

Practical Wireless

PW

amateur radio & more!

KENWOOD

with this issue

FREE
SHACK POSTER

Kenwood World Map!

AERIAL Radio & Flight
Special
ADDICTS

Plus

**Great Greenwell
Goodies Catalogue!**



**President Lincoln
28MHz Rig Review**

**It's A
Classic...
The Trio
TR-2300**

July 2001

£2.75



9 770141 085051

Win Air Tattoo Tickets!

WATERS & STANTON

THE ONLY
TWO
PLACES
TO GO

22 MAIN RD, HOCKLEY, ESSEX, SSS 4QS
CHESTERFIELD RD, MATLOCK, DERBYSHIRE, DE4 5LE

ICOM

IC-70B116 180 - 70cm All Mode



£1099

Plus £7.50 Carr.

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

YAESU

FT-817

180m - 70cm 5W Portable



£799

Plus £7.50 Carr.

FT-817 (shown with new Auto ATU as featured on opposite page) is an incredible design feat by Yaesu, and world reviews agree that there has never been anything like it. It's not expensive either. So why not get out in the fresh air, or put one in the car, and put the fun back into your radio. Check out the exciting AT & ATX portable antennas on elsewhere on this page.

KENWOOD

TS-2000

180m - 70cm + 23cm



£1695

Plus £7.50 Carr.

The amazing TS-2000 offers coverage from HF to UHF. And you can go right up to 23cm with the optional module Monitor the DX cluster whilst working other DX, optimise your satellite contacts, enjoy the benefit of built-in ATU. It's all there in one very compact box. Colour brochures available on request.

YAESU

FT-1000MP Mk-V 200W HF All Mode Transceiver



£2899

Plus £7.50 Carr.

The New Industry Standard
Would a Serious DXer accept
anything else ?

In choosing the FT-1000MP Mk V, you will be proud to own a rig with an impressive specification, reputation and lineage. Its outstanding performance and attention to detail, makes this the premier HF transceiver for the 21st Century. This radio is a class leader.

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

ICOM

IC-756PRO

1.8 - 62MHz 100W

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Plus £7.50 Carr.

18.4% APR Available

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

It has stood the test of time and used by the worlds top DXers and DXpeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

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

YAESU FT-1000MP AC

180 - 10m All Mode

£1799

Out and About Antennas

Mobile "Drive About" 80m - 6m

Driveabout Mobiles

Multiband base loaded whip. Choice of powers, 3/8" stud base.

Driveabout LP 50W	£69.95
Driveabout HP 200W	£89.95
Centre load adaptor	£t.b.a.

Walkabout Portables

Multi & single telescopic whips. Covers 80m to 6m BNC. Ideal for FT-817 and similar QRP radios.

ATX Walkabout 80 - 6m	£69.95
AT-80 Single band	£24.95
AT-40 Single band	£24.95
AT-20 Single band	£19.95
AT-17 Single band	£19.95
AT-15 Single band	£19.95
AT-12 Single band	£19.95
AT-10 Single band	£19.95

WM-308 Base Mic

The perfect answer for a high quality base microphone. Built-in pre-amp powered from rig or 2 x AA, electronic PTT and FM/SSB response switch. Includes lead with 8-pin plug.



£59.95
Carr. £6.00

Station Clock WWC-411

This smart wall clock offers 12 or 24 hour display. It also indicates date and temperature in C or F. Size is 26.6cm diameter and it requires 2 x AA cells.



QS-112 Speaker Mic

Models for Yaesu, Kenwood, Icom, Alinco and Motorola.



£16.95
Carr. £2.00

Frequency Counters

Each counter is supplied with internal Ni-Cad pack, AC charger and whip antenna.

Hunter	10MHz - 3GHz	£59.95
FC-130	1MHz - 3GHz	£79.95
S. Hunter	10Hz - 3GHz	£149.95
S. Searcher	10MHz - 3GHz	£99.95

W-GMV Deluxe Key

A high quality Morse key made of brass with wood base. Full set of adjustments



£39.95
Carr. £2.00

NIMH Cells & Chargers

1400mAh AA size cells for high current applications.

Pack of 4xAA £9.95
Automatic 4-way AC charger for NIMH and Ni-Cad cells.
230v AC charger £9.95



CS-600 2-way Coax Switch

This well-made 2-way coax switch is ideal for HF, 2m and 70cms. Fitted with SO-239 sockets. It will handle up to 500 Watts RF



£12.95
Carr. £3.00

WCT-321 Lapel Talker

Earpiece with combined lapel hanging mic and PTT. Models to suit most radios.



£19.95
Carr. £2.00

Hands-Free Mobile!

Models to suit almost any rig. Head/neck band with adjustable mini-mic boom and transmit/receive switch box. Drive safely!



£44.95
Carr. £2.00

SPM-102 Speaker Mic

Incredible value! Has 4-way 3.5mm plug for VX-1, VX-5, FT-50 and IQ-7E



Limited stocks.

£9.95
Carr. £2.00

WMM-3 Data Modem

£69.95
Carr. £6.00



This modem permits a wide range of data to be sent and received. Starterdisc for SSTV, CW, RTTY, Pactor, 1200baud Packet etc. included. The unit is powered from the PC serial socket.

WSA-1 PSK-31 Adaptor

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



£39.95
Carr. £2.00

SP-170F Mobile Speaker



£12.95
Carr. £2.00

Fitted with volume control and switched filter, it measures 97 x 67 x 27mm and has a 3m lead with 3.5mm mono plug.

WEP-400 Earpiece

This high quality earpiece fits snugly over the ear and provides extra fidelity over normal models. Fitted with 3.5mm mono plug.



£14.95
Carr. £2.00

FBI-9 Almost Invisible!

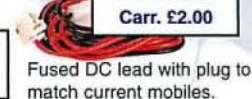
This skin coloured earpiece is almost invisible at a distance and is left/right adjustable. Fitted with 3.5mm mono plug.



£9.95
Carr. £2.00

Mobile 12V DC Leads

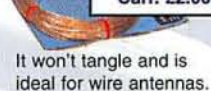
£6.95
Carr. £2.00



Fused DC lead with plug to match current mobiles.

Flexweave Antenna Wire

£6.95
Carr. £2.00



It won't tangle and is ideal for wire antennas.

Handy Adaptors

Connect anything to anything. 6 mating pcs. to produce "N", BNC, SO-239, PL-259, SMA, Mini UHF, TNC, plugs or sockets

PL-5/8 W-CN3

PL-259 to 3/8" socket £3.95
SMA to BNC socket £3.95



£49.95
Carr. £2.00

Torch Radio with Dynamo & Solar Panel



£12.95
Carr. £3.00

This amazing torch incorporates a full FM and AM radio. It can be powered from 4 x AA cells (extra), the internal dynamo, or from the solar panel on top. And all at an amazing price!

HF Mobile Whips

All whips are 2-section helical 2.25m.

WHF-160	£49.95	WHF-17	£18.95
WHF-80	£19.95	WHF-15	£18.95
WHF-40	£18.95	WHF-12	£18.95
WHF-30	£19.95	WHF-10	£18.95
WHF-20	£18.95		

Whip Accessories

W-BM1	Ball mount 3/8"	£19.95
MMT-1	Impedance matching xfr.	£19.95
3401	3-way mag mount 3/8"	£39.95
SS-504	Heavy duty spring 3/8"	£6.95

HF Accessories

ECW	50m 16g enamelled copper wire	£12.95
HDCV	50m hard drawn 16g copper	£14.95
PVC-50	50m clear covered multi-strand	£39.95
WAL-55	16.7m alloy wire 3.5mm	£7.95
WEW-50	50m Lightweight pvc wire	£9.95
WGR-330	30m Polyprop 14kg strain	£6.95
WGR-430	30m Polyprop 45kg strain	£14.95
WGR-630	30m Polyprop 130kg strain	£29.95
Kevlar	60m 181kg strain (Dacron)	£22.95
Insul-8	Black ribbed insulator	£0.99
LadderLoc	Centre insulator for 450 Ohm	£12.95

Avair VSWR Power Meters



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

AV-200	1.8 - 200MHz 5/20/200/400W	£49.95
W-400	140 - 525MHz 5/20/200/400W	£49.95
AV-600	1.8 - 525MHz 5/20/200/400W	£59.95

All fitted with SO-239, PEP/RMS readings, 3W for FSD approx. AV-600 has dual sensors.

Watson Power AC Supplies

CE & LVD Approved



Analogue		
W-3A	Fixed 3 Amp	£22.95
W-5A	Fixed 5 Amp	£29.95
W-10AM	Variable 10 Amp	£59.95
W-25AM	Variable 25 Amps	£89.95
W-30AM	Variable 30 Amps	£119.99

Portable Supply

Houses 13.8V 17Ah sealed cell. Has 2 x cigar sockets, 3-6-9V outputs at 1A and large crock clips. Will power 100W rigs! Package includes AC charger.



£69.95
Carr. £2.00

Base Antennas

2m / 70cm fibre glass colinears with stainless steel fittings, 3 short radials and SO-239 sockets. Pre-tuned and all hardware for mast mounting.

Dual Band 2m/70cms		
W-30	3/6dB 1.15m long	£39.95
W-50	4.5/7.2dB 1.8m long	£49.95
W-300	6.5/9dB 3.1m long	£59.95
Triple band 6m/2m/70cms		
W-2000	0/6/9dB 2.5m long	£69.95



Switch Mode		
W-10SM	Fixed 10 Amp	£49.95
W-20SM	Fixed 20 Amp	£79.95
W-40SM	Fixed 40 Amp	£149.95

Orders only: 08000 73 73 88

www.wsplc.com

sales@wsplc.com



WEB DIRECTORY

Linear Amp UK

E-mail: sales@lauk.karoo.uk
www.linamp.co.uk

G3TUX – Kits, Keys, QRP

E-mail: info@g3tux.com
www.g3tux.com

Radioworld

E-mail: sales@radioworld.co.uk
www.radioworld.co.uk

Pervisell Ltd

E-mail: ham@pervisell.com
www.pervisell.com

The Shortwave Shop

E-mail: sales@shortwave.co.uk
www.shortwave.co.uk

AKD

E-mail: roger@akdinfo.com
www.akdinfo.com

**To advertise here call Chris or Eileen on
01202 659920**

UK's Premier Service Centre

WE ARE STILL THE MOST COMPETITIVE PRICED SERVICE CENTRE

12.5kHz CONVERSIONS

Save money and keep your existing rig. Castle can convert most makes and models. Call us to discuss your requirements.

MAIL ORDER

Right in the heart of England, we are well placed to supply all major brand names at competitive prices by mail order. Before you buy from anyone, give us a call. You might be pleased you did!

For a cost of £15.00
Plus Carriage and VAT
we can do a full rig
check and report
RING FOR DETAILS

ICOM YAESU
KENWOOD

**DOOR TO DOOR
COLLECTION AND DELIVERY
SERVICE AVAILABLE**



**MAIN DEALERS
FOR ALL
MAJOR BRANDS**

FOR SERVICE

There really is only one choice. The choice many manufacturers have made when they want their own equipment serviced. When you send a repair or service to Castle Electronics, we do the job in house. We do not use sub-contractors!

Castle Electronics

Unit 20, Wolverhampton Business Airport
Bobbington, Nr. Stourbridge,
West Midlands DY7 5DY

Tel: (01384) 221036

Fax: (01384) 221037

Email: services@castle-elect.demon.co.uk

TRADE ENQUIRIES WELCOME



PW

JULY 2001
(ON SALE JUNE 14)
VOL. 77 NO 7 ISSUE 1132
NEXT ISSUE (AUGUST)
ON SALE JULY 12

EDITORIAL OFFICES
 Practical Wireless
 Arrowsmith Court, Station Approach
 Broadstone, Dorset BH18 8PW

☎ (01202) 659910
 (Out-of-hours service by answering machine)
 FAX: (01202) 659950

Editor
 Rob Mannion G3XFD
Technical Projects Sub-Editor
 NG ("Tex") Swann G1TEX
News & Production Editor
 Donna Vincent G7TZB

ADVERTISEMENT DEPARTMENT
ADVERT SALES & PRODUCTION
 (General Enquiries to Broadstone Office)
 Chris Steadman MBIM (Sales)
 Steve Hunt (Art Director)
 Bob Kemp (Layouts & Design)
 Peter Eldrett (Typesetting/Production)

☎ (01202) 659920
 (9.30am - 5.30pm)
 FAX: (01202) 659950

ADVERTISING MANAGER
 Roger Hall G4TNT
 PO Box 948, London SW6 2DS

☎ 020-7731 6222
 FAX: 020-7384 1031
 Mobile: (07885) 851385

BOOKS & SUBSCRIPTIONS
CREDIT CARD ORDERS
 ☎ (01202) 659930
 (Out-of-hours service by answering machine)
 FAX: (01202) 659950

E-MAIL

PW's Internet address is:
 pwpublishing.ltd.uk

You can send mail to anyone at PW,
 just insert their name at the beginning of
 the address,
 e.g. rob@pwpublishing.ltd.uk



Cover Subject

Keen 28MHz operator Jon Wheeler was really keen to 'parade' the President Lincoln 28MHz transceiver. Using the rig in the sunshine during May he achieved QSOs as far afield as Japan! In fact Jon was so smitten with this rig that he's bought one!

Photograph by: **Kevin Romang G4SKN**
 Design by: **Steve Hunt**



Kenwood world map and Greenwell

July features

17 Looking At.....

Join Gordon King G4VFW as he takes a look at audio stages.

22 Radio Basics

Moving coil meters are an extremely useful 'tool' to have on your workbench, so this month **Rob Mannion G3XFD** gives you some ideas on how to use them in your shack. There's also a little maths homework too!

24 The President Lincoln 28MHz Multi-mode Transceiver

Jon Wheeler G0IUE was very pleased when asked to go on 'parade' with the President Lincoln 28MHz transceiver. Read Jon's review to find out why he liked it so much that he decided to buy the review model.

30 A Three-Band QRP CW Transmitter

Carmel Fenech 9H1AQ shares an idea for a simple-to-build QRP three-valved three-band c.w. transmitter specifically aimed at the newcomer to Amateur Radio.

34 Antenna Workshop

A pair of lightweight vertical portable antennas are put through their paces by our v.h.f. author **David Butler G4ASR** this month.

36 Edison & The Invention Factory

Several inventors and inventions have helped to shape radio and make it what we know today. **Dick Pascoe G0BPS** reflects on Thomas Edison's famous inventions.

38 Royal International Air Tattoo Competition

30 lucky *PW* readers will watch the skies come alive at this year's RIAT at RAF Cottesmore. Enter our easy competition to be in with a chance of winning one of 15 pairs of tickets.

42 One Wire - Three Bands

One wire does it all! **Denis Payne G3KCR** describes a three band dipole that he's found great for using on the 14, 21 and 28MHz bands.

43 Errors & Updates

The gremlins have been at work again! So to sort things out we bring you some ammendments to articles recently published.

44 It's A Classic....

Richard Newton G0RSN owns a pair of Trio TR-2300 hand-sized portable transceivers and reckons they are great for hill-topping, portable operation and really do stand the test of time.

48 Amateur Radio Abroad

Visiting the Spanish Canary Islands turned into a truly enjoyable Amateur Radio holiday for **Jack Drake GM4MOX**. He shares his experiences and offers some hints and tips for taking your hobby on holiday.

52 Carrying on the Practical Way

Ideas sent from Russia with Love are the basis for **George Dobbs G3RJV**'s column this month.



l catalogue free with this issue



page 24



page 38



page 44



page 48



page 52

July regulars

9 Rob Mannion's Keylines

Rob G3XFD introduces another cram packed issue and news from his postbag.

10 Amateur Radio Waves

Readers make 'waves' by writing in with their comments, ideas and opinions.

11 Amateur Radio Rallies

A round-up of radio rallies taking place in the coming month.

12 Amateur Radio News & Clubs

Find out what's hot in the world of Amateur Radio, this month there's news of a new hand-held transceiver/scanner from Kenwood and don't forget to check out what activities your local club has planned too.

18 Subscriptions

Take out a subscription to the UK's only Independent Amateur Radio magazine - you'll save money and be guaranteed a great radio read every month

54 Valve & Vintage

Charles Miller shares more of his memories from his early days in radio.

56 VHF DXer

Trans-equatorial propagation and auroral back-scatter are the topics covered by **David Butler G3ASR** in his monthly round-up of the action on the v.h.f. bands

58 HF Highlights

Carl Mason GWOVSW has a bumper edition of his column as he reports on the recent happenings on the h.f. bands with the help of your logs and reports.

64 Keyboard Comms

Roger Cooke G3LDI has all the latest news from the data comms scene.

66 DX Destination

Get out and about with Amateur Radio as **Ed Taylor G0SQX** offers some ideas for exotic radio locations.

69 Tune In

Tom Walters wants to know how you listen to International radio, he also provides the latest h.f. broadcast schedules.

70 Bargain Basement

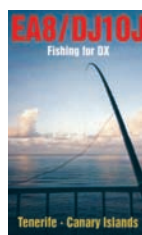
The bargains just keep on coming! Looking for a specific piece of kit? - Check out our readers' ads, you never know what you may find!

72 Book Store

The biggest and best selection of radio related books anywhere!

77 Topical Talk

This month take a tour with us around the recent London Amateur Radio and Computing show.



page 9



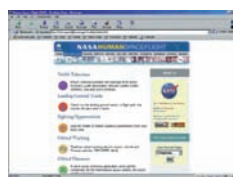
page 54



page 56



page 58



page 64



page 66



page 69



page 77

author info

Our Radio Scene reporters' contact details in one easy reference point.

