrite rod can then easily be broken at that point.

Before the ferrite rod can be fitted the coils have to be wound on. Referring to Fig. 1 the following table provides a guide for the three frequency bands:

	Turns	Tap	Range (MHz)
L1	30	3	1-8.5
L2	8	2	5-20
L3	2	1	17-39

The Turns column is the total number of turns and the tapping point is the number of turns from the 'earthy' end of the coil.

The frequency coverages shown above are what might be expected when C1 is 140pF. A larger value of C1, such as might be found in an old transistor radio, will possibly give a greater frequency range. The characteristics of the ferrite rod can vary from one piece to another and this might affect the frequency range

You could decide to simplify the design and dispense with the band switch. On an earlier project I found five turns, tapped two turns from the earthed end, gave a frequency range of 10 to 30MHz when tuned with a 250pF capacitor (a 'guessimetric' value).

A BNC socket is mounted on the top of the unit for a plug-in antenna when the instrument is used as a simple f.s.m. Plugging in the antenna will alter the tuning calibration.

Almost any meter capable of reading 100-200μA can be used, but it's usually convenient to use a rather sensitive meter and provide a series resistor to swamp out non-linearity arising from diode conduction characteristics. A potentiometer is used to adjust instrument sensitivity as required during operation.

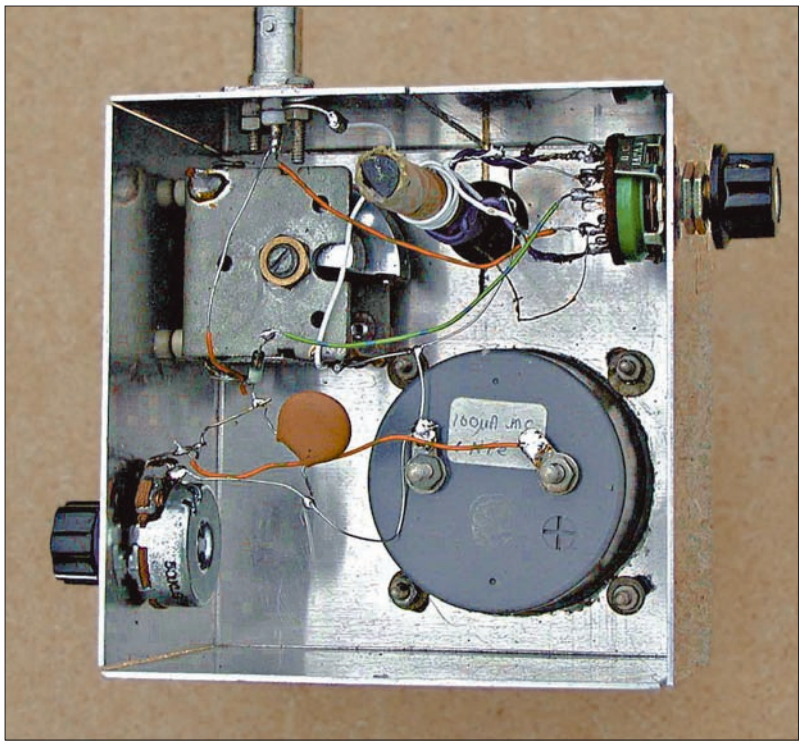


Fig 2: Internal view of the tuneable f.s.m. and current meter. Rubber grommets are fitted in holes at the ends of the slot to support the ferrite rod. C1 is a two-ganged capacitor of unequal values and only the larger value capacitor is used.

Relative Reading

Because the instrument is used only for making relative r.f. current and voltage readings meter level calibration is unnecessary and frequency calibration can be rudimentary. Frequency calibration can be done in one or more ways. If you have a signal generator the rear panel of the instrument is removed and the output lead can be connected to the 'Calibration' point in Fig. 1 (the braid of the signal generator lead is connected to the instrument box). The signal generator output is adjusted to give a reasonable f.s.d. on the meter when tuned to the instrument is tuned to the signal generator frequency.

Alternatively, the instrument can be calibrated from the current on the braid of the antenna coaxial when the station transmitter is transmitting a carrier. The ferrite rod should be at right angles to the coaxial cable for maximum reading. The frequency calibration requires only that the Amateur Radio bands are indicated.

Numerous Uses

There are numerous uses for this instrument. The induced current in guy wires and other unwanted parasitic elements can often make a marked difference in antenna performance. The instrument is very useful for checking the current distribution in antenna elements. It is also useful for measuring r.f. ground currents in radial systems. A buried radial may be located easily by sweeping the ground. Current division at junctions may be investigated. Areas of high current in existing radials may indicate where additional radials might be effective.

Stray currents in conductors not intended to be part of the antenna system can be investigated. It is not unusual to find r.f. currents in all metal structures and services around the house and most of these cannot be avoided. I find that I can detect the electrical wiring and plumbing pipes embedded in the wall using this method. If you come across a conductor that is radiating a higher than average current then it may be possible to reduce the current by bonding or changing the physical length.

In measuring the current in a conductor, the ferrite rod should be kept at right angles to the conductor, and at a constant distance from it. In its upright or vertical position, this instrument is oriented for taking measurements in vertical conductors. It must be laid horizontal to measure current in horizontal conductors.

When the ferrite rod is oriented parallel to the electric field lines, there will be a sharp null reading that may be used to locate the plane of polarization quite accurately. When using the meter, remember that the magnetic field is at right angles to the electric field.

When the instrument is used as a f.s.m. using the plug-in antenna it should be located some distance from the antenna under test. **PW**

ML&S martin lynch & sons

Suppliers of Communications Equipment

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS

TEL: 0845 2300 599 FAX: 0845 2300 339

E-MAIL: sales@hamradio.co.uk

WEB: www.hamradio.co.uk

MFJ Products at Lower Prices!

MFJ-461 Pocket size Morse Code Reader with built in display. Just place in front of your speaker to copy CW - instantly! Fully self contained, battery powered. **£69.95**

MFJ-418 Pocket size Morse Tutor with built in display. Random sending of Morse characters with confirmation on screen of what has been sent. Fully self contained, battery powered. **£69.95**

MFJ-1704 Probably the best 4 way antenna switch available. Cast Alloy construction, Power 2.5kW ● Isolation 60dB at 30MHz, 50dB at 500MHz ● Range DC ->500MHz. **£59.95**

MFJ-971 An ideal QRP ATU. Easy to use and very compact. QRP Portable ATU ● 1.8 - 30MHz ● 300W/30W 6W selectable ● Cross needle meter ● 12V DC Ext ● SO-239 sockets ● Tunes wire, coax, balanced lines ● Terminals & earth post ● Size 160 x 150 x 60mm ● Weight 870g. **£89.95**

MFJ-902 Tiny Travel Tuner. Tiny 4½ x 2¼ x 3 inch tuner handles full 150 Watts! Covers 80-10 Meters, has tuner bypass switch, tunes nearly anything! **£65.95**

MFJ-904H Tiny Travel Tuner/ SWR/Wattmeter & Balun. Tiny 7½ x 2¼ x 3 inch tuner handles full 150 Watts! Covers 80-10 Meters, has tuner bypass switch, tunes nearly anything! **£109.95**

MFJ-949E 300 Watt Antenna Tuner. More Hams use MFJ-949's than any other antenna tuner in the world! Why? Because the world's leading antenna tuner has earned a worldwide reputation for being able to match just about anything. **£139.95**

MFJ-974H 160 Thru 6 Meters Balanced Line Antenna Tuner. The MFJ-974H is a fully balanced true balanced line antenna tuner. It gives you superb current balance throughout its very wide matching and frequency range. **£159.95**

MFJ-993 300 Watt IntelliTuner Automatic Antenna Tuner. The MFJ-993 IntelliTuner lets you tune any antenna automatically balanced or unbalanced - ultra fast. It's a comprehensive automatic antenna tuning center complete with SWR/Watt-meter, antenna switch for two antennas and 4:1 current balun for balanced lines. **£209.95**

MFJ-994 also available, similar to above but handles 600W SSB & 300W CW. **£299.95**

MFJ-969 Roller Inductor Antenna Tuner. The MFJ-969 Antenna Tuner gives you MFJ's superb AirCore Roller Inductor and full 6 meteres through 160 Meter coverage! 300 Watts PEP SSB full featured antenna tuner, widest matching range, full size lighted Cross-Needle SWR/Wattmeter reads true peak forward power, QRM-Free PreTune, 8 Position antenna switch, built in 50 Ohm dummy load, heavy duty 4:1 balun. **£169.95**

MFJ-259Z Special * With Batteries, Charger & Loop *

Range: 1.8-170MHz. MFJ's favourite Antenna Analyser with HF frequency coverage. It's simple to operate and keeps your antennas in check. MFJ-259B gives you a complete pictures of your antenna's performance. You can read antenna SWR and Complex Impedance 1.8 to 170MHz. **£199.95**

MFJ-269 Range: 1.8-450MHz. MFJ's latest Antenna Analyser with UHF frequency coverage. Based on the successful MFJ-259B it combines all of the features plus more. **£269.95**

If you see it advertised cheaper in this magazine (or on the web) from a UK stockist

we will try and BEAT it!

ML&S now stock one of the largest displays of MFJ in the country!

You can buy any product over £250 from ML&S and not pay a penny for a whole TWELVE MONTHS? No Catch - pay NOTHING, keep the money in your bank earning interest. In 12 months time settle the amount in full.

Offer subject to status.

Take Away Now and Pay NOTHING Until This Time Next Year!!

Having many years of experience offering specific finance packages for our customers, we can now offer various options on payment. We have added "Take-Away Now & Pay Later" to all our products over £199. It works like this: 0% APR An example of our Take-Away Now: Discounted price of £300. Pay no interest provided you pay by the date the amount is due, in full. After the 12 months period has expired pay £15.76 for 36 months. TAP £567.43 Please note that interest is calculated from the date of the original agreement. 29.8% APR.

Call us 6 days a week, mon-sat 9.30-5.30

0845 2300 599

local call number

Diary Date

The ML&S Christmas Hog Roast & Boot Fair

Saturday 3rd December 9:00am - 4:00pm.

NEW Yaesu FT-60E
Latest Twin Band 5W Handie from Yaesu. **Only £169**
Or buy the FT-60E with a lapel speaker microphone for only **£189.95!**

Yaesu FT-847 + MFJ-993 & MP-250A Bundle!

Still our best selling All Band Base Transceiver. Bundled with the MFJ-993 Auto Tuner (that tunes practically anything) & the excellent MyDEL MP-250 PSU.
Total Package £1299
(Rig only £999)

FT-1000MP mkV 200W + MD-100 & SP-8
Plus FREE FH-1 Keypad!
Identical to the FT-1kField but 200 Watts and external PSU. With Desk Mic & Speaker.
Package Price: £2249
(Rig only £2099)

Yaesu FT-1000MP mkV Field + MD-100 & SP-8
The FT-1k Series has never been such good value. Offered with the matching Desk filtered Speaker and Base Microphone at an even bigger saving.
Package Price £1859
(Rig only £1699)

Yaesu FT-857+ ATAS-120A
Nobody can match the flexibility of the 857 & ATAS-120A Auto Antenna. Just plug the ATAS into the FT-857 & operate anywhere from 7MHz-432MHz, without having to change or touch the antenna! (Duplexer is required for 2/70).
We can even offer a professional car install service. Only £799 for both
(Rig only: £579)

Yaesu VX-7R
The U.K's best selling Triple Band Handie. **Only £249**
or with lapel microphone: Only £269

Yaesu VX-150
Built on the commercial VX-400, simple to use rugged 2m Handie, supplied with Nicads & Charger.
RRP: £149, ML&S: £99.95
or 'Twin Pack' only £199

Yaesu FT-817ND
Latest Version
The latest FT-817ND comes complete with HF+6+2+70 and Metal-hydride batteries, charger, mic & antenna.

Call for best price
(FT-817ND-DSP Version available)

Yaesu FT-897 + FNB-78 & CD24 PAckage
High Power version of the FT-817. 20W output as a transportable, 100W as a base/mobile. This month we are offering the full transportable set-up including the internal battery & charger.
CALL FOR BEST PRICE!
Don't forget the Miracle Antenna! **(Rig Only £649)**

Yaesu FT-dx9000D
Hopefully by the time you read this we should be taking deliveries of the first few FT-DX9000's. 200 Watts or 400 Watts, TFT Screen or not. You choose. Call now to request a brochure. **Price - £7299**

Yaesu FT-7800
Bar make the tea it'll give you 2m/70cm @ 50W/40W.
RRP: £239, ML&S: £239

Yaesu FT-8800
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.
RRP: £289,
or 48 x £8.26 p/m

Yaesu FT-2800M
2M brick-built 65W rig.
RRP: £179, ML&S: £159

Yaesu VX-2E
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.
NEW LOWER PRICE
Now only £119

Yaesu FT-8900
with FREE YSK-8900 Remote Kit! One-stop solution to high-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!
Only £339

Kenwood TS-2000E
Just superb on all bands 160m-2m with optional 23cm (X-Version).
RRP: £1699, ML&S: £1299

Kenwood TS-2000X
As above but with 23cm fitted.
RRP: £1999, ML&S: £1699

Kenwood TS-480SAT with FREE HEIL MIC! The best selling Kenwood H.F. Can be used mobile or base. Includes ATU.
ML&S: £699.95

Kenwood TS-480HX with FREE HEIL MIC! As TS-480SAT but 200 Watts, no ATU.
ML&S: £799.95

Kenwood TS-570DGE
Still the ideal choice if you are keen on H.F. and want an easy to use radio.
RRP: £999, ML&S: £799
or 48 x £23.64 p/m

Kenwood TMD-700E
The unique 700E is not only a dual-band FM rig but has APRS and TNC built-in.
RRP: £519, ML&S: £439
or 48 x £12.99 p/m

Kenwood TH-F7E
2/70 Handie with Gen Cov RX. If you must have SSB RX on your dual-bander then buy one!
RRP: £289.95, ML&S: £249

Kenwood TH-D7E
A 2/7- Handie with TNC and APRS capability. **RRP: £359, ML&S: £299 or 48 x £8.85 p/m**

Kenwood TS-50S
It's been around 10 years but if you want an HF rig in a compact package with excellent performance then buy one of these. As used by the recent DX-pedition FT5XO to Kerguelen Island. **Only £595**

NEW Icom IC-756Pro mkIII

The latest in the IC-756Pro Series
RRP £2495 ML&S £2099
or 36 x £76.31
Package deal: IC-756ProIII, SM20 Microphone, SP-23 New Base Speaker with filters.
RRP £2768, ML&S £2299
(Rig only: £2099)

Icom IC-7800
The worlds best H.F. Transceiver? Probably.
RRP: £6400.00

Icom IC-7400 + SM-20 + SP-21 + MP-250A
What a package!
New IC-7400 with Matching Desk Mic, Speaker & MyDEL Metered Base PSU.
Only £1349

Icom IC-7000
The replacement for the IC-706 will be arriving with us shortly.
HF/VHF/UHF All-mode Transceiver
IF-DSP technology comes to a new multi-bander.

Icom IC-703
10W Portable/Base HF Transceiver with built-in ATU.
RRP: £703, ML&S: £449

Icom IC-718
Basic ready to go 100W HF Transceiver supplied with Microphone & DC Lead.
RRP: £649, ML&S: £449
or 48 x £13.29 p/m

Icom IC-910X

The best 2/70 & 23cm dedicated all mode base. 23cm included.
RRP: £1675, ML&S: £1239
or 48 x £36.66 p/m
Basic Version (without 23cm). also available **£1089 or 48 x £31.93 p/m**

Icom IC-E208
2/70 mobile 50/55W Transceiver with host of additional features. Remote head leads included.
RRP: £365,
ML&S: £239

Brand New IC-E90
Triple Band Handie.
Only £199.95!
(Limited Stocks)

Don't forget! ML&S are approved stockists for the following: AOR, bhi Ltd., Icom, Kenwood, Maldol, M

The Big Three (Yaesu, Icom & Kenwood) are sponsoring the Hog Roast and promoting the new FT-DX9000, IC-7000 and the rest of their product range. Special prices and extra savings across all of the ML&S product range will be on offer.

Also on-site is the Boot Fair (with Talk-In on S22) and managed by the Whiton Amateur Radio Club. Admission is FREE - just turn up and set your own tables up.

LDG Tuners & Accessories

ML&S have been appointed Main Distributor for the US built LDG Product range.

LDG Z-100 100W Auto ATU 160M-6M **Only £119.95**

LDG AT-100Pro & AT-200Pro 100W or 200W Auto Tuner, 160M-6M with 2 Antenna outputs

AT-100Pro £169.95 AT-200Pro £179.95

LDG AT-1000 1kW Auto Tuner, wide tuning range (10:1 SWR) 160M-6M **Only £499.95**

AT-897 Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too!
Only £179.95 Special 'Intro' price

For the full range of LDG Products visit our web site!

Tom Tom Back in stock at ML&S

Why bother with any other GPS when you can have the easiest and best on the market?

Tom Tom GO 300
The latest GPS, UK maps, car window mount & car charger included. Ready to GO! **£369.99**

Tom Tom GO 500
Identical to 300 plus Hands Free Calling Via BlueTooth & major mapping of Europe. **£469.99**

Tom Tom GO 700
As 500 above plus door to door planning in Europe plus remote control. The ultimate! **£549.99**

ML&S can also program your Tom Tom with the latest Gatso database for only £20.

REMEMBER ALL TOM TOM GO's are available on our Buy Now Pay Later Scheme.

For further details see our website.

"Classic" Finance example: Kenwood TMD-700E. RRP: £519. Payment illustration: Zero deposit and 48 payments of £12.99 per month. Total amount payable: £623.52. APR: 19.9%. ML&S is a licenced credit broker. Finance offered subject to status. Full written details on request. E&OE.

Apply now for your very own ML&S Store Card Conditions Apply

TIGERTRONICS

Tigertronics Sound Card - Radio Interface

For all available Digital modes, the SignaLink SL-1+ also supports the latest Voice modes such as Internet Repeater Linking (EchoLink, VOIP, etc.), Remote Base, and Voice Keyer operation. We sell four versions of the enhanced model the SL-1+8R with 8-pin round mic. connector, the SL-1+RJ45 with RJ-45 mic. connector, the SL-1+RJ11 with RJ-11 mic. connector and the SL-1+6PMD with 6-pin mini Din Data Port connector SL-1+8xxx Interface with rig lead (you specify! **£69.95**

Extra leads
£14.95
(8 Pin, RJ-45, RJ-11, 6-pin mini DIN)
£19.95
(SL-CAB-13I 13-Pin Icom), (SL-CAB-13K 13 Pin Kenwood)

DAIWA METERS

Daiwa CN-101L: SWR/PWR Meter 1.8-150Mhz
Power range: 15/150/1.5kW ..... **ML&S only £59.95**

Daiwa CN-103LN: SWR/PWR Meter 140-525MHz
Power range: 20/200W ..... **ML&S only £65.95**

Daiwa CN-801H: SWR/PWR Meter 1.8-200Mhz
Power range: 20/200/2000W ..... **ML&S only £109.95**

Daiwa CN-801:V SWR/PWR Meter 140-525MHz
Power range: 20/200W ..... **ML&S only £119.95**

Daiwa CN-801S SWR/Power Meter 0.9-2.5Ghz
Power rating: 2/20 watts ..... **ML&S only £139.95**

MIRACLE ANTENNAS

Miracle Whip Others try & copy it but never quite get there. £99.95

Miracle Ducker Like the Miracle Whip but has BNC socket in lieu of whip to connect random wire. £99.95

Miracle Ducker IL Latest model! Identical to Ducker but has BNC plug for mounting instead of PL-259. £99 95

QPAK The best QRP ATU money can buy. £149 95

HUSTLER 6-BTV Only £229.95

We have literally sold hundreds of these with fantastic customer reports. At last a vertical that gives you REAL PERFORMANCE on 80m and 40m, as well as the other bands. No radials required. Just mount 18 inches above the ground, connect to a decent earth spike close by and operate.

MyDEL MultiTrap
Forget the G5RV. Install a proper TRAPPED wire dipole MutiTrap for 80-10M. Only 66'. Must be centre supported. **£99.95**

MyDEL MegaTrap
Same as Multitrap but 160m/80/40m, 105' long . **£109.95**

SMALL GARDEN? NO GARDEN?
Install an EH Antenna for HF today.

Introducing a new range of antennas from Arno Electronics. Available for any band 10m-160m, ML&S stock this exciting new product available for immediate despatch.
All antennas are beautifully built and pre-tuned at the factory. Supplied with fixing clamps & clear installation instructions. Easily fine tuned with outer ring sleeve. You will be totally amazed at how well they work. No ATU required. Just plug-in and work!

Cobra 10	28-29.8MHz,	2kW	90cm long	(500W RTTY/AM)	**£105.00**
Cobra 12	24.890-24.990	2kW	90cm Long	(500W RTTY/CW)	**£105.00**
Cobra 15	20.7-21.7MHz	2kW	90cm long	(500W RTTY/AM)	**£105.00**
Cobra 17	18.068-18.168MHz	2kW	90cm long	(500W RTTY/CW)	**£105.00**
Cobra 20	13.8-14.8MHz	2kW	90cm long	(500W RTTY/AM)	**£105.00**
Cobra 30	9.9-10.3MHz	2kW	93cm long	(500W RTTY/AM)	**£105.00**
Cobra 40	7-7.2MHz	2kW	93cm long	(500W RTTY/AM)	**£105.00**
Venus 80	3.5-3.8MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**
Venus 155	1.913-1.933MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**
Venus 160	1.830-1.850MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**

Delivery and Insurance: Cobra £20, Venus £25. (England & Wales, phone for other destinations)

MYDEL POWER SUPPLIES

A new rage of PSU's from MyDEL. The neatest smartest looking desk top power supplies that money can buy. Ideal for powering any main rig or accessory requiring 13.8V DC at up to 25 Amps.

MyDEL MP-250A

25 Amps maximum, 22Amps constant, ideal for most modern HF Transceivers

- Variable Voltage 9-13.8VDC
- 110-234V input
- 2 x outputs: 25A Binding Posts, 7A Cigar Socket
- Fan cooled, speed variable to voltage supplied
- Two huge back-lit meters, Volts/Amps
- Fully protected, supply shut off if more than 25A is drawn, re-setable by switching off for 25 seconds.
- Only 5 3/4"W x 4 1/2" H x 6" D in size
- Less than 35mV peak-to-peak ripple under full 25AMP load
- Full exchange warranty for 2 Years

Only £89.99 incl VAT!

MyDEL MP-4128

Another new switch mode PSU from MyDEL. Similar in spec to the MP-250A but without meters or cigar lighter o/p. 22-25 AMP output with heavy duty binding posts on the front panel and push on terminals for lower current output on rear. Fully protected. **£69.99**

Yaesu FP-1030A

A power supply for Life? Probably.
25 30 Amp £179.00

BUDDIPOLE

W3-BP Buddipole Compact Portable Dipole 40m-2M **£179.95**
W3-BM Buddipole Mast for Buddipole **£44.95**
W3-BPT Tripod for Buddipole **£79.95**

For the full range, please see our website.

PALM KEYS

MP-817 The smallest retractable paddle key - ever! **£59.95**
Code Cube Bolt-on memory keyer for Mini-paddle. **£79.95**

SBS-1 Real-time Virtual Radar

Ideal Christmas Present

Key Product Features

- Track Mode-S/ADS-B equipped aircraft in real time*
- An invaluable tool for aircraft enthusiasts
- Enhances operational efficiency at airfields
- Easy to install, portable and lightweight
- Real-Time aircraft position and identity data
- Connect to laptop/desktop PC via USB
- Powerful SBS-1 Basestation software included
- Package includes all necessary components to connect to your PC

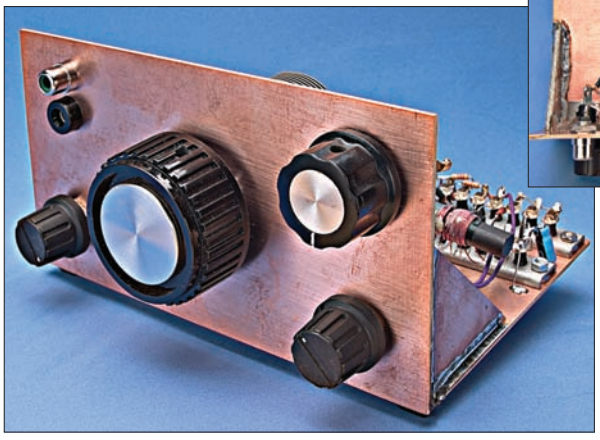
£499.95 plus £10 P&P

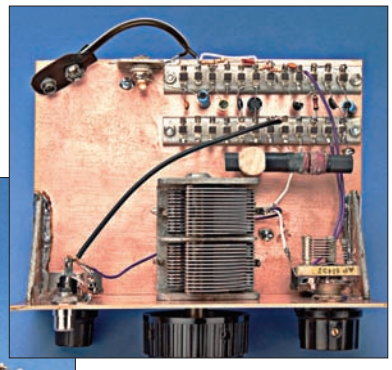
FJ, Miracle Antenna, Hustler, Tokyo-Hypower, Tom Tom, Diamond, Yaesu and many more!

Carrying On The Practical Way

As usual, to mark the season of the year, the Rev. George Dobbs G3RJV has a special Christmas project. This time it's a beginner's receiver. Enjoy - after reading this month's quotation!

"To live content with small means; to seek elegance rather than luxury, and refinement rather than fashion".
William Henry Channing (1810 – 1884)





The 2005 Christmas project will get you back to basic radio says G3RJV. You'll be amazed at what you'll hear on the little receiver!

Recently, a reader wrote to me saying that he was a beginner and felt that he needed more direction in how to construct individual circuit ideas. In reality however, there's rarely enough space to do that and it would not help those readers who like to see a circuit and bring it to fruition in their own way.

But the December *PW* is the year-end issue and I always like to take a theme, which can be built for, or by, children with the Christmas holiday in mind. So this article will have the emphasis on how to build a simple project, including the full layout of all the parts.

Ladybird Book

After I mentioned my old Ladybird Book, *Making a Transistor Radio* in my column for April 2005, I had some correspondence with **Mike Smith** who runs the **www.MDS975.co.uk** website.

The site is generous in its mention of the Ladybird book and deals with several other simple regenerative receiver ideas. In amongst these is the HAC (Heard All Continents) Triple T receiver; a regenerative short-wave receiver kit that was popular some years ago.

I remember the Triple T well, and like Mike, I built my own version using the old Denco 'green range' plug-in coils. It works very well for a simple receiver, and it's a good way to introduce a young person to short wave receiver construction and listening.

Mike's version uses a home-wound coil on a piece of ferrite rod to replicate the no longer available Denco coils. I thought it would make an ideal circuit for my end of year 'how to build it' project. Mike kindly gave me permission to use his coil information, I built my version and it makes a very useful little short wave receiver. The full circuit diagram is shown in **Fig. 1**.

The antenna input, L1, is feed via a potentiometer acting as a simple r.f. attenuator to a link winding on the input coil. It might seem odd having r.f. attenuation on so simple a receiver, but with experience you'll find it's very easy to overload the front-end of a regenerative receiver.

The potentiometer, R1, must be a linear carbon component and not a wire-wound potentiometer, which would add inductance. The main (and only) tuned circuit for the receiver is formed by L3 with C5 and C6.

The capacitor, C5, acts as a band-set control with coarse tuning across the whole frequency range of the receiver. The smaller value C6 is a bandspread control to tune a narrow range of the frequency set by C5. An alternative would be a have a reduction drive fitted to C5 to provide a slower tuning rate.