Author Info

Our Radio Scene reporters contact details in one easy reference point.

VHF DXer

David Butler G4ASR
Yew Tree Cottage
Lower Maescoed
Herefordshire HR2 0HP
Tel: (01873) 860679
E-mail: g4asr@btinternet.com

HF Highlights

Carl Mason GWOVSW
12 Llwyn-y-Bryn
Crymlyn Parc
Skewen
West Glamorgan SA10 6DX
Tel: (01792) 817321
E-mail: carl@gw0vsw.freemove.co.uk

Keyboard Comms

Roger Cooke G3LDI
Tel: (01508) 570278
E-mail: rcooke@g3ldi.freemove.co.uk
Packet: G3LDI@GB7LDI

Tune-in

Tom Walters
PO Box 4440
Walton
Essex CO14 8BX
E-mail: tom.walters@aib.org.uk

In Vision

Graham Hankins G8EMX
17 Cottesbrook Road
Acocks Green
Birmingham B27 6LE
E-mail: graham@ghank.demon.co.uk

DX Destination

Ed Taylor G3SQX
C/o PW Editorial Offices
Arrowsmith Court
Station Approach
Broadstone
Dorset BH18 8PW
E-mail: g3sqx@email.com

Down Under

Chris Edmondson VK3CE
Box 123
Eagle Heights
Queensland 4271
Australia
E-mail: publisher@radiomag.com

Copyright © PW PUBLISHING LTD. 2001. Copyright in all drawings, photographs and articles published in Practical Wireless is fully protected and reproduction in whole or part is expressly forbidden. All reasonable precautions are taken by Practical Wireless to ensure that the advice and data given to our readers are reliable. We cannot however guarantee it and we cannot accept legal responsibility for it. Prices are those current as we go to press.

Published on the second Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659910. Printed in England by Womersley Midlands PLC, Lincolnshire. Distributed by Seymour, 86 Newman Street, London, W1P 3 D, Tel: 0171-396 8000, Fax: 0171-306 8002, Web: http://www.seymour.co.uk. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Centa News Agency. Subscriptions INLAND £30, EUROPE £33, REST OF WORLD £42 (Airmail), payable to PRACTICAL WIRELESS, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659930. PRACTICAL WIRELESS is sold subject to the following conditions, namely that it shall not, without written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever. Practical Wireless is Published monthly for £50 per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659930. UK Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/o Yellowstone International, 2375 P. at Boulevard, Elk Grove Village, IL 60007-5937. The USPS (United States Postal Service) number for Practical Wireless is: 007075.

SRP TRADING

1686 Bristol Road South, Rednal, Birmingham B45 9TZ

★ ★ TRADE AND EXPORT ENQUIRIES WELCOME ★ ★




**ROTATOR
AR300XL**


Max load 60kg (with support bearing) 360deg. rotation in approx 65sec.

£49.95 + P&P.

Optional support bearing
£14.95



**PRESIDENT LINCOLN
10 METRE TRANSCEIVER**



28.000-29.7MHz. AM/FM.SSB/CW. Microprocessor controlled amateur radio. Switchable RF gain, RF/Modulation/SWR meter, variable RF output, variable (clarifier) RIT. 10kHz and 100Hz steps, frequency lock, frequency change on microphone, etc.

£208.95 + P&P

SANGEAN ATS-909

QUALITY PORTABLE SHORT WAVE RECEIVER




153kHz-30MHz (AM/SSB)
87.5MHz-108MHz (FM).
Includes free headset and short wave antenna.

£139.95
+ P&P

Features: (RDS) Radio Data System

**MAGNUM DELTA FORCE
10 MTR TRANSCEIVER**



28.000-29.699MHz 30 watts PEP.
AM/FM/USB/LSB/CW.

Microprocessor controlled, variable RF output. 5 digit LCD frequency display. S/R and SWR meter, scanning microphone, off-set (split) frequencies, etc.

£225.95 + P&P

SANGEAN ATS-505




**AM/FM/SSB FM-STEREO/
MW/LW/SW/PLL
SYNTHESISED
RECEIVER**

Professional digital multi-band world receiver.
Continuous coverage 150-29999kHz.

£99.00 + P&P

UNIDEN BEARCAT 9000XLT



**AM/FM/WFM switchable base station
HF/VHF/UHF scanning receiver.**

Range: 25-550MHz & 760-1300MHz.
Features include: speaker socket, backlit orange LCD display, squelch control, rotary tuner, sound squelch, scan delay, auto sorting, RF attenuator

£249.95 + £10.00 P&P

225 BASE SCANNER

**500 channel
programmable scanner**



Continuous coverage
Range 25-1300MHz.
'NO GAPS'.
MODES: AM/FM/WFM
switchable

£299.95.

£249.95
+ £10.00 P&P

FREE
homebase discone
antenna worth £49.95



**MAYCOM
AR108
COMPACT CIVIL
AIRBAND
SCANNER**



Frequency coverage:-
108MHz-137MHz (AM).
136MHz-180MHz (FM).

£69.95
+ P&P

**RECHARGEABLE
NI-MH BATTERIES**

"No memory effect".
Over twice the capacity of Nicads.

AA cell	1500mAh	@ 1.2V	.....£2.00 each
AAA cell	550mAh	@ 1.2V	.....£2.40 each
C cell	2200mAh	@ 1.2V	.....£3.99 each
D cell	2200mAh	@ 1.2V	.....£3.99 each
PP3 cell	150mAh	@ 1.2V	.....£3.99 each

CHARGERS FOR ALL SIZES AVAILABLE

**DC INVERTORS - 12V DC IN 240V
AC OUT**

150W version 12V only (for notebook computers etc.)	.....£39.95 + P&P £5
300W version 12/24V (for small power tools etc.)	.....£59.95 + P&P £5
600W version 12/24V (for medium power tool etc.)	.....£109.95 + P&P £10
1000W version 12/24V (for large power tools etc.)	.....£139.95 + P&P £10

Opening times: Mon-Sat 9.30am to 5.15pm. We are Kenwood, Yaesu, Icom, & Alinco dealers.

Trade customers are you getting the best deal? Phone and find out!

Call Mary (MOBMH) or Dave on

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

rob mannon's keylines

Welcome to 'Keylines'! Each month Rob introduces topics of interest and comments on current news.

Traditionally **PW** readers expect us to provide a suitable April Fool spoof article or little joke. On the occasions over the years we've not had space to continue the tradition, readers have told me how disappointed they were at not having their legs pulled! However, this year our spoof - The Switch Mode Receiver by **Denzil Roden G3KXF** - provided very distinctive reactions: readers were either extremely cross or they thought it was a very clever joke indeed!

The reaction from some readers surprised me and I think that they were so cross because (like myself) they really were fooled when they first read it. But on second reading it became obvious it was a joke and the red hot keyboards sizzled their E-mails and letters onwards to the **PW** office!

Thanks go to Denzil G3KXF for the original idea and to **Tex Swann G1TEX** for the innovative photography and providing the Acrylic (standing in for the Russian Cyrillic) lettering on the p.c.b. We can't promise not to pull your legs next year!

Reader Rescues Rob!

Following my request asking readers if they could help me find a replacement copy of *FJ Camm The Practical Man* (May Keylines) I'm delighted to say that **Michael Rowntree**, of Wellingborough in Northamptonshire kindly obliged.

Michael sent me the book and suggested that I donate something to the Radio Amateurs' Invalid and Blind Club. This I did with pleasure - sending a cheque to Michael to send on to the RAIBC.

My new book had its first outing when I provided a **PW** 'Club Talk' on Friday 18 May at the **Torbay Amateur Radio Society** in Newton Abbot, Devon. They enjoyed seeing the book and I hope to share it with more of you...thanks to the generosity of Michael in Northamptonshire. Thanks Michael - your kind gesture was much appreciated!

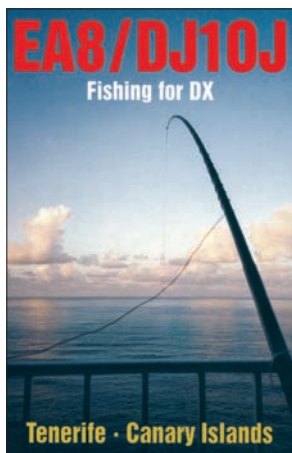
Brian Ward

Many readers, especially those who responded to his comments as published in the **PW** readers' letters column will remember the initials and name of B. C. N. Ward of Manchester. The writer - **Brian Ward** - wrote some critical letters which along with drawing attention to the errors appearing in **PW**, also seemed to be slating Radio Amateurs and the Amateur Radio hobby.

Unfortunately, I've now heard (from his executor who is a licensed Radio Amateur himself) that Brian died in March following a major operation. As I had learned from his (personal) letters to me - he'd suffered ill health for a while, but I didn't realise just how ill he was. I'd also realised that he lived alone and was in fact very keen on Amateur Radio although his

single person flat was totally unsuitable for our hobby - with the added problem of a large electrical sub-station transformer adjacent to the property. In other words, it turns out he was a truly frustrated budding Amateur.

However, following the controversial comments Brian Ward had published in **PW**, I think it's appropriate to mention that all his equipment has been donated (his express wishes) to an Amateur Radio Novice Class group. Personally, I think Brian Ward's gesture really showed his absolutely precise nature and approach to life and what he thought of our hobby. It's a great pity we weren't able to help him to enjoy it more himself. So, let's hope that more house bound, severely disabled potential Amateurs can and do get support in the future.



Fishing For DX

Realising the QSL card (for a 28MHz c.w. QSO) shown on the left here - used the same title (Fishing For DX - Antenna Workshop, February 2001) as my original article along with the Funktechnik telescopic fishing rod mast as I enjoy using - reader **Graham Slack G4AKR** sent it to me. Appropriately enough we've got an article on holiday DXing from the Canary Islands this month too!

Graham hopes to be active soon with his mast and

Kenwood TS-50 when the Foot & Mouth disease outbreak has been eradicated in his part of Yorkshire. I wish you a good DX catch Graham!

Competition Cock-Up!

My apologies for the competition cock-up in the May issue of **PW**. Somehow (we still don't know why) the word **Unit** disappeared from the SGC wordsearch competition after we'd thoroughly checked it here before it was sent to the printers.

Many readers contacted us and everyone who did was assured that results would be also judged on 11 words found rather than 12. You can be sure that any Gremlins entering don't stand a chance of the prize!

Free Gifts

By now you will have found your free gifts this month - the superb World Map jointly presented by Kenwood Electronics (UK) and ourselves and the Greenweld Goodies catalogue. The Kenwood map - long appreciated by keen DXers and listeners alike - can now take pride of place in your shack.

The Greenweld catalogue will help constructors find those bargains to encourage them to get building. So, enjoy reading it and then plug that soldering iron in and get busy!

Rob G3XFD

practical wireless services

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

Subscriptions

Subscriptions are available at £30 per annum to UK addresses, £38 in Europe and £42 (Airsaver), £49 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both **Practical Wireless** and **Short Wave Magazine** are available at £60 (UK) £73 (Europe) and £81 (rest of world), £85 (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. The printed circuit boards for **PW** projects are available from the **PW PCB Service**, **Kanga Products**, **Sandford Works**, **Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

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. Back issues for **PW** are £2.50 each and photocopies are £2.50 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for **PW/SWM** is also available from the Editorial Offices for £1 inc P&P.

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 (01202) 659930. 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 (01202) 659950.

The E-mail address is bookstore@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.

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

All other letters will receive a £5 voucher.



● **Dear Sir**

I was delighted to read the article in May's *PW*, about **Dick Pascoe GOBPS** and his involvement with hospital radio. Your readers may be interested to know that there are over 300 hospital radio stations in the UK, most of which belong to the

As well as providing services to member stations, the HBA offers a means of putting potential volunteers in touch with their local station. Anyone wishing to find out how to contact their local station should contact me and I'll send them the details. Although E-mail is the preferred and quickest means of communication, if they write to me I'll respond as quickly as possible.

For those with internet access, there's a very short and incomplete list of licensed Radio Amateurs who are also involved in hospital radio on my website, at http://ourworld.compuserve.com/homepages/paul_duell/hrhams and anyone who'd like their name and callsign attached to that list is welcome to E-mail me at the address below.

**Paul Duell G0TLG,
Membership Officer
National Association of Hospital Broadcasting
Organisations
3 Treeside Road
Shirley
Southampton
SO15 5FY
E-mail: membership@hbauk.com**

Metric From The Beginning?

● **Dear Sir**

The Editor's footnote comment to the reader's letter in *PW* (headed **Politically Correct** - May 2001) saying that "Radio science has been metric from the beginning" **might not be quite correct**. So, with respect may I offer the following which could be of some interest.

A paper I have seen (dated 22 September 1914) reports results of successful trials of an aircraft wireless transmitter made to Admiralty specifications, described as follows: A Mira Ignition coil, a brass spark gap, Dubilier condenser 0.002 μ F, a flat spiral inductance with power provided by an 8V, 10Ah accumulator. Total weight of apparatus including battery 18 pounds. Range of wavelengths from the primary circuit **300 to 1000 feet.**

The specification for an aircraft receive of mid 1914 called for a wavelength coverage of from **500 to 3000** feet. A letter dated 15 March 1917 from the Air Department requesting co-operation in listening out for an air test using c.w. (as opposed to spark) gives the wavelength on which to listen as **5050 feet.**

The previous reported events involved all the armed forces of that period. In addition the Marconi company in January 1915 reported that they were looking into an aeroplane receiver to cover **600 to 1000 foot** waves. Thus in this early period the Army, Royal Navy, Royal Flying Corps and civilian supplier **were all in step as it were...foot by foot!**

Ray Coley G3IFF
Havant
Hants

Editor's chastened reply:

Now I know better

Ray...when I call CQ on 7MHz perhaps it should be "CQ 131, CO 131" (Feet!)?

The Band & Cluster Police

● **Dear Sir**

In the book *The Complete DXer* by **Bob Locher**, the author makes several references to the Band Police. These are the self-appointed individuals who sit on the transmit frequency of a DX station and continually inform other Amateurs that the DX station is working split by sending 'up-up' or other such informative comments. These comments only serve to obliterate the DX station's signal usually when they're passing some important information such as QSL details. The Band Police turn up all over the place and can make working DX almost impossible.

Well, now it seems another group is emerging, The Cluster Police! These self-appointed individuals make it their job to monitor the spots on their local cluster and pass comments to the spotter as to validity of their spot.

As an example, recently I worked a Spanish event station having worked it I monitored for a while to see what custom it got. After several CQs without response I decided to spot him on the Cluster after all it cost me nothing. It worked and other stations began to call in.

A few moments later a local station initiated a talk request to me and informed me that the Spanish station wasn't really DX and that this wasn't the purpose of the Cluster. Against my better judgement I decided not to reply and eventually the talk request terminated.

A few days later I had another encounter with the

Cluster Police I noted that the YV5B beacon in Venezuela and LU44AA beacon were getting stronger at my QTH indicating that 14MHz was opening up to South America. I spotted both beacons on the cluster to give those working on other bands an idea that 14MHz propagation was changing, I glanced up at the screen only to find that I was being reprimanded by another 'policeman' asking "Why are you spotting beacons"? This really annoyed me so I returned the talk request and explained that "others may not know about the change in conditions and were there any rules against it"? I received no reply.

I always understood the Cluster Network to be a tool for the Amateur. A method of getting information that you would otherwise be unaware of and others like me use the cluster as a second op and any information, whether it be relevant to me or not, is welcome. I appreciate that, although some information appearing on my screen may not be useful to me, it's likely to be useful to someone else.

I find it sad that there are people out there with nothing better to do than to criticise others. If we all passed comments on the spots that we deemed were not relevant then eventually no one would spot anything for fear of criticism and the network would be useless. Let's look after this most useful of tools and encourage not discourage the contribution of information.

In closing I'll just add that it's interesting to note that when you check the files to see how many spots the 'policemen' have put on the system for others to use...it usually amounts to **zero!**

Chris Carrington
G0IYZ

Practical Wireless, July 2001



**Chellaston
Derby**

Editor's comment: If the 'policemen' want to do something really useful they could keep the packet stations (on 14MHz) and s.s.b. stations (on 18MHz particularly) off the International Beacon Project frequencies. But would they make the QRM problems worse?

Looking At S-Meters

● Dear Sir

Gordon King G4VVF's

latest topic in his series **Looking at...** dealt with receiver S-meter measurements. I think it's a timely one and will no doubt clear up many points. However, I would like to put forward a few things about the dBm.

All transmission systems involve the transfer of power from the sender to the receiver. For the purposes of measurement and adjustment of this power a reference level is required, this level being the milliwatt. Specifically 1 milliwatt abbreviated symbol m. This dBm is a certain power level referred to 'One milliwatt' being positive above 1mW, negative below 1mW.

It's customary to omit 'm' when dealing with differences between levels though. For instance, an amplifier A may have so many dB gain compared to the output of amplifier B in which case B could be said to be so many dB down on that of A.

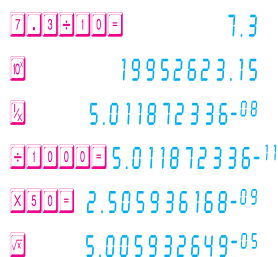
In the article it's stated that -73dBm when dissipated in 50Ω results in a potential difference (PD) of 50 millivolts. Whether or not this figure is a printing error* (*It was, see below Editor*). I wouldn't know. It should read μV (50 microvolts).