Regenerative Detector

The regenerative detector, Tr1, is an MFP102 field effect transistor (f.e.t.). The circuit would work well with a 2N3819 f.e.t. and pin-outs are given for both devices.

As with all regenerative receivers positive feedback is required between the detector output and input. A capacitor, C4, takes some of the output from Tr1 via a potentiometer to the feedback winding L2. The regeneration control, R2, controls the amount of feedback reaching L2. The inductor L2 is wired out of phase with L3 to allow positive feedback, but more of that later!

The audio signal from the detector is fed to a simple, single stage, audio pre-amplifier, Tr2. I used one of my ubiquitous 2N2222 transistors but almost any similar *npn* device would work in the circuit. The 2N3904 is an alternative, and I've provided pin-outs for them both.

One stage of audio amplification can produce a usable signal but I took the output to a 3.5mm stereo output jack socket. Wired as shown in the drawing, it should drive a pair of amplified loudspeakers of the type used with computers. An alternative would be to add a home-built audio amplifier to the output.

Winding The Coils

The first practical task is winding the coils L1, L2 and L3. All three coils are wound on 10mm diameter ferrite rod. A short length is sufficient, mine was about 55mm long.

Note: Take care when cutting a ferrite rod. A saw is not much use and the rod can easily crack in unwanted places. The best method is to cut a deep 'V' notch with the edge of a fine-toothed triangular file and then snap the rod.

Winding the coils can be a little tricky! One method I use is to wrap a paper sleeve around the rod and use sticky tape to secure the ends of the windings. My preferred method is to use beeswax to secure the turns. Beeswax is very simple to use. It can be melted on the tip of a soldering iron without harm to that tip.

I began by dripping a little wax on the rod in the place where the coils are to go. Use the hot iron to spread out an area of beeswax around the coil, about 30mm wide. (Add more beeswax if it is needed). The windings are pressed into the coating of beeswax to hold them in place.

Wind the coil L3 first. If the beginning of the first turn does not hold in place, warm the wax - the wax can be heated again when the coil is completed to hold the entire winding.

Leave about 20mm long excess wire at

each end of the coil. Next, L1 is added to the side of L2 with a small space; 1mm is enough.

Then add a little more wax over L3 and wind L2 over the centre of L2. Next, carefully holding the windings in place, strip the enamel from the ends of the coils and tin the wires with solder. Finally, lay the coil assembly aside to add to the circuit board later. Well done, you've have done the most difficult bit!

Tag Strips

I built my version of the receiver using two tag-strips each with 12 solder tags. It would also be possible to use a 24 tag group-board.

The two tag-strips are mounted in parallel about 20mm apart. The layout for the components is shown in **Fig. 2**. Several of the tags in the top row are connected to ground and these are shown. The six left-most tags on the top row are connected to the coils in the order marked. The coil assembly needs to

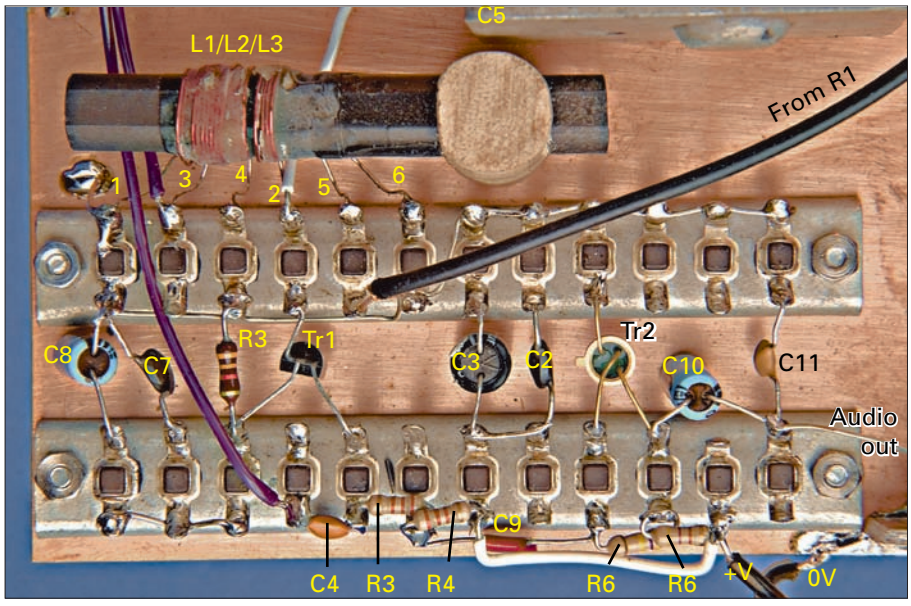


Fig. 2: For the construction G3RJV used two tag strips. The tag-strips are mounted in parallel about 20mm apart. The layout for the components is shown here. Several of the tags in the top row are connected to ground (see text).

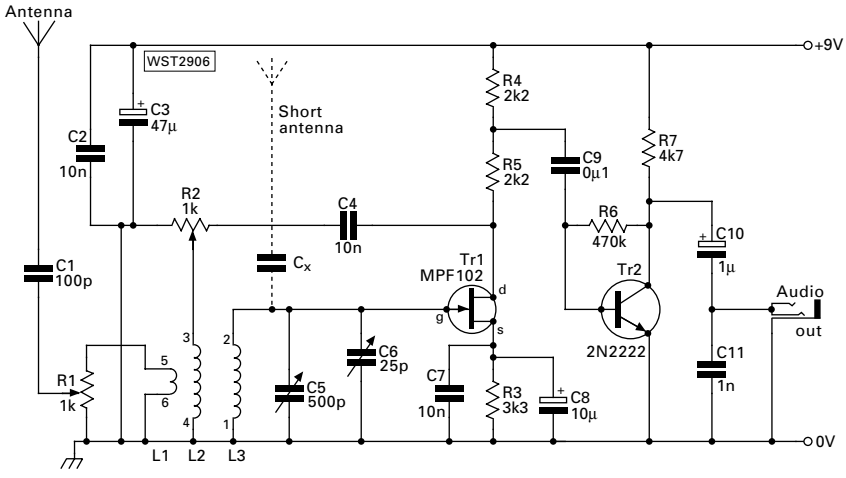
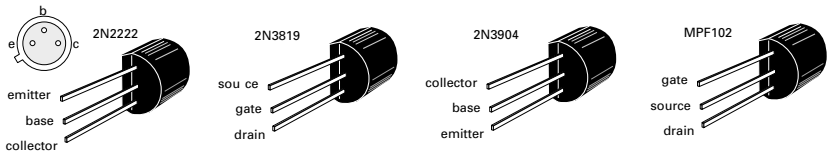


Fig. 1: Circuit diagram of the COTPW short wave receiver project (see text).



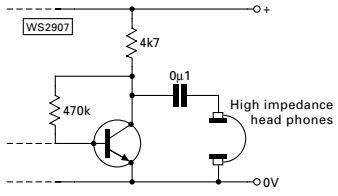


Fig. 3a: Using high impedance headphones (see text).

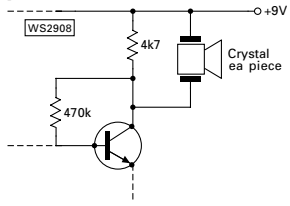


Fig 3b: Using a piezo-electric earpiece (see text).

be mounted close to these tags.

I used a short piece of wooden dowel with hole to secure the rod and the dowel is then glued to the base plate. **Note:** It's essential to connect the coil wires as shown in the diagrams Figs. 1 and 2. Notice also that L2 is connected the opposite way round from L3 to ensure positive feedback.

Follow the layout carefully and after completing it, join the wires to the other components (as shown in Fig. 2). Screened leads are advisable for the antenna input and audio output leads.

Some readers may find the variable capacitors tricky to obtain. I have gathered a collection over the years. The main tuning capacitor, C5, is half of a two-gang 500pF capacitor culled from an old broadcast receiver. A good source of variable capacitors are aged radios offered for sale at car-boot sales.

Operator Skill Required!

Using the receiver is fun and requires some operator skill! To start, he regeneration control should be set to just under the point of oscillation for a.m. stations and just above the oscillation point for s.s.b. or c.w. stations. This will vary as the receiver is tuned. It will also vary for settings of the input attenuator control.

Finally, I've suggested a couple of simple modifications. The link input winding (L1) is designed for a low impedance antenna input.

Simple regenerative receivers work surprisingly well with short pieces of wire as an antenna. but this will produce a high impedance input. In such cases a better place to link in the antenna is at the top of L3 as shown dotted in Fig. 1.

The value for Cx will depend upon the length of the antenna. Start at about 50pF and work down in value for best results. As I said early, the circuit of Fig. 1, could be used without additional amplification. The audio output will have a high impedance and can be resolved using high impedance headphones (**Fig. 3a**) or even a crystal earpiece (**Fig. 3b**).

I have been building regenerative receivers since the 1950s and I am still amazed at what such simple receivers can hear. Give it a try! **PW**

Valve & Vintage

Sporting a sprig of holly in his brown dustcoat, it's Phil Cadman G4JCP looking after the V&V 'shop' this month. Valves and film stars are the subjects this time!

Compliments of the season to you readers and a very warm welcome to my final column of 2005! As you've all (hopefully) been busy with your soldering irons of late, I thought a break from construction might be appropriate. But before moving on to the main topic of this month's column, there's an omission to rectify and I've a couple of queries, which readers may be able to help with.

In my September column, the Gremlins struck and the components list associated with Fig. 1 (that issue) was omitted.

***Note**: my apologies readers, this was due to lack of space! **Editor**).*

Most of the component values were given in my June column, but those that were not are:

V5 = 12AT7 or ECC81
C19, C21 = 3nF ceramic
C20 = 25µF 15V electrolytic
R12, R16 = 470kΩ
R13 = 8.2kΩ
R14 = 220kΩ
R15 = 500kΩ log variable
R17 = 4.7MΩ
(All resistors are 0.5W)

Keen Designer

Kevin Bindley of Leicester is a keen designer and constructor who has recently acquired a Post Office valve type VT103. Kevin is looking for information on this valve. As I'm unable to help, I wonder if anyone knows anything about this valve? The fact that there are three entirely different VT-series of valves doesn't help!

The most common VT-series are the American Service types and commercial equivalents to these valves can be found in most valve equivalents books. Over here, the Royal Air Force had their own valve numbering system, which consisted of the letter 'V' followed by a combination of letters and numbers. The letter 'T' was used as a second letter to denote a transmitting valve. Some valve equivalents lists also cover this series.

Unfortunately, the British Post Office also used 'VT' as a prefix for their valves. And so far, I haven't been able to locate a list of commercial equivalents for this series. So, can anyone help? Indeed, any information on Post Office valves would be most welcome.

While on the subject of unknowns, please take a look at **Fig. 1**. It shows a rather curious item that I picked up some time ago. It's marked CV359 and is 120mm (4.75 inches) long. All I know is that it's equivalent to an NE17; a gas-filled indicator designed to indicate peak power in an S-band wave guide.

Not having any S-band r.f. around the shack, I can't test the CV359. So, does anyone have any information on this device; how it works and how it was used?

Fig. 1: A mystery - can you help readers? It shows a rather curious item that Phil G4JCP picked up some time ago. It's marked CV359 and is 120mm (4.75 inches) long (see text).

Ancient Valves?

Some months ago, the Editor of a radio magazine (not *PW!*) received a letter from a gentleman who was clearly not impressed with 'yet more pages of ancient valve circuitry'. As expected, the writer was roundly set upon by some of those who hold a different view!

One correspondent expressed the belief that anyone who possesses a real interest in radio must be fascinated by its origins. An opinion I fully agree with!

Regrettably, there are people who think that the past is dead and buried, and has no bearing on the present or the future. Well, I don't believe that, and that's why I'm here in V&V!

Notable Anniversaries

There have been several notable 60th anniversaries this year, mostly related to the end of the Second World War. But there's one anniversary that won't have received much attention. In the October 1945 issue of *Wireless World* there was an article entitled *Extra-Terrestrial Relays: Can Rocket Stations Give World-Wide Radio Coverage?*

The then-unknown author was **Arthur C. Clarke** of the British Interplanetary Society. Of course, nowadays he's widely known as both a broadcaster and as a successful author of many science-fiction novels and stories. Not to mention the film *2001: A Space Odyssey*.

In the article, Clarke described how a communications satellite placed in orbit some 35800km above the Earth's Equator (in what is now often referred to as the 'Clarke Orbit' or 'Clarke Belt'), would appear stationary in space. Three such satellites, spaced at longitudes 120° apart, would give (almost) global broadcast and communications radio coverage.

Although the article didn't appear to generate much interest at the time, Clarke's idea was profound and, as we now know, absolutely correct. If you've never read the article, there's a copy at **http://www.clarkefoundation.org/**

To modern eyes, many of the ideas in Arthur Clarke's article appear somewhat naïve. But remember, this was 12 years before the Russians launched the World's first artificial satellite (*Sputnik*), 17 years before the first communications satellite (*Telstar*), and some 30 years before the first experimental geostationary broadcast satellites.

Added to which, transistors (as they are know known) were then only under development by Bell Laboratories in the USA, so Clarke envisaged a manned satellite. Someone had to change the valves when they wore out! Interestingly, his ideas about how a permanently-manned satellite could be constructed and

operated, bear comparison with the International Space Station.

The most powerful rocket available at the end of 1945 was the German V2, whose possibilities as a launch vehicle Clarke had suggested in a letter to the Editor of *Wireless World* published in February that year. Although the V2 could not achieve orbit itself, if its payload was, say, a 1000kg rocket - a 'second stage' - the smaller rocket might achieve orbital velocity whilst carrying a small payload.

While Clarke's October article is justifiably acclaimed, it's in his February letter that he first suggests the use of geostationary satellites. He also has a guess at the time scale: 50 years. So when did you get Sky TV?

Important as Clarke's predictions were, the December 1941 and January 1942 issues of *Wireless World* contain articles which describe ideas of possibly even greater significance, which are only now beginning to be fully realised. The articles' author was the former first Chief Engineer of the BBC - **Peter Pendleton (P.P.) Eckersley** - who was a great believer in wired broadcast systems.

Eckersley maintained that radio should never be used if a wired system would serve instead. Radio, he believed, should primarily be used for mobile services and the like, where a wired system was impracticable. He also wanted a greater choice of programmes, with different broadcasters providing programmes on one particular theme, rather than trying to provide a broad spectrum of programmes. Eckersley also suggested that his wired system could carry facsimile transmissions, so that printed items - like a daily paper - could be printed out in a subscriber's own home.

These ideas did not go down well, and they were the subject of much criticism at the time. Despite Eckersley's work on a 12-channel system prior to the outbreak of war, nothing of any significance came of his ideas. Until now, that is.

The Internet already carries the broadcast output of some radio stations, and television will surely follow when available bandwidth allows. But unlike traditional broadcasts, programmes are only sent to the people who want them, not to all and sundry. This potentially makes an on-demand system more efficient than a broadcast system. Of course, the Internet is not the only wired system in operation, cable TV companies have for some time provided a service remarkably close to what Eckersley envisaged. So have satellite broadcasters, come to that.

To top things off, Eckersley intended to use the electric supply distribution network as the physical means of getting broadcasts into people's homes. Shades of PLT! Even the Post Office had a project for broadcast distribution over the telephone network (*WW*, September 1940), but Eckersley chose the mains because far more houses had electricity than had a telephone in those days.

In retrospect, Eckersley's ideas were not really practicable at the time he published them. Nor would they be for many years. But the inevitable change from analogue to digital, the use of data-reduction techniques and the shift to on-demand services, is making wired broadcasting not only possible, but even essential, given the huge number of programmes and services now available.

Hedy Lamarr

If all my reminiscing hasn't convinced doubters that the past does influence the future, then I've one more example. More mature readers of *PW* will remember a rather beautiful actress by the name of **Hedy Lamarr**. What's not often appreciated is the fact that the lady was, on 11 August 1942, granted a US patent for a "**Secret Communication System**" for guiding torpedoes by radio!

In her late teens, Austrian Hedy Lamarr (her real name was Hedwig Eva Maria Kiesler) married **Fritz Mandl**, a leading European arms manufacturer. She was not happy - the marriage had been arranged by her parents - and eventually she escaped to London. Fearing Mandl would find her, she made her way to the USA and ultimately to Hollywood, where she met **George Antheil**, an avant-garde composer.

Together they thought of an idea, which enabled torpedoes to be radio controlled, thus greatly increasing the chance they would hit their target. Hedy knew from what she had overheard at the dinner parties she hosted for her husband and his potential customers, that conventional radio control was useless for guiding torpedoes. The enemy could easily jam the controlling transmission and even worse, the enemy might possibly send the torpedo back to the ship it was launched from!

The answer was for the radio transmitter to regularly change frequency in an apparently random manner. This would make jamming by conventional transmitters impossible. The problem was in synchronising the receiver in the torpedo with the transmitter.

Anthiel's work on synchronising mechanical pianos using slotted paper tapes provided the answer. Both he and Hedy worked on the details of their idea until it was ready to submit to the National Inventor's Council, a programme established by the US War Department. Following further development, they were jointly awarded a patent. Unfortunately, the US Navy thought the system was not practicable and eventually the patent lapsed without ever having been proved.

However, the patent was not wholly forgotten. Engineers working at Sylvania Electronic Systems took the ideas set out in the patent and, using solid state electronics, made a working system. Not for torpedo control, but for secure military radio communications. The system being used in 1962 by the US Navy in the blockade of Cuba. As the original patent had expired, neither Anthiel (who had died in 1959) nor Hedy, ever profited from their invention.

So what exactly was significant about their invention? Well, it was the first time **frequency-hopped spread spectrum** had been thought of. Nowadays, frequency-hopping radio systems are commonplace and not used simply to provide the military with secure communications. The same frequency-hopping principle is used by many systems - including cellular telephones - and by the current 'flavour of the month', **Bluetooth**.

Ah, time for me to hop off. Have a very enjoyable Christmas and New Year, and if you get a 'Bluetooth-enabled' device in your stocking, just remember who thought of it first. Please send your comments and letters to me, either via E-mail to: **phil@g4jcp.freeserve.co.uk** or by mail to: **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX**.

Merry Christmas de G4JCP! **PW**

www.radioworld.co.uk
42, Brook Lane,
Great Wyrley,
Walsall, WS6 6BQ.
Tel. 01922 414796.
Fax. 01922 417829.

RADIOWORLD

ALINCO - AOR - BHI - CUSHCRAFT - DIAMOND - HEIL - ICOM - KENT - KENWOOD - MFJ - RADIOWORKS - WATSON - WEST MOUNTAIN - YAESU - YUPITERU

KENWOOD TS-2000

HF 6m 2m 70cm 23cms Option. DSP

UT-20 23cms Unit . £369.95
DRU-3A Rec Unit ... £99.95
VS-3 Voice Synth ... £45.95
SP-23 Ext Speaker . £68.95
MC-60 Desk Mic ... £117.95
MC-90 DSP Mic £187.95

1 YEAR WARRANTY **£1,295.00**

KENWOOD TS-480SAT

WITH FREE HEIL MH5 + Cable

New HF+6m. HX-200W - £1099.00

VGS-1 Voice Unit ... £64.95
SP-23 Ext Speaker . £68.95
MC-60 Desk Mic ... £117.95
PG-4Z Ext Cable £44.95
PS-53T 23A PSU .. £229.95
SO-3 TCXO £109.95

1 YEAR WARRANTY **£699.00**

KENWOOD TS-870S

100W Base HF. 1.8-30MHz. DSP

VS-2 Voice Unit £45.95
SP-31 Ext Speaker . £82.95
MC-60 Desk Mic ... £117.95
LF-30A LP Filter £45.95
PS-52T 23A PSU .. £229.95
SO-2 TCXO £122.95

1 YEAR WARRANTY **£1,295.00**

KENWOOD TS-570DGE

100W Base HF. 1.8-30MHz. DSP ATU.

VS-3 Voice Unit ... £45.95
SP-50 Ext Speaker . £27.95
MC-60 Desk Mic ... £117.95
MB-430 Bracket £44.95
PS-53T 23A PSU .. £229.95
SO-2 TCXO £122.95

1 YEAR WARRANTY **£789.00**

KENWOOD TS-50S

100W Moble HF. 1.8-30MHz.

AT-50 TS-50 ATU . £319.95
SP-23 Ext Speaker . £68.95
MC-60 Desk Mic ... £117.95
MB-13 Bracket £39.95
HS-5 Del Phones £52.95
SO-2 TCXO £122.95

1 YEAR WARRANTY **£594.00**

KENWOOD TMD700E

2m & 70cms. Dual Band. APRS. TNC

SP-50B Speaker £27.95
PS-33T DC PSU ... £199.95
MC-58DM DTMF £44.95
PG-4X Ext Cable £61.95
PS-53T 23A PSU .. £229.95
VS-3 Voice Unit £45.95

1 YEAR WARRANTY **£424.00**

KENWOOD TMG707E

2m & 70cms. Dual Band. Det Front

SP-50B Speaker £27.95
DFK-3C Panel kit £34.95
MC-58DM DTMF £44.95
PG-4X Ext Cable £61.95
MB-12 Mount £14.95
MB-201 Mount £14.95

£265.00

KENWOOD Handhelds

TH-F7E 2&70 .... £237.00
TH-D7E 2&70 .... £289.00
TH-22E 2m £135.00
THG-71 2&70 .... £219.00
TH/K2E 2m £139.00
TH/K4E 70cms .. £139.00
Plus much more phone...

www.radioworld.co.uk

YAESU FT-1000MP

HF Base DSP. MkV 200w £2099.00

SP-8 Ext Speaker . £136.95
MD-100 Base Mic . £116.95
TXCO-6 TXCO £124.95
DVS-2 Voice Unit .. £199.95
FH-1 Keypad £33.95
E-DC-20 DC Cable . £11.95

FT1000MP FIELD **£1,699.00**

YAESU FT-847

HF 6m 2m 70cm. DSP. ATU Option

ATAS-120 Act ant . £259.95
ATAS-25 Man ant . £189.00
FC-20 ATU £249.95
FVS-1A Voice Unit £199.95
MH-36D8 DTMF £54.95
MMB-66 Bracket £32.95

2 YEAR WARRANTY **£989.00**

YAESU FT-897D

HF 6m 2m 70cm.100W Transportable

FP-30U AC supply £199.95
FNB-78 Batt pack ... £99.95
FC-30 Ext ATU £249.95

MMB-80 Bracket £15.95

2 YEAR WARRANTY **£649.00**

YAESU FT-857D

HF 6m 2m 70cm.100W. Mobile

ATAS-120 Act ant . £259.95
FC-30 Ext ATU £249.95
MH-36E8J DTMF ... £57.95
CT-39 Packet cab ... £14.95
TCXO-9 TCXO £69.95
YSK-857 Sep kit £45.95

FREE DSP **£579.00**

YAESU FT-817ND

HF 6m 2m 70cm. Portable / Mobile

FP-30U AC supply £199.95
FNB-78 Batt pack ... £99.95
FC-30 Ext ATU £249.95
TCXO-9 TCXO £69.95
MMB-80 Bracket £15.95

FREE BATTERY & CHARGER **£449.00**

YAESU FT-840

100w Mobile / Base 1.8-30MHz.

FIF-232C CAT cab . £99.95
FM-747 FM unit £49.95
MD-100 Desk Mic . £110.00
SP-6 Ext Speaker . £146.95
TCXO-4 Temp Osc . £41.95
YH-77STA Hdphs ... £49.95

2 YEAR WARRANTY **£389.00**

YAESU FT-8800/8900

FT-8800 Dual Band Mobile. 2/70
£269.00

Quad Band Mobile. 10/6/2/70 **FT-8900**
£329.00

2 YR WARRANTY

YAESU FT-2800M

2m Mobile. 137-174 MHz RX. 65W. VHF Rugged Mobile TX.

MH-48A6J DTMF ... £39.95
SP-7 Speaker £34.95
MLS-100 Ext sprkr ... £29.95
FP-1030A PSU £199.95
DC Power cord £17.95

2 YEAR WARRANTY **£159.00**

www.radioworld.co.uk

ICOM IC-7800 FLAGSHIP

HF+6m Flagship 200W. 32Bit DSP. ATU. LCD Scope.

Keboard&Monitor . £469.95
SM-20 Base Mic ... £144.99
SP-20 Ext Sprkr £164.99
CT-17 CI-V Conv £99.95

2 YEAR WARRANTY **£6,400.00**

ICOM IC-756 PROIII NEW

HF+6m 100w ATU. 32 Bit DSP.

AH-4 100W ATU ... £359.95
SM-20 Base Mic ... £144.99
SP-20 Ext Sprkr £164.99
PS-125 25A PSU £295.95
CT-17 CI-V Conv £99.95
UT-102 Voice unit £32.99

2 YEAR WARRANTY ~~**£2099.00**~~
call for the latest price

ICOM IC-7400

HF 6m 2m 100W ATU. 32 Bit DSP.

AH-4 100W ATU ... £359.95
SM-20 Base Mic ... £144.99
SP-20 Ext Sprkr £164.99
PS-125 25A PSU £295.95
CT-17 CI-V Conv £99.95
CR-338 TXCO £43.48

2 YEAR WARRANTY **£1,279.00**
Inc. SP-21 & SM20

ICOM IC-706 MkII G

HF 6m 2m 70cm 100W DSP Mobile.

AT-180 ATU £329.95
MB-62 Bracket M £17.99
MB-63 Bracket F £9.99
MB-72 Handle £9.95
OPC-581 Sep Cab . £32.99
UT-86 Voice unit £41.13

2 YEAR WARRANTY **£749.00**

ICOM IC-E208

VHF / UHF Dual bander FM Mobile.

CS-208 Cloan SW £329.95
MB-58 Bracket R £25.99
MB-65 Bracket C £25.99
HM-133 Rem mic £55.34
OPC-601 Sep Cab . £39.99
SP-10 Mob Spkr £49.99

2 YEAR WARRANTY **£215.00**

ICOM IC-718

HF 100W TX. Dual VFO. Auto Notch.

AH-4 100W ATU ... £359.95
MB-5 Bracket £35.25
MB-23 Carry strap £9.99
UT-102 Voice unit £32.99
OPC-599 ACC Cab £32.99
UT-106 AF DSP £84.99

2 YEAR WARRANTY **£439.00**

ICOM IC-910H / X

All mode 2 & 70. 100W. 9600bps op.

AG-25 Preamp £159.95
MB5 Bracket £35.25
CR-293 TXCO £89.99
UT-102 Voice unit £32.99
UX-910 23cms unit £349.99
UT-106 AF DSP £84.99

2 YEAR WARRANTY **£1087.00**

ICOM & YEASU Handhelds

IC-T3H 2m FM .. £129.00
IC-E90 6/2/70 .... £199.00

FT-60E 2&70 ..... £169.00
VX-2E 2&70 ..... £119.00
VX-6R 2&70 ..... £189.95
VX-7R 6/2/70 .... £199.00
VX-110 2m FM £99.95

www.radioworld.co.uk

01922 414796

ORDER HOTLINE

Email: sales@radioworld.co.uk

Mon - Fri - 09:00 - 17:30,
Sat - 09:30 - 1600.

Most Goods are shipped for 24Hr delivery. [UK Mainland] is £10 P&P unless otherwise stated.

MERRY CHRISTMAS TO ALL OUR CUSTOMERS

Credit Cards Accepted

MasterCard VISA VISA Electron SWITCH SOLO

Order Hotline - 01922 414796
Order Online - www.radioworld.co.uk

MFJ. Tuners

Tuners, Meters, Analysers.

MFJ-989C 3Kw	£319.95
MFJ-986C 3Kw	£299.95
MFJ-993 Intelliturner	£209.95
MFJ-971 QRP	£89.95
MFJ-969 300w	£169.95
MFJ-962D 1.5Kw	£249.95
MFJ-949E 300w	£135.95
MFJ-948 300w	£119.95
MFJ-945E Mobile	£99.95
MFJ-941E 300w	£109.95
MFJ-934 ATU+AG	£159.95
MFJ-921 2m	£59.95
MFJ-924 70cms	£59.95
MFJ-914 Extender	£56.95
MFJ-901 200w	£72.95

Reads SWR + Resistance(R) & Reactance(X) or Magnitude(Z) & Phase(degrees). Coax cable loss(dB) Coax cable length and Distance to fault... plus more.

Analysers

MFJ-249 1.8-170 Dig	£219.95
MFJ-259B 1.8-170 Rm&Dig	£199.95
MFJ-269 HF/VHF/UHF	£269.95

Dummy Loads

MFJ-250 1kw Oil filled	£69.95
MFJ-250X 1kw without oil	£44.95
MFJ-260C 300w PL259	£33.95
MFJ-260CN 300w N-Type	£39.95
MFJ-264 1.5kw PL259	£59.95
MFJ-264N 1.5kw N-Type	£69.95

MFJ-418
Morse Decoder / Tutor
£69.95

Learn Morse code anywhere, anytime with this MFJ Pocket Morse Code / CW Tutor! Take it everywhere! enjoy code at home, going to work, on vacation, on a plane or in a hotel. A large LCD display reads out letters, numbers and punctuation in plain English.

Heil. Audio.

Microphones, Headsets, Accessories.

Pro-Set-Plus Headset	£155.95
Pro-Set-Plus-IC Headset	£169.95
Pro-Set-HC-4/5 Headset	£109.95
Pro-Set-HC-IC Headset	£119.95
Goldline GM-4 Stick mic	£109.95
Goldline GM-5 Stick mic	£109.95
Goldline Vintage Stick mic	£129.95
HM-10-4 HC4 Reg stick mic	£69.95
HM-10-5 HC5 Reg stick mic	£69.95
HM-Dual HC4+5 Stick mic	£119.95
HM-10-I Icom Stick mic	£89.95
HMM-1C Icom Hand Mic	£59.95
HMM-K HC4/5 Ken hand mic	£74.95
HMM-Y HC4/5 Yae hand mic	£74.95
Traveller-817 Yaesu headset	£79.95
Traveller-706 Icom headset	£79.95

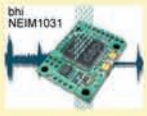
Call for Leads and Accessories

Adonis Microphones

AM-708E
Variable Compression
2 Microphone Outputs
£129.95

Adonis AM-7500E	£Phone
Adonis AM-708E	£129.95
Adonis AM-508E	£79.95
Adonis AM-308E	£69.95
Adonis FX-10	£59.95

bhi DSP



Noise Cancelling Solutions for Amateur Radio & SWL

NES10-2 Speaker with dsp	£89.95
NES1031 Inline dsp module	£129.95
NES1061 817 dsp module	£89.95
NES1061 817 brd inc fitting	£115.95
NES1062 dsp module	£89.95
NES1042 Switch Box	£19.95

Watson Supplies

W30-AM

0-15VDC
30/35A Peak
£119.95

W25-XM
NEW

13.8VDC
25A Switchmode
£99.95

W-25AM 25A Supply	£89.95
W-10AM 10A Supply	£59.95
W-5A 5A Supply	£29.95
W-3A 3A Supply	£22.95
W-25SM 25A Supply	£79.95
W-10SM 10A Supply	£49.95

Diamond Supplies

GZV4000
5-15 VDC
40A Peak
£154.95

GZV-6000 60A Supply *NEW.*	£299.95
GZV-4000 40A Supply	£154.95
GSV-3000 30A Supply	£144.95
GZV-2500 25A Supply	£114.95

Frequency Counters

Will tune AR-8200, AR8000 & IC-R10
Super Searcher
£99.95

FC130	£79.95
Hunter	£59.95

Call for further details

* 10Hz-3GHz
* Imp - 50 Ohms
* LCD readout
* 10-Digit display

Super Hunter
£149.95

Daiwa Accessories

Cross-needle meters

CN101L HF/VHF	£59.95
CN103N VHF/UHF	£65.95
CN801H HF/VHF	£109.95
CN801V VHF/UHF	£119.95

Coax Switches 2/4 Way.

CS-201 2-Way	£24.95
CX401 4-Way	£49.95
CS401N 4-Way NType	£Call

Avair Meters

AV-200
HF / VHF PWR SWR meter

AV-201 HF/VHF	£49.95
AV-401 VHF/UHF	£49.95
AV-601 HF/VHF/UHF	£69.95
AV-1000 HF/VHF/UHF	£89.95
AV-20 HF/VHF	£29.95
AV-40 VHF/UHF	£29.95

Palstar Tuners

TThe AT1500CV is an antenna tuner that can handle up to 1500 watts (1500 watt PEP) with low profile construction and bullet proof operation

AT-1500CV **£389.00**

AT-1KD Digital Display	£299.95
AT-1KM Regular Display	£289.95
AT-1500BAL 1500w Bal	£599.95
AT-1500CV 1500w ATU	£389.95
BT-1500BAL Dual Bal	£569.95

Palstar ZM30 - Antenna Analyser
Micro-controlled SWR antenna analyzer **£289.00**

Watson Antennas

Watson W2000
Bands 6m/2m/70cm
Gain 2.15/6.2/8.4dB
Power 200W (50W 6m)
Type 1/2, 2x5/8, 4x5/8
Length 2.5m
£69.95

W-30 2/70 Base	£39.95
W-50 2/70 Base	£49.95
W-300 2/70 Base	£64.95
W-2000 6/2/70 Base	£69.95
WBV-70 4m 1/2 Wave Base	£39.95

Bencher Antennas

Butternut HF-6V
Bands: 80/40/30/20/15/10
Height (Adj): 26 ft (7.9 m)
Weight: 12 lbs (5.4 kg)
Impedance: Nom 50 ohms
VSWR: 1.5:1 or less
£299.95

Butternut HF-2V 40/80m	£229.95
Butternut HF-6V 80-10m	£299.95
Butternut HF-9V 80-6m	£349.95
Butternut HF-5B 20-10m	£319.95
30-MRK 30m ad for HF2V	£89.95
A-17-12 17&12 ad for HF6V	£49.95
A-6 6m ad for HF6V-X	£14.95
TBR-160S 160m HF2/6/9V	£114.95

Hustler Antennas

Hustler 5-BTV
5 Bands - 80-10m
Height 7.64m - Weight 7.7kg
SWR 1.15:1 - Power 1kW
£189.95

Hustler 4-BTV 4 Band Vert	£159.95
Hustler 6-BTV 6 Band Vert	£209.95

West Mountain Radio

RIGblaster Pro	£209.95
RIGblaster Plus	£119.95
RIGblaster M8	£89.95
RIGblaster M4	£89.95
RIGblaster RJ	£89.95
Nomic 8P	£59.95
Nomic 4P	£59.95
Nomic RJ	£59.95

Tonna Antennas

Tonna - 20655
23cms (1296 Mhz) 55 element 21.5 dbi gain "N" 4.64m long.

Tonna 20505 6m 5el	£89.95
Tonna 20809 2m 9el	£54.95
Tonna 20811 2m 11el	£79.95
Tonna 20817 2m 17el	£99.95
Tonna 20909 70cm 9el	£45.95
Tonna 20919 70cm 19el	£59.95
Tonna 20921 70cm 21el	£74.95
Tonna 20635 23cm 35el	£64.95
Tonna 20655 23cm 55el	£89.95
Tonna 20745 13cm 25el	£69.95

Diamond Antennas

HF10FX 10m Mobile	£39.95
HF15FX 15m Mobile	£39.95
HF20FX 20m Mobile	£39.95
HF40FX 40m Mobile	£39.95
HF80FX 80m Mobile	£42.95
CR8900 10/6/2/70	£72.95
CP6 Base 6m-80m	£239.95
X50 Base 2/70	£54.95
X200 Base 2/70	£84.95
X300 Base 2/70	£99.95
X510 Base 2/70	£124.95
X700 Base 2/70	£249.95

Cushcraft Antennas

X-7 - 20/15/10 7el Yagi	£669.95
A3S - 20/15/10 3el Yagi	£499.95
A4S - 20/15/10 Yagi	£569.95
A3WS - 12/17 3el Yagi	£379.95
ASL-2010 13-32MHz Log	£749.95
MA5B - Mini Beam	£369.95
D3 - 20/15/10 Dipole	£249.95
D3W - 30/17/12 Dipole	£249.95
D4 - 40m Rotary Dipole	£349.95

TGM Antennas *Mini Beams*

** Call for prices on TGM upgrade kits.*

MQ-24SR 6-20m 2el	£329.95
MQ-34SR 6-20m 3el	£449.95
MQ-3 6-20m 3el	£379.95
MQ-26 6-20m 2el	£389.95
MQ-26SR 6-20m 2el + EH	£419.95
MQ-36SR 6-20m + Dir	£559.95

Radioworks Wire Ants

CW-160 160-10m (252ft)	£129.95
CWS-160 160-10m (133ft)	£114.95
CW-80 80-10m (133ft)	£89.95
CWS-80 80-10m (66ft)	£109.95
CW-40 40-10m (66ft)	£84.95
CW-20 20-10m (34ft)	£89.95
G5RV+ 80-10m	£59.95
Radioworld G5RV Fullsize	£29.95
Radioworld G5RV Halfsize	£27.95

ALINCO · AOR · BHI · CUSHCRAFT · DIAMOND · HEIL · ICOM · KENT · KENWOOD · MFJ · RADIOWORKS · WATSON · WEST MOUNTAIN · YAESU · YUPITERU

RADIOWORLD
If You Don't need it, we won't sell it to you.

price match
Find a lower price? We'll try to match it!*

AND A HAPPY NEW YEAR

www.radioworld.co.uk

RADIOWORLD

42, Brook Lane,
Great Wyrley,
Walsall, WS6 6BQ.
Tel. 01922 414796.
Fax. 01922 417829.

ALINCO - AOR - BHI - CUSHCRAFT - DIAMOND - HEIL - ICOM - KENT - KENWOOD - MFJ - RADIOWORKS - WATSON - WEST MOUNTAIN - YAESU - YUPITERU

LDG Electronics

AT-1000

1KW Auto ATU - 1.8-54MHz - 1-8 secs Tune - Approx SWR Rating of 10:1

£449.95

LDG Z-100

100w Auto ATU - 1.8-54MHz - 0.5 - 6 secs

£115.00 ***BEST SELLER****

LDG TW-1 TALKING WATTMETER *New*

Speaks Fwd - Rev power in Watts & SWR
Continuous tone for amplifier adjustments
Power range: 0 – 2000 watts PEP

£109.00

LDG AT-100Pro *New*

100w Auto ATU - 1.8-54MHz
1-5 seconds Tune - 2 Pos Ant switch

£169.95 ***New***

LDG RBA 1:1 & 4:1

1:1 or 4:1 Balun - Covers 1.8 - 30Mhz
Power rating 200w

£29.95

LDG AT-897

100w Auto ATU for FT-897 - 1.8-54MHz

£199.95

Accessories:

K-OTT Kenwood Interface	£49.95
Y-OTT Yaesu Interface	£54.95
Icom-IC1 Icom Interface	£29.95
Alinco-IC1 Alinco Interface	£29.95
AC-1 Cable	£19.95

W4RT Electronics

One-Plug-Power

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now.

OPP-817 £54.95

NEW! 2300 mAh Large Capacity FT-817 Internal Battery Solution Still use Internal 817 Charger

OPP-897 £89.95

One Plug Power for the FT-897 4500 mAh; Fully Compatible with the FT-897 and Yaesu Charger.

NEW!

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now. One-Plug Power comprises a 1800 mAh NiMH battery pack, both over-termperature and over-current protection, connection to the FT-817 Molex connector, and a modified Yaesu battery cover door featuring a power jack that allows connection of a battery charger such as the Maha MH-C777 or MH-C888.

One-Big Punch

One BIG Punch (OBP) is a custom add-on accessory for the Yaesu MH-31 microphone commonly used with many Yaesu amateur radios

OBP £49.95

Speech Compressor for the Yaesu MH-31 mic and FT817 FT857, FT897. Improve the TALK POWER.

MAX PUNCH £165.95

You can also enjoy the "MAX PUNCH" option that features the HC-4 with the OBP and the HC-5 (w/o OBP). The TONE switch is used to select which element is operational.

HAND MIKE £57.95

W4RT Electronics Microphone with One BIG Punch Speech Compressor included.

The One BIG Punch is an AF-based speech compressor specifically configured to provide remarkable increase in talk power while maintaining good audio quality. The OBP is NOT a clipper, but a compessor providing great voice compression, high-level limiting, and noise gating. The unit can be mounted inside the MH-31, requires no additional electrical power, and can be turned on or off by using the MH-31's TONE switch.

One-Board-Filter

The One-Board Filter (OBF) affords you the opportunity to have both the Collins CW and SSB mechanical filters available in your FT-817 together!

OBF £229.95

Replace two filters in the space of one. OBF includes the two optional filters and fitting.

Collins Mechanical Filters
for the Yaesu FT-817, 857 & 897.

500 Hz CW - £94.95 ***2.3kHz SSB - £94.95***

This is the option that many, many FT-817 owners have requested. The OBF utilizes Collins Mechanical Filters that are the same as used in the optional Yaesu filters for the FT-817. The bandwidth of the 7-pole CW filter is 500 Hz and the 10-pole SSB filter is 2.3 kHz. The One-Board Filter is NOT available for installation by FT-817 owners. This is not a "do-it-yourself" option. The One-Board Filter must be installed by RADIOWORLD, or a competent engineer. If in doubt please call for details.

One-Touch-Tune

At the touch of a button, you have the carrier needed for tuning. One-Touch Tune (OTT) is totally transparent to the FT-817 and to any external equipment that you have attached to the rig.

OTT-817 £54.95

It requires no external power and works with both manual and automatic tuners.

W4RT OTT-FT817	£54.95
W4RT OTT-FT100/857/897	£54.95
W4RT OTT-FT847	£54.95
W4RT FT817 One Fast Charger	£Call
W4RT Antenna Boss	£139.95

NEW* FT-817 Stand £19.95

Simply snaps into position. Adjust for desired height. Complete with non slip feet and allen wrench.

Professional-Grade FT-817 Stand

W2IHY Technologies

*Available and IN STOCK now**

Finally, professional audio processing technology is applied to the unique requirements of amateur radio operators! The W2IHY 8 Band Audio Equalizer and Noise Gate is an easy-to-use, sophisticated unit loaded with high-performance features.

W2IHY 8 Band Audio EQ Noisegate

£229.95

If You Are Ready for New Adventures in High-End Transmit Audio Then You're Ready for -- *EQplus by W2IHY*

£299.95

iBox is a versatile accessory for amateurs who are serious about their audio.

£Call for information

Adapter cables to fit Icom - Kenwood - Yaesu £22.95

ATX Walkabout

ATX Walk--about PL-259

£47.95

The ATX Walkabout covers all bands (including WARC bands) from 80-6m, 5W guaranteed, 25W max. When fully telescoped it is about 65 inches long. This makes it ideal for the FT-817 or any other portable HF radio.

ATX Walkabout BNC	£47.95
ATX Walkabout PL259	£47.95
ATX Walkabout Universal	£54.95

The Miracle Whip

RX - 0.6 to 460 Mhz
TX - 40,30,20,17,15,12, 10, 6, 2m & 70cm

Power Limits 25W PEP 10W Cont.

£127.95

In Stock*

* The Miracle Whip will transmit on almost any frequency you are licensed to use including WARC, MARS/CAP, Alaska Emergency, Citizens Band, Marine, and most commercial HF SSB and VHF/UHF channels

** The Miracle Whip is optimized for for best receive rather than lowest swr on 80 and 160, as no short antenna will present good transmitting opportunities at these frequencies

Portable Masts

Telescopic Masts Inc Guy Rings

Small 17' 6"	£55.95
Medium 26' 0"	£65.95
Large 33' 0"	£75.95
Tripods to fit masts	£25.95

Mobile Mounts

Solarcon MAGZ-17 TRI-MAG

£39.95

An extremely strong magnet base which actually consists of 3 x 5" chrome magnets that are interconnected with metal strips to form one very large mount. Suitable for very large mobile antennae such as ¼ wave tank whips.

Siro MAG125 3/8	£17.95
Siro MAG125 PL	£17.95
Siro MAG 145 3/8	£22.95
Siro MAG 145 PL	£22.95
Solarcon Magz-17	£39.95

RM Amplifiers

RM HLA-150
HF - 1.5-30MHz
Power Amplifier
150 WATTS

£249.95

RM HLA-300
HF - 1.5-30MHz
Power Amplifier
300 WATTS

£329.95

01922 414796

ORDER HOTLINE

Email: sales@radioworld.co.uk

Mon - Fri - 09:00 - 17:30,
Sat - 09:30 - 1600.

Most Goods are shipped for 24Hr delivery. [UK Mainland] is £10 P&P unless otherwise stated.

MERRY CHRISTMAS TO ALL OUR CUSTOMERS

Credit Cards Accepted

MasterCard VISA VISA Electron SWITCH SOLO

Do a great deal better @ RADIOWORLD

01922 414796 - www.radioworld.co.uk

price match
Find a lower price? We'll try to match it!

Linear Amp U.K.

Challenger Mk3
£1795.95

Challenger MK3 HF	£1795.95
Ranger811H HF	£945.95
Discovery 2-31 2m 1KW	£1395.95
Discovery 2-35 2m 1.5KW	£1595.95
Discovery 6-31 2m 1KW	£1395.95
Discovery 6-35 2m 1.5KW	£1595.95
Discovery70 70cms 700w	£1495.95
LA-STNM Bal Super Tuner	£345.00
LA-STWM Bal Super Tuner	£395.00

SGC. Smartuners

SGC-230 200Watts
£359.95

SGC-230 HF	£359.95
SGC-231 HF+6m	£359.95
SGC-235 HF-500w	£749.95
SGC-237 HF+6m	£299.95
SGC-237 Porta	£589.95
SGC-237 PCB	£299.95
SGC-239 HF	£185.95
MAC-200	£339.95

Rotators

YAESU

G-2800SDX Rotator	£999.95
G-450C Rotator	£299.00
G-550C Rotator	£309.00
G-650C Rotator	£379.00
G-1000DXC Rotator	£429.00
G-5500C Rotator	£569.00

Feeders & Wire

Military Spec High grade
50 Ohm coaxial Cable
£69.95 A 100m Drum

RG58U	£0.50 per Metre
RG8 Super	£0.70 per Metre
RG213	£1.00 per Metre
W103 Westflex	£1.30 per Metre
RG-8 75 Metre Drum Special	£39.95
Flexweave 50m Flex	£29.95
Flexweave-PVC-50 50m	£39.95
Enamelled Copper Wire 50m	£12.95
Hard Drawn Copper Wire 50m	£14.95

Rotator Cable: - Color coded Cable

3 core	£0.45 per Metre
7 core	£0.79 per Metre
8 core	£1.09 per Metre

DC Connecting Cable

5A DC Cable	£0.50 per Metre
10A DC Cable	£0.75 per Metre
20A DC Cable	£1.00 per Metre
25A DC Cable	£1.10 per Metre

Wonder Wand *New

Wonder Wand MonoBand Antenna. Mono Band QRP antenna High Quality Mono Band antenna. Available for 3 x Bands.

MB-160 Mono 160m	£49.95
MB-80 Mono 80m	£49.95
MB-60 Mono 60m	£49.95
Wonder Wand 40m-70cm	£89.95

C-POISE Wander-Wand Tunable Counterpoise System £40.00

The UK's No.1 Used Equipment Trader

Second Hand List.

Quality Used Equipment. 3 Month Warranty.
Best prices paid on your used equipment.