For those whose need-to-know urge beats hard within the breast (and at the risk of boring old hands) this result can be confirmed by the use of two formulae:

$$\text{dB} = 10 \log_{10} \left(\frac{P_{\text{out}}}{P_{\text{in}}} \right)$$

$$E = \sqrt{WR}$$

Which will present no problem to those with an arithmetic bent. However, for the sake of completeness here is the result as obtained on a Casio Scientific calculator.



Keystrokes and display as for a Casio fx-451 scientific calculator

I hope to hear more on the subject!

**Alan Pidgeon G6CBP
Worcester**

Editor's comment: Please see the Errors & Updates in this issue (Page 43) for the article in question. Additionally, there's been so much interest shown in this topic that Gordon G4VVF is planning to delve more deeply into the subject in a later article.

The MFJ-616 & Hearing Problems

● Dear Sir

Following the review by the **Rev. Hubert Makin G3FDC** of the MFJ-616 Speech Intelligibility Enhancer and the apt comments by **Peter Knowles M0BRV** (Radio Waves June PW), I have ordered one. Having lost some of my high frequency response, I work with groups who have hearing loss. Despite hearing being one of our two main sensory inputs, it is grossly neglected, even abused.

Hearing loss affects one in seven of the population - 8.7 million people, so there's a lot of it about. There are many simple electrical and electronic devices to help those with hearing loss, whether or not they use a hearing aid.

However, most people are unaware that such equipment exists, let alone where to obtain it. Many of these items help those with hearing problems with using the telephone or listening to radio or TV.

It occurs to me that our hobby has provided many servicing volunteers for Talking Books for the Blind. It would help considerably if like-minded people could help spread the word that equipment is to hand, much of it at low cost (often VAT-free), for those whose hearing is a few dB down. I have prepared a summary of gear and a list of suppliers who will provide free catalogues and I will gladly send it to anyone interested. I can be reached QTHR or via E-mail radius@euphony.net

**Ray Burgess G3RXG
Shipham, Somerset**

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.

June 17

The Newbury & District ARS Boot Sale

Contact: George Cook

Tel: (01488) 682814

Website: <http://www.nadars.org.uk>

Taking place at the Acland Hall & Recreation Field, Cold Ash, Newbury, from 0900 'till 1500, there will be a talk-in on S22. Why not go along and support the club?

June 17

The Leeds & District Amateur Radio Society Rally

Contact: J. Mortimer MOJAM

Tel: (01943) 874650

This twice yearly traditional outdoor rally and car boot sale is being held at the Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. There will be plenty of free parking for buyers.

June 24

The Bangor and District ARS Summer Rally

Contact: Norman G3YMY

Tel: (0289) 146 6557

E-mail: normannewell@beeb.net

Website: <http://welcome.to/bdars>

A good selection of radio and computer traders will be in attendance. at the Crawfordsburn Country Club, which is near Bangor, County Down at the Bangor ARS summer rally. Doors open at 12 noon and admission is £2. Look out for the Bring & Buy!

June 24

Longleat Rally

Contact: Ron G4GTD

Tel: (0117) 985 6253

Website: <http://www.longleatrally.co.uk>

The 44th Longleat Rally will be held at Longleat House, near Warminster, Wilts, just off the A36 Bath - Salisbury road. All the usual major exhibitors and attractions including RSGB bookstall, RA stand - and Craft Fair. Entrance: Adults £3, Senior Citizens £2, Children £1. There will be a Car Boot Sale and Table-top Sale at 1000 for the whole day, with no advance booking. Sub-let or share with a friend if you wish. Talk-in on 2m, S22.

July 1

The York Radio Rally

Contact: Pat Trask G0DRF

Tel: (01904) 628036

E-mail: pat.trask@linone.net

Taking place at The Knivesmire Building, York Racecourse, York. Doors open 1030. There will be all the usual traders and free parking. Entrance fee £2, children under 14 free.

July 8

The Sussex Amateur Radio & Computer Fair

Tel: (01424) 428064

Celebrating its 21st Annual Rally the Sussex Amateur Radio & Computer Fair takes place at Brighton Racecourse with its refurbished facilities, the new owners have spent over 3 million pounds on improving the Grandstand and Exhibition halls, including the refreshment and bar areas. Doors open 1030-1600. There will be the usual traders and club stands, with the very popular Bring & Buy hall. Entrance fee is £2.50 with free on-site parking.

July 14

Cornish Annual Mobile Rally & Electronics Fair

Contact: G4LJY

E-mail: g4lly@qsl.net

The Cornish Radio Amateur Radio Club will be holding their 38th Annual Mobile Rally and Electronics fair on Saturday 14 July at Penair School Truro. Doors open at 10.30. Admission is £1.50. Many trade stands, demonstrations, Bring and Buy, refreshment and talk-in

July 15:

The McMichael Amateur Radio Rally & Car Boot Sale

Contact: Dave Chislett G4XDU

Tel: (01628) 625720

E-mail: g4xdu@amsat.org

Website: <http://come.to/mcmichaelrally>

Taking place at a new venue, the Reading Rugby Football Club, Sonning Lane (B4446), just off the A4 near Reading, Berkshire. The key benefits for this larger site is a better parking and car boot area, better catering services, bigger fully licensed bar, easier access, first aid and a talk-in station on v.h.f. This will be Berkshire's Premier event with many traders present and the ever popular car boot sale makes it a good rally to visit. Various local clubs and organisations also have stands at the rally.

● Keep your letters coming to fill PW's postbag

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 call sign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'.

Editor

Practical Wireless, July 2001

● Stop Press!

New Portable Transceiver/Scanner

Visitors to the Dayton Amateur Radio, show in the USA were treated to the first viewing of Kenwood's new v.h.f./u.h.f portable transceiver to feature a built-in full range scanner. The sample shown at Dayton was a prototype of the American-market triple-band radio, which includes the 220MHz band (not available in Europe). The UK/European version doesn't cover this band for transmitting purposes and therefore will have a different model designation and will be called the **TH-F7E**.

Features of the TH-F7E include:

- Dual-band transmit on 144/430MHz.
- Receives 2 frequencies simultaneously, even on the same band.
- 0.1-1300MHz receive (on 'B' band).
- f.m., f.m.-w, f.m.-n, a.m. plus s.s.b./c.w. receive.
- Internal VOX.
- Internal ferrite rod antenna for a.m. broadcast receive.
- 1200/9600 packet ready (with external TNC).
- 434 memory channels
- 16-key pad plus multi-scroll key
- Lithium-ion battery as standard (7.4V/1550mAh) giving 5W output.
- Special charging circuit for simultaneous charging/operating.
- MIL-STD 810 C/D/E for vibration, shock, humidity and light rain.
- Automatic Simplex Checker.
- Windows Memory Management software (free download from Kenwood Website).



The price for the TH-F7E is expected to be under £300 and first shipments are expected in the autumn.

Kenwood Electronics (UK),
Kenwood House, Dwight Road,
Watford, Hertfordshire WD1 8EB
Tel: (01923) 655284 FAX: (01923) 655297
Website: www.kenwood-electronics.co.uk

Sunshine Bargains

Waters & Stanton Open Day

Sunday 13 May dawned bright with blue skies and rapidly the temperature reached 27°C - the perfect setting for Waters & Stanton's Open Day.

The annual W&S open day event was well attended with the usual queue of customers eagerly awaiting for the doors to open at 1000. Everybody made straight for the bargain stand in one section of the marquee where all kinds of items were on offer from Second World War equipment to end-of-line bargains and service department write-offs.

A free prize draw also took place, with visitors eagerly awaiting to see who'd won the VX-1R kindly donated by Yaesu and the various other prizes donated by Kenwood and Icom, all of who had stands within the marquee.

During the afternoon Mark Francis held his famous “Every Thing Must Go” auction where a wide range of products were sold off, and judging by the large number of boxes and bags being carried away, many visitors found bargains!

**Waters & Stanton PLC,
22 Main Road,
Hockley,
Essex SS5 4QS
Tel: (01702) 206835
FAX: (01702) 205843
E-mail: info@wsplc.com
Website:
www.wsplc.com**



● New from Nevada

Outdoor Balun

A new outdoor balun designed by American manufacturer Palstar is now available from Nevada of Portsmouth.

The Palstar B4000 4kW 4:1 balun is designed for outdoor use and may be used to terminate open-wire or balanced feeders before they come into the shack. It can be mounted remotely at the base of a mast or tower or just outside your shack window.

When used with an open-wire fed doublet antenna, the B4000 balun (with a suitable a.t.u.) gives coverage of all nine h.f. Amateur bands. The B4000 is available direct from Nevada for **£79.95**.



Nevada, Unit 1 Fitzherbert Spur,
Farlington, Portsmouth PO6 1TT.
Tel: (02392) 313090. FAX: (02392) 313091. E-mail: info@nevada.co.uk

● Essay Competition

Win a Trip to Turkey!

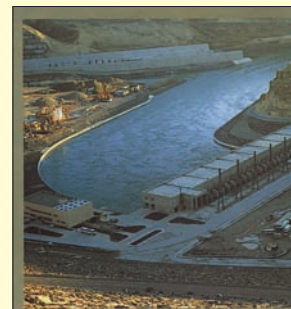
Do you fancy an all-expenses paid trip to Turkey? If so read on...

The Voice of Turkey has just announced its 2001 essay competition.. Six lucky people will be invited to Turkey for an all-expenses paid visit lasting 12 days.

To be in with a chance of winning you need to answer the following question by writing an essay. The question is: 'If you had the chance to come to Turkey, which areas of historic and touristic attraction would you prefer to see and why?'

Your essay must be no more than three pages long and should be sent to the address below before **July 15 2001**. So go on get writing!

English Section
TRT, The Voice of Turkey
PO Box 333, Yenisehir,
Ankara 06443, Turkey



MOONRAKER

www.amateurantennas.com

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

LOG PERIODIC

MLP32 TX & RX 100-1300MHz one feed, S.W.R. 2:1 and below over whole frequency range professional quality (length 1420mm)**£99.95**

MOBILE HF WHIPS (with 3/8 base fitting)

AMPRO 6 mt**£16.95**
(Length 4.6' approx)
AMPRO 10 mt**£16.95**
(Length 7' approx)
AMPRO 12 mt**£16.95**
(Length 7' approx)
AMPRO 15 mt**£16.95**
(Length 7' approx)
AMPRO 17 mt**£16.95**
(Length 7' approx)
AMPRO 20 mt**£16.95**
(Length 7' approx)
AMPRO 30 mt**£16.95**
(Length 7' approx)
AMPRO 40 mt**£16.95**
(Length 7' approx)
AMPRO 80 mt**£19.95**
(Length 7' approx)
AMPRO 160 mt**£49.95**
(Length 7' approx)
AMPRO MB5 Multi band 10/15/20/40/80 can use 4 Bands at one time (length 100")**£69.95**

DUAL BAND MOBILE ANTENNAS

MICRO MAG 2 Metre 70 cms Super Strong 1" Mag Mount (Length 22")**£14.95**
MR 700 2 Metre 70 cms (1/2 & 1/4 wave) (Length 20") (% fitting)**£6.99**
MR 700 2 Metre 70 cms (1/2 & 1/4 wave) (Length 20") (SO239 fitting)**£9.99**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (3/8 fitting)**£16.95**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (SO239 fitting)**£18.95**
MR 750 2 Metre 70 cms 5.5 & 8.0 dBd Gain (1/2 & 3 x 1/4 wave) (Length 60") (SO239 fitting)**£38.95**

SINGLE BAND MOBILE ANTENNAS

MR 214 2 Metre 1/2 wave (% fitting)**£3.99**
MR 214 2 Metre 1/2 wave (SO239 fitting)**£5.00**
MR 258 2 Metre 1/2 wave 3.2 dBd Gain (% fitting) (Length 58")**£12.95**
MR 650 2 Metre 1/2 wave open coil (3.2 dBd Gain) (Length 52")**£9.95**
MR 775 70 cms 1/2 wave 3.0 dBd Gain (Length 19") (SO239 fitting)**£14.95**
MR 775 70 cms 1/2 wave 3.0 dBd Gain (Length 19") (% fitting)**£12.95**
MR 776 70 cms 1/2 over 1/4 wave 6.0 dBd Gain (Length 27") (SO239 fitting)**£18.95**
MR 776 70 cms 1/2 over 1/4 wave 6.0 dBd Gain (Length 27") (% fitting)**£16.95**
MR 444 4 Metre loaded 1/4 wave (Length 24") (% fitting)**£12.95**
MR 444 4 Metre loaded 1/4 wave (Length 24") (SO239 fitting)**£15.95**
MR 641 6 Metre loaded 1/4 wave (Length 56") (% fitting)**£13.95**
MR 644 6 Metre loaded 1/4 wave (Length 40") (% fitting)**£12.95**
MR 644 6 Metre loaded 1/4 wave (Length 40") (SO239 fitting)**£13.95**

TRI BAND MOBILE ANTENNAS

MR 800 2 Metre 70 cms 6 Metres 5.0, 7.9 & 3.0 dBd Gain (1/2, 3 x 1/4 wave) (Length 60") (SO239 fitting)**£39.95**

1/2 WAVE VERTICAL FIBRE GLASS (GRP) BASE ANTENNA 3.5 dBd (without ground planes)

70 cms (Length 26")**£24.95**
2 metre (Length 52")**£24.95**
4 metre (adjustable top section)**£36.95**
6 metre (adjustable top section)**£46.95**

VERTICAL FIBRE GLASS (GRP) BASE ANTENNAS

SQ & BM Range VX 6 Co-linear: Specially Designed Tubular Vertical Coils individually tuned to within 0.05pf (maximum power 100watts)
BM100 Dual-Bander**£29.95**
(2 mts 3dBd) (70cms 6dBd) (Length 39")
SQBM100* Dual-Bander**£39.95**
(2 mts 3dBd) (70cms 6dBd) (Length 39")
BM200 Dual-Bander**£39.95**
(2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
SQBM200* Dual-Bander**£49.95**
(2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
BM500 Dual - Bander Super Gainer**£49.95**
(2 mts 6.8dBd) (70cms 9.2dBd) (Length 100")
SQBM500 Dual - Bander Super Gainer**£59.95**
(2 mts 6.8dBd) (70cms 9.2dBd) (Length 100")
BM1000 Tri-Bander**£59.95**
(2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
SQBM1000* Tri-Bander**£69.95**
(2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
***SQBM 100/200/500/1000 are Polycarbon Fibre Glass with Chrome & Stainless Steel Fittings. 2 years warranty.**

2 METRE VERTICAL CO-LINEAR BASE ANTENNA

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

70CMS VERTICAL CO-LINEAR BASE ANTENNAS

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

TRI-BANDER BEAM 5dBd all bands

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

HB9CV 2 ELEMENT BEAM 3.5 dBd

70cms (Boom 12")**£15.95**
2 metre (Boom 20")**£19.95**
4 metre (Boom 23")**£27.95**
6 metre (Boom 33")**£34.95**
10 metre (Boom 52")**£44.95**

MINI HF DIPOLES (length 11' approx)

MD020 20mt**£39.95**
MD040 40mt**£44.95**
MD080 80mt**£49.95**

CROSSED YAGI BEAMS

All fittings Stainless Steel

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

YAGI BEAMS

All fittings Stainless Steel

2 metre 4 Element (Boom 48") (Gain 7dBd)**£19.95**
2 metre 5 Element (Boom 63") (Gain 10dBd)**£34.95**
2 metre 8 Element (Boom 125") (Gain 12dBd)**£44.95**
2 metre 11 Element (Boom 156") (Gain 13dBd)**£65.95**
4 metre 3 Element (Boom 45") (Gain 8dBd)**£39.95**
4 metre 5 Element (Boom 128") (Gain 10dBd)**£54.95**
6 metre 3 Element (Boom 72") (Gain 7.5dBd)**£49.95**
6 metre 5 Element (Boom 142") (Gain 9.5dBd)**£69.95**
70 cms 13 Element (Boom 76") (Gain 12.5dBd)**£39.95**

ZL SPECIAL YAGI BEAMS ALL FITTINGS STAINLESS STEEL

2 metre 5 Element (Boom 38") (Gain 9.5dBd)**£35.95**
2 metre 7 Element (Boom 60") (Gain 12dBd)**£45.95**
2 metre 12 Element (Boom 126") (Gain 14dBd)**£65.95**
70 cms 7 Element (Boom 28") (Gain 11.5dBd)**£24.95**
70 cms 12 Element (Boom 48") (Gain 14dBd)**£44.95**

HALO LOOPS

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

MULTI PURPOSE ANTENNAS

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

G5RV Wire Antenna (10-40/80 metre)

All fittings Stainless Steel

Standard**£22.95****£19.95**
Hard Drawn**£24.95****£21.95**
Flex Weave**£32.95****£27.95**
PVC Coated**£37.95****£32.95**
TS1 Stainless Steel Tension Springs (pair) for G5RV**£19.95**

POWER SUPPLIES

PS-20 20amp with 25amp surge Dual Meter & Adjustable Voltage 5-15v**£99.95**
PS-30 30amp with 35amp surge Dual Meter & Adjustable Voltage 5-15v**£119.95**

SHORT WAVE RECEIVING ANTENNA

MD37 SKY WIRE (Receives 0-40Mhz)**£29.95**
Complete with 25 mts of enamelled wire, insulator and choke Balun Matches any long wire to 50 Ohms. All mode no A.T.U. required. 2 "S" points greater than other Baluns.
MWA-H.F. (Receives 0-30Mhz)**£29.95**
Adjustable to any length up to 60 metres. Comes complete with 50 mts of enamelled wire, guy rope, dog bones & connecting box.

MOUNTING HARDWARE

ALL GALVANISED

6" Stand Off Bracket (complete with U Bolts)**£6.90**
9" Stand off bracket (complete with U Bolts)**£9.90**
12" T & K Bracket (complete with U Bolts)**£11.95**
18" T & K Bracket (complete with U Bolts)**£17.95**
24" T & K Bracket (complete with U Bolts)**£19.95**
3-Way Pole Spider for Guy Rope/wire**£3.95**
4-Way Pole Spider for Guy Rope/wire**£4.95**
1 1/2" Mast Sleeve/Joiner**£8.95**
2" Mast Sleeve/Joiner**£9.95**
Solid copper earth rod 4'**£9.95**

POLES H/DUTY (SWAGED)

1 1/4" x 5' Heavy Duty Aluminium Swaged Poles (set of 4)**£19.95**
1 1/2" x 5' Heavy Duty Aluminium Swaged Poles (set of 4)**£29.95**
2" x 5' Heavy Duty Aluminium Swaged Poles (set of 4)**£49.95**

REINFORCED HARDENED FIBRE GLASS MASTS (GRP)

1 1/2" Diameter 2 metres long**£16.90**
1 1/2" Diameter 2 metres long**£20.90**
2" Diameter 2 metres long**£24.90**

GUY ROPE 30 METRES

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

COAX

RG58 best quality standard per mt**35p**
RG58 best quality military spec per mt**60p**
best quality military spec mini 8 per mt**70p**
RG213 best quality military spec per mt**85p**
H100 coax cable per mt**£1.10**
PHONE for 100 METRE DISCOUNT PRICE.

10/11 METRE VERTICALS

G.A.P.12 1/2 wave aluminium (length 18' approx)**£16.95**
G.A.P.58 5/8 wave aluminium (length 21' approx)**£19.95**

BALUNS

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

RIBBON LADDER USA IMPORTED

300Ω Ribbon (20 Metres)**£13.90**
450Ω Ribbon (20 Metres)**£13.90**

TRI/DUPLEXER & ANTENNA SWITCHES

MD-24 (2 Way Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd SO239 fittings**£22.95**
MD-24N same spec as MD-24 "N-type" fitting**£22.95**
MD-25 (2 Way external/Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd**£24.95**
CS201 Two way antenna switch, frequency range 0-1GHz, 2.5 Kw Power Handling SO239 fittings**£18.95**
CS201-N same spec as CS201 "N-type" fitting**£28.95**
Tri-plexer 1.6-60Mhz (800w) 110-170Mhz (800w) 300-950Mhz (500w) SO239 fitting**£49.95**
4 way antenna switch 0-500Mhz**£29.95**

ANTENNA ROTATORS

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 Control Box**£449.95**
AR26 Alignment Bearing for the AR300XL**£18.95**
RC26 Alignment Bearing for RC5-1/3**£49.95**

ROTATOR CABLE

3 Core**0.45p** per metre
7 Core**0.80p** per metre

MOUNTS

Turbo mag mount (7") 1/2 or SO239**£14.95**
Tri-mag mount (3x5") 1/2 or SO239**£39.95**
Stainless Steel Heavy Duty Hatch Back Mount with 4 mts of coax and PL259 plug (1/2 or SO239 fully adjustable with turn knob)**£29.95**
Stainless Steel Heavy Duty Gutter Mount with 4 mts of coax and PL259 plug (1/2 or SO239 fully adjustable with turn knob)**£29.95**

BEST QUALITY ANTENNA WIRE

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

INDUCTORS

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

TRAPS

10 metre trap 400W**£21.95**
15 metre trap 400W**£21.95**
20 metre trap 400W**£21.95**
40 metre trap 400W**£21.95**
80 metre trap 400W**£21.95**



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

sales@moonrakerukltd.com

All prices plus
£6.00 P&P per order

MOONRAKER

TEL: (01908) 281705

FAX: (01908) 281706

www.amateurantennas.com

All prices plus
£6.00 P&P per order

LOG PERIODIC ANTENNAS



MLP32

SPECIFICATION

- ★ Frequency Range:
Transmit freq: 100-1300MHz
(/2/70/23cm)
Receive freq: 100-1300MHz
- ★ Forward Gain: 11-13dB
- ★ Forward to Back ratio: 15dB
- ★ Boom Length: 1.4mts
- ★ Elements: 16
- ★ Longest Element: 1.44mts
- ★ Connector: 'N Type'
- ★ Mast up to 2"
- ★ Power: 500 watts
- ★ VSWR: <2.0:1
- ★ Weight: 3 Kg

£99.95

MLP62

SPECIFICATION

- ★ Frequency Range:
Transmit freq: 50-1300MHz
(6/4/2/70/23cm)
Receive freq: 50-1300MHz
- ★ Forward Gain: 10-12dB
- ★ Forward to Back ratio: 15dB
- ★ Boom Length: 2mts
- ★ Elements: 20
- ★ Longest Element: 3mts
- ★ Connector 'N Type'
- ★ Mast up to 2"
- ★ Power: 500 watts
- ★ VSWR: <2.0:1
- ★ Weight: 5 Kg

£199.95



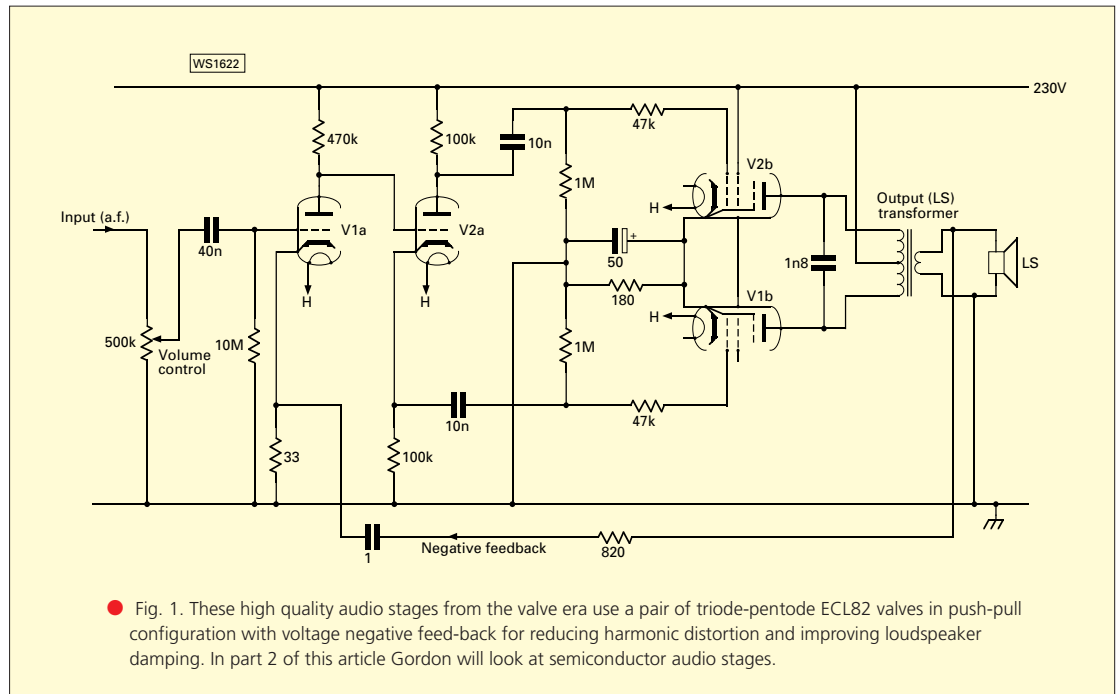
The MLP log periodic antenna is constructed to the highest specification and are supplied to our military and commercial customers. They cover the whole stated frequency, have good front to back ratio and cross polarisation rejection. With an input VSWR of less than 2:1 and requiring just one coax feed, the MLP is one of the most popular antennas for the ham and scanner enthusiast alike.



THE AUDIO STAGES

-Part 1

Gordon King
G4VFF
presents the
first part of
his look at
audio stages.
Read on to
find out what
it's all about...



The signal which I have looked at in previous columns, from the antenna to the detector, has now been processed to the stage where it has virtually become audible. Well, audible, that is, in the way that it would be strong enough to be heard weakly in a pair of high impedance headphones connected across the output of the detector. The signal certainly wouldn't be man enough, though, to pump adequate audio power into a loudspeaker for armchair listening!

What has to be done next is to raise this small audio signal to a significantly stronger signal with some power punch behind it for driving a loudspeaker. So, let's get some idea of what this means.

As an example let's say that the signal at the output of the detector from a strong transmission is 2V (it probably wouldn't be as much as this) and that the detector load (R) is 10,000Ω, then, by using the simple expression $V^2/R=W$, we find that the power works out to a mere 0.004W, or 400μW, ($2^2/10,000\Omega=0.004W$).

To drive a low impedance loudspeaker for a reasonable sound intensity, something in the region of 3W would be needed. By simple rearrangement of the above expression to $(W \times R)^{0.5}=V$, it can easily be calculated that the input to a 4Ω loudspeaker, not an uncommon value, would need to be almost 3.5V [$(3 \times 4)^{0.5}=3.46$] to produce 3W. Audio power at this and higher levels is provided by a power amplifier, driven by a preamplifier.

Remarkable Evolution

Relatively recent years have seen a remarkable evolution not only in the design but also in the construction of audio amplifiers. It was only about three decades ago when valve audio stages were all the rage and indeed, a contribution from my pen would be singularly incomplete without reference to such outdated (?) technology! In my *Radio and Audio Servicing Handbook* (Newnes-Butterworths) first published in 1965, I explored the audio stages of a then current up-market receiver using a pair of

ECL82 triode-pentode valves.

The circuit, whose relevant aspects are revealed in Fig. 1, makes a good starting point for looking at audio stages both in this and in the next instalment of the Looking at... series. The two valves, drawn as two triodes and two pentodes, provide both the pre- and power-amplifier requirements, with a phase-splitter thrown in for driving the push-pull pentodes. The first triode V1A serves as the preamplifier, receiving at its grid the input audio signal at a level selected by the setting of the volume control.

An amplified replica of the signal appearing across the 470kΩ anode load resistor is directly coupled to the grid of the second triode V2A, which serves as the phase-splitter. The triode then couples to the control grid of each of the two power pentodes, V1B and V2B, from corresponding 100kΩ loads in its anode and cathode circuits.

Although having virtually unity gain, the primary task of this triode is to feed the signal to the control grids of the pentodes in 180° phase opposition, such

that the grid of one pentode swings positive while that of the partner pentode swings negative, providing the push-pull action!

Pentode Biased

The pentodes are biased by the volts drop across the common 180Ω cathode resistor, which makes the cathodes more positive than the control grids or, in other words, the grids more negative than the cathodes by an amount suitable for the correct biasing. Amplifiers designed for high audio quality commonly adopt class A biasing, where the anode current flows at all times. Alternatively class AB1 biasing, where the anode current in one of the valves flows for appreciably more than a signal half cycle, but less than a complete cycle

could be used.

The 50μF electrolytic capacitor in parallel with the cathode resistor inhibits current negative feedback (n.f.b.), thereby avoiding both an undesirable increase in anode impedance and a reduction in gain. However, the circuit does adopt voltage n.f.b. introduced from the secondary of the output transformer back to the cathode of V1A, via the 820Ω resistor and 1μF capacitor. Voltage n.f.b. 'cleans up' the signal by cancelling harmonic distortion while enhancing the 'damping' across the loudspeaker, thereby minimising transient (overshoot) distortion.

Output Transformer

The amplified signal swinging across the primary winding of

the output (LS) transformer, between the two high impedance anodes, is inductively coupled to the secondary winding and hence to the loudspeaker. The step-down turns ratio of the transformer translates the high impedance voltage at the primary to low impedance current at the secondary, thereby providing the necessary current drive for the loudspeaker.

Let's say the input to a 4Ω loudspeaker is 3W, if so then by using the simple expression $I=(W/R)^{0.5}$, we'll find that the current (I) is close to 0.86A, or 860mA [$(3/4)^{0.5} = 0.86$]. At the start of the column I described that the input for a 4Ω loudspeaker to yield 3W was 3.46V, so now we have values for all four parameters, voltage ($V=3.46$), current ($I=0.86A$), ($W=3$) and resistance ($R=4W$) which we can toy with!

So this may seem old hat, but we had to start somewhere! In Part 2 I shall be looking at less vintage semiconductor technology. You'll remember that at the start I did place a query against outdated technology!

However, would you believe, hot thermionic valves are certainly not extinct. Indeed, they are revered by many an audiophile, including yours truly; they are still very active in recording studios and they are also still found in some capacitor microphones and in certain Amateur Radio kit. They are still being manufactured in small quantities.

Perhaps I shall have to get some of my early radio books republished! Watch these pages.

PW



SUBSCRIBE - YOU'LL SAVE MONEY!

As an **avid** reader of the UK's **only** independent **Amateur Radio** magazine, you really **should** consider taking out a **subscription**.

By paying up front for your magazine you can be assured of never missing out on your favourite radio read month after month. You are also saving yourself money over the period of the year! For example 12 issues at current cover price would cost you £33 but by taking out a subscription you are saving £3!

BY SUBSCRIBING YOU ALSO GET THE EXTRA BENEFITS OF:

- ★ Seeing your copy **before** it gets to the Newsagents! ★ Ensuring that you're **right up-to-date** with all the **latest news** and **reviews**!
- ★ Having **PW** delivered **direct to your door** every month! ★ **Protecting** yourself **against** cover price rises for the duration of your subscription period! ★ Getting the chance to place **FREE** Bargain Basement adverts!

SO, DON'T DELAY - ORDER YOUR SUBSCRIPTION TODAY - YOU KNOW IT MAKES SENSE!

To order your subscription, please use the form on page 76 or call the Credit Card Hotline on (01202) 659930 and quote PW Subs 7.

Subscription Rates

£30	(UK)
£38	(Europe Air Mail)
£42	(Rest Of World Airmail)
£49	(Rest Of World Airmail)

HAYDON

Communications


Mail order: 01708 862524

 PRICES SUBJECT TO CHANGE
WITHOUT PRIOR NOTICE. PLEASE
VERIFY BEFORE ORDERING. £80E.

Q-TEK PENETRATOR

"WE'VE SOLD 100S ALL OVER EUROPE"

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

 ONLY **£179.95** delivery £10

SEND SAE FOR LEAFLET

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

Q-TEK ZL SPECIALS

Delivery £10.00

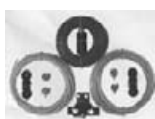
2m	5ele (boom 45"/9dBd)	£49.95
2m	7ele (boom 60"/11dBd)	£54.95
2m	12ele (boom 126"/13.8dBd)	£79.95
70cm	7ele (boom 28"/11dBd)	£39.95
70cm	12ele (boom 48"/13.8dBd)	£59.95

Q-TEK YAGIS

Delivery £10.00

2m	5ele (boom 63"/9dBd)	£49.95
2m	8ele (boom 125"/11dBd)	£64.95
2m	11ele (boom 156"/12.7dBd)	£94.95
2m	5ele crossed (boom 64"/9dBd)	£79.95
2m	8ele crossed (boom 126"/11dBd)	£99.95
4m	3ele (boom 45"/7dBd)	£56.95
4m	5ele (boom 128"/9dBd)	£69.95
6m	3ele (boom 72"/7dBd)	£59.95
6m	5ele (boom 142"/9dBd)	£79.95
70cm	13ele (boom 76"/12dBd)	£46.95
70cm	13ele crossed (boom 83"/12dBd)	£79.95

DELUXE G5RV


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

 ONLY **£42.95**

 Half size 51ft. Only **£36.95** Carriage £6.00.

Choke Balun Inline balun for G5RV.....£24.95 P&P £3

STANDARD G5RV

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

Q-TEK INDUCTORS

80mtr inductors + wire to convert 1/2 size G5RV into full size. (Adds 8ft either end).....£24.95 (was £22.95) P&P £2.50 (a pair).

REPLACEMENT PARTS

5m length	300Ω twin feeder h/duty	£5.00 P&P £3
10m length	300Ω twin feeder h/duty	£10.00 P&P £3

BALUNS & TRAPS

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

CUSHCRAFT ANTENNA SALE

MA5B	Mini beam 10, 12, 15, 17, 20m	£289.95 £259.95
A3S	3 ele beam 10, 15, 20m	£389.95 £349.95
R6000	Vertical 6, 10, 12, 15, 17, 20m	£299.00 £269.95
X-7	7 ele 10, 15, 20m	£549.95 £449.95
X-9	9 ele 10, 15, 20m	£799.95 £699.95

RECHARGEABLE ALKALINE CELLS


 Starter kit includes charger & 4 x AA cells. **£13.99** + £2.50 P&P.

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

Extra cells available @ 8 x AA pack £10.99 £1 P&P

4 x AA pack £5.99 £1 P&P 4 x AAA £6.25 £1 P&P. Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x capacity of nicads.