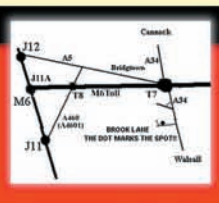
432-50 70cms Amp 50w SH MML 432-5 £99.00
AEA PK-12 Packet Terminal SH AEA PK-12 £69.00
AEA PK-232MBX-DSP SH PK-232MBX £199.00
AEA PK-900 SH PK-900 £199.00
AKD 6001 6m FM Trx SH AKD 6001 £135.00
Alan HQ-2000 SWR / Watt Meter SH HQ 2000 £25.00
Alinco DJ-G5 Dual Band Handy SH DJ-G5 £159.00
Alinco DJ-V5 Handheld SH DJ V5 £99.00
Alinco DJ-X10 Wide Band Rx SH DJ X10 £200.00
Alinco DJ-X2000 Intelligent Receiver SH DJ-X2000 £275.00
Alinco DX-77E HF Transceiver SH DX-77E £389.00
Alinco EDX-2 Auto ATU SH EDX-2 £219.00
AOR 350L Bar Element SH 350L £30.00
AOR 350M Bar Element SH 350M £30.00
AOR 8200-PC Computer lead SH 8200-PC £45.00
AOR AR-1500 Wideband Receiver SH AR-1500 £89.00
AOR AR-2002 Receiver SH AR-2002 £199.00
AOR AR-3000A Wide Band Receiver SH AR3000A £425.00
AOR AR-3000A Wideband Receiver SH AR-3000A £450.00
AOR AR-7030 SH AR-7030 £550.00
AOR AR-7030 HF Receiver sH AR7030 £550.00
AOR AR-8200 2 SH AR-8200 £199.00
AOR AR5000A+3 HF Rx SH AR 5000+ £1599.00
AOR AR8000 SH AR8000 £189.00
AOR LA-350 Loop Antenna SH LA-350 £129.00
Avair AV-200 VSWR/POWER Meter SH AV-200 £30.00
Bearcat UBC-120XLT Scanner SH UBC120 £69.00
Bearcat UBC-278 XLT Scanner SH UBC 278 £99.00
Bearcat UBC-780XLT Scanner SH UBC-780XL £199.00
Bnos 20AMP PSU SH BNOS 20 £89.00
BNOS LP50-3-50 6m linear amplifier SH BNOS-50 £99.00
Codan 9360 SSB transceiver SH 9360 £399.00
Comet CD-270D Meter SH CD 270D £49.00
Commtel Comm-225 Rx SH Comm 225 £150.00
Daiwa CNA-1001 SH CNA-1001 £149.00
Daiwa CS-201 2 Way Switch SH CS 201 £10.00
Datong FL-2 Multimode Filter SH FL-2 £69.00
Dewsbury Electronics Supa-Tuta SH DE Supa £35.00
Diamond SX-100 Meter SH SX 100 £65.00
Diamond SX-200 Meter SH SX 200 £69.00
Drake R8E HF Receiver SH R8E £425.00
EDC-16B adapter SH EDC-16B £9.99
ERA Microreader CW Decoder SH ERA MR £79.00
FRT-7700 SH FRT-7700 £69.00
FT-290R 2m Multi mode SH FT-290R £150.00
FT-817 SH FT-817 £375.00
Fujion F-2000A Finder F 2000 A £99.00
GRE PSR-214 FM Base Scanner SH PSR-214 £89.00
Heil BM-10-5 Headset SH BM-10-5 £50.00
Hi-Mound Manipulator Paddle Key SH HMM £30.00
Hora C-150 2m FM Handheld Transceiver SH C-150 £79.00
IC-7400 HF, 6m & 2m transceiver SH IC-7400 £899.00
ICE 413 2m Band Pass Filter SH ICE 413 £30.00
Icom CT-17 Computer Interface SH CT-17 £59.00
Icom IC-Δ1E SH IC-Δ £249.00
Icom IC-207H 2 / 70 cm SH IC 207H £199.00
Icom IC-24ET Dual Band Handy SH IC-24ET £139.00
Icom IC-703 HF, 6m Portable SH IC703 £399.00
Icom IC-706MKIIG SH 706MkIIG £649.00
Icom IC-706MkIIG DSP SH IC-706M2G £649.00
Icom IC-718 HF Transceiver SH IC-718 £379.00
Icom IC-740 HF Transceiver SH IC-740 £389.00
Icom IC-740 HF Transceiver SH-IC740 £350.00
Icom IC-7400 HF, 6m & 2m Transceiver SH IC7400 £899.00
Icom IC-746 HF / 6 / 2 SH IC 746 £875.00
Icom IC-756Pro SH IC-756Pro £995.00
Icom IC-756Pro HF / 6m Transceiver SH IC756Pro £995.00
Icom IC-E90 Tri Band Handy SH IC-E90 £149.00
Icom IC-R72 Receiver SH IC R72 £350.00
Icom IC-R8500 Receiver SH IC-R8500 £899.00
Icom IC-R8500 RX SH IC R8500 £999.00
Icom IC-T7E Dual Band Handy SH IC-T7E £139.00
Icom IC-W31E Dual Bander SH IC W31E £160.00
Icom PS-55 Power Supply SH PS55 £99.00
Icom SP-20 Loudspeaker SH SP-20 £99.00
ICS AMT-2 Terminal Unit SH AMT-2 £49.00
Jil SWR Meter SH Jil SWR £15.00
JPS NIR-10 Noise Unit SH NIR 10 £99.00
JRC NRD-345 HF Receiver SH NRD-345 £285.00
JRC NRD-545 DSP Receiver SH NRD-545 £899.00
Junker Pump Key SH JP Key £75.00
Kamtronics KAM Multimode TNC SH KAM TNC £140.00
Kantronics KPC-3+ TNC SH KPC-3+ £129.00
Kent Straight Key SH Kent Key £45.00
Kenwood AT-50 ATU SH AT-50 £175.00
Kenwood BO-9 Base Unit SH BO-9 £39.00
Kenwood IF232 SH IF232 £50.00
Kenwood MB-201 SH MB201 £20.00
Kenwood MC-60A Microphone SH MC-60A £80.00
Kenwood PS-31 Power Supply SH PS-31 £129.00
Kenwood SM-230 Station Monitor SH SM-230 £499.00
Kenwood SO-2 Hi-Stab Oscillator SH SO-2 £69.00
Kenwood SP-230 Loudspeaker SH SP-230 £49.00
Kenwood SP-950 Loudspeaker SH SP950 £90.00
Kenwood TH-F7E Dual Band Handy SH TH-F7E £189.00
Kenwood TH-G71E Dualband Handie SH TH G71 £129.00
Kenwood TH-K2E 2m Handie SH TH K2E £99.00
Kenwood TM-G707E Dual Band Mobile SH TM-G707E £189.00
Kenwood TS-570D HF Transceiver SH TS570D £525.00
Kenwood TS-570DG/E SH TS570 £675.00
Kenwood TS-690S HF -6m Transceiver SH TS-690S £499.00
Kenwood TS-850S /AT SH TS-850SAT £699.00
Kenwood TS-870S HF Transceiver SH TS-870S £849.00
Kenwood TS-950SD HF Transceiver SH TS-950SD £1099.00
Kenwood TSU-8 CTCSS encoder SH TSU-8 £30.00
Kenwood VS-1 Voice Synthesiser SH VS-1 £39.00
Kenwood VS-2 Voice Synthesizer SH VS-2 £30.00
Kenwood YG-455C IF Filter SH YG-455C £65.00
Kenwood YK-88SN-1 SSB Filter SH YK-88SN1 £40.00
KP-100 Keypad SH KP-100 £29.95
Linear Amp Challenger II amplifier SH CHAL2 £1199.00
M/Mods 144/100 SH MML144/10 £119.00
M/Mods 432/50 SH MML432/50 £99.00
Maplin YN48C Dip Meter SH YN48C £49.00
MFJ-1272B TNC / Mic Switch SH MFJ 1272B £20.00
MFJ-16010 Wire Tuner SH MFJ-16010 £35.00
MFJ-1701 6 Way Antenna Switch SH MFJ-1701 £40.00
MFJ-442 Elec + Memory keyer SH MFJ 442 £89.00
MFJ-722 CW / SSB Filter SH MFJ 722 £59.00
MFJ-784 DSP Filter SH MFJ-784 £149.00
MFJ-9015 15m cw Trx SH MFJ 9015 £84.26
MFJ-912 Remote Balun SH MFJ-912 £20.00
MFJ-914 SH MFJ-914 £39.95
MFJ-921 VHF 200 Watt ATU SH MFJ 921 £50.00
MFJ-931 Artificial Ground SH MFJ931 £69.00
MFJ-948 ATU SH mfj948 £89.00
MFJ-949E Versa Tuner SH MFJ-949E2 £109.00
MFJ-962D Versa Tuner SH MFJ-962D £220.00
Microset PC2S 30 Power Supply SH PC2S 30 £99.00
Microset PT 135 PSU SH PT 135 £120.00
Microset R50 2m Amp SH R50 £79.00
Mizuho ATU SH MIZ ATU £40.00
MML432-30L SH MML432/30 £89.00
MML432-50 70cm's Linear Amplifier SH MML432/50 £79.00
OptoElectronics X Sweeper SH XSWEEP £1199.00
Palstar PS-30N PSU SH PS 30N £79.00
Pro.Sis.Tel Rotator and Head Unit SH PST £289.00
Proset-Plus SH-PROSET-PL £109.00
Realistic Pro-2006 Scanner SH Pro-2006 £129.00
Realistic Pro-2012 SH PRO-2021 £79.00
Realistic Pro-26 Scanner SH Pro-26 £89.00
Rexon RL-501 Dual Band Handy SH RL-501 £89.00
SMC 150PL Dummy Load SH 150-PL £29.00
Snooper S5-R Safety Alert System SH S5-R £119.95
Standard C-156E 2m Handheld SH C-156E £125.00
Standard C468 70cm Handy SH C468 £59.00
Target HF3 HF3 RX SH HF3 £99.00
Tentec Paragon HF Base Inc. Speaker SH TT PARA £700.00
TenTec RX-350 HF Receiver SH TT RX 350 £799.00
Timewave DSP-59+ Filter SH DSP 59+ £129.00
Timewave PK-12 Packet SH PK12 £99.00
Tokyo Hy-Power HT-106 6m Transceiver SH HT-106 £199.00
Tono Theta 777 TNC SH 777 £49.00
Trio (Kenwood) YK-88C IF Filter SH YK-88C £40.00
Vibroplex Vibro Keyer Deluxe SH VB-DK £119.00
Watson W-25SM 22A Power Supply SH W-25SM £59.00
WELZ DL-600 Dummy Load SH DL-600 £49.00
Yaesu FC-20 ATU for FT-847 SH FC-20 £175.00
Yaesu FL-2025 25W Linear Amplifier SH FL2025 £99.00
Yaesu FP-707 PSU SH FP-707 £110.00
Yaesu FR-101 HF RX SH FR-101 £399.00
Yaesu FRG-100 HF Receiver SH FRG-100 £299.00
Yaesu FRG-7 HF Receiver SH FRG-7 £99.00
Yaesu FRG-7700 HF Receiver SH FRG7700 £199.00
Yaesu FRG-9600 VHF-UHF Receiver SH FRG9600 £199.00
Yaesu FRT-7700 SH FRT 7700 £70.00
Yaesu FRT7700 Antenna Tuner SH FRT7700 £69.00
Yaesu FRV-7700 Converter FRG-7700 SH FRV 7700 £60.00
Yaesu FRV7700 Converter SH FRV7700 £60.00
Yaesu FT-1000 "CLASSIC" HF Trx SH FT-1000 £1399.00
Yaesu FT-1000MK V 200w SH FT-1000Mk £1499.00
Yaesu FT-1000MP AC HF Base SH FT-1000MP £1199.00
Yaesu FT-1000MP Mark -V Field SH FT-1000Mk £1349.00
Yaesu FT-101ZDmk3 HF Transceiver SH FT-101ZD3 £325.00
Yaesu FT-2800M 2m Transceiver SH FT2800M £119.00
Yaesu FT-290MkII 2m Multi-mode Trx SH FT-290MK2 £250.00
Yaesu FT-416 2m Handy SH FT-416 £79.00
Yaesu FT-41R Handheld Transceiver SH FT 41R £120.00
Yaesu FT-470R Dual Band Handheld SH FT 470R £129.00
Yaesu FT-51R Dual Band Handy sh FT51R £149.00
Yaesu FT-690Rmk2 6m Multi mode SH FT 690 MK £275.00
Yaesu FT-707 HF Transceiver SH FT-707 £220.00
Yaesu FT-7100M Dual Band Mobile Trx SH FT7100M £159.00
Yaesu FT-736R 23cms Module SH FEX-736 1 £399.00
Yaesu FT-736R 2m/70cm Base mode SH FT736R5 £499.00
Yaesu FT-736R 6m, 2m & 70cm Base SH FT736Ra £699.00
Yaesu FT-736R 2/70 +6m+23cms SH FT-736R £899.00
Yaesu FT-747 HF Trx SH FT 747 £299.00
Yaesu FT-767GX HF, 6m & 2m trx SH FT767GX £599.00
Yaesu FT-76R 70 cms Handheld Transceiver SH FT 76 £99.00
Yaesu FT-7800 2/70 mobile SH FT 7800 £199.00
Yaesu FT-817 Portable Transceiver SH Yae 817 £375.00
Yaesu FT-847 Multi-Band Transceiver SH FT-847 £849.00
Yaesu FT-857D Multi-band Mobile SH FT-857D1 £499.00
Yaesu FT-8900 Quad Band Mobile Trx SH FT-8900 £279.00
Yaesu FT-897 Multiband Portable Trx SH FT-897 £539.00
Yaesu FT-900/AT HF Transceiver SH FT900AT £549.00
Yaesu FT-902DM HF transceiver SH FT-902DM £325.00
Yaesu FT-920AF HF / 6M Base SH FT 920 £899.00
Yaesu FT-990 /AC SH FT-990 £899.00
Yaesu FT857 Multiband Mobile SH FT857 £425.00
Yaesu FTV-901R 2m / 6m Transvertor SH FTV901R £275.00
Yaesu FV-901DM VFO SH FV901DM £175.00
Yaesu MD-1 Desktop Microphone SH MD-1 £75.00
Yaesu MH-29 Speaker Microphone SH MH-29 £49.00
Yaesu MMB-31 Mobile Mounting Bracket SH MMB-31 £15.00
Yaesu MW-1 Remote Control Mic SH MW1 £60.00
Yaesu NC70 Battery Charger SH NC70 £60.00
Yaesu PA-11C SH PA-11C £20.00
Yaesu VR-5000 Receiver SG VR5000 £389.00
Yaesu VX-110 2m Handy SH VX-110 £79.00
Yaesu VX-1R Handie SH VX1 £89.00
Yaesu VX-2E Dual Band Handy SH VX-2E £99.00
Yaesu VX-5R Tri-Band Handy SH VX-5R £149.00
Yaesu VX-7R Tri Band Handy SH VX7R £169.00
Yaesu VX-7R Tri Band Handy SH VX7RS £169.00
Yaesu XF-10.9M-202-01 Filter SH XF109 £30.00
Yaesu XF-455K-251-01 CW filter SH XF455 £30.00
Yupiteru MVT-225 SH MVT-225 £149.00
Yupiteru MVT-3300EU Scanner SH MVT-3300 £99.00
Yupiteru MVT-7100 SH MVT 7100 £140.00
Yupiteru MVT-7100 Scanner SH MVT7100 £149.00
Yupiteru MVT-7300 Scanner SH MVT-7300 £179.00
Yupiteru MVT-9000 MK2 Scanner SH MVT-90002 £249.00
Yupiteru MVT-9000 Scanner SH MVT-9000 £199.00

CLICK AND BUY USED ONLINE !

www.radioworld.co.uk

The UK's No.1 Used Equipment Trader - Call 01922 414796

ALINCO · AOR · BHI · CUSHCRAFT · DIAMOND · HEIL · ICOM · KENT · KENWOOD · MFJ · RADIOWORKS · WATSON · WESTMOUNTAIN · YAESU · YUPITERU



42 Brook Lane
Great Wyrley
Walsall WS6 6BQ

We are Premier UK Dealers for ICOM, Kenwood, Yaesu.
Full UK Warranty with full peace of mind. RADIOWORLD

AND A HAPPY NEW YEAR

Practical Wireless

Volume 81 January to December 2005

Index 2005

Index of Antenna, Features, Practical Projects, Reviews & Theory articles

Antenna Features/Projects

Antenna Workshop

Classic Projects

Constructional/Practical Projects

Errors & Updates

Features

Doing It by Design by Tony Nailer G4CFY

Reviews

Technical for the Terified by Tony Nailer G4CFY

Theory

Supplements, Free Gifts & Special Offers

Don't forget we still have stocks of *PW* back issues for 2005 as well as 2004, 2003, 2002 & 2001 available. But hurry as stocks are limited. To order back issues either use the **Order Form** on **page 59** of this issue or telephone the **Credit Card Hotline on 0870 224 7830**. Back Issues are available for **£4.75 each inc. P&P UK, £5.25 each inc. P&P overseas.**

MAKE SURE YOU NEVER MISS AN ISSUE OF THE UK'S ONLY INDEPENDENT AMATEUR RADIO MAGAZINE - SUBSCRIBE TODAY! See page 64 for a special Christmas offer.

Remembering the RAF TR1196

Although Trevor Sanderson G4OEY lives and works in Holland nowadays, he still gets his PW. A mention of a classic RAF receiver units ended up with the following article, which is bound to get retired surplus chasers drooling!

This article came about because of a mention by the *PW* Editor **G3XFD** June 2004 issue in a feature entitled Those Glorious Surplus Days. Rob mentioned the receiver part of the TR1196 transceiver, which brought back many memories of surplus days to myself G4OEY!

As a youngster I was given the transmitter part of the TR1196 like the one shown in **Fig. 1**, which was promptly dismantled for parts, as did so many of them in those days. Years later I finally managed to acquire a complete working TR1196.

Since then, I've collected lots of information about the history and use of the TR1196 and other associated RAF transceivers, which I'd like to share with readers.

The TR1196 & Ancestors

Just before the beginning of the Second World War, the RAF developed the TR9 and TR11 for short range h.f. radiotelephony (r.t.) communications for fighter and bomber aircraft respectively. These were the predecessors of the TR1196.

The TR9 used a two valve transmitter and a six-valve t.r.f. receiver and operated in the range 4.3 to 6MHz. It was designed for fighters. It used carbon microphones and high impedance headphones and had an intercom for use in two-seat fighters. The TR11 operated in the range 3 to 4.3MHz and was intended for use in bomber aircraft.

The very first version of the TR9 was used in many pre-war aircraft. It was tuned and operated by a lever on the side of the set. A freshly charged 2V accumulator and 120V dry battery unit powered the set. It was generally considered to be somewhat difficult to operate.

The TR9 was soon improved and by the start of the Second World War was replaced by a range of versions. These included the TR9B for single seat aircraft, the TR9C with a single channel crystal controlled transmitter and the TR9D, **Fig. 2**, with two crystal controlled channels.

Spitfire & Hurricane

The TR9D was used in the early Spitfire and Hurricane, fighters, mounted on a crate just behind the pilot. One of the channels in the TR9D was used with a temperature stabilised clockwork-controlled Master Contactor, **Fig. 3**, the so called 'Pip Squeak'.

The 'Pip Squeak' transmitted a signal to ground controller for 14 seconds of every minute. This enabled the ground controllers using the Chain Home radar system to know the position of every aircraft. This simple system was one of the success stories of Battle of Britain, during the time these h.f. transceivers were used.

Early bombers used the TR9F for r.t. (voice) communications, together with the A1134 or 1134A intercom, shown in **Fig. 4**. The TR9F was used and operated by the pilot for short range, up to 48km (30 miles) communications, and had two spot frequencies. Incidentally, my own TR9F, which is in desperate need of a case, is shown in **Fig. 5**.

For long range telegraphy using Morse code, an additional T1083 and R1082 combination was used, operated by the wireless operator. This was later superseded by the T1154 and R1155.

In early Lancasters the TR9F transceiver was mounted under the navigator's table. It was operated by the pilot using a lever on the top of the windscreen.

One channel of the TR9F was tuned to the 'Darky' frequency, which I believe was 6.440MHz, with the output attenuated to restrict its range. Any aircraft which was lost could call up a network of ground stations on this frequency with the phrase

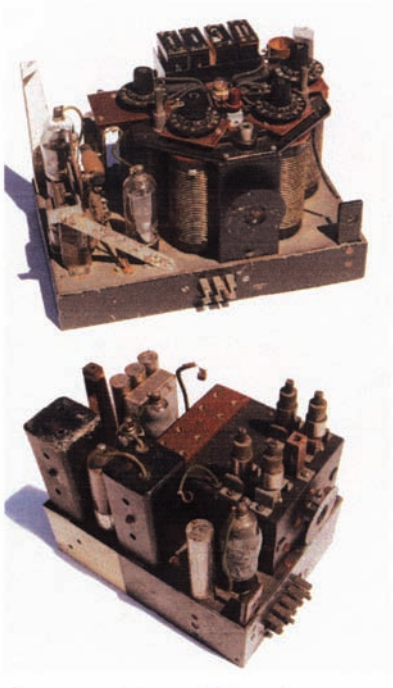


Fig. 1: The ex-RAF 1196 receiver unit (see text).

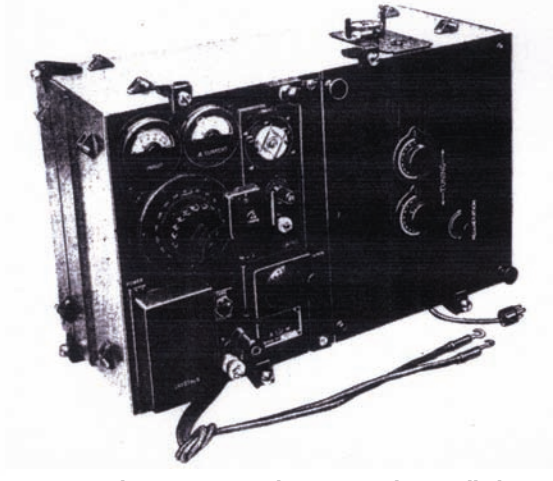


Fig. 2: The RAF TR9D with two crystal controlled channels (see text).

Fig. 3: The TR9D was used in the early Spitfire and Hurricane, fighter. One of the channels in the TR9D was used with a temperature stabilised clockwork-controlled Master Contactor, the so called 'Pip Squeak (an early transponder type device - see text).

Transceiver

'Hello Darky'.

A ground station within range would then reply 'Hello Darky' and give the aircraft its approximate position. Many an aircraft was brought home safely using this system. These stations probably used the ground based version of the TR9 transceiver, the R/T Station No. 9, **Fig. 6**.

The TR1196

The TR1196 was developed as an h.f. transceiver to replace the TR9, primarily for use in Fleet Air Arm and Coastal Command aircraft. Eventually, the TR1196 found its way into RAF fighters and bombers.

Being of similar dimensions as the TR9, the TR1196 could be mounted in the same place as the TR9. In Spitfires and Hurricanes, it was mounted behind the pilot in the same place as the TR9.

In aircraft such as the Lancaster, the 1196 was mounted in the mid section of the fuselage. Being fully crystal controlled it was considerably easier to use, the control box being mounted in both fighter and bomber aircraft on the side of the cockpit alongside the pilot.

The complete TR1196 transceiver, shown in **Fig. 7**, consists of five main parts, the Receiver Type 25 (shown in Fig. 2 and 3 of the original article in the June 2004 issue), the Transmitter Type 22, the Power Unit 87 (the 24V TR1196) or 104 (the 12V TR1186A) and the frame which joins everything together. The fifth part is the push button Control Box, Controller Type 4.

Complete TR1196 sets were sold on the surplus market for many years after the war. However, they weren't used extensively by Amateurs as they covered the range 4 to 6.5MHz and were crystal controlled. So a complete example is somewhat difficult to find these days.

The VHF Transceivers

Already, before the war, the v.h.f. TR1133 transceiver was being developed. It was introduced so that communications could be made at v.h.f. instead of h.f., for short range communications and thereby provide a much more reliable R/T link.

The v.h.f. receivers were already in use at the time of Dunkirk, but were removed from front line aircraft in France to prevent them falling into enemy hands. However, they had actually seen service in some Squadrons during the Battle of Britain. In fact the TR1133 was a major breakthrough and was another instance of radio making a substantial contribution to the outcome of the War.

The TR1133 was quickly followed by the TR1143. This was used in the later years of the war in almost every aircraft in the RAF.

During the conflict, Britain and America co-operated very closely not only in the conduct of war, but also in the development of equipment and so the design of the TR1143 was given to the Americans so that they could mass produce it. The result was the SCR522, which was almost identical to the TR1143 and designed to be interchangeable both mechanically and electrically with it.

The American set even included British 'W' plugs in it. It was manufactured by the Bendix Corporation in enormous numbers and was still in production after the war. Both sets used a push-button control unit very similar to that used with the TR1196, making it very easy for the pilot to use. These v.h.f. sets eventually developed into the v.h.f. multi-channel communications systems still in use in commercial aircraft today.

My Early Surplus Days

My early interest in radio began when our next door neighbour gave me a couple of headphones. Later, I bought a couple of carbon microphones (ex RAF microphone type 28) from a surplus shop whilst on holiday in Scarborough.

It was not until a year or two later, when I was told I needed a microphone transformer, that I was able to get it to work. I think I bought it by mail order from Annakins in Otley, who advertised extensively in *PW*. A simple little intercom using these parts brought me and my sister endless hours of pleasure every night before bed.

In 1956 I started buying *PW* and I've still got my first copy! Soon after I bought F.J. Camm's book *The Beginners Guide to Radio* and started to build the one valve radio descried in it. The book was based on a series of articles in *PW*, which began in May 1953.

Later, the radio had two more l.f. audio stages added until I accidentally blew the heaters. As a youngster I could not afford to replace them. One day I plan to remake this lovely little set, now that I have found one of the Hivac valves. I've got all the bits I need, except the valveholder.

Fig. 4: Early bombers used the TR9F for r.t. (voice) communications, together with the A1134 or 1134A intercom (see text).

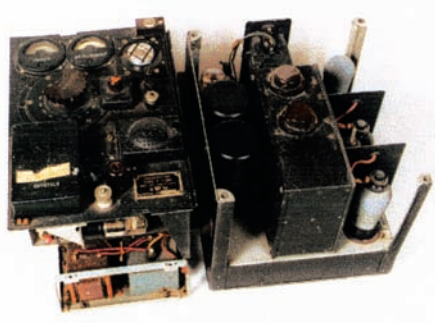


Fig. 5: The author's own TR9 - in need of a case (see text).

Not long afterwards, I bought a Command Set, the one covering 6-9MHz range, from Peter Seymour's in Hull and carried it 13km (eight miles) home on my bicycle. Luckily, this coincided with a couple of articles in *PW* describing it (Converting the Command Receiver, by R.E.S. Coulson, *PW*, November 1957, page 605 and December 1957, page 717, Fig. 14).

Hours of joy followed listening to Radio Nederlands and other broadcast stations, but unfortunately for some reason I was never able to pick up any Amateur stations. One of our neighbours, a Radio Amateur, had an R1155 and a modified T1155, with which he worked Top Band all over the UK and parts of Europe. How I wished I'd had one covering 1.8 or the 3.5MHz band.

Over the years I bought many components from Fanthorpes in Hepworth's Arcade. There was another shop in Hull, called Short Wave Radio. But I never dared go into that one!

Wireless Set 18

Another set I was lucky enough to obtain, was a Wireless Set 18 bought for £1.50 from

a friend, together with a hefty R1355 radar receiver. I carried it all the way from Grimsby by train to New Holland, across the Humber on the Ferry, and then all the way across Hull to the train station and then home! (I'm not sure how I managed this!).

Luckily, I still have the WS18, but again, I never really managed to listen to any Amateur stations on it. Unfortunately, the R1355 was thrown away a good few years ago before I realised its value.

As a student in London in the 1960s, I got to visit the surplus stores in Lisle St and Tottenham Court Road very often. One or two I remember well, were Proops and Relda Radio. Both also had interesting adverts in *PW* and other magazines and were always worth a visit.

Some 10 or 15 years ago I started collecting surplus equipment again and finally obtained my first R1155 receiver. Unfortunately, it was not a trawler band equipped N model, which years ago were so highly praised. But it was equipped with the later version of slow motion drive (slow motion drives and the R1155 in Short Wave Section by A.W. Mann, *PW*, March 1958, page 51).

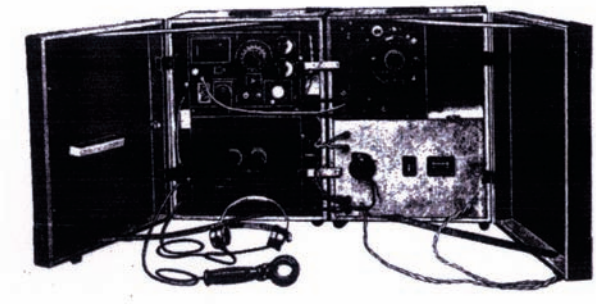


Fig. 6: The 'Darky' emergency DF stations probably used the ground based version of the TR9 transceiver, the R/T Station No. 9, shown here (see text).

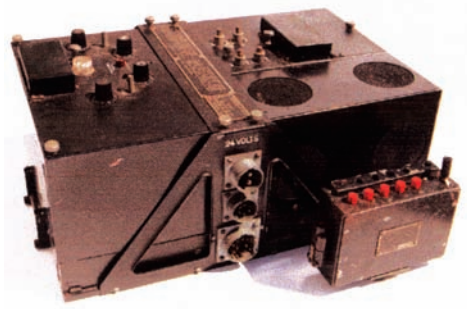


Fig. 7: The complete TR1196 unit.

The R1155 was designed to be used with relatively long antenna. This might explain why the quoted sensitivity is around 5 to 10µV, whereas even in those days, a sensitivity of around 1µV was easily achievable.

Years ago there were many articles about improving the R1155 (for example the series The R1155 communications receiver, *PW*, September 1956, page 461). Luckily my set was completely unmodified.

Years ago most owners ripped out the D/F section from the R1155. In my opinion, this is the best part of the set. The 1155 set was designed as a dual purpose communications receiver and a direction finding set. An extra r.f. amplifier was built in to amplify the weak signal coming from the aircraft's loop antenna. The clever thing about this is that the loop is part of the tuned input coil and is designed to track with the rest of the r.f. circuits when used with the correct table and matching unit. When properly set up, it performs extremely well. In fact, for receiving Radio 4 Long Wave, my R1155 is better than any other set I've got.

Not surprisingly, after all these years, I'm still avidly collecting and restoring this classic equipment! **PW**

In Next Month's *Radio Active*

Competiton!

Great Prizes to be won in our bumper competition - Airband, Amateur, CB, DAB and PMR 446 Prizes - Something for Everyone!

Tried & Tested

Alan 777 PMR 446 Hand-Helds
Morphy DAB EPG FM Radio

Scouting Radio

Jamboree on the Air Report

The Coaxial Story

Cable from Yesterday to Today

Plus all the usual features packed with information for the radio enthusiast...

radio ACTIVE Introducing You to Hobby Radio

RADIO ACTIVE December ISSUE ON SALE 18 Nov

Radio Active is published on the third Friday of each month - available from all good newsagents or direct by calling 0870 224 7830 priced at only £2.85.

ShortWaveMagazine SWM & Scanning Scene

CRAMMED FULL TO BURSTING WITH ESSENTIAL INFO FOR ANY RADIO ENTHUSIAST

Coming up in December 2005 *SWM*

- Computers & Radio Part 5b - A compelling connection
- DRM Update - A look at the latest developments in this digital broadcast mode
- Bumper Scanning Section
- Trying to locate that particular article? See our 2005 Index
- *SWM* Radio Clubs Directory - Find That Club Near You
- Plus! Regular coverage of Scanning, Airband, Broadcast, Satellite Newsfeeds, Weather Satellites, DXTV, Data Modes and h.f. Utilities.
- Keep on top of the world of monitoring

December 2005 Issue On Sale 24 November 2005 - £3.25 - Miss it! Miss out!

WEB DIRECTORY

LAM Communications
E-mail: sales@lamcommunications.net
www.lamcommunications.net

Nevada
E-mail: sales@nevada.co.uk
www.nevada.co.uk

Waters & Stanton
E-mail: sales@wsplc.com
www.wsplc.com

Rocket Group
E-mail: sales@rocketradio.net
www.rocket-group.co.uk

To advertise here call
020 7731 6222

WORSLEY COMMUNICATIONS
COMMUNICATIONS SPECIALIST
ROBIN C WORSLEY G0 MYR
'OMARU', PENNANCE ROAD,
LANNER, REDRUTH,
CORNWALL TR16 5TQ
WWW.hamradiosales.co.uk
Tel: 01209 820118

We're here to make advertising better.

(Not to make better advertising. Sorry.)

Here at the Advertising Standards Authority, we judge ads on whether they're harmful, misleading, or offensive. Not on whether they're funny, clever or they look good. Which is just as well, really.

Telephone 020 7492 2222 www.asa.org.uk

ASA
Keeping advertising standards high

UK's Premier Service Centre
WE ARE STILL THE MOST COMPETITIVELY PRICED SERVICE CENTRE

ICOM KENWOOD Listen to the Future YAESU

WE NOW HAVE NEW WORKSHOPS IN MID WALES

FOR SERVICE & SUPPLY OF PARTS

There really is only one choice. The choice many manufacturers have made when they want their own equipment serviced. We have a comprehensive workshop, fully equipped with modern radio test sets and spectrum analysers, along with 25 years experience in all the main manufacturers

PLEASE RING US FOR YOUR SERVICE AND REPAIR NEEDS

SPARES

We now offer a spare parts service on all main makes and models

RING FOR DETAILS

Castle Electronics

Tanybryn, Pool Road, Llanfair Caereinion, Nr Welshpool, Powys SY21 0HN

Telephone/Fax 01938 810778 TRADE ENQUIRIES WELCOME

SHORTWAVE SHOP *Ltd*
18 FAIRMILE ROAD, CHRISTCHURCH, DORSET BH23 2LJ
Phone/Fax 01202 490099 Website: http://www.shortwave.co.uk

COMMUNICATION SOLUTIONS FROM *The* SHORTWAVE *Shop*

MARINE & SECURITY RADIO EQUIPMENT

LATEST RANGE OF HF TRANSCEIVERS AVAILABLE

WORLDWIDE DISTRIBUTORS FOR WELBROOK RECEIVING ANTENNAS

COMPREHENSIVE RANGE OF ANTENNAS FOR MOBILE AND FIXED LOCATIONS

HF/VHF/UHF RECEIVERS FROM ICOM, YAESU & KENWOOD

DAB & WORLDSPACE RECEIVERS

VISIT: www.shortwave.co.uk FOR OUR LATEST USED EQUIPMENT LISTING

ALINCO, AOR, AKD, BEARCAT, COMTEL, DRAKE, FAIRHAVEN, ICOM, KENWOOD, JRC, LOWE, MAYCOM, MFJ, OPTO, WELLBROOK, YUPITERU, YAESU

THE COMMUNICATION SPECIALISTS
Receivers - Scanners - Transceivers

Call & discuss which part of the radio spectrum you wish to operate and we will advise you on the most cost effective way achieving it.