Q-TEK COLINEARS

P&P £10.00

Glassfibre construction

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

MOBILE ANTENNAS

P&P £7.00

DB-770M	2m/70cm (3.5 - 5.8dB) 1m PL-259	£24.95
DB-7900	2m/70cm (5.5 - 7.2dB) 1.6m PL-259	£39.95
PL-62M	6m + 2m (1.4m) PL-259	£19.99
MA5M	(20 - 10m) 3/8" fitting	£29.99
CA-HV	(20m - 6m/2m) PL-259	£89.99

COPPER ANTENNA WIRE

Enamelled copper wire (50 mtrs)	£12.95 P&P £5
Hard drawn copper wire (50 mtrs)	£13.95 P&P £5
Multi-Stranded (Grey PVC)	£9.95 P&P £4
Flexweave (H/duty 50 mtrs)	£30.00 P&P £5
Flexweave H/duty (20 mtrs)	£15.95 P&P £5
Flexweave (PVC coated 20 mtrs)	£18.95 P&P £5
Flexweave (PVC coated 50 mtrs)	£40.00 P&P £5
PVC coated earth wire 15mtr roll	£10.00 P&P £5
Copper plated earth rod (4ft)	£13.00 P&P £6
Copper plated earth rod (4ft) + 10m wire	£18.99 P&P £6

NISSEI TH-887



A superb headset with boom mic & PTT to fit Alinco, Yaesu, ADI Standard handies (most models).

£24.95 P&P £3.00

TH-887K version to fit Kenwood handies.....£24.95

COAX BARGAINS

 100m roll of RG-213 coax
ONLY **£49.95** P&P £10

 100m roll of RG-58 coax
ONLY **£25.00** P&P £8.50

 100m roll of Mil spec RG-213 coax
ONLY **£69.95** P&P £10

 100m roll of Mil spec RG-58 coax
ONLY **£35.00** P&P £8.50


NISSEI PWR/SWR METERS



RS-502	1.8-525MHz (200W)	£79.95 P&P £5
RS-102	1.8-150MHz (200W)	£59.95 P&P £5
RS-402	125-525MHz (200W)	£59.95 P&P £5
RS-101	1.8-60MHz (3kW)	£79.95 P&P £5
RS-40	144/430MHz Pocket PWR/SWR	£34.95 P&P £1

CAROLINA WINDOM

CW-160	(160-10m)	£105.95 P&P £7.00
CW-80	(80-10m)	£82.95 P&P £7.00
CW-80	Special (1/2 size)	£89.95 P&P £7.00
CW-40	(40-10m)	£79.95 P&P £7.00
Windoms	are 1/2 or end fed	.....P&P £7.00

INTERFERENCE STOP IT



Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables. Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done!

 Bulk purchase hence **2 for £7.95** (P&P £2.50)


FERRITE RINGS

 10 for **£10.00** or **£15.00** P&P £3.00
Superb quality

NEXT DAY DELIVERY TO MOST AREAS, £10.00.

20ft BARGAIN MAST SET

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

 SSP ~~£60.00~~

LIMITED STOCK

£39.95

Del £10



2 sets for £70.00

Del £12.50

3 sets for £90.00

Del £15.00

20ft MAST SET

 4 x 5' lengths of 1 1/4" swaged slot together aluminium pole.
SSP £29.95.

 LIMITED STOCK **£24.95** DEL £10

ALUMINIUM POLES

2" x 2.5m length	2mm wall thickness	£19.99 P&P £10
2" x 10ft collection only	2mm wall thickness	£24.99
2" x 12ft collection only	2mm wall thickness	£29.99
2" x 20ft collection only	2mm wall thickness	£39.99

ALL MEASUREMENTS ARE APPROX

FIBRE GLASS MASTS

1 1/2" Dia	£8.50 per metre P&P £10
1 3/4" Dia	£10.50 per metre P&P £10
2" Dia	£12.50 per metre P&P £10

Fibreglass available up to 5m lengths.

NB. WE CAN ONLY DELIVER UP TO 2.5m LENGTHS

TELESCOPIC MASTS

6 section telescopic masts. Starting at 2 1/2" in diameter and finishing with a top section of 1 1/4" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and stainless steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 10 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

 8 mtrs **£99.95** 12 mtrs **£139.95** Carriage £10.00.

Telescopic mast lengths are approx.

Tripod for telescopic masts.....£89.95

METAL WORK & BITS

MAST HEAD PULLEY



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

£8.95 + P&P £2.00

2"	Mast base plate	£12.95 P&P £5
6"	Stand off	£6.95 P&P £5
9"	Stand off	£8.95 P&P £5
12"	T&K Brackets	£12.00 P&P £8
18"	T&K Brackets	£18.00 P&P £8
24"	T&K Brackets	£20.00 P&P £8
U bolts (1 1/2" 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" mast sleeve		£9.95
1 1/2" mast sleeve		£8.95
Standard guy kits (with wire)		£23.95 P&P £6
Heavy duty guy kits (with wire)		£26.95 P&P £6
Ground fixing spikes (3 set)		£18.00 P&P £6
30m pack nylon guy rope		£10.00 P&P £2
Nylon dog bone insulators		£1.00
Self amalgamating tape		£6.00

HAYDON

Communications

VISIT O



Mail order: 01708 862524

PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE VERIFY BEFORE ORDERING. E&OE.

NEXT DAY DELIVERY TO MOST AREAS, £10.00.

KENWOOD TS-570DGE



In our opinion, the best HF transceiver below £1500.

INCLUDES ATU

ONLY
£819.00

KENWOOD TS-870S



TRUE IF DSP
TRANSCIVER

When only the best will do!

STILL OUR
No1 SELLER!

OUR PRICE
£1299.00

KENWOOD TS-2000



New all mode multiband:
HF/50/144/430 optional 1200MHz.
Optional UT-20
(1200MHz module) £299.00

Our first customers comments
were: "This unit
outperformed anything
else we tried".

£1699.00

+ FREE PSU WORTH £90

KENWOOD TS-50S



- ★ Superb compact HF transceiver
- ★ 100 watt
- ★ 160m-10m transceiver
- ★ 500kHz-30MHz
- Gen. cov. receiver
- RRP £699

SPECIAL
OFFER
£549.95

ALINCO DX-70TH



100W HF + 6m
transceiver.
SSP £699.00

LATEST UK MODEL

SAVE £100

ONLY
£599.00

ICOM IC-706II G



Now on its 3rd generation, this
classic all-band transceiver is still our
No. 1 best seller.

HF + 6m + 2m + 70cm.

LATEST UK MODEL

2 year warranty

ONLY
£939.95

KENWOOD VC-H1



VISUAL COMMUNICATOR

- ★ ★ SAVE £100.00! ★ ★
- Portable SSTV unit (CCD camera + LCD monitor). Connect to a Kenwood hand-held/mobile or HF tcvr with optional cable.

Was £299.00

NOW
£199.00

NISSEI PS-300

UK's No1



Features:

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

INTRO PRICE
£99.95
Del £10

NISSEI PS-1020



New 25A. PSU.

- Volts adjust (9-15vdc)
- Light in weight: 2.1kg
- Automatic shutdown on load fault
- Ultra quiet cooling fan
- Over volts protection
- Compact size
- 190W x 120H x 225D mm.

INTRO PRICE
£89.95

KENWOOD TH-D7MKII

FREE HEADSET WORTH £25



2m + 70cm handheld with built-in modem and APRS. Buy one this month and we'll give you a headset worth £25.00 FREE.

Optional extended Rx available
VCH-1 camera/monitor for
above.... £199.00

ONLY
£259.00

KENWOOD TM-D700E



2m + 70cm transceiver with built-in modem and APRS facility. Optional Rx available.

A true dual-band radio
suitable for the most
demanding operator.

ONLY
£425.00
A.P.R.S.

ICOM IC-2800H



2m + 70cms. True
dualbander + 3 inch
TFT colour display.

Includes: Bandscope, 50W
O/P & EXTL video input
(optional RX: 118 -
530Mhz (am/fm))

~~£449~~ NOW ONLY
£349.95

ALINCO DJ-V5

SAVE £55.00



Compact 2m + 70cm handheld transceiver with optional wideband receive (76-999MHz). Up to 5W output. £229.00.

★ BUY BEFORE PRICE
INCREASE ★

ONLY
£179.95

YAESU G-450C

SAVE £150



Heavy duty rotator for HF beams, etc. Supplied with circular display control box and 25m of rotator cable. GC-038 Lower mast clamps £25.00 GC-065 2" Thrust bearing £48.00

ONLY
£339.95
P&P £10

YAESU G-1000DXC

SAVE £100

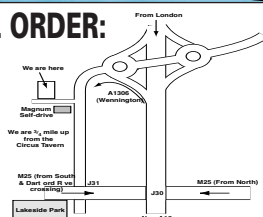


Heavy duty rotator for large HF arrays. £599.99
The ultimate in man-size rotators
GC-038 Lower mast clamps £25.00
GC-065 2" Thrust bearing £48.00

SPECIAL OFFER
£499.95

THURROCK, ESSEX SHOWROOM & MAIL ORDER:

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



W. MIDLANDS SHOWROOM

Unit 1, Canal View Ind. Est., Brettell Lane,
Brierley Hill, W. Mids. DY5 3LQ
Open Mon-Fri 9.30-5pm., Sat 9.30-1pm

5 mins from
Merryhill Centre

NO MAIL ORDER TO MIDLANDS BRANCH

OUR THURROCK SHOWROOM "THE LARGEST AMATEUR SHOWROOM IN THE UK"

ICOM IC-R3 NEW MODEL

NOT FOR THE FAINTHEARTED!
 'A first!' TV/video picture & sound!
 Certainly a gadget for the future - see things you didn't know existed!
 A wide-band scanner covering 0.5-2.3GHz (AM/FM/WFM) with "TFT" colour display.
 Case. £17.99

NOW AVAILABLE
£449.00



MVT-7100E UK MODEL

Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad / car charger / charger / antenna. Extremely user-friendly handheld receiver with outstanding performance unmatched by its rivals.
 MVT-9000 MHz £329.95
 Soft case for 7100EU/9000 - specify. £19.99

SPECIAL OFFER
£199.95



MVT-7300

SPECIAL OFFER

- Compact wideband hand-held receiver
 - Covers 521kHz-1300MHz (all mode)
 - 8.33kHz steps
 - De-scrambler & bug detector
- Nicads and charger option. £19.95

£289.00
£259.00



NEW AR8600

Extremely versatile all mode receiver (530kHz-2040MHz). Latest UK version

AR5000£1399
 AR5000+3£1549
 SDU5500£799
 AR3000A£699

REDUCED PRICE
£649.95



FAIRHAVEN RD-500VX+

Superb wideband receiver (all mode) with over 50,000 memories capable of holding text. 20kHz-1750MHz. UK's No1 PERFORMER.

8.33kHz compatible

SSP: £999.00
 SALE PRICE
£799.00



BEARCAT UBC-9000XLT

25-1300MHz wideband desktop scanner with turbo scan. (Selectable AM/FM/WFM). Selectable tuning steps + alpha-numeric tagging.

SPECIAL OFFER
£249.00
 P&P £10.00



WORLDSPACE HITACHI KH-WS1

Over 40 channels of crystal-clear, fade-free programming direct from satellite to your portable digital radio.

Original RRP £249.00.
 Sanyo WS-1000 now in stock. £99.95

OUR PRICE
£99.95

Incl. post.
 Outdoor Yagi antenna kit. £50.00



SANGEAN ATS 909

Superb receiver with true SSB and 40Hz tuning. Sold under Roberts name at nearly twice the price. Features RDS facility, 306 memories and FM stereo through headphones. The ATS-909 is superb value. Runs on 4 AA batteries not supplied or optional PSU.

SPECIAL OFFER
£139.00
 P&P £10



REALISTIC DX-394

- ★ Superb SW receiver
- ★ 0.2-30MHz (all mode)
- ★ Selectable tuning steps (min 100Hz)
- ★ 240 or 12V ★ Digital S-meter
- ★ Attenuator ★ Key pad entry
- ★ 160 memories ★ Clock/timer
- ★ Noise blanker ★ Limit scan
- ★ Tape output.

Was £199.00.
 SPECIAL OFFER
£149.95



Send SAE for review

GARMIN GPS12

Powerful 12 channel GPS 500 way points with graphic symbols. Simple one-hand operation. Waterproof construction. (Ideal for APRS use!).

Etrix "CAMO" new model.....£129.95
 Etrix Special offer.....£109.95
 Emap Special offer.....£199.95

SALE PRICE
£99.95



GARMIN STREET-PILOT

UK's most popular GPS system. You may know where your coming from but do you know where your going? Garmin knows both. Superb-ready-to use (with maps) car GPS.

SPECIAL OFFER
£399.00



GARMIN GPSIII+/+

Powered by AA cells or 13.8V, this compact navigational system gives detailed maps of the UK & Europe. Supplied with data lead and free on-board maps also with free CD ROM.

SALE PRICE
£349.95
 FREE THIS MONTH - UK MAP CD WORTH £70.00



JUMBO WALL CLOCK

RADIO CONTROLLED

- Wide screen/ 2" digit time display
- Barometer
- Calendar
- Temp
- Auto RF synch clock from Rugby.

SALE PRICE
£59.95
 P&P £4.50



SONY SW-100E

- ★ Miniature portable all mode SW receiver
- ★ Single side band system
- ★ Tuning in 100Hz + 1kHz steps
- ★ Includes compact ant/stereo earphones/ carrying case RRP £229.95.
- ACE-30 PSU for above...£24.95
- AN-100 Active antenna...£64.95

SPECIAL OFFER
£139.95
 P&P £10



SGC-230

200W instant auto ATU. Tune any length of wire with this superb ATU. (Minimum length applies.) Worlds best selling smarttuner! (Optional earth stake£13.00)

ONLY
£319.00



MFJ PRODUCTS

MFJ-259B

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

ONLY **£199.95** P&P £6



MFJ-269	160-70cm analyser	£269.00
MFJ-949	300W ATU + dummy load	£125.00
MFJ-969	HF + 6m ATU	£149.95
MFJ-962D	1.5kW versa tuna	£219.95
MFJ-784B	DSP filter	£189.95
MFJ-418	CW tutor	£64.95

D-308B BLACK DELUXE DESK MIC

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

£49.95
 P&P £6.00



OPTIONAL LEADS (P&P £1.50)

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

NEW NISSEI PS-1225

25A @ 13.8V yet lighter than an IC-706 but about the same size.

- ★ Features: ● Ultra quiet fan ● Over voltage/current protection ● Weight's ~ 1.8kgs ● Size: 57 x 177 x 190mm ● Additional sockets at front & rear
- SSP £99.95.



INTRO PRICE
£69.95
 Delivery £10.00

Radio Basics

This time Rob Mannion G3XFD provides some more ideas on how to use moving coil meters, and with the help of Tex Swann G1TEX gives you a little maths homework too!

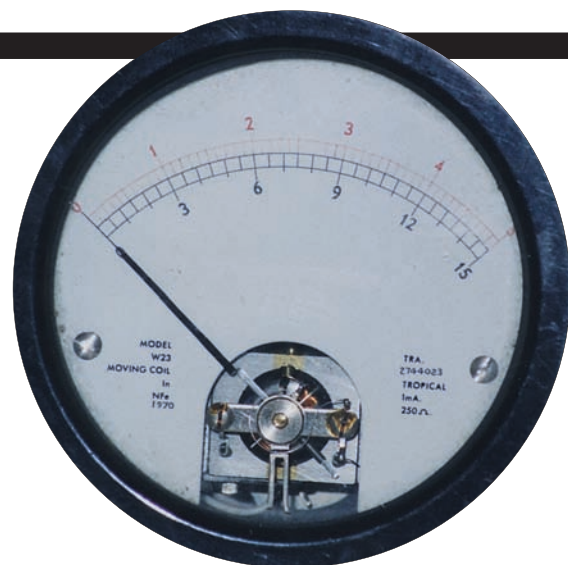


Fig. 1: A high quality 3.5 inch (88mm) diameter moving coil meter unit. This example is fixed in place using a threaded ring collar. Extremely well made (and expensive to buy in 1970 when new!) this instrument has many uses (see text).

I've been extremely busy in my new workshop in the last few months, busily preparing future projects for the Radio Basics (RB) column, including some using moving coil meter movements. However, I've discovered that despite the fact there are plenty of surplus meters available for us to buy, getting suitable instruments new (and to a known standard) has proved difficult.

Fortunately though, I've been able to locate a source of good quality meters (see the RB Information Board) which although not new, will prove very useful to anyone who does not attend rallies or shows. So, there's no excuse not to join in and have a go!

The meters available from the source I've mentioned on the RB information board are

1mA full scale deflection (f.s.d.) and this is a very convenient for our purposes and used to be almost an industry standard. And although the meter shown, **Fig. 1**, is a different **physical shape**, it is a 1mA f.s.d. type.

On the left of the meter's dial (below the pointer, which is resting at zero) you'll see the information that it's a moving coil instrument. To the right on the dial the manufacture has marked that it's a sealed 'Tropical' unit, together with the important information on the f.s.d. and the internal resistance of the instrument.

To use the meter to indicate a voltage reading we have to incorporate a series dropping resistor circuit to suit the range needed. Of course, the meter only indicates the current flowing

in the circuitry - but using Ohm's law we can work out what the voltage will be and calibrate the meter (either directly on the meter's scale or by using an external chart). Additionally, if a known voltage source is applied - the same circuitry can be used to measure an unknown resistance - turning the instrument into an ohmmeter.

The photograph, **Fig. 2**, shows a meter being prepared for use as a voltmeter. The three high quality wirewound resistors have been chosen because they are all well within 5% of the marked values. This is an important factor to remember...but also bear in mind you cannot expect laboratory standards with a simple home-made meter!

A simple voltmeter can be made without switching, the only requirement is to connect

the source to be measured to the meter circuitry. This can be done with wander leads and plugs and sockets. However, you can even build a meter into a receiver if you wish, so that it's possible to monitor battery voltage, current consumption, and even (when you've more experience) also use the same instrument to indicate signal strength. They are extremely versatile!