- **Full range of new & secondhand equipment available.**
- **We stock all leading brands:- Airband Amateur CB, Marine Shortwave Licence-exempt transceivers ● Business and Security Radios**

4 MILES FROM BOURNEMOUTH INTERNATIONAL AIRPORT ON B3073
300 YARDS FROM CHRISTCHURCH RAILWAY STATION. FORECOURT PARKING FOR DISABLED

Trader's Table

The equipment for sale on this page is secondhand or ex-demonstration

Disclaimer

Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K, will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

THE SHORTWAVE SHOP

01202 490099

TRANSCEIVERS

ICOM IC 703 HF+50Mhz QRP TCVR £350
ICOM IC 706 Mk1 HF/VHF TCVR £395
ICOM IC 718 HF/DSP TRANSCEIVER.....£395
ICOM IC471E UHF MULTIMODE TCVR.....£225
ICOM IC746 HF/VHF TRANSCEIVER £495
YAESU FT707 HF TRANSCEIVER.....£195
YAESU FT857 HF/VHF/UHF TCVR.....£395
KENWOOD TS130 HF TRANSCEIVER.....£195
KENWOOD TS450S HF TRANSCEIVER £450
KENWOOD TS140S HF TRANSCEIVER £275
KENWOOD TR751E VHF ALL MODE TCVR..£195
TRIO TS50 HF TRANSCEIVER.....£325
TRIO TS811 UHF BASE TCVR.....£325
KENWOOD TH75 VHF/UHF HANDIE £99
KENWOOD TM 707E VHF/UHF TCVR.....£165
PALSTAR KH-6 50Mhz HANDIE £65
STANDARD C5800 VHF ALL MODE TCVR....£135
YAESU FT290R1 VHF PORTABLE TCVR £95
YAESU FT290R2 VHF PORTABLE TCVR £125
YAESU VX5 50/VHF/UHF HANDIE TCVR.....£125
YAESU VX7 50/VHF/UHF HANDIE TCVR.....£179
ICOM E90 50/VHF/UHF HANDIE TCVR £150
ALINCO DJ191 VHF HANDIE £95

RECEIVERS

SANYO WS1000 WORLDSPACE RCVR.....£85
YAESU FRG 7 HF RECEIVER £85
FAIRHAVEN RD500 RECEIVER.....£395
YAESU VR500 HH RECEIVER.....£99
KENWOOD R5000 HF/VHF RECEIVER.....£325
KENWOOD R2000 HF/VHF RECEIVER.....£225
KENWOOD R1000 HF RECEIVER.....£135
KENWOOD R600 HF RECEIVER.....£95
GRE PSR225 BASE SCANNER £135
LAFAYETTE HA 600A HF RECEIVER.....£95
AOR AR7030 HF HI SPEC RECEIVER.....£475
AOR AR7030 PLUS HF RECEIVER.....£550
ICOM IC R75 HF RECEIVER £450
ICOM IC R72 HF RECEIVER £250
YAESU FRG7700 HF RECEIVER.....£125
YAESU VR5000 WIDE BAND RECEIVER.....£325
YAESU FRG100 HF RECEIVER125.....£275

ACCESSORIES

PALSTAR AT300CN HF ANTENNA TUNER....£89
YAESU FP707 20AMP PSU-SPEAKER.....£85
YAESU FC-707 ANTENNA TUNER.....£55
GLOBAL AT-1000 SWL ANTENNA TUNER £39
RN ELECTRONICS 144/50 TRANSVERTER.....£85
RN ELECTRONICS 144/70 TRANSVERTER.....£85
WELTZ SP220 HF/VHF SWR-PWR METER....£39
BNOS LP50-10-50 50Mhz AMPLIFIER £85
TIMEWAVE DSP9 PLUS DSP UNIT.....£85
MICROWAVE MODULE 50Mhz 30W AMP £65
MICROSET R25 VHF AMPLIFIER £65
MFJ 871 HF ATU.....£50
AEA ET-1 HF ANTENNA TUNER.....£65
DATONG FL2/3 FILTER.....£55
WATSON W30 DUAL BAND RF AMP.....£45
MICROWAVE MODULES 144/100LS AMP £75
DIAWA SW110 SWR/PWR METER.....£39

For latest list please see www.shortwave.co.uk

NEVADA

023-9231 3090

Alinco DJ595 Twinband handy wi h EMS59 Spk Mic & EDC97 Fast Charger..... £179 00
Alinco DJC7 Handy Transceiver c/w Soft Case/Earphone/ERW4C Interface Lead..... £149 00
Kenwood TM231e 50w 2m FM Mobile..... £110 00
Kenwood TR7730 2m FM 25w Transceiver..... £89 00
President Lincoln 10m All Mode 20w Transceiver..... £175 00
Trio TS700s 10w All mode 2m Base Tx wi h Ext VFO..... £299 00
Yaesu FT726R 2M/70CM All Mode 10W Base Transceiver £499 00
Yaesu FT726R 2M/70CM All Mode Base Transceiver..... £399 00
Yaesu FT8800 Dua Band Mobile T ansceiver £239 00
Yaesu VX2E Twinband Compact Handie wi h Wide Receive..... £139 95
Alinco DJX10 Wideband Scanning Receiver..... £199 00
Alinco DJX3 Handheld Scanner c/w accessories & book..... £159 00
Aor AR8200 Wideband Handheld Scanning Receiver £169 00
Commtel COM213 100 channel Handheld Scanner..... £75 00
Fairmate HP2000 All Mode Scanning Receiver..... £107 00
Yaesu VR500 All Mode Handheld Scanner £149 00
Yupiteru MVT9000 MK I Wideband Scanning Receiver £229 00
AOR AR7030 Hi Quality HF Receiver with remote control..... £499 00
Grundig Sat 700 Portable World Receiver..... £169 00
Icom R75 Gene al Coverage Receiver w th 50Mhz..... £499 00
Sangean ATS303 Portable Receiver 13 SW bands & FM/MW £39 00
Icom 718 10-100w (LSB,USB,CW,AM) HF Base/Portable £375 00
Icom 756 100w HF & 100w 6m Transceiver (with 2 filters)..... £699 00
Icom 756Pro 100w HF & 6m T ansceiver wi h ATU & DSP..... £850 00
Kenwood T731e 2/70cms Twinband FM Mobile £199 00
Kenwood TS870SAT 100w DSP HF Transceiver wi h Auto Tune £999 00
Realistic HTX-10 10m 25w All Mode Mobile..... £145 00
Perste BluenotePersona DAB Radio..... £59 00
Moonraker Minor 40 Channel CB Radio £39 95
Zetagi M27 Antenna Matcher £20 00
ADONIS AM-601 Desk Microphone (Wired 8 pin Yaesu)..... £39 00
Alinco EDX2 Automatic Antenna Tuner £225 00
Amdat ADC60 Frequency Standard Clock..... £99 00
Aor CT8200 CTCSS Card £55 00
Astatic Desk Mic wire 8pin for Yaesu..... £59 00
Daiwa PS304II 30 Amp Power Supply (with vo tage protection board). £89 95
Dewsbury S/TUNER Super Tuner..... £25 00
Diamond SX600 UHF/VHF 2-Sensor Meter..... £79 95
Elmic CONTROLS Noise Limitor £10 00
Global AT2000 Tuner..... £65 00
Hei Proset Plus Studio Headphones..... £119 00
Icom AT160 Coaxial Auto ATU..... £179 00
Icom RSR75 Remote Control Software for R75..... £25 00
Icom SCR20 Software & Lead..... £35 00
Jim NF96XI Filter..... £15 00
Kenwood MB201 Mounting Bracket..... £10 00
Kenwood PS30m 20amp Power Supply..... £110 00
MFJ 934 Antenna Tuner & Artificial Ground..... £129 95
MFJ 948 Antenna Tuner..... £99 00
Morse Key Brass Key..... £35 00
Nevada TM1000 1KW Coaster Antenna Tuning Unit..... £169 00
Pakratt 232 Data Terminal & Leads £99 95
Samlex 1223 20amp Switch Mode Power Supply £79 95
Trio TL922 HF Amplifier £895 00
Trio TL922 HF Linear Amplifier £795 00
Uniross Charger and Batteries £12 00
Watson WM2000 Base Microphone..... £85 00
Yaesu CD24 Charger for FT897/FNB78..... £75 00
Yaesu FC107C Antenna Tuning Unit..... £175 00
Yaesu MH35A2B Speaker/Mic for older models..... £19 00

Check our web site for latest Items available. E&OE Prices quoted are in pounds sterling and exclude carriage.

WATERS & STANTON

01702 206835

AlincoEDX-2 1 6-30MHz Automatic 200W ATU for DX-70, DX-77..... £199 00
Timewave DSP-9+ Audio Noise Filter w th Gain Control £99 00
Icom IC-82 H 2m, 70cm All Mode Base T ansceiver 45/40W 12V..... £799 00
Icom IC-3230H 2m 70cm FM Mobile,45/35W Full Duplex..... £249 00
AOR AR-3000 100kHz-2036MHz All Mode Receiver 400ch. 12V + psu ... £449 00
Kantronics KAM plus Multimode Dual Port Data Controller + Pactor £199 00
SGC Power Clear DSP Audio Noise Filter + 5W amp, Band Pass Filter . £179 00
Icom IC-M11 VHF Ma ine FM H/held T ansceiver 6W + sp mic £149 00
Icom IC-2SRE 2m FM H/held t ansceiver + 25-950MHz AM,FM, WFM receiver..... £129 00
GRE PSR-282 66-512MHz (w th gaps) AM,FM Hand Held Receiver 200ch..... £69 00
Yaesu FT-1 R 2m FM H/Held T ansceiver + DTMF keypad..... £99 00
Yaesu RV-7700 B 50-59, 118-130, 140-150MHz Converter for RG-7700/8800..... £59 00
MFJ MFJ-784B Tunable DSP Audio Noise Filter..... £189 00
Alinco DJ-190T 2m FM H/held Transceiver + CTCSS..... £99 00
Icom IC-R3 0 5-2450MHz AM,FM,WFM Receiver 450Ch. + 2" TFT colour TV..... £269 00
Sony ICF-SW7600GR Portable Receiver w th FM stereo and SSB £89 00
MFJ MFJ-852 Power Line Noise Meter £69 00
ADI AT-400 70cm FM H/Held w th Batte y box 420-465MHz RX..... £89 00
BNOS TL50-144-25 6m 25W Linear Transverter w th 2m IF at 1W 12V DC (5A max) £89 00
Sony ICF-SW07 Min Receiver + FM stereo, SSB & "One Touch" tuning..... £169 00
Realistic Pro-39 68-960MHz (wi h gaps) H/held scanner AM,FM 200Ch Hyperscan..... £69 00
MFJ MFJ-204B 1 8-30MHz Antenna Tuning Bridge up to 500ohm..... £59 00
Yaesu VR-500 100kHz-1300MHz All Mode Receiver 1000Ch Alpha..... £169 00
Lowe HF-125 30kHz-30MHz All Mode Receiver 12V £199 00
Roberts RC-828 Portable Receiver w th SSB and Cassette..... £125 00
Icom IC-R3 0 5-2450MHz AM,FM,WFM Receiver 450Ch. + 2" TFT colour TV..... £269 00
MFJ MFJ-203 1 8-30MHz Bandswitch Dip Meter..... £65 00
Yaesu RT-7700 150kHz-30MHz Receive ATU for RG-7700/8800..... £69 00
Icom IC-R72 100kHz-30MHz AM,CW,SSB Base Receiver mains or 12V £329 00
Palstar R-30HF 100kHz-30MHz AM, SSB Receiver 12V DC..... £329 00
Roberts R-827 Portable 0-30MHz w th FM Stereo & SSB via BFO..... £119 00
Icom IC-R3 0 5-2450MHz AM,FM,WFM Receiver 450Ch. + 2" TFT colour TV..... £269 00
Uniden UBC-3000XLT 25-1300MHz AM,FM Handheld Receiver 400Ch... £129 00
Team EURO-8000 80ch 4w UK CB Base Station 12V or mains..... £99 00
Diamond GZV-6000 12V variable 60A Regulated Switch Mode PSU + meters £199 00
Team EURO-8000 80ch 4w UK CB Base Station 12V or mains..... £99 00
Yaesu FT-50R 2m/70cm FM Hand Held Transceiver + Dua Display, Wide RX £149 00
Yupiteru MVT-9000 0 5-2039MHz All Mode Receiver 1000Ch £199 00
Icom IC-R75 30kHz-60MHz All Mode Receiver + DSP option 12V wi h psu..... £525 00
Kenwood TM-251E 2m FM Mobile Transceiver 50W, 10W, 5W + 70cm RX, Ful Duplex..... £199 00
Kantronics KAM plus Multimode Dua Por Data Controller + Pactor £199 00
Yaesu VR-120D 100kHz-1300MHz AM,FM,WFM Hand Held Receiver 640Ch..... £109 00
GRE PSR-282 66-512MHz (w th gaps) AM,FM Hand Held Receiver 200ch..... £69 00
JRC NRD-525 90kHz-34MHz All Mode Communications Receiver 200Ch. Mains..... £449 00
Yaesu VR-500 100kHz-1300MHz All Mode Hand Held Receiver 1000Ch. Alpha..... £149 00
Icom IC-R75 30kHz-60MHz All Mode Receiver 12V w th psu..... £499 00
Microwave Modules MMT-144-28 2m 10W T ansverter 28MHz IF..... £69 00
Alinco DJ-C1 2m FM Micro Hand Held + CTCSS & Wide RX £69 00
Global AT-1000 0 5-30MHz SWL ATU..... £59 00
Alinco DJ-191 2m FM H/Held w th DTMF keypad..... £119 00
Icom IC-R3 0 5-2450MHz AM,FM,WFM Receiver 450Ch. + 2" TFT colour TV..... £299 00
AKD AKD-7003 70cm FM Mobile Channelised 3W..... £89 00
MFJ MFJ-382 Amplified Speaker 1W (36 dB max) 9V batt or 12V DC..... £29 00
Kantronics KAM Multimode Data TNC..... £99 00
ADI AT-200 2m FM H/Held T ansceiver w th Nicad & Charger £89 00
Alinco DJ-480E 70cm FM H/Held Transceiver + Nicad & Charger..... £89 00
MFJ MFJ-959C 0-30MHz Receiver ATU w th 20db Preamplifier, 12V £65 00
Fai haven RD-500VX ....10kHz-1750MHz All Mode Receiver w th PC Control, CD ROM, 13000+ Ch. 12V + PSU £549 00
Global AT-2000 150kHz-30MHz SWL ATU wi h Q selector £69 00
Ameritron ALS-600XCE 10-160m Solid State 600W Amplifier £849 00
Icom IC-746 HF,6m,2m All Mode Base T ansceiver + DSP, ATU & Gen Cov. RX 12V..... £899 00
Yaesu VR-120 100kHz-1300MHz AM,FM,WFM Receiver 640Ch..... £109 00
Garmin Geko 20112ch GPS Receiver..... £69 00

Please check our website for latest list.
www.wspic.com

AMATEUR & CB RADIO KITS & MODULES

TRANSVERTERS for 2 or 4 or 6 metres from a 10 metre rig, or 4 or 6 metre from a 2 metre rig. Includes new overtone local oscillator, and integral interface unit. 20dB receive gain, 25W transmit power. Low level drive dual IF versions **TRC2-10dL, TRC4-10dL & TRC6-10dL**, high level drive single IF versions **TRC2-10sL, TRC4-10sL, TRC6-10sL, TRC4-2sL, TRC6-2sL, Complete kit £163.00. Built £244.00**.

TRANSMIT AMPLIFIERS, for 2 or 4 or 6metres, single stage switched class AB linear. Diecast box with SO239 connectors. 1W to 5W drive, 8W to 30W output, Types **TA2SA, TA4SA, TA6SA**. **Complete kit £59.00**. **Ready Built £82.00**. 5W to 20W drive, 22W to 60W output, **Types TA2SB, TA4SB, TA6SB, Complete kit £65.00. Ready built £88.00.**

NEW TWO TONE OSCILLATOR as featured in PW March 2005. A vital piece of test equipment used together with an oscilloscope for setting up AM, DSB, & SSB transmitters. **PCB & bits £10.00. PCB assembled £20. PCB & hardware kit £25. Ready Built £52.50**

MELLSTOCK 4M AM 1W TX Two channel transmitter with 1W carrier power and high quality audio from integral speech processor. Subject of PW Sept and Oct 2005 articles. **PCB £16**. Mod transformer **£9.50**. Complete kit with PCB, transformer, mic gain pot, channel switch & mic chassis plug **£57.50**. Complete kit plus drilled and labelled box and other hardware **£76.50**.

MELLSTOCK 4M AM RX Two channel double superhet receiver to go with the Mellstock transmitter. 0.4uV sensitivity. **PCB £10**. Components plus volume pot and channel switch (excluding crystals & S Meter) **£30.00**.

STATION PREAMPS for 2 or 4 or 6metres. RF & DC switched. Adjustable 0-26dB gain. 100W power handling. **RP2S, RP4S, RP6S, PCB & Hardware kit £29, Ready Built £47**.

MASTHEAD PREAMPs, for 2 or 4 or 6mtrs. RF switched & DC fed via the coax. With station box and heavy duty waterproof masthead box. **RP2SM, RP4SM, RP6SM, PCB & hardware kit £38.00, Ready Built £57.00**.

SPEECH PROCESSOR increases the average sideband power of SSB transmitters without driving the PA into clipping. Includes filtering to enhance the higher voice tones to increase intelligibility, and it sounds nice too. Panel control for clip and output level. Supplied with plugs & sockets to suit most popular rigs. Type **SP1000, PCB & Hardware kit £29.00, Ready built £63.50**.

SPECTRUM COMMUNICATIONS

12 WEATHERBURY WAY, DORCHESTER, DORSET DT1 2EF. Tel & Fax 01305 262250.

Mail order only. Prices include postage. Cheques payable to A.J. & J.R. Nailer.

e-mail: wway@screaming.net Web site: http://members.tripod.co.uk/spectrum

Amateur, CB, Hospital Radio Links, OB Links, & RSL Transmitters

the pwpublishing RADIO BOOK STORE

The wait is over!

The *UK Scanning Directory* - the essential book for all scanner owners and frequency collectors is available right now!

Place your order today.

ONLY £19.75 PLUS P&P

Frequencies Covered:
- Aeronautical Navigation
- Amateur Radio
- Ambulance Service
- CB
- Civil Aviation
- Commercial Broadcasting
- Digital Radio
- Fire Brigade
- Maritime
- Military Aviation
- Mobile Telephones
- Ministry of Defence
- Outside Broadcasting Links
- Paging
- PMR
- Point - Point Links
- Police
- Radio Microphones
- Satellite Links
- Satellite Navigation
- TV Broadcasting

- The 9th edition of The ***UK Scanning Directory*** is packed full of VHF/UHF frequencies - from 26MHz to 2.5GHz. It covers everything from covert gove nment frequencies to local council traffic wardens and dust carts. It has been completely updated; old frequencies have been discarded and thousands of new, verified ones added. This is the definitive frequency guide and that's why it's used not only by radio enthusiasts and frequency collectors but also by industry and the military, the police and various other gove nment departments.
- Everybody's amazed by the information we print. We list frequencies for Civil and Military Aviation, Army, Navy, Police, DSS Snoopers, GCHQ, Prisons, Eye-in-the-Sky Links, Bailiffs, Outside Broadcasting, Motor Racing, Universities, Railways, Telephones, Couriers and many more we dare not mention. All frequencies are listed in a logical o der under the relevant sections of the radio spectrum to make it easier for you to find the ones you're looking for and to help you to explore new areas.
- The Aviation Bands section covers both Military and Civilian Aviation and a separate section lists every airport and military airfield in alphabetical order to make finding frequencies easier and quicker.
- As well as frequency lists, there are also articles on scanning and the law, scanning for beginners, how to monitor PMR, the military and the civilian aviation bands, Formula One and rallies and a late news section for the very latest discoveries. **Whether you're an experienced scanner user or just starting out, this book will help you to get the most out of the hobby.**

The *UK Scanning Directory* is Britain's largest and best selling VHF/UHF frequency directory and the undisputed leader in the field. No other book dares to list so many frequencies and in such great detail.

THIS BOOK WILL NOT DISAPPOINT!

Order BY PHONE · 0870 224 7830
For credit card orders.

Order BY FAX · 0870 224 7850
See our book service for details.

VHF DXer

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

DAVID G4ASR HAS REPORTS OF AN ACTIVE SUN DURING A SOLAR MINIMUM

Contacting stations in far-away places, 'Working DX', is one of Amateur Radio's greatest challenges, especially if you choose to do it within the v.h.f. spectrum. When these bands open up for DX they can produce some truly exotic signals.

If you start to get interested you could soon be hearing the stunning strength of Sporadic-E signals, the raspy sound of signals reflected back from an aurora or the startling bursts of high speed data or single-sideband telephony scattered from meteor trails. And one day, if you really go for it, you could be hearing your own signals echoing back from the Moon!

To work DX, you are to a great extent, dependent on the prevailing propagation conditions. Propagation is by far the most important factor effecting whether you can work a particular station or not. If there is no propagation path open to the station, the sad fact is that your site, equipment and operating skill are of no importance. On the other hand, when the band is wide open, you can work very long distances with minimal equipment. So be aware of the various propagation modes and make good use of them when they occur.

THE 50MHz BAND

One of the easiest v.h.f. bands on which to work DX is the 50MHz band. Antennas can be relatively small and you don't need lots of power either. At this point in the sunspot cycle the best DX opportunities on the 'magic band' will come via Sporadic-E (Sp-E) propagation that normally occurs between May to August. Sp-E openings can also occur during the winter period too but they're generally few and far between

Last year for example there were only 11 brief openings during the December-January period. The winter Sp-E openings are normally quite weak and the maximum usable frequency (m.u.f.) doesn't rise much above 60MHz or so. However, there's always the exception, openings have been noted on the 144MHz band, but these are very rare.

A number of operators have reported that Sp-E openings continued into September although by the time you read this most of these events will have disappeared. Openings were reported on September 1 between 0945-1015UTC to Spain (EH5DIT) and Ceuta and Melilla (EH9IB), on September 9 between 0650-0730UTC to Germany (DL1MAX) and beacons in the Faroe Islands (OY6SMC), Slovenia (S55ZRS) and Switzerland (HB9SIX) and on September 15 between 0845-0930UTC to the Czech Republic (OK1AIT), Poland (SP6DNS) and later in the day between 2100-2145UTC to Morocco (CN8KD). There were also further Sp-E openings at the end of the month between 1850-1950UTC on September 28 to Portugal (CT1JFC) and Morocco (CN8MC beacon), between 1145-1315UTC on September 29 to Italy (IK5RLP) and later around 1700UTC again to Italy (IG9/I2ADN) and Morocco.

Andy Foad G0FTD (Kent JO01) reports that he has recently worked a number of stations on the 50MHz band despite running only 5W output into a two wavelength wire loop pinned to his bedroom wall. His contacts accomplished via Sp-E propagation include the c.w. stations of ES8DH, HA1YA, HA2RD, HA3UU, HA6NL, IK3GHZ, LZ3RX, OH2LE, OH3JR, OH3MF, S51UF and 9A1CM.

Andy also made an s.s.b. contact with the station of CT1DIZ whilst using his low-power Yaesu FT-817 transceiver and a miniscule 50MHz 'rubber duck' antenna. Incidentally, Andy mentions that he monitors the Band 1 television frequencies 49.7386 and 53.736MHz to detect possible band openings.

The incidence of Sp-E propagation should now be pretty much non-existent and at this stage of the solar cycle there will be very little in the way of DX to be found on the 50MHz band for at least the next five months. However, some DX activity will still be available via auroral backscatter propagation.

Interestingly, an E-layer type opening approximately 24 hours before the coronal mass ejection impacts the Earth precedes some auroral events. This is termed a pre-auroral enhancement. So, if you note an unusual opening on the 50MHz band don't forget to look for an aurora on the following day.

ACTIVE SUN

The Sun was unusually active during September, so much so that solar minimum looked strangely like solar maximum. On September 7 a huge sunspot rounded the Sun's eastern limb and as soon as it appeared, it exploded, producing one of the brightest x-ray solar flares for over a decade.

In the days that followed the growing spot exploded eight more times. Each powerful 'X-flare' caused a short-wave radio blackout on Earth and pumped new energy into a radiation storm around our planet. The blasts hurled magnetic clouds toward Earth and auroral openings were reported on September 9, 10, 11, 12, 13 and 15.

Although solar minimum isn't due until 2006 forecasters did expect that 2005 would be a quiet year on the Sun. But it's been anything but quiet with an X-flare on New Year's Day and since then we've experienced four severe geomagnetic storms and 14 more X-flares! During the most recent solar maximum (in 2000) there were three severe geomagnetic storms and 17 X-flares. When you compare these two years you will see how similar the geomagnetic activity was during solar minimum and solar maximum.

Scientists track the 11-year solar cycle by counting sunspots. When sunspot numbers peak, that's solar maximum, and when they ebb, that's solar minimum. This is supposed to work because sunspots are the main sources of solar activity.

Sunspot magnetic fields become unstable and explode producing a flash of electromagnetic radiation, a solar flare. It can also hurl a billion-ton cloud of magnetised gas into space, a coronal mass ejection or c.m.e. When the c.m.e. reaches Earth it sparks a geomagnetic storm and we enjoy radio auroras on the v.h.f. bands.

The auroral backscatter openings that occurred between September 9-15 weren't particularly widespread but they did manage to generate activity on all bands from 50 through to 430MHz. Six Metre operators reported contacts throughout the UK, Eire and Denmark.

The Svalbard beacon, JW9SIX (50.048MHz) and the Jan Mayen beacon JX7SIX (50.079MHz) were also heard via Auroral-Es on September 10 and 12 with signals peaking 579. Not much auroral activity was heard on the 70MHz band during the period although stations did report working around the UK and into Denmark between 1445-1530UTC on September 15.

The OY6BEC (70.035MHz) and OZ7IGY (70.021MHz) beacons were also spotted at the same time. There was much more activity on the 144MHz band with contacts being made on September 10 between 1615-1800UTC with stations in Denmark (OZ), Norway (LA), Sweden (SM) and northern Germany (DL), on

September 11 between 0630-0715UTC to Sweden and in the afternoon between 1330-1600UTC around the UK and over to Belgium (ON), Germany and the Netherlands (PA).

A brief 144MHz opening was reported on September 12 between 1540-1600UTC and the best event of the period occurred on September 15 with contacts being made between 1400-1630UTC with stations as far east as Poland (SP). Among the DX worked on the 144MHz band were the c.w. stations of DL/UT8AL, LA4YGA, LA8NK, OZ0TE, OZ8FR, SM2ILF, SK7MW and SP2MKO. The impact on September 15 was so intense that inter-UK c.w. contacts were also made on the 430MHz band.

It's interesting to note that although sunspot numbers have declined since 2000 the solar activity still persists. The reason for this is that whilst the sunspots of 2005 have been fewer most have done more than their share of exploding. Sunspot 798/808, the source of the September 7 super flare and eight lesser X-flares, by itself has made September 2005 the most active month on the Sun since March 1991. But is this just an aberration or the normal rush to the bottom of the solar cycle? Unfortunately, we need to observe more solar cycles to answer that question and because each cycle lasts 11 years the observations takes time.

Meanwhile in 2006 solar minimum should finally arrive but who knows what the Sun will do then? Solar activity can be very unpredictable, which is exactly why v.h.f. DXers learn about the various propagation modes and make good use of them when they occur.