Low current reading moving coil meters - as mentioned last month, can also be used to measure very much higher currents than their true f.s.d. by using a shunt. The photograph, **Fig. 3**, shows a neat little trick I've used in the past when a low resistance shunt is required...employing an old coil. The coil shown actually provided just the right resistance to enable me to measure 100mA on a 500μA f.s.d. meter.

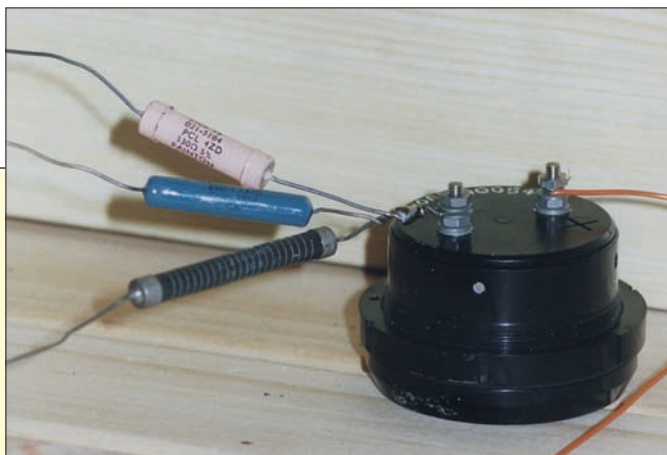
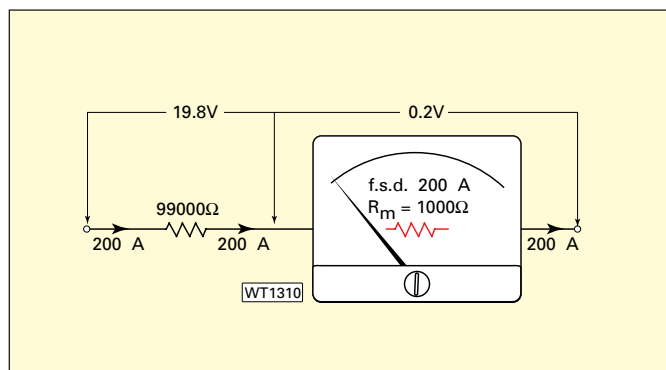


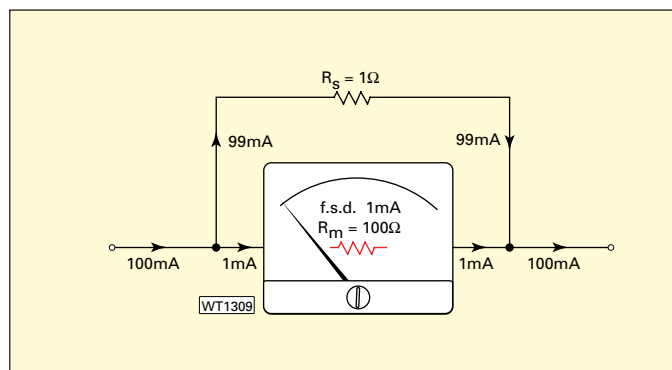
Fig. 2: A meter being prepared for use as a voltmeter. Three high quality wirewound resistors have been chosen to obtain the highest accuracy possible (see text).

Fig. 3: A neat little trick used by G3XFD when a low resistance shunt is required...employing an old coil. The coil shown enabled current flows up to 100mA on a 500μA f.s.d. meter (see text).





● Fig. 4: If you wish to 20V on this meter movement the total resistance will be 20 (V) x 5000 (Ω/V ohms per volt) = 100,000Ω (100kΩ). As the meter itself has a resistance of 1000Ω (1kΩ) the series resistance will need to be 99000Ω. However, in practical terms a selected (for best possible accuracy) standard 100kΩ resistor should suit (Taken from Modifying Moving Coil Meters - PW January 2000 - see text).



● Fig. 5: If you require to measure up to 100mA (millamperes) and your basic meter movement has a f.s.d. of 1mA with an internal resistance of 100Ω, the circuit would be as shown here. (Taken from Modifying Moving Coil Meters - PW January 2000 - see text).

Time For Maths!

Many people are frightened of mathematics and I was one of them until I took an Open University Maths Foundation course over 25 years ago. The course, and the preparatory work provided by the National Extension College (NEC) - The charitable forerunner of the OU* - was very helpful drove my fear of maths away - but I know many of you don't enjoy the subject.

So, to help encourage you reluctant RB mathematicians **Tex Swann G1TEX** our Technical Projects Sub-Editor has prepared some extremely simple examples, in the keystroke **Tables 1, 2 and 3**, demonstrating how you can - by using a cheap scientific calculator - work out what's required.

Please don't be ashamed if you can't work things out in your head - I'd rather

you use a calculator and be successful and enjoy the process than get stuck trying to remember how to do it without help! **Treat the calculator as yet another tool on your workbench.**

**If you'd like to improve your maths - and enjoy using your knowledge to help you with your radio, write to me and I'll give you the details of the NEC in Cambridge. Their correspondence courses are truly excellent, with superb tutorial back-up.*

Practical Help

When it comes to looking for more practical help and guidance, **PW** author **Walter Farrar G3ESP** wrote an interesting article on the subject of meters - which was published in the January 2000 issue (See Information Board).

In fact, the circuits shown

in **Figs. 4 and 5** were originally published in that article. And, if you don't have the January 2000 issue of **PW**, I've included details of how you can get a free photocopy in the information board.

So, once you've got a suitable meter, and you're armed with the RB information - plus the photocopy of **G3ESP's** article you should be ready to have a go making simple test meters. Hopefully you'll also be on the look-out for the many bargain moving coil meter units on sale at rallies and shows. But let's hope we don't end up arguing who saw it on sale first as I'm a whimp really and will probably back down to enable you to buy it! Cheerio until next time.

PW

Information Board

Moving coil meters: After a great deal of searching, **Robin Sykes G3NFB** of Sycom has unearthed a small supply of surplus (Bakelite cased, 1mA f.s.d. (not fitted with shunts or internal resistors) large clear scale calibrated in 75, 300 and 1000V d.c.) milliamperemeters requiring a 3.5 inch (88mm) mounting hole. These are available on a first-come-first-served basis for £3.50 each plus postage. Telephone Robin on **(01372) 372587** or see the Sycom advert in this issue.

Extra information: If you don't have access to the **PW** article written by **Walter Farrar G3ESP** (published in the January 2000 issue) and you wish to experiment further with moving coils meters - please send an s.a.e. (**1st class 27p stamp please**) and a request stating **Radio Basics Meter Information to: Rob Mannion G3XFD, Editor Practical Wireless (Radio Basics), Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**. In return you will receive a photocopy of **G3ESP's** original single page article. Incidentally, the number of requests will also give me a good idea of the level of interest on this topic so I can plan for future articles in the RB series.

Find the resistance using the formula

$$R = \frac{V}{I} = \left(\frac{\text{Volts}}{\text{Amps}} \right)$$

$$= \frac{20V}{0.2mA} = \frac{20}{0.0002}$$

$$20 \div .0002 = 100000$$

$$-100000 = 99000$$

● Tables 1, 2 and 3: Showing mathematics and associated keystrokes (using a scientific calculator) required. **Tex G1TEX** and **Rob G3XFD** both encourage you reluctant mathematicians to have a go for yourself!

Find the f.s.d. (V) of the meter alone using the formula

$$V = IR \text{ (amps} \times \text{ohms)}$$

$$= 0.001 \times 100$$

$$0.001 \times 100 = 0.1$$

Now find the resistance that allows the other 99mA to flow when the voltage is 0.1V (100mV) using the formula

$$R = \frac{V}{I} = \left(\frac{\text{Volts}}{\text{Amps}} \right)$$

$$= \frac{100mV}{99mA} = \frac{0.1}{0.099}$$

$$0.1 \div .099 = 1.01010$$

Cost:	£225 plus P&P
Company:	Nevada
Contact:	Sales
Tel:	023-9231 3090
E-mail:	info@nevada.co.uk

On Parade...

The President Lincoln 28MHz Multi-mode Transceiver

Keen 10 metre operator Jon Wheeler G0IUE was surprised when he was asked to review the President Lincoln 28MHz transceiver on behalf of PW. However he said "I didn't need to be asked twice"!

● Heading photograph: When he was 'on parade' with the President Lincoln transceiver Jon Wheeler G0IUE enjoyed the experience so much he bought the rig!

Now that single band 28MHz (10 metre) transceivers have been de-regulated and are legal for use in the United Kingdom, the President Lincoln is one of those available for Amateur use. The original prohibition dated back to the late 1980s, when a restriction order was placed on such equipment which also included the prohibition of converting 27MHz multi-mode radios to the 28MHz Amateur band.

Regretably, this latter piece of needless legislation has never been rescinded and unfortunately remains in force, despite the efforts of many Amateurs - including the Editor of PW who has frequently raised this point in his Keylines editorials. However, I'll get off of my own soapbox and on to the review now!

The Radio

The President Lincoln is a 28MHz multi-mode transceiver, capable of transmitting on the c.w., a.m., s.s.b. (l.s.b. and u.s.b.) and narrow band f.m. (n.b.f.m.) modes between 28 and 29.7MHz. The radio is clearly aimed at the world-wide CB market, however, in this country it's supplied to cover only the 10 metre Amateur band allocation.

The manufacturer's specification states a transmitter output of 10W on a.m., c.w. and n.b.f.m. and 21W on s.s.b. It comes complete with a noise cancelling microphone with up/down frequency selection. Also included are a mobile mounting bracket, power lead, and detailed multilingual instruction book which includes a circuit diagram. The heading picture and the photographs in **Fig. 1**, and **2** clearly demonstrate how neat the transceiver is inside.

Front Panel

Let's look at the all important front panel. There are a host of functions available to the user and all are accessible from the front panel either

by means of several rotary knobs or by simply pushing in/out buttons.

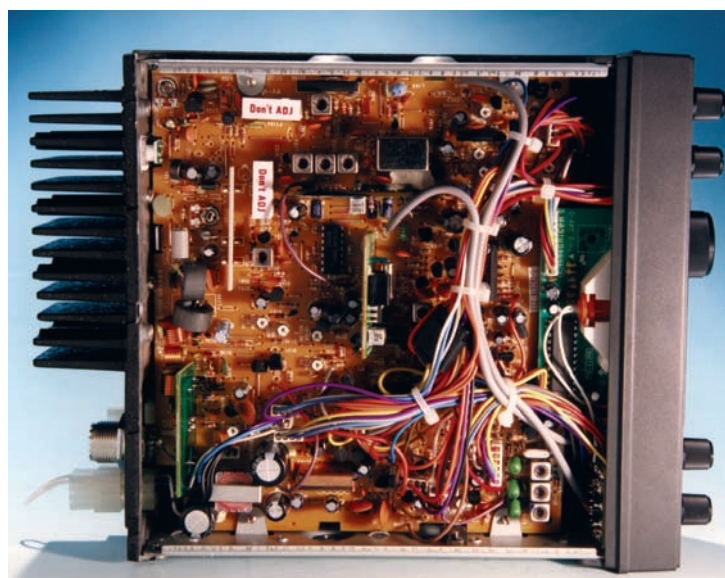
A clear, but not overly large, orange tinted background liquid crystal display shows frequency, channel number, band display (indicated as four banks of 50 channels and displayed as blocks A, B, C and D). Also available on the main display are an standing

wave ratio (s.w.r.) function indicator and modulation meter.

Away from the display is the rotary mode control allowing the user to switch easily between the c.w., a.m., s.s.b. and n.b.f.m. modes. An RIT function allows the user to adjust the receive frequency $\pm 2.3\text{kHz}$ whilst the transmit frequency remains unaffected. This is particularly useful when in a QSO with a station whose transmit frequency doesn't quite match your own.

Power output can be varied between 1 and 10W in c.w., a.m. and n.b.f.m. modes only. Useful perhaps when driving a low input power amplifier.

There are the universally recognised volume and squelch rotary controls. The squelch has a useful function referred in the handbook as auto squelch, this basically sets the squelch at a preset level and would I suppose have its uses in a mobile scenario on either the a.m. or n.b.f.m. modes.



● Fig. 1: Inside top view of the transceiver, showing efficient heat-sinking arrangements, the neat layout and warnings not to tamper!



Scan Functions

Other useful facilities include a scan function that scans through all 50 channels of the selected block. Also available is a **Dim** button that allows the user to reduce the brightness of the display (I preferred it in the brighter position myself).

There's also a **Roger Beep** for those that want it. And there's a facility I found particularly useful: the frequency lock function. This allows you to lock the radio to a frequency of your choice – especially useful during this review when my five year-old daughter **Emma** decided to venture in to my shack and spin the v.f.o. knob to see what it did (luckily nothing as the frequency had been locked).

Public Address (PA) and **Noise Blanker (NB)** facilities are also available and 10kHz incremental steps can be selected via the up/down channel buttons. This made changing frequency while operating on n.b.f.m. much easier.

The most useful function for me was the v.f.o., allowing fine-tuning down to 100Hz, something not available on the Albrecht AE485s reviewed in *PW* a few months ago. This made operation (particularly mobile operation) so much easier.

There are no memory or repeater shift functions on the radio. This is disappointing because you can neither store your favourite channels/frequencies nor can you easily work through any of the 28MHz repeaters often heard so strongly when band is open. Whizzing the v.f.o. backwards and forwards between the input and output of a repeater is a tedious task and one you'll get fed up with in a hurry!

Rear Panel

The rear panel sports the usual SO239 connector, and a two-pin power lead connection. There's also a very unusual 9-pin accessory connector, which can be seen in **Fig. 3**.

Being used to jack plugs it came as a surprise to be confronted with a 9-pin block that **requires wires to be inserted across pins to obtain functions such as an extension speaker, Morse key and PA speaker**

connections. Although unusual it does work and is something I would get used to with time. Mounted on the underside panel is a 4W speaker. In my shack it was perfectly adequate, however, the addition of an extension speaker in a noisy (perhaps mobile) environment would be an advantage.

On The Air

For my on-the-air tests I connected the radio to my G5RV antenna, via my antenna tuner but with it switched to by-pass as the G5RV matched so well, and switched on just after it had got dark one April evening and tuned across 28MHz. The band seemed dead until I tuned up to the n.b.f.m. section and found two local stations **Kevin Romang G4SKN** and **Martin Yallop G4YNT**, both in the Corsham area of Wiltshire, in QSO together on 29.550MHz.

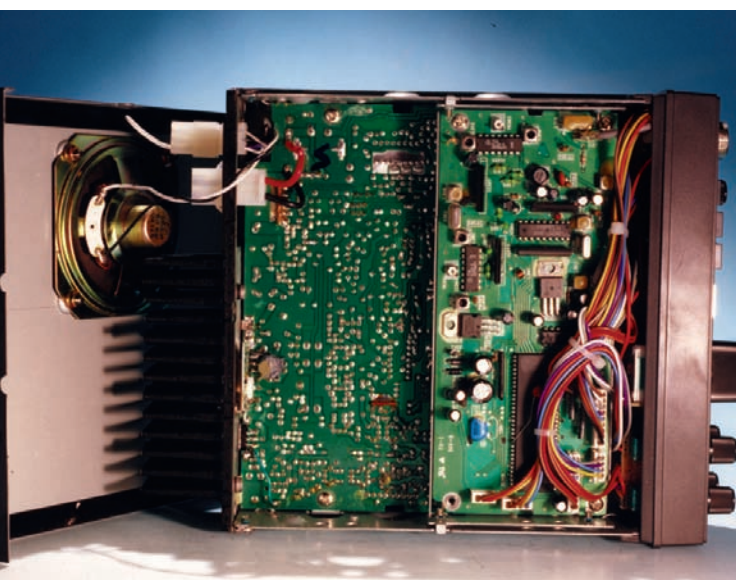
I quickly took the opportunity to call in and spent the next half an hour having an enjoyable QSO with Kevin and Martin on a seldom used part of the 10 metre band (for local QSOs that is). I received favourable reports from both stations although it was implied that my audio level was "a little down" it was in no way a major criticism. On reflection it became apparent that I hadn't been speaking directly in to the microphone and the lack of audio was down to me, not the radio!

The following evening, again connected to my G5RV, I replied to a CQ from **Rui CT3GV** in Portugal on 28.508MHz s.s.b. He replied first time and gave me a 5–9 report. I was particularly impressed with the receive audio, which was very clear and in no way tinny.

More QSOs were made on the evening of the 26 April with **LW9EOC** in Argentina, and **PY1NEZ** in Brazil. Both stations were worked on s.s.b. Incidentally...both stations were surprised that I was only running about 20W and my report on both occasions was 5 by 5.

A trip up to 29.600MHz netted **Juan EA8AGQ**, in Las Palmas Gran Canaria, who amazingly gave me 5 & 9 plus on n.b.f.m. Although he was running 40W, I could only give him 5 by 7 in return. And at this point I quickly set up my Yaesu FT-920, fitted a change-over switch between both radios and connected my 2-element beam.

To be honest there wasn't a vast difference in what I heard between the two rigs. Yes, the FT-920 **was better**, it has better receive options (DSP, Noise Reduction, etc.) but the Lincoln held its own and marginal signals on the '920 were still copyable on the President Lincoln – so there's no doubt the review model had a pretty good receiver.



Product

The President Lincoln 28MHz multi-mode Transceiver

Pros & Cons

Pros: Simple and easy to use, has v.f.o. tuning to 100Hz, sensitive receiver, good transmit audio reports, built in VSWR meter, frequency change possible from the microphone and a comprehensive manual that includes a circuit.