METEOR SCATTER

For the next five months or so, apart from occasional auroral openings, the v.h.f. bands can remain fairly quiet. Of course the real DXer knows that meteor scatter (m.s.) and moonbounce (e.m.e.) can fill in the gaps! Meteor scatter communication works by scattering v.h.f. signals from the ionised trails of meteors. Although the reflections, or bursts, are generally quite short, contacts can be made with similar enthusiasts up to 2000km away.

The very best time for meteor scatter is during a major shower but thanks to the impressive software from **Joe Taylor K1JT** contacts can easily be made every day via sporadic meteors. All you need is the *WSJT* program running on a computer with a simple interface and a low-power s.s.b. transceiver and antenna.

The *WSJT* program is free and is available at **www.pulsar.princeton.edu/~joe/K1JT/** or on the European mirror site **www.vhfdx.de/wsjt/**. It currently supports three principal modes, FSK441, JT6M and JT65. The FSK441 mode is designed for meteor scatter communication using the very brief 'pings' from meteor trails in the ionosphere. On the other hand JT6M is also used for meteor scatter but is specifically optimised for meteor reflections that occur on the 50MHz band. Finally, JT65 is not used for 'intermittent' m.s. propagation but is designed for extremely weak but slowly varying signals such as those found on troposcatter and Earth-Moon-Earth (e.m.e.) paths.

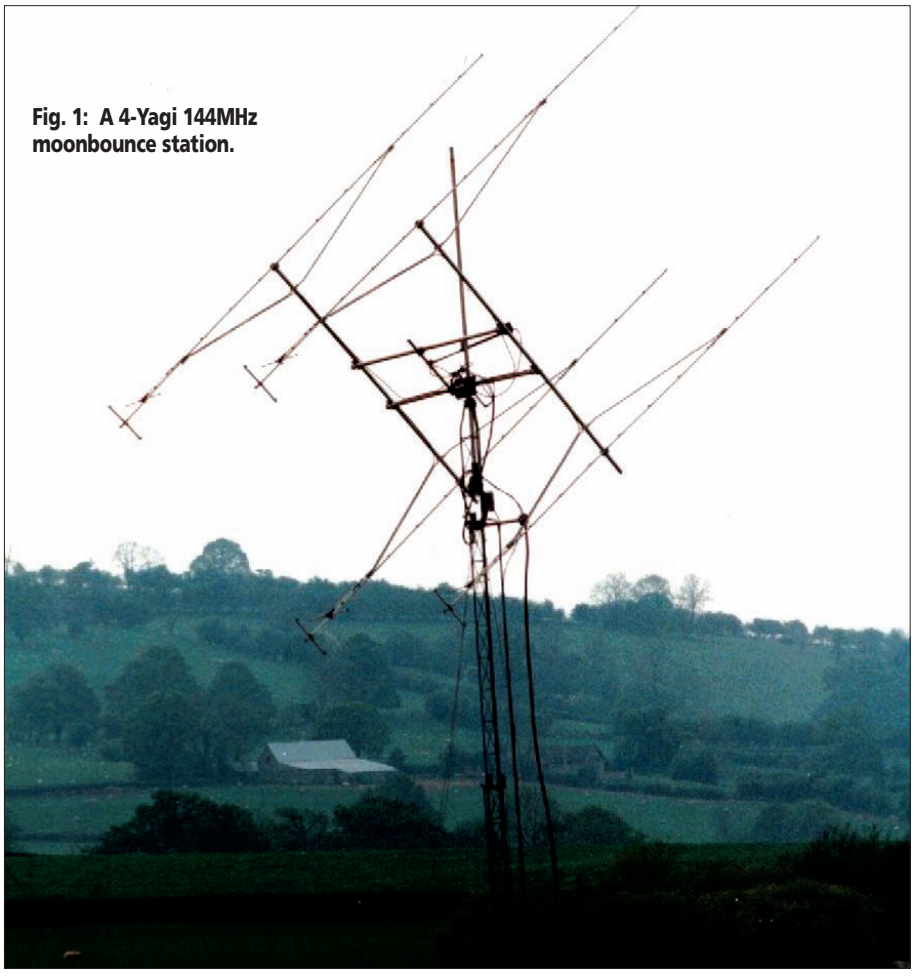


Fig. 1: A 4-Yagi 144MHz moonbounce station.

The majority of WSJT activity is found around 50.230MHz (using JT6M) or 144.370MHz (using FSK441). There's currently very little activity on the 70MHz band due to restricted allocations throughout the region. Meteor returns on the 430MHz band are so minimal that only stations with very high power and good antennas attempt contacts and then only during the peak of a major shower.

September was a reasonable month for meteor activity and some of the JT6M contacts made on the 50MHz band during the period included the stations of CN8IG, EH4EHI, F1RLF, HB9QQ, IC8/N5KME, LA8NK, LX3DX, LY3UM, OE5MPL, OZ1P, SM3BIU, SP9HWY, S59MA and 8S5X. On the 144MHz band UK operators reported FSK441 contacts with HA5RL, IV3DXW, LZ2FO, OE3JTB, OK2AF, SM/DJ8MS, SP3VSC, S54T, YU1EV and 9A4QV.

MOONBOUNCE

In September K1JT released the new Version 5.3.8 of his *WSJT* software and this contains many new improvements over older versions. The use of JT65 for moonbounce communication has really opened up a new world (literally) for many v.h.f. and u.h.f. weak-signal stations. It's now possible to work e.m.e. on a regular basis using only a single Yagi (even a small one) and 100W (or even less!) at the antenna. With such equipment it is not only possible to work the very big stations but it is definitely possible to work many smaller stations as well.

On the 144MHz band a single Yagi and 100W is enough to work four Yagi stations (shown in **Fig. 1**) and there are very many of these around the world. On the 430MHz band a single Yagi and 100W are enough to work eight Yagi stations.

In fact if you have a single Yagi and 50W you can easily work many of the larger stations on both the 144 and 430MHz bands by using JT65 techniques. In September the station of GW4HDF running 200W and a 9-element Yagi worked RN6BN on the 144MHz band and G4RGK running 45W and a 21-element Yagi contacted HB9Q on the 430MHz band. Making low-power e.m.e. contacts is now a reality thanks to K1JT and his amazing *WSJT* software.

DEADLINES

If you've made any DX QSOs recently or just wish to pass on any news please let me know about it. Send any reports or news, preferably by E-mail, to reach me by the last weekend of the month.

73, David G4ASR

DAVID BUTLER G4ASR
YEW TREE COTTAGE
LOWER MAESCOED
HEREFORDSHIRE HR2 0HP
TEL: (01873) 860679
E-MAIL: g4asr@btinternet.com

HF Highlights

AS USUAL, INFORMATION, REPORTS AND PHOTOGRAPHS TO ME PLEASE BY THE 15TH OF EACH MONTH.

CARL GW0VSW ROUNDS UP THE LATEST NEWS FROM THE HF BANDS WITH THE HELP OF YOUR REPORTS

As winter is almost upon us I guess that now is the time we should all be checking our antenna installations before the cold weather really sets in. Winds here in the UK appear to be getting stronger now and it makes sense to ensure that all your masts, beams, verticals, dipoles and guy wires are secure ready for whatever the UK weather has in store for us! The morale should be 'If in doubt replace it' as there is nothing worse than picking up the pieces of your favourite antenna, which would have survived had you carried out a few minutes maintenance!

DX NEWS

On to some DX news now and the same **Clipperton DX Club** team that activated the **A52FH** and **A52CDX** calls in 2000 and 2004, will once again return to Bhutan. The team will be there from 18 November until the 3 December. Operators mentioned as I put the column together were Gerard Debelle F2VX, Jean-Louis Dupoirer F9DK, Vincent Denecker G0LMX and Alain Tuduri F5LMJ.

Team members will be at the Amateur centre in Thimphu from November 18-29th, and then try to be active from Bunthang and Paro Valley. This is not a DXpedition but a 'ham radio project', which is hoped will promote the growth of Amateur Radio in Bhutan. To continue their project with the Bhutan Telcom Authority, they will donate one or two radios that would be used to create new radio clubs in eastern Bhutan. The QSL info will be the same as the 2004 operation via F9DK with QSL cards OK via the bureau or direct to **Jean-Louis Dupoirier, 11 rue Henri Barbusse, 78114 Magny Les Hameaux, France.**

Another operation to look out for will be from the US Virgin Islands where **John Thompson K3MD**, will be active as **KP2/K3MD** during the CQ WW DX CW Contest from 26-27th November as a Single-Op/All-Band/High-Power entry. John will be operating portable from the north shore of St. John's for a few days before the contest using wire antennas and a vertical running 500W. Activity is expected to be on all bands from 3.5 to 28MHz but will exclude the WARC bands during the contest. The rules for this years CW contest can be found at **www.cq-amateur-radio.com/WWDXConRules8905.pdf**

There is a change of country for **Joseph Raihshtain** whose new callsign will be **RD4HF** after moving to Russia with his family. He has held the following callsigns: 4K6GF, UD6GF, UD6DLJ, 4K500GF, 4K70GF and 4KA6GF. Any QSL cards for all these previous calls and of course his new one will be available direct from his mail address **Joseph S. Raihshtain, PO Box 12466, Samara 443084, Russia.**

YOUR REPORTS

On to your reports now and **Colin Topping GM6HGW** who has been trying out his new SG-2020 transceiver, which replaces his Icom IC-706. He has been very pleased with the SG-2020's performance logging 7MHz s.s.b. contacts with LA3BG (Norway) 0915, OO7DDG (Belgium) 1430, HB0/ON6UQ (Liechtenstein) 1955 and IW7ED (Italy) at 2050 from his QTH in Gauldry, Fife.

Also on 7MHz was **Martin Addison M3JUQ** in East Finchley, North London who uses a Yaesu FT-840 running 10W s.s.b. into a folded half-size G5RV. Martin thought he had a quiet month until he went to submit his logbook for this month's report! His large log contains many stations worked during the International Lighthouse/Lightship weekend, as well as a long list of Europeans. This includes F5NMK/P (France) 0701, EA9CP/P (Ceuta & Melilla), DA0QS (Germany) 0721, IK2WXQ (Italy) 0755, MM0LSB/P (Scotland) Dennis operating on Gigha Island EU-008 at 0933, PA0AGA (Netherlands) 1757 and Alan G4XNG/P operating from Lindisfarne EU-120 at 1930UTC.

A warm welcome back now to former columnist **Leighton Smart GW0LBI** in Trelewis, Mid-Glamorgan who has been QRT for sometime. The good news is that he has been persuaded, encouraged, nagged and coaxed to return to the h.f. bands by a large number of local Amateurs including **Kevin Dawson MW0KEV**! Leighton say's "One reason for me closing down was the appalling drop in standards on the bands particularly on 3.5 and 7MHz. However, I have now returned with a more compact station comprising a Yaesu FT-100 with small extension speaker and three home-brew antennas".

Leighton goes on to explain "The first is a dog-legged dipole for 7MHz with one leg sloping down to one corner of the garden and the other end running over the roof of the house dropping down at the pine end. I cut a dipole for 14MHz and constructed a vertical for 18, 21 and 28MHz bands. The FT-100 performs very well and the power output can be dropped to 1W or less at the push of a button, enabling me to operate at QRP levels, which I have enjoyed so much in the past". Leighton made a large number of 1W c.w. QRP contacts including LA5ZO (Norway) 1801, RK3AOL (European Russia) 1945, DF2DM (Germany) 2029, ZA/Z35M (Albania) 2140 and EW6DW (Belarus) at 2121UTC.

On 10MHz all c.w. man **Ted Trowell G2HKU**, Isle of Sheppy, Kent managed just one contact with ND9M/MM off the coast of Portugal bound for the Mediterranean Sea at 1900UTC using a Ten-Tec Omni-V and G5RV antenna. Ted mentioned that "During a QSO with well known QRPer **George Burt GM3OXX** who was running his usual '1W' he mentioned that it was nice to QSO once again. I asked him when we had previously contacted each other and he said 30 years ago!

"We agreed to try and make the next contact before the next 30 years goes by! During the past month I have also had 10 contacts with **Peter Taylor 8R1J** who surprised me by saying that many years ago he often used to sit on the end of Southend Pier looking across to my island watching the paddle steamers arriving. He stayed in Thorpe Bay and prior to Second World War had a yacht built there, which ran aground once in Mid Estuary. What a small world!"

THE 14MHz BAND

On 14MHz Ted found band conditions slightly better, logging ST0RM (Sudan) at 1800 followed by CX6VM (Uruguay), ZP6CW

(Paraguay), 8R1J (Guyana), YV5YMA (Venezuela), FY5PO (French Guiana) and PY1OTO (Brazil) around 200UTC. The mobile log of **Mark Taylor G0LGJ** continues to grow with C31/F5PZQ (Andorra) 0649, YB3SAD (Indonesia) 1701, ZX2B (Brazil) 2148 and A43JA (Oman) at 2240UTC all being worked this month. Mark uses a Kenwood TS-480 and DK3 screwdriver antenna.

Keith Winward 2E0JKD has changed his station once again and is now using a Yaesu FT-1000D and a two element beam. His first QSO's were with LA9LMA (Norway) at 2220 and N4BNM (U.S.A.) in Kennesaw, Georgia at 2335UTC. It looks like there will be some DX rivalry now between Keith and his friend **Philip Roberts 2E0BBP** who incidentally, scored top marks in his radio exam!

On to Biggleswade in Bedfordshire and **Owen Williams G0PHY** who had a quiet month again but found time to switch on his Yaesu FT-757 and with 100W s.s.b. working R0K/P (Asiatic Russia) on Bolshoy Routan Island AS-038 at 1209 followed by J20VB (Djibouti) at 1657UTC. His antenna is a dipole. In Dumfries **Jim Pedley GM7TUD** found c.w. station 8S9M (Sweden) 0842, then had s.s.b. contacts with ZL6LH (New Zealand) 1002, R0K (Asiatic Russia) on AS-174 at 1248, SU8IOTA (Egypt) on AF-099 at 1300, BA4DW/7 (China) 1359, HB0/PA6TUE (Liechtenstein) using RTTY at 1556, OX/EA3EKS (Greenland) NA-018 and 9V1YC (Singapore) AS-019 at 1736UTC using a Kenwood TS-450S at 100 watts to a TGM MQ4 beam.

Martyn Medcalf M3VAM in Chelmsford, Essex worked s.s.b. stations YO3CTK (Romania) 1237, HA9RU (Hungary) 1254, 9A5BS (Croatia) 1258, S53EO (Slovenia) 1303, LY9A (Lithuania) 1307, UT7DK (Ukraine) 1329, RK3AWL (European Russia) 1603, SM6FJY (Sweden) 1943 and SV9/IK7VEH (Crete) EU-015 at 2004UTC using an Icom IC-746 and long wire antenna with SGC-237 auto tuner.

It was "Not a bad month for DX when the bands were open" said **Chris Colclough G1VDP** in Nuneaton. "There was plenty of Island activity on 14MHz and it was nice to be able to work some of the more 'local' European IOTAs with the chance of receiving a QSL card to confirm the contacts fairly quickly. For me this is probably the most frustrating part of the hobby. Working a new DX entity or island and then not getting a QSL card even when you send direct is annoying to say the least".

I am sure we have all experienced this problem at some time or other. Some of the stations in Chris's s.s.b. log include ZS6CCY (South Africa) 0604, ED8LHT (Canary Islands) 1012 on Grand Canaria AF-008, SV/IK8VRH (Italy) 1550 on Skiza Island EU-158, T88BH (Belau) 1648 OC-009, BV50CRA (Taiwan) 1723 AS-020, JA1DVF (Japan) 1724 AS-007, T6X (Afghanistan) 1754, S61FD (Singapore) 1814, 9M2CNC (West Malaysia) 1832, SV1EQU/8 (Greece) 1851 on Aigina Island EU-075, RV3MA/0 (Asiatic Russia) 1912 on Shalaurova Island AS-174, OZ1DYI/P (Denmark) 1937 on Jyland Island EU-125, P4/N9LAH (Aruba) 2057 SA-036, ZP5PVM (Paraguay) 2100, CX5BW (Uraguay) 2114, EI9FBB (Eire) 2116 EU-115, K0ARY/VP9 (Bermuda) 2131 NA-005, TI8CBT (Costa Rica) 2134, KL7LF (Alaska) 2220 and 4U1WB (USA) 2221 operating from the World Bank in Washington, DC using an Yaesu FT-897, 400W and Cushcraft MA5B Beam antenna.

The 9M2CNC QSL card worked by Chris Colclough G1VDP on 14MHz (see text).

Leighton Smart GW0LBI who has returned to the Amateur bands after a long break.

THE 18 & 21MHz BANDS

A few reporters worked the 18MHz band, though openings here were not that good. Ted G2HKU found N1EA (USA) 1600 in Green Harbor, Massachusetts and later around 1900UTC 4S7NE (Sri Lanka) AS-003, OH0JFP 1912 (Aland Island) EU-002 and YV50HW (Venezuela). The mobile s.s.b. of Mark G0LGJ reached KW7Y (USA) 1731 Marysville, Washington, HI3/KB2MS (Dominican Republic) 2032 NA-096 and LW2DFH (Argentina) 2050UTC.

The 5W c.w. of Leighton GW0LBI was copied by 9H1AL (Malta) 1635 EU-023, HF10YGS (Poland) 1936 and VP5/K4SV (Turks & Caicos Islands) 2250 NA-002. Two other contacts were made using 10W s.s.b. and they were with SV1EQU/8 (Greece) 1430 and YV5EED (Venezuela) at 2200UTC. Martin M3JUQ logged WB3IHJ (USA) at 1248 in Hazelton, Pennsylvania and EA7/DH3WO/P (Spain) at 1916UTC using s.s.b. once again.

In Scotland Jim GM7TUD logged one 21MHz contact with VC9W (Canada) at 1844UTC on NA-014 while Chris G1VDP worked FM5WE (Martinique) at 2210 NA-107. Mark G0LGJ managed two stations here, YB3ASD (Indonesia) at 1701 followed by ZP5PVM (Paraguay) at 2115UTC.

THE 24 & 28MHz BANDS

The higher bands have been very quiet yet again with not much activity reported. However, a brief visit to 24MHz by Jim GM7TUD caught HB0/PA6TUE (Liechtenstein) using s.s.b. at 1045 and the same station again on 28MHz a short while later at 1049UTC. Finally, Chris G1VDP worked XQ3/IQ6CC (Chile) at 2046 and later LU7HN (Argentina) at 2115 despite some rather poor conditions.

SIGNING OFF

Well that is all there is space for once again. The h.f. bands continue to open up and at odd times with the lower bands showing most signs of activity. Once again there does appear to be the odd short openings on 21MHz and up though this later in the evenings. Static noise has been very high on these higher bands making operating very hard on the ears! With the winter months upon us I hope we see some improvement soon!

As usual my thanks go to all our reporters this month and to **Tedd Mirgliotta KB8NW** Editor of the *OPDX Bulletin* and **Mauro Pregliasco I1JQJ/KB2TJM** Editor of the *425 DX Newsletter* for the DX information. Until next time have a good DX filled month.

73, Carl GW0VSW

CARL MASON GW0VSW
12 LLWYN-Y-BRYN
CRYMLYN PARC
SKEWEN, WEST GLAMORGAN SA10 6DZ
Tel: (01792) 817321
E-MAIL: carl@gw0vsw.freeserve.co.uk

The Radio Communication Handbook is Back !

BIGGER & BETTER THAN EVER BEFORE!

The RSGB Radio Communication Handbook
8th edition
Edited by Mike Dennison, G3XDV and Chris Lorek, G4HCL

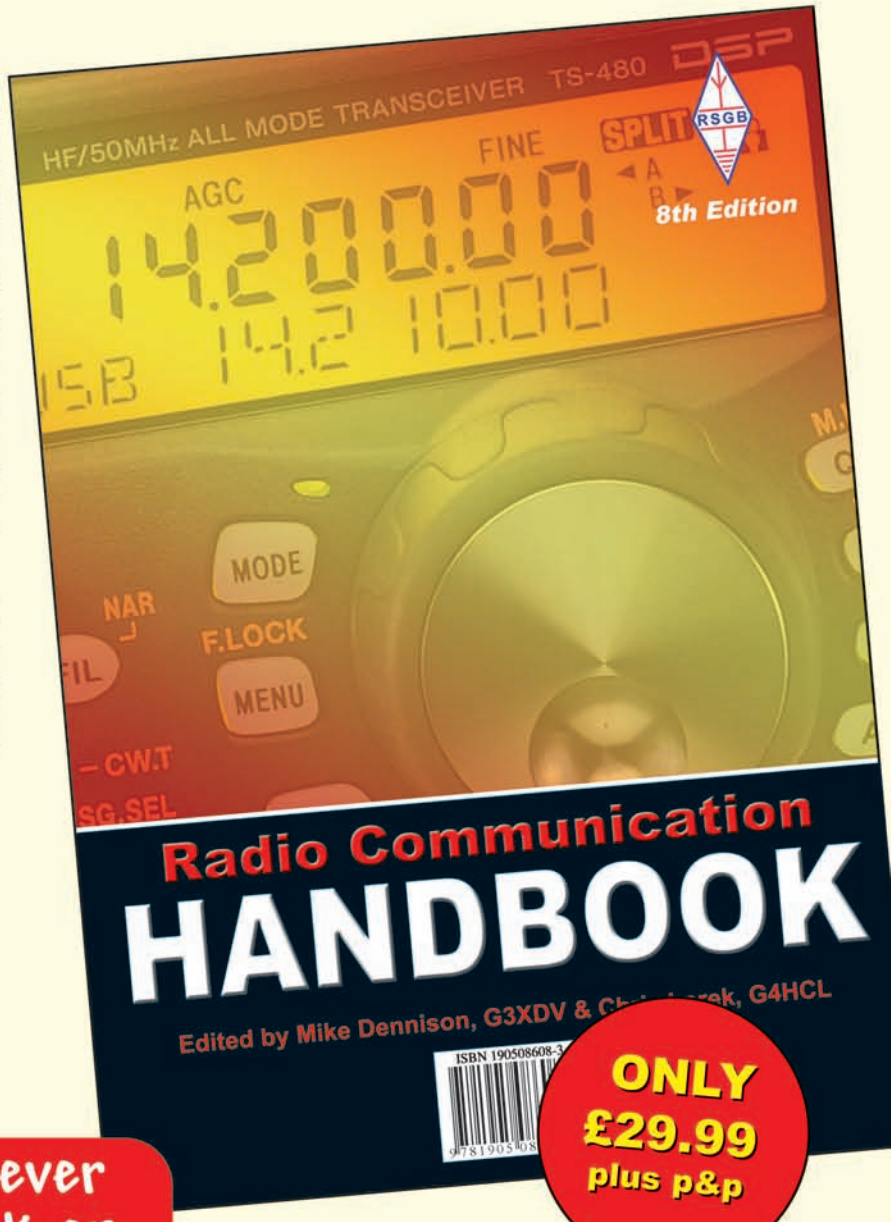
Many books claim to have been extensively revised however the RSGB Radio Communication Handbook, 8th edition has had the largest revision for many an edition. Once again, the RSGB has recruited experts on a wide variety of subjects to produce the most comprehensive guide to the practical side of amateur radio. Covering the entire spectrum from the basics through to advanced projects, and including many classic circuits, the Radio Communication Handbook makes an essential shack accessory. Just about everyone will find items of great value in this great book. Chapters vary from the essentials right through to detailed ones on specialist topics. For the experienced radio amateur there are hosts of new ideas, including modern techniques such as microprocessors, surface mount components and computer aids to designing circuits and antennas. The book also contains for the first time since the original 20-part RadCom serial the 'PIC-A-STAR' brainchild of Peter Rhodes, G3XJP. This is a complete transceiver project, based around PIC technology and giving state-of-the-art performance. Appendices contain all the useful reference data and artwork for printed circuit boards. With 26 chapters spread over 768 pages this is packed with far more ever than can be detailed here.

FREE CD

If this updated book were not enough you can now search every page of the RSGB Radio Communication Handbook, 8th edition at the touch of a button. A free CD is enclosed in the book that contains a searchable and printable version of the book. This makes the book incredibly easy to navigate and finding that important page has never been easier. The ability to print individual pages is a significant bonus for every experimenter and builder wishing to use those all important circuit diagrams.

* New larger format
* 768 A4 pages
* Half a million words!
* Over 1500 illustrations
* 26 chapters and two appendices
* Extensively revised
* Much new material
* Complete PIC-A-STAR transceiver project
* Projects for 136kHz to 76GHz
* Free CD

RSGB members price £25.49 plus p&p



If you only ever buy one book on amateur radio, this should be the one!

ORDER FROM:

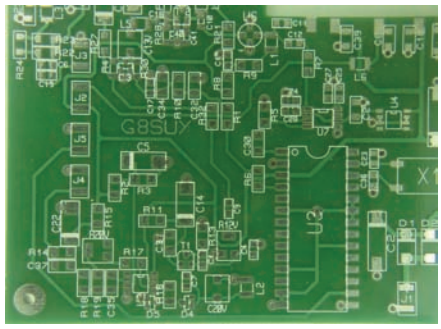
RSGB, Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE Tel. 0870 904 7373 Fax. 0870 904 7374

ORDER 24 HOURS A DAY ON OUR WEBSITE www.rsgb.org/shop

E&OE

RSGB SHOP

In Vision



The SUY p.c.b. as seen under magnifying bench lamp (see text).

A strip of nine 8.2kΩ resistors, compared with 5p coin.

GRAHAM G8EMX LOOKS AT THE LATEST NEWS FROM THE ATV SCENE

So, it's official! No more UK analogue broadcast TV after 2012 with a switch off roll-out, starting with the English/Scottish Borders in 2008, announced by Media and Culture Secretary Tessa Jowell on Thursday 15 September. Now nothing concentrates the mind more than a firm decision that something will be no more, and with Freeview digital still only covering three out of four households (source: Freeview website, PressPack download, 29 September) the rush will certainly be on to install those digital transmitters and motivate the millions of viewers still using analogue services where digital is available.

The coming removal of analogue television has prompted the question – will analogue radio disappear too? We are being assured that there are no plans to remove the f.m. and a.m. radio services, although of course Digital Audio Broadcasting (DAB) will continue to expand in coverage and 'platforms' e.g. more DAB receivers, MP3 radio downloads by computer, and radio channels via digital television. Maybe it's time for manufacturers to consider turning off the vision circuits to save power and potential damage to display devices, due to a static image when radio is being received?

KIT BUILDING PROGRESS

Thanks to the readers who have sent very kind E-mails recently in response to the previous In Vision. Here I mentioned a digital ATV transmitter, building ATV kits using surface-mounted components (SMC), and a ready-built 24cm (1270MHz) ATV transmitter - all your comments are much appreciated!

After searching the Internet, I have now got a 'round tuit' (!) and will be constructing my SUY 24cm ATV transmitter kit over the next few months. You will be able to follow my progress – or any problems – as part of this column!

So let's begin! All kit building starts with preparation; essential tools are a low power (10 to 15W) fine-tipped soldering iron, usually small cutters and pliers, small gauge lead-free solder, plus metal tweezers. All this can be bought separately but the Maplin outlets sell a variety of 'soldering stations', see the catalogue, look on-line or pop into one of the many Maplin stores.

The most important 'tool' is lighting. Surface-mounted components are small – very small - and not really intended for manual assembly, so even the younger eye will benefit from adequate illumination of the work station and eventually the magnifying work-bench lamp will become essential. This will make p.c.b. and component appear almost the size of their conventional counterparts, the placing and soldering operations becoming relatively straightforward.

I usually begin assembly of any kit with the resistors. These will be the least heat-sensitive of any component, their value is easily verified with the multimeter (another essential tool) and I generally place all of a particular value at their respective positions.

The 'SUY transmitter uses 29 fixed-value resistors, so my first operation was to fix in place the seven, 8k2Ω components, as these were the most common value in the circuit. The kit comes with a component list and diagram, so 'mark off' each resistor as it is placed. Next, the capacitors.

DONINGTON RALLY

Apologies to anyone who came to the Donington Rally on the Friday, looking for the British Amateur Television Club (BATC) on its usual table. My circumstances (I had a job interview!) prevented my appearance on the first day, but I managed to put a 'reduced BATC' stand up on the Saturday. This time there was no computer running or any ATV demonstrations because of the charge for stand electricity – also I was planning to spend some time away from the table, attending *PW* Editor **Rob Mannion's** presentation. Later that afternoon I was pleased to meet In Vision reader and BATC member **Art Smyth G3XNE**, followed by another interesting chat with **Reg Colclough G7FSA** from Stoke-on-Trent, who lives in the coverage of the 24cm (1.3GHz) ATV repeater **GB3UD**.

The Stoke-on-Trent 24cm ATV repeater, GB3UD, is the one repeater I can receive from the high point of Barr Beacon, north Birmingham. The GB3UD repeater, which has been on-air for several years, always cycles test cards when not being accessed and the RSGB Repeater Management Committee web page will take you to a basic coverage map for it. This indicates very good signal strength from due north to south-west, with a spur to the south of The Wirral and significant cover between Liverpool and Manchester. **Reg G7FSA** is asking for more stations to use GB3UD and has approached the Stoke-on-Trent ARC and Leek and Moorlands club too. If either of these club's would like an illustrated presentation on ATV and the BATC, please get in touch with me, send an E-mail to **g8emx@tiscali.co.uk** For more information about GB3UD and activity, write to Reg Colclough at **8 Parker-Jervis Road, Parkhall Estate, Longton, Stoke-on-Trent ST3 5RP**.

ANALOGUE SATELLITE RECEIVER

I often recommend visitors to the BATC rally table to buy an analogue satellite receiver as a cheap way to begin their ATV station, as these should be sensitive enough to resolve a local repeater. But has anyone seen any analogue boxes lately? I certainly did not spot any at Donington.

The availability of ATV information and hardware for Radio Amateurs wanting to start in Amateur television may well be an issue for the BATC's General Meeting due in 2006. The club still has not decided on, or been offered anywhere to hold this meeting and convention, which naturally takes some months to organise.

If any rally organisers for 2006 are able to offer space to the BATC, or would like Amateur Television to significantly feature at their rally, please visit the club's website (**www.batc.org.uk**) click on Committee list and send an Email to BATC Chairman **Trevor Brown**. There, Trevor, never say I don't send you anything hi!

Wishing all readers of In Vision a very Happy Christmas and P5 pictures in the New Year. Hope to see you again in 2006!

Graham G8EMX

GRAHAM HANKINS G8EMX
17 COTTESBROOK ROAD
ACOCKS GREEN
BIRMINGHAM B27 6LE
E-MAIL: g8emx@tiscali.co.uk

mail order...huge range in stock...fast delivery...

the pwpublishing RADIO BOOKSTORE

NEW THIS MONTH!
UK Scanning Directory - 9th Edition

This book will not disappoint!

The UK Scanning Directory is Britain's largest and best selling VHF/UHF frequency directory and the undisputed leader in the field. No other book dares to list so many frequencies and in such great detail. More details on page 51 of this issue.

	Pages	Price	Code
Airband			
AIRBAND RADIO GUIDE (abc) 6th Edition	122	£8.99	ABRG6
AIRBAND RADIO HANDBOOK (Sutton) David Smith	190	£12.95	ABRHB
AIR TRAFFIC CONTROL		£8.99	ATC9
AIRWAVES 2005 (Photavia)	144	£10.95	AIR25
AIRWAVES SELCAL CIVIL & MILITARY DIRECTORY (Photavia)	176	£11.95	AIRSEL
CALLSIGN 2005 (Photavia)	2005	£10.95	CAL25
CIVIL AIRCRAFT MARKINGS 2005 (abc) Alan Wright	368	£7.99	CIVAIR
FLIGHT ROUTINGS 2005 Williams	180	£10.00	FR25
MILITARY AIRCRAFT MARKINGS 2005 (abc) March & Curtis		£7.99	MILAIR
BRITISH ISLES ATLANTIC TRANSITION CHART (AERAD)	1020x520mm	£9.00	UKH6
BRITISH ISLES LOW ALTITUDE CHART (AERAD)	1020x520mm	£9.00	UKL2
NORTH ATLANTIC ROUTE CHART (AERAD)	1020x520mm	£9.00	NATHL1
Frequency Guides			
FERRELLS CONFIDENTIAL FREQUENCY LIST 13th Ed.	540	£21.50	FERR13
KLINGENFUSS GUIDE TO UTILITY STATIONS 2005	552	£31.50	KFUTIL
KLINGENFUSS SHORTWAVE FREQUENCY GUIDE 2005	504	£24.50	KFSWFG
KLINGENFUSS SHORTWAVE FREQUENCIES CD 2005		£17.70	KFSWCD
PASSPORT TO WORLD BAND RADIO 2006 (IBS)	592	£17.50	PASS26
RADIO LISTENERS GUIDE 2005	160	£5.45	RLG25
ULTIMATE SCANNING GUIDE & CD Richard Allport	464	£19.99	USG
WORLD RADIO TV HANDBOOK 2005 (WRTH)	688	£22.50	WRTH25
Scanning & Short Wave			
UK SCANNING DIRECTORY 9th Edition	544	£19.75	UKSD9
BUYING A USED SHORT WAVE RECEIVER 4th Edition. F. Osterman	78	£5.95	BUSWRX
RECEIVING (VALUE) STATION LOGBOOK (RSGB)	80	£4.95	RXLOG
SCANNERS 4 SCANNING INTO THE FUTURE. Bill Robertson	245	£9.95	SCAN4
THE ESSENTIAL GUIDE TO SCANNING. Martin Peters	108	£6.00	EGTS
THE SUPERHET RADIO HANDBOOK. I.D. Poole (Babani)	104	£4.95	BP370
Antennas/Transmission Lines/Propagation			
25 SIMPLE INDOOR & WINDOW AERIALS E.M. Noll (Babani)	50	£1.75	BP136
25 SIMPLE TROPICAL & MW BAND AERIALS E.M. Noll (Babani)	54	£1.75	BP145
AN INTRODUCTION TO RADIO WAVE PROPAGATION J.G. Lee (Babani)	116	£3.95	BP293
ANTENNA FILE (RSGB)	285	£18.99	ANTFIL
ANTENNA TOOLKIT (inc. CDROM). Joseph J. Carr	214	£25.00	ANTOOL
ARRL ANTENNA BOOK (inc. CDROM) 20th Edition	944	£32.00	RRAB20
BACKYARD ANTENNAS. Peter Dodd G3LDO (RSGB)	200	£18.95	BYANTS
BASIC RADIO PRINCIPLES & TECHNOLOGY. Ian Poole G3YWX	262	£15.99	BRPRIN
EXPERIMENTAL ANTENNA TOPICS. H.C. Wright.	70	£3.50	BP278
HF ANTENNA COLLECTION. Edited by Erwin David G4LQI (RSGB)	233	£19.95	HFANTC
INTERNATIONAL ANTENNA COLLECTION G. Brown M5ACN (RSGB)	250	£11.95	IANTC
INTERNATIONAL ANTENNA COLLECTION 2. G. Brown M5ACN (RSGB)	200	£11.95	IANTC2
MORE WIRE ANTENNA CLASSICS (ARRL)	200	£10.50	MWANTC
PHYSICAL DESIGN OF YAGI ANTENNAS (Hardback) David B. Leeson W6QHS (ARRL)	200	£15.50	PDYAGI
RADIO PROPAGATION PRINCIPLES & DESIGN. Ian Poole G3YWX	102	£14.95	PROPPR
RECEIVING ANTENNA HANDBOOK. Joe Carr (HighText)	189	£17.50	RXANHB
UNDERSTANDING,BUILDING & USING BALUNS. (CQ Publications) Jerry Sevick	125	£18.95	BUBALS
VHF UHF ANTENNAS. Ian Poole G3YWX (RSGB)	128	£13.99	VUANTS
WIRE ANTENNA CLASSICS (ARRL)	200	£10.50	WANTC

	Pages	Price	Code
Beginners/Licence/Manuals			
ADVANCE! THE FULL LICENCE MANUAL. Alan Betts GOHIQ & Steve Hartley GOFUW (RSGB)	104	£11.99	ADCFLM
AMATEUR RADIO EXPLAINED. Ian Poole G3YWX (RSGB)	150	£9.90	AREXPL
AN INTRODUCTION TO AMATEUR RADIO. I.D. Poole (Babani)	150	£4.99	BP257
FOUNDATION LICENCE NOW! Alan Betts GOHIQ (RSGB)	32	£4.99	FLNOW
HF AMATEUR RADIO. Ian Poole G3YWX (RSGB)	120	£13.99	HFAR
INTERMEDIATE LICENCE BUILDING ON THE FOUNDATION Steve Hartley GOFUW (RSGB)	76	£6.99	INTLIC
SECRET OF LEARNING MORSE CODE. Mark Francis (Spa)	84	£6.95	SOLMC
Design & Construction			
COIL DESIGN & CONSTRUCTION MANUAL (Babani)	106	£3.95	BP160
LF EXPERIMENTERS HANDBOOK (RSGB)	112	£18.99	LFEXHB
PRACTICAL PROJECTS. G. Brown M5ACN (RSGB)	208	£13.95	PRPROJ
PROJECTS FOR RADIO AMATEURS & SWL. R.A. Penfold (Babani)	92	£3.95	BP304
RADIO & ELECTRONICS COOKBOOK (RSGB Newnes)	319	£16.99	RECOOK
RF COMPONENTS & CIRCUITS. Joe Carr (RSGB Newnes)	398	£22.50	RFCOMP
TECHNICAL COMPENDIUM (RSGB)	288	£17.99	RSTECO
THE ART OF SOLDERING. R. Brewster (Babani)	84	£3.99	BP324
UNDERSTANDING BASIC ELECTRONICS (ARRL)	314	£15.50	UNDBEL
Shack Essentials			
AMATEUR RADIO MOBILE HB. P. Dodd. (RSGB)	114	£14.99	MOBHB
AMATEUR RADIO (VALUE) LOGBOOK (RSGB)	80	£4.95	TXLOG
ARRL HANDBOOK 2005 inc CD	1152	£32.00	RRHB25
ARRL OPERATING MANUAL 7th Edition (WSL)	420	£18.50	RROPM
DIGITAL MODES FOR ALL OCCASIONS. M. Greenman. (RSGB)	208	£16.95	DMFAO
GREAT CIRCLE MAP (PWP)	400 x 400mm	£1.50	GCMAP
LF TODAY GUIDE TO SUCCESS 136kHz. M Dennison (RSGB)	128	£11.95	LFTOD
RADIO AMATEURS MAP OF THE WORLD		£8.00	ARMAPW
RADIO AMATEURS WORLD ATLAS (A4 size) (DARC)	20	£8.00	ARWAT
RSGB AMATEUR RADIO OPERATING MANUAL (RSGB)	224	£19.95	OPMAN
RSGB PREFIX GUIDE (RSGB)	34	£8.95	PFXGDE
RSGB YEARBOOK 2006 Edition (RSGB)	504	£18.95	RSYB26
CALLSEEKER GB AMATEUR CALLSIGN LISTING CD 2006		£14.95	CALLCD
Microwaves			
AN INTRODUCTION TO MICROWAVES. F.A. Wilson (Babani)	134	£3.95	BP312
INTERNATIONAL MICROWAVE HANDBOOK. A. Barter (RSGB ARRL)	474	£24.95	IMWHB
QRP			
LOW POWER COMMUNICATIONS 2nd Edition (ARRL)	240	£13.95	LPCOM
LOW POWER SCRAPBOOK (RSGB)	320	£12.99	LPSCRA
QRP BASICS. George Dobbs G3RJV (RSGB)	204	£14.95	QRPBAS
VHF & Higher			
ALL ABOUT VHF AMATEUR RADIO. W. I. Orr W6SAI (ARRL)	163	£8.95	AAVHF
GUIDE TO VHF/UHF AMATEUR RADIO. Ian Poole G3YWX (RSGB)	180	£8.99	GTVUHF
VHF/UHF HANDBOOK. Dick Bidduph G8DPS (RSGB)	180	£22.00	VUHFHB
Crystal Sets			
THE XTAL SET SOCIETY NEWSLETTER Volume 1 & 2 Combined. Phil Anderson W0XI.	96	£14.00	XTNL12
THE XTAL SET SOCIETY NEWSLETTER Volume 4. Phil Anderson W0XI	88	£7.00	XTNL4
CRYSTAL RECEIVING SETS & HOW TO MAKE THEM (Lindsay)	124	£7.95	XTHTM
CRYSTAL SETS. The Xtal Set Society Newsletter. Volume 5. Phil Anderson W0XI	88	£7.00	XTNL5
CRYSTAL SET BONANZA Vol 9, 10 & 11 Xtal Set Society Newsletter	226	£15.00	XTBONZ
CRYSTAL SET LOOPERS, A THREE TUBER & MORE Volume 8 Xtal Set Society Newsletter	128	£10.50	XTLOOP

visit our website: www.pwpublishing.ltd.uk for full descriptions of these books

Historical

	Pages	Price	Code
100 RADIO HOOK UPS 2nd Edition (reprinted)	48	£3.35	100RHU
1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback (Lindsay Publications) (WSL)	260	£11.85	1934SW
AMATEUR RADIO A BEGINNERS GUIDE (1940 REPRINT) (Lindsay Publications). Douglas Fortune W9UVC	156	£7.70	ARABG
COMMUNICATIONS RECEIVERS THE VACUUM TUBE ERA. R.S. Moore	141	£17.95	COMRXV
MARCONI'S ATLANTIC LEAP (H/B). Gordon Bussey (Marconi)	96	£6.99	MALEAP
POP WENT THE PIRATES. Keith Skues	568	£14.99	POPPIR
SAGA OF MARCONI OSRAM VALVE (Paperback). B.Vyse & George Jessop	346	£25.00	SMOV

Valves

	Pages	Price	Code
HOW TO BUILD THE TWINPLEX REGENERATIVE RECEIVER. T.J. Lindsay	63	£6.75	HTBTRR
HOW TO BUILD YOUR FIRST VACUUM TUBE REGENERATIVE RECEIVER. T.J. Lindsay	127	£8.25	HTBFVA
HOW TO BUILD YOUR RADIO RECEIVER (A4) (Popular Radio Handbook No. 1)	100	£6.70	HTBYRR
HOW TO MAKE A NEUTRODYNE RECEIVER. Webb	63	£5.95	HTMNRX
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS C.F. Rockey	127	£8.75	SHBRRX

Electronics

	Pages	Price	Code
ELECTRONIC PROJECT BUILDING FOR BEGINNERS. R.A. Penfold (Babani)	110	£4.95	BP392
GETTING THE MOST FROM YOUR MULTIMETER. R.A. Penfold (Babani)	102	£4.99	BP239

Binders

	Price	Code
Practical Wireless	£6.50	BINDPW
Short Wave Magazine	£6.50	BINDSW

how to order

By Post: Write to the Book Store, remembering to include your name, address, daytime telephone number and payment details (Sterling, cash not accepted), at: **Book Store, PW Publishing Ltd., Broadstone, Dorset BH18 8PW.**

By Telephone: Call **Clive G4SLU** in the Book Store, Monday to Friday 9am to 4pm. Outside these hours your order will be recorded on an answerphone. **Call: 0870 224 7830**

By Fax: If you wish to FAX your order to us please mark it for the attention of the Book Store and send it to: **FAX: 0870 224 7850**

By E-mail: clive@pwpublishing.ltd.uk

Photocopies & Back Issues: To order a Back Issue please call the Order Line to check availability. We can photocopy articles from issues that are not available and we have a Review List going back years!

Back Issues (non-current): *SWM* @ £5.00 (£5.50), *PW* @ £4.75 (£5.25), *RA* @ £4.60 (£5.10).

Postal Charges: (UK) one item £1.75 / Two or more items £2.75.

EUR/RoW: One item £2.75 / two or more items add 75p for every item.

Review List: £2* (* includes P&P - add a further £1 for EUR/RoW)

Photocopies / Reprints: (Articles over 3 years old) £3.00, UK £4.00 overseas

E&OE

order form

Photocopies are acceptable

Please send me the following books:

.....Code ..... Price (£).....

.....Code ..... Price (£).....

.....Code ..... Price (£).....

.....Code ..... Price (£).....

.....Code ..... Price (£).....

.....Code ..... Price (£).....

.....Code ..... Price (£).....

.....Code ..... Price (£).....

Total cost of Books Ordered: .....Price (£).....

Postage Charges
Please remember to add postage to your order. (£).....

UK
£1.75 P&P for one item, £2.75 for two or more (UK)

Airmail
£2.75 P&P for one, £4.25 for two, 75p extra per item for three or more

Total cost of order including postage.....Price (£).....

Send this completed form to:

Book Store, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

Payment Details. Please note: For security purposes, you must include your house number and postcode.

Name .....

Address.....

.....

.....

Postcode.....

Telephone (Daytime) .....

I enclose my Cheque/Postal Order for £.....

(Cheques MUST made payable to PW Publishing Ltd.)

MasterCard DELTA AMERICAN EXPRESS VISA

or please debit my Access/Visa/Amex

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Expiry Date ..... Security No. ☐☐☐

or please debit my Maestro/Solo Maestro

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐

Expiry Date ..... Security No. ☐☐☐

Start date ..... Issue No (if on card).....

Signature.....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at the time of going to press.
Please note: all payments must be made in Sterling, cash not accepted.

Bargain Basement

SEND YOUR ADVERT TO:-

***PRACTICAL WIRELESS*, BARGAIN BASEMENT, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW**

For your advert in Bargain Basement please remember to include your dated, coloured corner flash from this page along with your entry.

YOUR ATTENTION PLEASE!

Bargain Basement rules - £4 per advert

Please write your advert **clearly** in **BLOCK CAPITALS** up to a maximum of **30 words**, plus **12 words f**or your contact details on the form provided and send it together with the dated corner flash and your **payment of £4** (**subscribers** can place their advert **free of charge** as long as they provide their **subs number and corner flash**), cheques should be made payable to **PW Publishing Ltd.**, credit card payments also accepted.

Send your advert to **Bargain Basement, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** or E-mail your advert to **peter@pwpublishing.ltd.uk** (If you don't want to include your credit card details on your E-mail, just 'phone us on **0870 224 7820**.

Please help us to help you by preparing your advert carefully. Any advert which contains **??** marks indicates that the advertiseing dept. could not read/interpret the wording.

Please avoid FAXing your advert - it could delay publication.

Advertisements from traders or for equipment that it is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. **No responsibility will be taken for errors and no correspondence will be entered into on any decision taken by the Editor on any of these conditions.**

You should state clearly in your advert whether equipment is professionally built, home-brewed or modified.

The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

FOR SALE

RIGBLASTER PLUS Brand new, £80. Roberts RC828 f.m. stereo l.w., m.w., short wave. Includes amateur bands, s.s.b. cw with b.f.o., cassette. World receiver, £80. Both postage paid. GJ3X2E. Tel: 01534 852093 or GJ3X2E@jerseymail.co.uk

SILENT KEY ICOM 275H with PSU, oscilloscope 10MHz Morse tutors x 2 Avometer ATU's 300 & 2000 Watt Bencher key plus various filters & switches. E-mail for full list. james.anderson48@tiscali.co.uk

COLLECTORS ITEM:- GEC- McMichael (Circa 1970-80) CED video disc player in good working order with discs. Please contact for details. John Stacey G8BXO, 3 West Park, South Molton, Devon EX36 4HJ Tel: 01769 573382.

PYE ADVANCED high speed valve tester, mint condition, complete with cards & adapters, Heath valve milivolt meter, AV3U Cossor valve volt meter, 1044k Icom communications hand-held receiver mod. ICR2 as new in box not used. 01934 517728 (North Somerset).

FT-107S HF requires service with built in power supply. FT-77S HF 10 Watt QRP requires service. BC221 wave meter built in power supply mint Ajax ship-to-shore AM 25 Watt transceiver. Advance 50 MEG 'scope requires service. 01934 517728 (North Somerset)

YAESU FRG-100 HF RX with PSU, £200. BH1 NES10-2 DSP speaker, £45. Diamond discone D-130 25 Tto 1300MHz with lead, £30. As new. Buyer collects. Postage extra. Tel: Mike 01689 842223 (Croydon).

KENWOOD TS-520S TCVR. New boxed. Never used. Silent key sale + Ext VFO 520 VGC classic T/R set up easy, £225 o.n.o. Tel: John Hill 01482 667630.

THREE AND FOUR SPEED RECORD PLAYERS and reel-to-reel tape recorders plus tapes. Old radio's used and new octal and other valves Styli SAE lists. D. A. Pine. 11 Lockeridge Road, Bere-Alston, Devon PL20 7AW.

CLOSING DOWN SALE. All shack contents including IC-735, DX394, power supplies, test gear, aerials, valves, crystals, components, books, magazines etc. Lists from G3LYK (LINCS). E-mail: g3lyk@tesco.net

ELECTRONIC MORSE KEYER programmed for 5-35 w.p.m. with automatic switch-off and easy-to-build details, needing very few extra components. Ideal for practice or transmit, £10. E-mail: chick@chickene.freeserve.co.uk

ETON S350 as new, £30 with manual. Icom R-20, £100. Sony SW ICF100 portable, £50 as new. Buyer collects. Tel. Paul: 01209 613429.

MOST YAESU FT-902DM spares and complete PC panels, fan VFO frequency counter and display. Ganged tuning inductors and capacitors. Extender boards. Matched pairs of correct heater 6146B. Some 12BY7A. Front panel. Tel: 01904 794680.

KENWOOD TS-850S all leads and manual with Palstar PS-30m PSU only used 5 times, also antenna for 10m and Altai AR300XL rotator never used, £500. Tel or text: John 07799 574876 (Huddersfield).

YAESU FT-101ZD/3 excellent condition, £200. Sangean ATS803 £40. Tel: 01279 815020 (Essex).

RADIO MICROPHONE EQUIPMENT. Control desk 8 faders telephone connection. Dual VHF/UHF FM TX 840MHz. Diversity RX.GM500. Talkback TXSR300 Senn Hgiser antenna splitter. Vortex matrix unit. Racks, cables etc. Offers over £500. 3 years old. Tel: Roy G7CQD QTHR 01885 488585 inspect, collect (Herefordshire).

ICOM IC-R7000, Trio R-1000, outdoor antenna, various power supply transformers, bondwell amp, mics, radios, other bits and pieces. All fair offers considered. (Blackpool area). Tel: Julian on 01253 621915 or 07802 472021 (mobile).

TRIO TS-780 all-mode transceiver g.w.o., fair condition with workshop manual, £150. Yaesu FTDX 560 HF rig (pre-war) as is with user manual £50, or both for £180. Collect only. Tel: Neil G8LIU: 01895 230006 (Uxbridge).

WANTED

G2DAF RECEIVER any mark/condition, complete working unfinished project or any parts. Cash waiting can collect. E-mail: s2sand@aol.com Tel: 01759 304315.

GRUNDIG YACHT BOY RADIO. Must be model 210 from between 1970 - 1974. Must be in absolutely mint condition. Will pay very good money for a set in mint condition. Contact Peter Tankard on 0114 2316321 between 9am to 10pm (Sheffield).

MANUAL WITH CIRCUIT DIAG for TenTec 225 power supply - black tuning knob for Argosy II 2 inch of 3/16 shaft. Tel: Mel 01274 817178 (West Yorkshire).

MARCONI GANNET RECEIVER type 1159A also Gannet TX type 1158A any condition. John Harrison, 83 Lundi Street, Radcliffe, Manchester. M26 3AW Tel: John 0161 723 3452.

SPY/CLANDESTINE radio sets from WW11 and since wanted by collector. Your price paid for special items. Incomplete units and accessories also wanted. Tel: Bill G8PUJ 020 8505 0838.

SP RADIO 'Sailor' receiver described by some as the ugly green receivers Denco range 1 coils and white oscillator coils for all ranges. Tel: Tony 01905 641759 (Worcester).

EXCHANGE

RACAL RAI17 RAI7C s/key sale must be top order for an **EDDYSTONE 830/2** in top order. Tel: 01279 815020 (Essex).

bargain basement order form

Please insert this advertisement in the next available issue of *Practical Wireless*.

❑ **For Sale** ❑ **Wanted** ❑ **Exchange**

Please note: For security purposes, you must include your house number and postcode. Don't forget the corner flash!!

Name.....

Address.....

.....

..... **Post code**.....

Telephone Number.....

please write in block capitals

CARD NUMBER

Signature..... Security number

Switch issue number (if on card).....

Start date of card..... Expiry date of card .....

My Subs Number is.....*(or mailer label)*.....

	(30)		

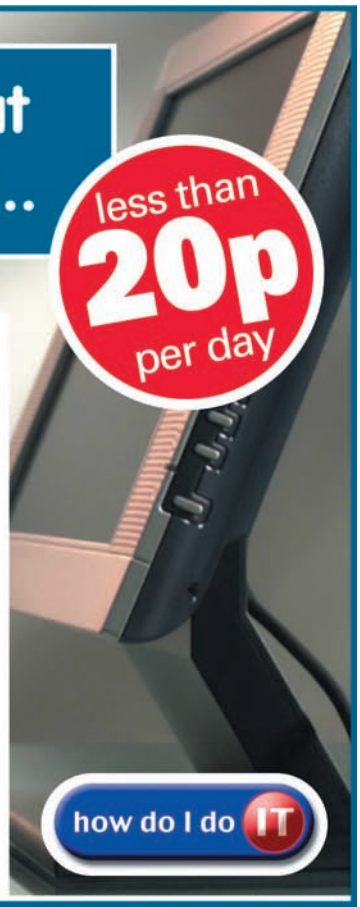
CONTACT DETAILS FOR ADVERT.

Please only write in the contact details you wish to be published with your advert, ie. do you want your name & address, or just your telephone number?

Your advert, you decide! PLEASE - No FAXed Ads!

			(12)

Your own personal IT helpdesk at your fingertips all day, everyday...



Are you getting the most out of your PC?

Probably not, but you don't have the time to take a course or wade through dull study manuals.

There is another way:

- The How Do I Do IT desktop IT solution provides access to over 70,000 multimedia tutorials online.
- Easy to Use modules with audio & visual capability giving you the exact skills required at your fingertips.
- Compatible with all major Office & Internet applications and cross referenced to support the national curriculum.
- Comprehensive online support & monthly newsletter providing Help, Hints & Tips.
- Motivational personal profile tracking facility providing a summary of achievements & learning history.

For a demo or to buy online go to www.hdidi.co.uk/pwp

PW PCB SERVICE

PW Whitcombe	WT2347	Apr 04 .....£5.00
AF Voltage Amp	WT2376	May 04.....£1.50
HF Voltage Amp	WT2375	May 04.....£1.40
HF Tuned Amp	WT2375	July 04 .....£2.00
IF Tuned Amp	WT 2417	July 04 .....£2.00
Colpitts Xtal Osc	WT2443	Sept 04 .....£3.00
Voltage Reg	WT2559	Nov 04.....£1.65
FET AF Amp	WT2597a	Jan 05.....£2.00
FET HF Amp	WT2597b	Jan 05.....£2.00
PW 2 Tone Osc	WT2613	Feb 05 .....£3.75
HF Bands LPF	-	Feb 05 .....£10.00
Cascode FET HF Amp	WT2658	Mar 05.....£4.00
Cascode FET VHF Amp	WT2660	Mar 05.....£4.00
Mosfet HF Amp	WT2662	Mar 05.....£4.00
Mosfet VHF Amp	WT2664	Mar 05.....£4.00
Mosfet Mixer	WT2741	May 05.....£4.00
2 Diode Mixer	WT2801	July 05 .....£1.50
2 Transistor Mixer	WT2802	July 05 .....£3.00
DBD Mixer	WT2858	Sept 05 .....£1.50
SA602 Mixer	WT2859	Sept 05 .....£3.00
PW Mellstock TX	WT2840	Oct 05 .....£14.25
PW Mellstock Keyer	WT2879	Oct 05 .....£1.00

P&P 75p. Any quantity of boards.