Cons: Low output power, no jack plugs for extension speaker/Morse key, no repeater shift, no memory facility and bulky size in a mobile set-up.

Summary

All in all, it was a pleasure to test this monoband 28MHz transceiver. The President Lincoln gets a definite thumbs up from me, so much so that I've decided to buy the review model. What more can I say - other than "See you on ten metres"?

Price

Normally **£225 plus £9 p&p**, however Nevada have arranged a **special offer price of £199** for *PW* readers (plus p&p) for the on sale period of the July issue.

Thanks

Thanks to **Nevada of Unit 1, Fitzherbert Spur, Farlington, Portsmouth, Hampshire PO6 1TT. Tel: 023-9231 3090, FAX 023-9231 3091, for the loan of the review model.**

Fig. 2: Inside view of the underside of the chassis. When in use the loudspeaker is mounted underneath the unit.

- Fig. 3: The rear panel - complete with unusual 9-pin socket (see text for comments).

Going Mobile

The next day was actually a sunny one and it luckily coincided with a day off work for mobile tests. For these I looked out an old K40 CB antenna (shortened for 28MHz operation) fitted it on the roof of the car and installed the Lincoln on the passenger seat.

At this point I must confess that I'd invited Kevin G4SKN along with me as he had a digital camera and if any photos of this part of the review are shown they are down to him. Thanks Kevin!

The President Lincoln is a little bulky compared to some mobile rigs on the market today. It's roughly the same size as the Icom IC-706 but has no remote head facility. For the purpose of the review I parked the car in a lay-by on high ground near Corsham, and because it was warm and sunny I placed the radio on the roof of the car next to the K40 antenna and called CQ on s.s.b..

At first there were no responses and although the band was open, conditions weren't that good. But a few minutes later we were called by **Yura US5EAU**, in Dnepr Ukraine. Yura gave me a 5 by 6 report and I replied with the same.

At this point I was happy with that and was preparing to put the transceiver back inside the car when we thought we heard a JA (Japanese) station. Kevin said give him a call.

I called "QRZ from G0IUE Mobile" and a reply of "the mobile station again please, this is JA7DYJ in Northern Japan" wow...we'd got him! Contact was established and



I worked **Sato** for a full five minutes on s.s.b. He was very surprised to hear where I had mounted the radio and that I was only running with about 21W.

Sato gave me a 5 - 5 report; he was 5 by 8. There was an enormous pile up for him as soon as we'd signed so I guess I just timed my call right! Both Kevin and I were in a state of shock after that and once we'd picked ourselves up off the floor, we

departed from our vantage point, more than content with the results.

No Nonsense!

The President Lincoln is a no nonsense transceiver with enough functions to keep most people fully occupied. The lack of repeater shift and memory facilities wasn't too much of a problem to me but may be to some operators.

The front panel is well designed and easy to use. The l.c.d. display is clear and easy to view (I would have preferred it to be slightly larger though). The 9-pin block on the rear panel is clearly unusual for this type of radio and is something you would just have to live with I'm afraid.

The reports I had on the transmitted audio were very good and the receiver held up well when compared to my FT-920. I didn't try the rig on a.m. or c.w. but you should be able to read how much we enjoyed s.s.b. and n.b.f.m!

DNW

- Fig. 4: Jon Wheeler G0IUE enjoyed using the President Lincoln 28MHz transceiver so much that he bought the review model! (Photograph courtesy of Kevin Romang G4SKN).

MANUFACTURER'S SPECIFICATIONS

General	
Channels:	170
Modes:	c.w., a.m., s.s.b., n.b.f.m.
Frequency range:	manual quotes 26 to 29.7Mz. (Review model only 28 to 29.7MHz)
Antenna Impedance:	50Ω
Power supply:	13.2V
Dimensions (in mm):	185 x 250 x 60
Weight:	2kg
Accessories supplied: Microphone with support, mounting cradle, screws and fused power lead.	
Transmitter	
Frequency deviation:	±300Hz
Carrier power:	10W c.w., a.m., n.b.f.m., 21W s.s.b.
Audio response:	300Hz - 3kHz a.m., s.s.b., n.b.f.m.
Microphone Sensitivity:	6mV
Current drain:	4.5A (with modulation)
Receiver	
Maximum sensitivity:	0.5μV - 113dBm (a.m./n.b.f.m.)
0.4 μV - 115dBm (s.s.b.)	
Frequency response:	300Hz to 3kHz in a.m.; s.s.b., n.b.f.m.
Maximum audio power:	4W
Image rejection rate:	>70dB
Receiver (with signal)	1A nominal

airband
basics**backchat****on the**
road**satellite**
monitoring**amateur**
airwaves**software**
spot**world of**
cb**scanners**

IN THIS MONTH'S

radio ACTIVE

Win a four day ticket to the Bristol International Balloon Fiesta

- Build something different - try kite antennas
- VOLMET and ATIS explained
- CB DXing in Jersey
- Your First CB Station
- The Yaesu VR-120 and ICOM R3 reviewed

RADIO ACTIVE JULY ISSUE ON SALE 15th JUNE

Radio Active is published on the third Friday of each month -
available from all good newsagents or direct by calling
(01202) 659930, priced at only £2.25



June SWM

The
SHORT WAVE
& Scanning Scene
Magazine



**CRAMMED
FULL OF
ESSENTIAL
INFO FOR ANY
RADIO
ENTHUSIAST
CAN YOU REALLY
AFFORD TO BE
WITHOUT IT?
June 2001 Issue
On Sale Now - £3.25
Miss it! Miss out!**

SSB UTILITIES SPECIAL

SSB SPECIAL

In this year's 'SSB Utilities' Special, Graham Tanner concentrates on just one particular aircraft type and provides a complete list of KC-10A selcall codes.

SSB UTILITIES - THE COLUMN

Graham has news of a new GHFS station which has opened, as part of the 'Scope Command Network', as well as information of the five groups of frequencies available in the NAT Systems.

OTHER FEATURES

ICOM IC-R3 1st UK REVIEW

Alan Gardener finally gets his hands on the latest and desirable hand-held scanner with built-in video capabilities - the Icom IC-R3.

JW ON WJ - A TALE OF TWO PRETTIES

John Wilson shakes down a pair of Watkins Johnson desirables, the HF-1000 and the WJ 8711.

JUST THE JOB - THE FT - 70G

An old friend remembered with fondness. Dave Roberts reflects.

GMDSS

Regular 'Airband' columnist Godfrey Manning has now acquired his GMDSS Short Range Certificate, find out what this now enables him to do.

MORE LIKE OLD TIMES

The PC versus the Laptop...Bob Ellis considers both.

WIN Royal International Air Tattoo Tickets

15 PAIRS TO BE WON!

Short Wave Magazine - The ONLY choice!
DON'T MISS THE JULY SWM - IT'S OUR SCANNING SPECIAL!
Containing TWO scanner reviews - Yaesu VR-5000 & Alinco DJ-X2000

NEVADA®

LARGE STOCKS FAST DELIVERY EXPERT ADVICE

www.nevada.co.uk

USED EQUIPMENT BUY WITH CONFIDENCE

All safety tested & guaranteed for 3 months

HF TRANSCEIVERS

ICOM 725	100W HF TRANSCEIVER	395
ICOM IC765	100W HF TRANSCEIVER	799
KENWOOD TS850 SAT	100W HF TRANSCEIVER	699
YAESU FT900	100W HF MOBILE BASE	599
YAESU FT77	100W HF TRANSCEIVER	299
YAESU FT1000	200W HF TRANSCEIVER	1299

VHF/UHF TRANSCEIVERS

ADI AR-446	70CM FM TRANSCEIVER	149
AKD 2001	2M FM TRANSCEIVER	125
ALINCO ALM-203E	HANDIE 2M	75
ALINCO DR-430	70CMS MOBILE	155
ALINCO DR 510E	2M/70CM MOBILE TRANS	179
ALINCO DR MO6	10W 6M MOBILE TRANSCEIVER	149
ICOM IC2100H	2M FM MOBILE TRANSCEIVER	169
ICOM IC2500E	70/23CM MOBILE TRANSCEIVER	329
KENWOOD TH 79E	2M/70CM HANDIE TX	159
KENWOOD TH D7E	2M/70CM HANDIE + TNC	169
KENWOOD TM 231E	2M MOBILE	139
NAVICO AMR1000S	2M FM TRANSCEIVER	75
STANDARD CB900	2M FM MOBILE	125
TRIO 751E	ALL MODE 2M MOBILE	325
YAESU FT41	70CMS HANDIE + ACCS	125
YAESU FT2200	2M FM MOBILE TRANSCEIVER	139
YAESU FT221R	2M MULTIMODE TRANSCEIVER	199
YAESU FT225RD	2M MULTIMODE TRANS	359
YAESU FT411	2M FM HANDIE - BOXED	125
YAESU FT736R	6M/2M/70/23CM BASE	999
YAESU FT5100	2M/70CM MOBILE TRANS	269
YAESU FT12014	VHF PMR TRANSCEIVER	75
YAESU VX-SR +SU1	6M-70CM HANDHELD	229
YAESU VX1M00	MARINE TRANSCEIVER	129

AMPLIFIERS

TOKYO HL700	SOLID STATE HF AMP	599
TOKYO HL100B	100W AMP 21 - 28MHZ	129
TOKYO SAGRA 600	2M 700W AMP 2X4CX250R	799

SCANNERS & RECEIVERS

ALINCO DJ-X10E	HANDHELD SCANNER	225
BEARCAT UB9000XTL	500 CHANNEL BASE	199
COMMET COM510	HANDHELD SCANNER	139
GRUNDIG YB400	SHORTWAVE RECEIVER	79
GRUNDIG SATLIT 800	MULTIBAND RECEIVER	399
ICOM IC727	HF RECEIVER	399
LOWE HF150	HF RECEIVER	199
SONY ICF-SW7600G	SHORTWAVE RECEIVER	119
YUPIITERU MY7-1100	HANDHELD SCANNER	169

ACCESSORIES

AMDAT ADC60	FREQ STANDARD CLOCK UNIT	99
HI-MOUND HK802	BRASS HAND KEY	49
KENWOOD AT250	AUTO TUNER	175
KENWOOD VS2	VOICE BOARD	40
KENWOOD MC85	BASE MICROPHONE	69
KENWOOD PS-52	BASE POWER SUPPLY	145
MFJ 784B	DIGITAL FILTER	139
MW MODULES 432/144	2M/70CM TVTR	59
PALSTAR AT-300	HF ANTENNA TUNER	69
SYMEK TNC 2H+RF DECK	9.6K TNC +10W RADIO	179
SWAN WM6200	50-150MHZ PWR/SWR M	30
TIMEWAVE DSP-59+	DSP FILTER	249
TOKYO HX-240	2M - HF TRANSVERTER	99
TONO Q-550	TERMINAL UNIT	125
YAESU FC-1000	AUTO ATU FT757 ETC	189
YAESU PF232CVAN	COMPUTER INTERFACE (FT736)	79

NEW ITEMS COMING
IN DAILY - CALL

PALSTAR USA PRODUCTS



PALSTAR AT1500

HIGH POWER HF ANTENNA TUNER
with CERAMIC ROLLER INDUCTOR
for HIGH RELIABILITY

- 1.5kW
- 1.8 - 30MHz
- Built in 4:1 Balun
- 6 position antenna switch
- X needle SWR/Power meter

NEVADA PRICE £369

PALSTAR AT300 ANTENNA TUNER



- 150W
- 1.8 - 30MHz
- 4:1 Balun

NEVADA PRICE £429.95 £99

PALSTAR AT300LCN



- 1.8-30MHz
- Heavy duty 4:1 Balun
- Built-in Dummy Load
- 8-way Antenna switch
- Peak/Avg power reading

Housed in a larger heavy duty cabinet with many improved features - this has to be one of the best antenna tuners on the market!

NEVADA PRICE £139.95

PALSTAR ACCESSORIES

ALL PLUS £6 P&P B4000

B1500	1.5kW 4:1 Balun	£35.95
B1500C	1.5kW 1:1 current Balun	£35.95
B4000	4kW 4:1 Balun	£79.95
R128C	2kW 28uH ceramic roller ind	£99.95
C240	240pf 4.5kV var capacitor	£49.95
C350	350pf 6.0kV var capacitor	£69.95



PALSTAR R30

PORTABLE COMMUNICATIONS
RECEIVER

- 100kHz - 30MHz
- 100 memories
- Ceramic filters fitted
- 4 pole XTAL filter @ 45MHz
- Analogue S meter

NEVADA PRICE £399.95



DAIWA ACCESSORIES

SWR/POWER METERS

CN801H	1.8 - 200MHZ 2KW	£109.95
CN801V	140 - 525MHZ 200W	£119.95
CN101	1.8 - 150MHZ 1.5KW	£59.95
CN103	140 - 525MHZ 200W	£65.95

PLUS £6 P&P (UK MAINLAND)

DAIWA TRIPLE BAND ANTENNAS

IDEAL REPLACEMENT ANTENNAS 144/430/1200MHZ

HA45S	SMA Triple band L: 4.5cm	£12.95
HA45B	BNC Triple band L: 4.5cm	£12.95
HA96B	BNC Triple band L: 9.5cm	£16.50

Add £2.75 p & p for all antennas (UK MAINLAND)

COAXIAL ANTENNA SWITCH

CS201A 0 - 600MHZ 1kW SO239 £19.95

HEIL PRO SET

THE DXER'S CHOICE FOR OUTSTANDING AUDIO

PRO SET 4 For contesters & DX'ers who want to cut through the pile ups. Using hc4 insert.

£129.95 £5 P&P (UK MAINLAND)

PRO SET 5 A fuller range insert for rag chews who want quality with clarity. HC5 insert.

£129.95 £5 P&P (UK MAINLAND)

AD-K Kenwood Adaptor Cable£14.95

AD-1 Icom Adaptor Cable£14.95

AD-Y Yaesu Adaptor Cable£14.95



ALINCO DJ-VS

- New dual band handy TX
- 5W/1W/0.5W output power
- Super wide RX (76-999MHz)
- Includes wide FM mode
- CTCSS enc/dec fitted
- 200 memory channels
- Up to 6 char. alpha-tagging

NEVADA PRICE £229.95



ALINCO DJ-19S

- New 2 metre (144-146MHz)
- Wide RX possible (typical 135-173MHz)
- Up to 5W output
- 40 memory channel+1 call ch
- Large range of accessories available

NEVADA PRICE £159.95



ALINCO DR-13SE

- 50/10/5 W output
- 144-146MHz (RX 118-170MHz) Airband RX with NEW 8.33 steps
- 100 memory channels
- Built-in CTCSS sub tones
- Optional internal TNC (EJ41U)

NEVADA PRICE £235.95



ALINCO DX-70TH

- 100W HF + 100W 6 metres
- All modes fitted, LSB, USB, CW, AM & FM
- Wide range RX 150kHz to 54MHz
- CW and SSB narrow filters fitted
- 100 memory channels
- Optional smart tuner available - EDX2

NEVADA PRICE £699

COMET HIGH QUALITY JAPANESE ANTENNAS

NEW UHV-6

MULTIBAND MOBILE ANTENNA

40/*20/15/10/6/2/70cm
* 20m coil (optional)

- Configure this 6/2/70cm whip to the 6 bands of your choice with the 3 screw in HF coils supplied
- 20m coil available as optional extra
- Convenient fold-over hinge for entering garages, parking structures, etc.
- Uses PL-259 Connector.

£89.00 P & P £10 (UK MAINLAND)

NEW LOW PROFILE 'FLEXIBLE'

ANTENNAS for the YAESU FT817

CHF-412

7, 21, 144MHz, 0.74M Long...£59.95

CHF-816

3.5, 28, 50MHz, 0.74M Long...£59.95

postage & packing £4.75 (UK MAINLAND)

COMET BASE ANTENNAS

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

COMET HF MOBILE ANTENNA

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

p & p £9.50 all items above (UK MAINLAND)

COMET VHF MOBILE ANTENNAS

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

p & p £8.00 all items above (UK MAINLAND)

COMET BALUNS

CBL-2000	0.5 - 60MHz 2kW 1:1	£27.50
CBL-30	1.7 - 30MHz 1kW 1:1	£21.95

COMET DUPLEXERS

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

COMET TRIPLEXERS

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

SG-239 HF AUTOTUNER

INTRODUCING THE NEWEST MEMBER OF THE SMARTTUNER FAMILY!

Ideal for FT817, TS50, 1C706

- Power.....1.5 - 200W
- Freq.....1.8 - 30MHz
- Memories.....170

CALL FOR DETAILS

SG-230

HF Smart Tuner

NEVADA PRICE £359.95

LINEAR AMP UK

NEW! Pioneer

1.3kw HF amp

(4 x 572 B)

Now in stock

NEVADA PRICE £1295

£15 p&p all amps

(UK MAINLAND)

DISCOVERY (HP) 2M 3CX800 (1kW) £1395

HUNTER SIX 6M 3-500ZG (900W) £895

RANGER 811H HF 4 X 811A (800W) £895

NEW PIONEER 4 X 572B (1300W) £1295

CHALLENGER 1 HF 2 X 3CX 800 (1.5kW) £1495

CHALLENGER II HF 3CX 1500 (1.5kW) £1995

023 9231 3090

e-mail: info@nevada.co.uk • website: www.nevada.co.uk • fax: 023 9231 3091

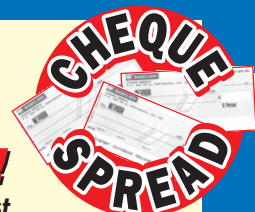
Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT



NEW OPENING HOURS
MON - FRI 9.30 - 5.30
CLOSED ALL DAY SATURDAY



- **NO HASSLE**
- **NO CATCH**
- **NO PROBLEM!**



Buy the radio of your choice at the best price and pay by 3 POST DATED CHEQUES - INTEREST FREE! or part exchange your old radio & pay the balance by CHEQUESREAD - EASY ISN'T IT!