Cheques payable to A.J. & J.R. Nailer

Spectrum Communications

12 Weatherbury Way, Dorchester, Dorset, DT1 2EF Tel 01305 262250

PEAK electronic design ltd www.peakelec.co.uk Tel. 01298 70012

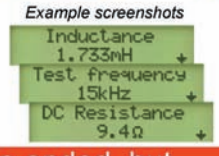
Peak Electronic Design Ltd
Atlas House
Harpur Hill Business Park
Buxton, SK17 9JL, UK

"They are worthy additions to any amateur constructor's bench at an affordable price."
Rev. Dobbs, PW Magazine

LCR Analyser - Atlas LCR40

- Automatically identify and measure Inductors, Capacitors and Resistors.
- Automatic test frequency selection.
- Inductors from 1µH to 10H.
- Capacitors from 1pF to 10,000µF.
- Resistors from 1Ω to 2MΩ.
- 1% Basic accuracy.

Example screenshots

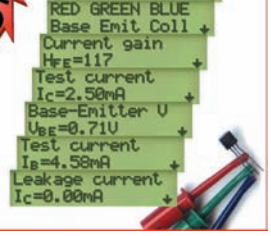


Previous offer prices have ended, but...
Buy both analysers and get a free carry case!

Semiconductor Analyser - Atlas DCA55

- Automatically analyse most 2 and 3 leaded semi's: transistors, MOSFETs, JFETs, diodes, LEDs etc...
- Automatically identify all leads. Connect any way!
- Measures lots of parameters too, such as gain, PN characteristics, MOSFET gate thresholds, leakage current and much more.

Example screenshots:



all prices include UK Delivery and VAT

Classified Ads

To advertise on this page see the booking form below.

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 publishe s 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.

Classified Advertisment Dept.
PW Publishing Ltd,
Arrowsmith Court,
Station Approach, Broadstone,
Dorset BH18 8PW

Valves

VALVES AND ASSOCIATED COMPONENTS Available from stock as well as manuals and service information. Phone or SAE for your requirements. Chevet Book Supplies, 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 654650/649380/650725.
Mobile:- 07733 283084.
Fax: 01484 655699.
E-mail: wilsonv@zoo.co.uk
Visa etc. Fast & personal service.

VALVES AND ELECTRONIC COMPONENTS Large stocks. Send for list to: Stuart Scott, 19 Portway, Steying, W. Sussex BN44 3QF.
E-mail: triumph.76@btinternet.com

VALVES AND ALLIED COMPONENTS IN STOCK Ring for free list. Valves/books/magazines wanted. Geoff Davies (Radio). Tel: 01788 574774.

TOP PRICES PAID

for all your valves, tubes, semi-conductors and ICs.

Langrex Supplies Ltd.

1 Mayo Road, Croydon, Surrey CR0 2QP.

TEL: 0208-684 1166. FAX: 0208-684 3056.

Repairs

REPAIRS TO ALL AMATEUR AND VINTAGE Rx/Tx Cost effective service. Phone or call in for details. Medway Aerials, Rear of 14 Luton Road, Chatham, Kent ME4 5AA.
Tel: 01634 845073.

REPAIRS TO ALL AMATEUR EQUIPMENT call for details. G0PGY Electronics, 56 Bassenhally Road, Whittlesey, Cambs PE7 1RR. 01733 351538.

Aerials

GAREX ELECTRONICS VHF/UHF accessories and aerials, PMR equipment and spares. www.garex.co.uk Tel: 0771 4198 374
PO Box 52, Exeter EX4 5FD.

Antennas

VARGARDA ANTENNAS ARE BACK! All antennas are pre-tuned. NO matching required. UK Distributor, Steve Burrows M5BXB. www.qsl.net/m5bxb
E-mail: steve.m5bxb@ntlworld.com
Tel: 01992 623335

Societies

ROYAL NAVAL AMATEUR RADIO SOCIETY seeks your support and membership. Qualify? Join today!
www.rnars.org.uk

QSL Cards

FULL COLOUR QSL CARDS for all your QSL needs. Shirts and caps with callsigns and also ham cartoons by GW3COI. For free samples contact Chris M0DOL. E-mail: qslers@aol.com
P.O. Box 184 Northampton NN3 9JH

For sale

RUGGED 4A SOLAR PANEL REGULATORS £24.99 inclusive. Cheque payable to Mr. S Taylor. LPG Electronics, 76 Queensdown Gardens, Brislington, Bristol BS4 3JF.

Qtz x-tals 455.2kHz/£1.75 to 28.060MHz/£1.95. Mtchd 9MHz and 10MHz £12/8, 4MHz £2/8. 1.4MHz USB/LSB fltrs £14.00, 10.7MHz 10kHz fltrs £8.00, P&P £1.75 + VAT. IQ Electro 0208 391 0545. E-mail: vincent@jakomin.fsnet.co.uk

Wanted

WANTED: GRUNDIG YACHT BOY RADIO Must be model 210 from 1970–1974. Must be in absolutely mint condition. Tel: 0114 231 6321 between 9am & 10pm.

WANTED: WIRELESS SET NUMBER 19 TRANSCEIVER Complete. Write to Mr. Hall, 38 Elmbank Way, Hanwell, London W7 3DG.

WANTED FOR CASH

COMMUNICATION RECEIVERS

Valve or solid state – working or not. Older or obsolete amateur radio equipment. Transceivers, station accessories, etc. Ex-Govt. wireless equipment. Radio books and magazines. We can collect anywhere in U.K. We also have a selection of the above items for sale in our shop. Open Tuesday, Thursday, Friday and Saturday 10am-6pm. Prior phone call before visiting appreciated.

Chevet Supplies, 157 Dickson Road, Blackpool FY1 2EU. Tel: 01253 751858. Fax: 01253 302979.

E-mail: chevet@globalnet.co.uk

ORDER FORM FOR CLASSIFIED ADS

PLEASE WRITE IN BLOCK CAPITALS

The prepaid rate for classified advertisements is 42 pence per word (minimum 12 words), box number 70p extra. Semi-display setting £13.90 per single column centimetre (minimum 3cm). Please add 17.5% VAT to the total. All cheques, postal orders, etc., to be made payable to PW Publishing Ltd. Advertisements, together with remittance, should be sent to the Classified Advertisement Dept., Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0870 224 7820, Fax: 0870 224 77850.

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: .....
.....
.....
.....
Telephone No.: .....
Box Number @ 70p: Tick if appropriate ..... ☐
Category heading: .....

Please photocopy this form or write on a separate sheet if you prefer

BOWOOD ELECTRONICS LTD

SUPPLIERS OF ELECTRONIC COMPONENTS

Visit our website and order on-line at
www.bowood-electronics.co.uk

or send 60p stamp for catalogue

E-mail: **sales@bowood-electronics.co.uk**

Contact name: Will Outram
Unit 1, McGregor's Way, Turnoaks Business Park, Chesterfield S40 2WB
—— Telephone 01246 200222 ——

J. BIRKETT

SUPPLIERS OF ELECTRONIC COMPONENTS

25 The Strait
Lincoln LN2 1JF
Tel: 01522 520767
Partners J.H.Birkett
J.L.Birkett

AIR SPACED VARIABLE CAPACITORS Wi h Slow Motion Drive 200+350pF @ £3 50. 350+400pF @ 3 50, 365+365pF @ £3 50, 365+365+ 365pF @ £4 95.
POSTAGE STAMP TRIMMERS 20pF @ 30p, 30pF @ 30p, 50pF @35p, 1000pF @ 60p.
IGBT SEMICONDUCTORS 23 Amp 600 Volt @ 5 for £1 25, 35 Amp 1200 Volt @ 5 for £1 20, 30 Amp 300 Volt @ 5 for £1 25.
VHF PIN DIODES @ 5 for 75p, UHF PIN DIODES @ 5 for 80p.
MINIATURE LOUDSPEAKERS Approx Dia. 8 ohm 38mm, 75 ohm 56mm bo h 75p each, 3 for £2.
SILICONIX FETS E304, E111, E113, W3009, P CHANNEL J177, 2N5461, All @ 5 for £1 00. OTHER FETS 2N3819 @ 35p, MFE131 @ 40p, J304 @ 25p, J230 @ 20p.
GERMANIUM DIODES CG91 @ 20 for £1, OA10 @ 10 for £1.
MINIATURE RELAYS 12 Volt, 10 Amp SPCO Contacts @ 3 for £1.
P.C. ELECTROLYTICS 4 7µF 50v w. 10µF 50v w. 100µF 35v w. All @ 20 for £1.
DOOR KNOB CERAMIC CAPACITORS Tag ended 22pF 10kV @ £1 95.
POWER TRANSISTORS OC25 @ 60p, OC35 @ 80p, OC28 @ £1, NKT404 @ £1, 2N4348 @ £1.
MINIATURE POLYESTER PC CAPACITORS 1000pF 2kV, 1000pF 1 6kV, 1500pF 1 6kV, 0 01µF 400v w., 0 01µF 1600v w., 0 047µF 400v.w., 0.1µF 250v w., 0.15µF 400v w., 0 68µF 250VAC. All @ 10 for £1.
PANEL MOUNTING MINIATURE RED NEONS @ 50P.
SMALL WIRE ENDED CHOKES 1µH, 3µH, 6 8µH, 10µH. All @ 8 for £1.
MULLARD LOCKFIT TRANSISTORS BC149, BF194 @ 12 for £1.
IGBT SEMICONDUCTORS 23 Amp 600 Volt @ 5 for £1 25, 35 Amp 1200 Volt @ 5 for £1 50, 30 Amp 300 Volt @ £1 25.
FILM DILECTRIC TRIMMERS 10pF @ 6 for £1.
FETS BS170 @ 25p, TIS14 @ 6 for £1.

MASTERCARD, ACCESS, SWITCH, BARCLAYCARD accepted. P&P £2 under £10. Over Free, unless otherwise stated.
www.zyra.org.uk/birkett.htm

For genuine mobile phone accessories - buy online

dontpayretail.co.uk

We sell all the top brands - Nokia, Sony Ericsson, Motorola & many more

Take a look at our full range:
www.dontpayretail.co.uk

DSP Noise cancelling products from bhi

New NES10-2 MkII

Now with on/off audio bypass switch
Simply connect in-line with your equipment

And Hear the Difference!

bhi Ltd. PO Box 136, Bexhill-on-Sea, East Sussex TN39 3WD
Tel: +44(0) 870 240 7258 Website: www.bhi-ltd.co.uk

JOHN'S RADIO ELECTRONICS TEST AND COMMUNICATION EQUIPMENT

LARGE QUANTITY SALE EX-MOD

MARCONI TF2019A Synthesized signal generators. 80kHz to 1040Mc/s - AM, FM - high class with many functions - £285 each.
HP COMMUNICATION TEST SET 8922M 10 to 1000Mc/s + GMS 83220E converter 1710 to 1900Mc/s. DCS, PCS, MS - £500.
HP COMMUNICATIONS TEST SET 8922M OPT 010 (Dual) etc. - £750.
TEKTONIC 2445A OSCILLOSCOPE 150Mc/s four channel - £300.

ALL UNITS PRICED EX WORKS WITH INSTRUCTIONS - TESTED, BASIC WORKING. CARRIAGE AND PACKING IF REQUIRED, EXTRA.

Phone for appointment or to request items lists, photos, site map. All welcome. Private or trade for sales, workshop repairs or callibration.

Please contact Patricia at Smithies Mill, 885 Bradford Road, Birstall, Batley WS17 8NN.
Phone 01924 477377
Web site: www.johnsradio-uk.com www.johnsradio.com

CVC CHELMER VALVE COMPANY

If you need Valves/Tubes or other electronic components . . . then try us!

We have vast stocks, widespread sources and 38 years specialist experience in meeting our customers requirements.

The Stables, Baddow Park, Great Baddow
Chelmsford, Essex CM2 7SY
Tel: 01245 241300
Fax: 01245 241309
E-mail: sales@chelmervalve.com Web site: http://www.chelmervalve.com

PCP Technologies

Made in the UK for Radio Amateurs

THE TRANZMATCH-R

3.5MHZ - 30MHZ BALANCED/UNBALANCED
1KW AERIAL MATCHER WITH PWR/VSWR METERING INCORPORATED
for all aerial systems (wires, doublets, G5RV's & dipoles)
full details at www.aerialmatchers.co.uk
Unit 3A, Knightsbridge Business Centre, Cheltenham GL51 9TA
Tel: 01242 680979 Fax: 01242 680068

Sycom

P. O. Box 148, Leatherhead
Surrey KT22 9YW

Phone 01372 372587
Fax 01372 361421

Robin G3NFV
Geoff G4ECF

Toroids are our speciality

Try us for:
- Resistors
- Capacitors
- Switches
- Semiconductors
- Cable connectors
- and much more

COMPONENTS AND AMATEUR RADIO EQUIPMENT PURCHASED

E-mail: robin@sycomcomp.co.uk
Web: www.sycomcomp.co.uk

CHRISTMAS SUBSCRIPTION OFFER

With Christmas just around the corner how about this for a great present for you or a fellow hobbyist?

Subscribe today and get a free binder!

Offer valid from 10 November to 7 December 2005 inclusive.

❑ I would like to order a one year subscription to *Practical Wireless* starting with the **January 2006** issue.

❑ I enclose my cheque/postal order* for £
made payable to PW Publishing Ltd. (*Delete as necessary)

❑ or please debit my Access/Visa/Amex card No.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ 2005

MasterCard VISA AMERICAN EXPRESS Expiry Date.....Security Number ☐☐☐☐

or please debit my Switch card No.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

SWITCH Switch Start Date..... Switch Issue Number (if on card).....

Switch Expiry Date.....Security Number ☐☐☐☐

Signature .....

Name .....

Address.....

.....

.....

.....

Postcode.....Daytime Tel. No. .....

You must fill in your name & address here even if you are not the recipient of the subscription. Please note: For security purposes, you must include your house number and postcode.

If you are giving the *PW* subscription as a gift, please fill in the recipients name and address here (UK recipients only).

Name: .....

Address: .....

.....

.....

.....

Postcode: .....

Photocopies of this page are acceptable

Subscribe to Practical Wireless

- **Never miss an issue**
- **Have it delivered to your door**
- **Subscribers get their copies before they reach the shops**
- ***PW* is Britain's best selling Amateur Radio magazine**

To order a subscription please contact our subscription agency:

Practical Wireless Subscriptions
PO Box 464
Berkhamsted
Hertfordshire HP4 2UR. UK

Credit Card Orders taken on:
(01442) 879097
between 9am - 5pm. Outside these hours your order will be recorded on an answering machine.

FAX Orders taken on
(01442) 872279

Internet Orders can be placed at:
www.webscribe.co.uk

or **via E-mail** to: **pw@webscribe.co.uk**

Please note cheques should be made payable to PW PUBLISHING LTD and CASH is NOT accepted.

Subscription Rates

1 YEAR	UK	£33
	Europe Airmail	£41
	ROW Airmail	£50
3 YEARS	UK	£89
	Europe Airmail	£111
	ROW Airmail	£143

rob mannion's topical talk

This month Tony Nailer G4CFY shares the discussion of the chosen tropical subject. Tony puts his point of view replying to Ray Howe's questioning of amplitude modulations projects in *PW*, and Rob G3XFD rounds the session off.

So, over to you Tony....

Rob, I thank you for giving me the opportunity to respond to the letter from **Ray Howes G4OWY,** which said "a.m. is dead, why perpetuate it"? He champions the construction side of things, but then says *PW* should concentrate on Digital Communications, as that's the future.

In replying to Ray I must say that unfortunately digital communications, using complex programming and microprocessors, or digital signal processors does **not** lend itself to home construction. This means that as far as *Practical Wireless* is concerned, home-brewing digital communications is likely never to happen.

When the Editor reprinted the **John Hey G3TDZ's** 70MHz a.m. transmitter/receiver circuit (originally produced in *Short Wave Magazine* in November 1968) several months ago, I thought it was a bit tongue-in-cheek, not knowing if there was still interest.

To determine the level of interest Rob offered complete reprints of the original *SWM* article for a small sum to cover P&P. There were about 180 requests for reprints. We must conclude from this that a.m. is **not dead**. And since producing a modern version of the same thing in the form of the Mellstock 70MHz a.m. transmitter the kits have been steadily streaming out of the door of Spectrum Communications.

Incidentally, I've also been asked to produce 50 and 144MHz versions of the Mellstock transmitter. Many readers also enquired if there would be a matching receiver, and that has now been done and it was published in the November *PW*.

Interesting Project For G4CFY!

It has been quite interesting project for me to revamp a.m. Hopefully, what I've done in *PW* will bring a lot of joy to those constructors who wish to have a go at it.

Unfortunately, f.m. projects may well be a waste of time on any of the v.h.f. bands as there are just so many ex-PMR rigs available. There probably would be insufficient demand to produce a similar project in the magazine.

I have thought about doing narrow band f.m. (n.b.f.m.) on 1.8MHz though. This is because it may well provide a very useful mode of communications on a band, which is plagued by amplitude noise.

I hope in the not-to-distant future to start doing s.s.b. projects, but first it will be necessary to produce a stable v.f.o., which is reliably reproducible by the *PW* readership. This will also open the door to receivers and transmitters of all sorts in the h.f. bands as well as the s.s.b. sections of the v.h.f. bands.

Unfortunately, I cannot offer you the prospect of any digital construction projects. But I hope you may still find something of interest in project using the more traditional modes.

Antony Nailer G4CFY, *PW* Author

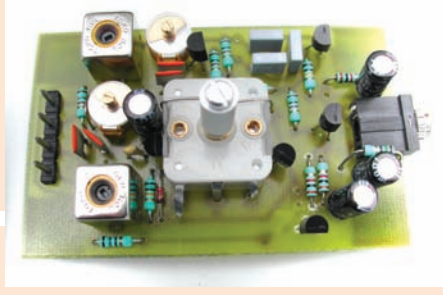
Rob G3XFD rounds off: Of course, I wholeheartedly agree with Tony G4CFY. We've had many discussions together, in close co-operation with **Tex Swann G1TEX** (*PW* Technical Projects Sub Editor) to bring the projects for you. And, as Tony G4CFY mentioned in his reply- some s.s.b. projects are under development. Finally, on this topic we must bear in mind that s.s.b. is a specialised form of amplitude modulation! See you next month. **G3XFD**. **PW**

Next Month in Practical Wireless, the magazine that brings you Amateur Radio & So Much More....

britain's best selling amateur radio magazine
PW
practical wireless

THE UK'S BEST AND ONLY INDEPENDENT AMATEUR RADIO MAGAZINE

PROJECT BUILDING
- **K is for Kilve, which in Morse means 'over to you' and that's exactly what Tim Walford G3PCJ says to readers this month as he encourages you to have a go at building the Kilve - a simple direct conversion single band receiver.**



DOING IT BY DESIGN
- **Tony Nailer G4CFY invites you to join him once more at his designer's desk as he aims to gives you a hands-on approach to theoretical topics.**

HERITAGE & HISTORY
- **Rob Mannion G3XFD continues with the occasional series that looks at historical and significant radio sites that have played a part in shaping Amateur Radio and communications as we know it today.**

ANTENNAS
- **Taking his turn in the 'Antenna Workshop' David Butler G4ASR shares some antenna designs with readers.**

Plus all your regular favourites including:

● *Amateur Radio Waves* ● *Bargain Basement* ● *Club News* ● *Keylines* ● *News* ● *Radio Scene* ● *Valve & Vintage* **and much, much more!**

* contents subject to change

JANUARY 2006 ISSUE ON SALE 8 DECEMBER..PLACE YOUR ORDER TODAY!
Also available direct for £3.00 by calling 0870 224 7830

CAN YOU AFFORD TO MISS IT?

YOUR SPECIALIST & LOCAL DEALERS

CORNWALL

WORSLEY COMMUNICATIONS
Robin C Worsley G0 MYR
'Onaru', Pennance Road,
Lanner, Redruth,
Cornwall TR16 5TQ
www.hamradiosales.co.uk
Tel: 01209 820118

ESSEX

WATERS & STANTON PLC
Spa House, 22 Main Road, Hockley
Essex SS5 4QS
Tel: (01702) 206835/204965
Fax: (01702) 205843
Web: http//www.waters-and-stanton.co.uk
E-mail: sales@wsplc.demon.co.uk
Open 9am to 5.30pm Monday to Saturday inclusive
MAIN AGENTS – ALL BRANDS
PHONE/FAX FOR FREE PRICE LIST

EAST YORKSHIRE

LINEAR AMP UK LTD
Field Head, Leconfield Road, Leconfield,
Beverley, East Yorks HU17 7LU
Tel/Fax: 01964 550921
E-mail: sales@linamp.co.uk www.linamp.co.uk
Manufacturers and suppliers of top quality HF and VHF valve amplifiers and antenna tuning units.
Repairs of most make of amplifier undertaken

IRELAND

CELLCOM IRELAND
DEERPARK, ORANMORE,
CO. GALWAY, IRELAND
www.cellcom.ie
Approved dealers for: ICOM,
TENNADYNE & LINEAR AMP UK
Several o her brands also available
We an supply and install your experimental radio station!
info@cellcom.ie
Tel: +353 (0)91 790222/4 Fax: ++ 790223

MID GLAMORGAN

SANDPIPER AERIAL TECHNOLOGY
Unit 5, Enterprise House, Cwmbach
Industrial Estate, Aberdare,
Mid Glamorgan CF44 0AE
Tel: (01685) 870425 Fax:(01685) 876104
A full range of transmitting & receiving antennas available for the amateur commercial market.
www.sandpiperaerials.co.uk
e-mail: sales@sandpiperaerials.co.uk

SCOTLAND

JAYCEE ELECTRONICS LTD
20 Woodside Way, Glenrothes, Fife KY7 5DF
Tel: (01592) 756962 (Day or Night)
Fax No. (01592) 610451
New opening hours: Tuesday-Friday 9am to 5pm. Saturday 9am to 4pm. Closed Sunday & Monday.
KENWOOD, YAESU & ICOM APPROVED DEALERS
A good stock of new and secondhand equipment always in stock

SCOTLAND

TENNAMAST SCOTLAND LTD
Masts from 25ft - 40ft
Adapt-A-Mast
(01505) 503824
81 Mains Road, Beith, Ayrshire KA15 2HT
E-mail: nbrown@tennamast.com
Web site: www.tennamast.com

SOUTHWEST & WALES

QSL COMMUNICATIONS
- For all amateur radio and listener needs.
- New and secondhand equipment.
- Part exchange welcome.

Unit 6, Worle Industrial Centre, Coker Road,
Worle, Weston-Super-Mare BS22 6BX
Tel/Fax: (01934) 512757

SOUTH YORKSHIRE

LAM Communications
71 Hoyland Road, Hoyland Common
Barnsley, South Yorks S74 0LT
www.lamcommunications.net
E-mail: lamcommunications.net
Tel: 01226 361 700
Specia ists in amateur radio equipment, new and second hand. Scanners, receivers, C.B. radio, and taxi. We buy, se l and broker equipment and will part exchange.
Opening times:- Monday 12 00noon to 18 00hrs
Tuesday - Friday 0 00hrs to 7 00hrs Satu day 0 00hrs to 5 00hrs
SPECIAL VIEW NG TIMES CAN BE ARRANGED W TH LEE *We also accept Sw tch Visa/Cash/Cheques*

WEST SUSSEX

Adur Communications
Belmont Buildings, The Street,
Bramber, W. Sussex BN44 3WE.
Tel: (01903) 879526
E-mail: service@adurcomms.com
Repairs and alignment to all amateur and commercial radio equipment.

YORKSHIRE

LEEDS AMATEUR RADIO LTD
SUPERSLAB CB CENTRE
The home of GB3YW operating on 145.7875MHz. CTCSS 82.5Hz
★ The complete radio suppliers ★
CONTACT STEVE POUNDER
BRADFORD ROAD, EAST ARDSLEY,
NR. WAKEFIELD WF3 2DN
Tel: 0113-252 4586 Fax: 0113-253 6621

PW BOOK SERVICE
Telephone Clive:
0870 224 7830
or
Fax: **0870 224 7850**
E-mail: clive@pwpublishing.ltd.uk

Phone 0207 731 6222 to advertise in Practical Wireless

Don't Miss Out!

Direct

Did you know that you can buy the current issue of *Practical Wireless* direct from the publishers?

Some readers may be experiencing difficulties in finding copies of *PW* in their local WH Smith stores or independent newsagent. So, as we don't want you to miss out on your favourite radio read, we'd like to remind you that you can buy current issues at cover price direct from us.

Simply send a cheque (payable to **PW Publishing Ltd.**), Postal Order or Credit Card details for the cover price (**£3.00** inclusive of P&P, UK only, overseas customers please add £1.00) with your name and address to **Clive Hardy G4SLU** in the Book Store and your copy will sent out to you (**cash not accepted**).

This service is also available for copies of *Short Wave Magazine* (£3.25) and *Radio Active* (£2.85). Alternatively, you may like to consider a subscription to ensure you don't miss out, see page 78 of this issue for details.

Book Store, PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

Tel: 0870 224 7830 Fax: 0870 224 7850

E-mail: clive@pwpublishing.ltd.uk Please check wi h bookstore for p ice and availability of back issues.

Index to Advertisers

ICOM

Go DIGITAL

IC-V82/IC-2200H

Thinking about getting into Digital? Icom leads the industry in bringing Digital Technology to Amateur Radio. Go Digital! Go Icom! Now available from your Authorised Icom Dealer.

NEW! IC-V82

The IC-V82 is Icom's first handheld transceiver with digital capabilities when used in conjunction with the optional UT-118. Features include; callsign calling; up to 20 character text messages; position exchange; 7 watts of high power; alphanumeric display; 207 memory channels; CTCSS and DTCS tone squelch plus DTMF decoder and pager operation with optional UT-108.

IC-2200H

The IC-2200H has a stable 65 watts output power and an optional UT-118 digital unit for digital and voice communication. Features include; callsign calling; up to 20 character text messages; position exchange; easy operation with large tuning dial and backlit display; one-piece; die-cast aluminum chassis for reliable operation; 50 CTCSS/104 x 2 DTCS encoder/decoder built-in plus DTMF and pager operation with the optional UT-108.

Icom UK Ltd.
Sea Street, Herne Bay, Kent CT6 8LD. Telephone: 01227 741741.
Fax: 01227 741742. e-mail: sales@icomuk.co.uk Website: www.icomuk.co.uk

PERFECT PARTNERS

FC-40

Automatic Matching 100 Memory Antenna Tuner

Automatic Matching for FT-857/897

Compact Size 236 x 175 x 53mm

Rugged Waterproof Case

100W Power Handling

FT-857

Ultra Compact

Rugged, High Output

High Performance Receiver

High Resolution Display

Wide Frequency Coverage

Enhanced Performance (DSP)

Advanced Features - VHF/UHF

YAESU

Choice of the World's top DX'ers

www.yaesu.co.uk