WORLDSPACE
DIGITAL SATELLITE RADIO

- WorldSpace satellite plus FM/MW/SW
- SW1: 2.3 - 7.3MHz
- SW2: 9.5 - 26.1MHz
- Portable bat pwr+AC adapt
- Stereo headphone socket
- Stereo line out connectors for integration with your stereo
- Built-in easy to aim antenna
- Encryption and narrowcast capability
- Program selection by language and category
- 10 presets & last station mem
- 1-line 8 character LC display
- Port for easy attachment to the WorldSpace PC card to enjoy multimedia services

NEW!
PW SPECIAL THIS MONTH - CALL!

Receive over 40 channels of FADE FREE DIGITAL PROGRAMS direct from satellite to this radio - from almost ANYWHERE in the world!

NEVADA PRICE **£99.95**

CHEQUE SPREAD
YAESU FT1000MP MK V

HF 200W
All mode transceiver

NEVADA PRICE **£2795**

CHEQUE SPREAD
ICOM IC-756 PRO

Icoms latest SUPER rig

NEVADA PRICE **£2395** **£1895**

SPECIAL OFFER BULK PURCHASE £2395 £1895

CHEQUE SPREAD
KENWOOD TS-2000

DC to Daylight!
HF to 1200MHz*

IN STOCK!
*1200MHz optional

NEVADA PRICE **£1699**

CHEQUE SPREAD
YAESU FT-847

70cm
- Top Band
All Mode

NEVADA PRICE **£4699** **£1199**

CHEQUE SPREAD
ICOM 910H

- VHF/UHF
- All mode TX
- Suitable for DX'ing or Sat
- 100W 2mtr/ 75W 70cm
- Full Duplex

NEVADA PRICE **£1299**

CHEQUE SPREAD
KENWOOD TS570 DGE

100W HF radio with a superb DSP RX.

NEVADA PRICE **£999.95** **£849**

LOW LOSS COAX SPECIALS

NEVADA H100

Semi airspaced double screened low loss 50 Ω cable

LOSS PER 10 METRES

FREQ.	LOSS
28MHz	0.20dB
50MHz	0.25dB
100MHz	0.35dB
400MHz	0.82dB

100 METRE DRUM QUANTITY PRICE **£85**
£59
£10 p&p MAINLAND UK

NEVADA RG213

Popular low loss 50 Ω cable

LOSS PER 10 METRES

FREQ.	LOSS
28MHz	0.36dB
50MHz	0.45dB
100MHz	0.67dB
400MHz	1.47dB

100 METRE DRUM QUANTITY PRICE **£73**
£49
£10 p&p MAINLAND UK

NEVADA RG58CU

Popular lightweight coax cable

LOSS PER 10 METRES

FREQ.	LOSS
28MHz	0.78dB
50MHz	0.97dB
100MHz	1.4dB
400MHz	3.0dB

100 METRE DRUM QUANTITY PRICE **£38**
£25
£10 p&p MAINLAND UK

NEVADA MINI RG-8

Low loss small diameter cable

LOSS PER 10 METRES

FREQ.	LOSS
28MHz	0.69dB
50MHz	0.86dB
100MHz	1.28dB
400MHz	2.82dB

PRICE PER METRE **£0.45**
100 METRE DRUM CLEARANCE PRICE **£45**
£29
£10 p&p MAINLAND UK

CHEQUE SPREAD
YAESU FT-817

- HF/6/2/70 cms
- Transportable with wide RX
- Supplied c/w Nicads, Charger, antenna & mic

NEW! IN STOCK!

NEVADA PRICE **£799**

CHEQUE SPREAD
ICOM 706 MKIIIG

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

NEVADA PRICE **£4499.95** **£995**

CHEQUE SPREAD
KENWOOD TM-D700E

Dual band DATA mobile radio

NEVADA PRICE **£469**

CHEQUE SPREAD
YAESU FT-1500M

50W Heavy duty 2 metre FM mobile

NEVADA PRICE **£229**

CHEQUE SPREAD
ICOM IC-718

100W HF Transceiver Built in keyer General coverage RX

NEVADA PRICE **£699**

CHEQUE SPREAD
ICOM 2800H

- 232 channels
- FM narrow capability with a dedicated narrow band FM mode
- Up to 50W or 35W output for VHF and UHF bands

NEVADA PRICE **£399**

CHEQUE SPREAD
YAESU FT-90

Micro-sized TWINBANDER WIDE RX inc AM AIRBAND

NEVADA PRICE **£475** **£349**

INCLUDES FREE YSK90

CHEQUE SPREAD
ICOM IC-R75

- 0.03 - 60MHz
- Twin PBT built-in
- PC control capability
- Synchronous AM detection

IN STOCK! READY TO SHIP!

NEVADA PRICE **£699**

CHEQUE SPREAD
PALSTAR PS-50

50 Amp heavy duty supply with meters. 13.8V DC 40/50 Amp

NEVADA PRICE **£469** **£149**

PRESIDENT LINCOLN

High class 21W 10 mtr Multimode Transceiver

- 28 - 30MHz
- AM/FM/SSB

NEVADA PRICE **£225** **£199**

CHEQUE SPREAD
YAESU FT-8100

Dual band high power mobile + wideband receive

NEVADA PRICE **£399**

CHEQUE SPREAD
ICOM IC-R8500

IN STOCK! Covering 100kHz - 2GHz & lots of features inc computer control.

NEVADA PRICE **£4349** **£1299**

CHEQUE SPREAD
PALSTAR PS-30

3-15V adjustable 25/30A max Voltage + current meters 10mW RMS noise & ripple

NEVADA PRICE **£99**

ALBRECHT 485

25W Multimode 10 mtr Transceiver

- 28 - 30MHz
- AM/FM/SSB
- Repeater shift

NEVADA PRICE **£199**

CHEQUE SPREAD
TIMEWAVE DSP 5992X V-5

NOW WITH PSK 31 INTERFACE

- Eliminate heterodynes
- Filters QRM
- Brickwall PSK31 filter
- Sound card interface
- Binaural CW
- CW spotlight
- Enhanced noise reduction

NEVADA PRICE **£359.95**

CHEQUE SPREAD
ANC 4

ANTENNA NOISE ELIMINATOR

Reduces noise from power lines, TVs etc - up to 40dB. Wipes out S9 line noise. 500kHz-80MHz

NEVADA PRICE **£199.95**

CHEQUE SPREAD
PK12 PACKET TNC

- 1200 BPS, VHF/UHF packet
- Host mode
- Advanced command set
- GPS commands
- APRS adaptor avail.
- Includes PK-TERM 99 demo software

NEVADA PRICE **£129.95**

YAESU ROTATORS

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

G650C MEDIUM DUTY
C/W Cont of Box & 25 Cable..... **£459**

G450C LIGHT DUTY
C/W Control Box & 25 Cable..... **£349**

*£10 p&p on all Yaesu rotators

CHEQUE SPREAD
YAESU VX-SR

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

NEVADA PRICE **£359** **£299**

CHEQUE SPREAD
YAESU VX1R

Mini 2M/70cm transceiver & wideband RX 500kHz-999MHz.

NEVADA PRICE **£169**

CHEQUE SPREAD
KENWOOD THD7E

Dual Band Handie Up to 6W Output • Built in TNC!

NEVADA PRICE **£269**

IT'S EASY TO PAY!

• by three post dated cheques
minimum order: £99

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



A Three-Band QRP CW Transmitter For The Newcomer

Carmel Fenech
9H1AQ has
come up with
an idea for a
simple-to-build
QRP three-
valved three-
band c.w.
transmitter.

As the cost of commercially made radio equipment is climbing higher and higher, many newly licenced Radio Amateurs may be scared of joining the hobby. But getting started with your first station need not be so expensive. In fact building a transmitter, as described here, can be cheap and give a degree of satisfaction at having built it.

The QRP level transmitter I'm going to describe here, is a two-valved crystal controlled unit that can easily produce a useful amount of power on the three bands of 7, 14 or 21MHz. Each band can have an individual crystal, or the oscillator stage can produce output at harmonically related frequencies.

And if you don't have a source of suitable crystals, there's always the option of using the v.f.o. input. By using a sufficiently stable oscillator, a tuneable transmitter can be yours. This option treats the first valve as an amplifier/multiplier, rather than as an oscillator.

Look at the circuit diagram of **Fig. 1** and I'll describe it for you. The first stage around V2, is configured as a Colpitts oscillator and drive amplifier/multiplier. As shown, the stage is acting as an oscillator, as the crystal is in circuit.

Natural Frequency

Capacitive coupling and feedback from the cathode of the valve should cause this stage to oscillate quite well at the natural frequency of the crystal. As the valve will initially have no reverse grid bias, even small oscillations will cause some grid current to flow.

The grid current that flows on oscillation peaks, will not be able to leak away through the 100k Ω grid resistor. So, a negative voltage at the grid with respect to the cathode will tend to build up. Eventually the level of oscillations will stabilise at one level, for any one crystal, as only a small average grid current flows.

If a stable v.f.o. signal (preferably several volts peak-to-peak) is available then, with the switch S3 in the other position, the first stage acts as an amplifier. The amount of drive available from the v.f.o. would perhaps need to be adjusted to give the desired output power from V3.

But in a similar fashion to when it's used as an oscillator, when used as an amplifier, the circuit will also tend to act as a gain controlled stage and give a more stable output level. If the oscillator input is low (with the stage is running at a higher

current) then dissipation in the anode resistor R3 can rise rather sharply.

Crystal Controlled

I think that this transmitter will most likely be used as a crystal controlled one. This need not mean that the frequency is completely fixed. A degree of frequency shift of a few kilohertz could be managed, if a small value variable capacitor is added to the circuit, either in series or, in parallel with the crystal. Other crystals in the 7MHz band could also be plugged into the circuit to provide other frequency choices.

When V3 is acting as a multiplier stage, for output on the 14 or 21MHz band, then the v.f.o. input will probably need to be quite high level, to achieve adequate drive for the stage. The output from the first stage is taken from the anode tuned circuit, where one of three coils is resonated with C7/8, at either 7, 14 or 21MHz.

Note: *It might even be possible to get some drive out at 28MHz, but the level is likely to be somewhat lower.* **Editor.**

Safety Feature

Capacitor C7 acts as a safety feature, blocking the standing anode voltage of V1 from the peaking capacitor C8. I fitted this component, as many capacitors recovered from old radio are likely to be physically small units, and have a lower breakdown voltage.

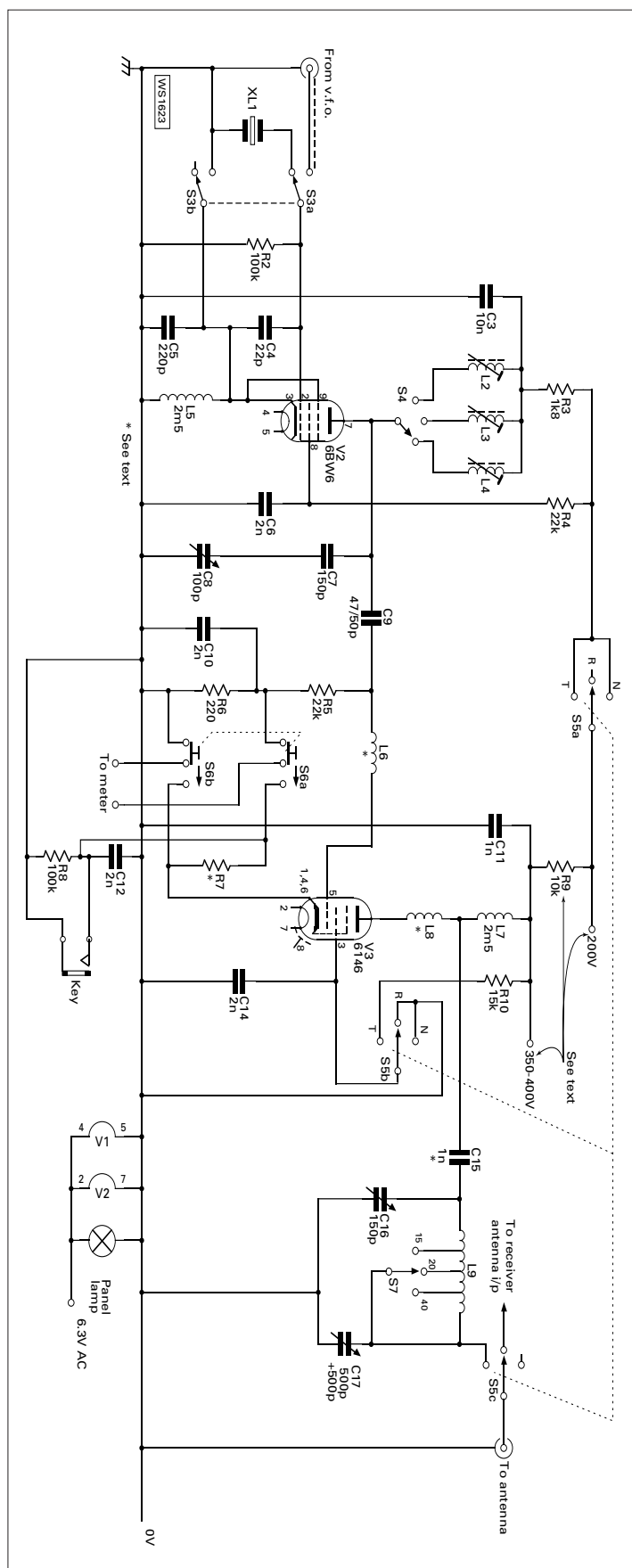
The selected signal from V2, is coupled to the power amplifier stage of V3, a simple keyed cathode amplifier. The two small inductors L6 and L8 reduce self oscillation or harmonic operation.

Monitoring of both the grid drive and cathode currents will aid tuning and matching the stages. And this may be carried out with the station multimeter, thus saving the cost and complexity of building in meters to monitor these currents.

Circuit Arranged

Please note that the circuit is arranged so that the meter does not have to be reversed when measuring the grid current and cathode current. As V3 should be driven hard enough to take grid current, the grid itself will be negative with respect to the chassis (0V).

So, if you have a simple moving coil ammeter, the negative lead should be coupled to the right-hand of the terminals labelled Meter. If the transmitter is



● Fig. 1: Valved transmitters, like this simple two-valved one, are both simple to build and robust in use by newcomers. But adequate care must be taken as the applied supply voltages may be lethal to the unwary!

Shopping List

Resistors

Carbon or metal film (1W 5%)

220Ω	1	R6
22kΩ	1	R5
100kΩ	2	R2, 8

Wirewound (5W 5%)

1.8kΩ	1	R3
15kΩ	1	R10
22kΩ	1	R4

Wirewound (10W 5%)

4.7kΩ	1	R1
10kΩ	1	R9

Capacitors

Silver Mica (or high voltage polyester)

22pF	1	C4
47pF	1	C9
150pF	1	C7
220pF	1	C5

High voltage ceramic

1nF	1	C11
2nF	4	C6, 10, 12, 14
10nF	1	C3

Ceramic (2kV working)

1nF	1	C15
-----	---	-----

Electrolytic 550V working (see text for alternatives)

8μF	C1
16μF	C2

Variable Air Spaced (wide plate spacing)

100pF	1	C8
150pF	1	C16

Variable (good quality airspaced)

500+500pF	C17
-----------	-----

Valves

OA5	1	V1
6BW6	1	V2
6146	1	V3

Inductors

2.5mH	1	L5 (must be capable of carrying 50mA)
2.5mH	1	L7 (a transmitter style choke coil, to carry 100mA)
5H	1	L1 (or other heavy duty low frequency choke)

RF coils {0.46mm (26s.w.g.) enamelled wire close wound on a 6mm former with a dust core}

L2	11turns
L3	21turns
L4	45turns

Pi-match inductor

L9	22 turns of 1.22mm (18s.w.g.) tinned copper wire wound (spaced one wire diameter) on a 32mm former, with tapings at 12 and 5 turns from C17 end of the coil
----	---

Radio Frequency Chokes

L6, L8	5 turns 0.305mm (30s.w.g.) enamelled wire wound on a 1W 100Ω resistor
--------	---

Miscellaneous

A suitable box and chassis, valvebases, interconnecting wire, insulating and terminal posts, and other hardware to suit, 7MHz crystal and holder, mains transformer suitable for the power supply, various switches as suggested in text

keyed without drive, there may quite a large current flowing through V3 so, some form of meter protection may be needed.

During periods of receiving or 'netting' the p.a. stage has the g2 voltage of the valve taken to 0V. This takes the valve V3, very near to cut-off as well as reducing the possibility of spurious operation.

Ceramic Type

The change-over switch used in the S5 position should ideally be a ceramic type.

But, because of the high voltages that will be present at these points, the switch used must have adequate spacing to allow for safe connections.

The p.a. stage has the usual inductive anode load component of L7, feeding the output Pi-match tuning and matching circuit. Capacitor C15 forms the safety aspect of blocking V3's high value of d.c. voltage and must be a high quality unit capable of withstanding high voltage (1.5-2kV).

Obviously the output power is dependant on the voltages applied, especially to the p.a. stage

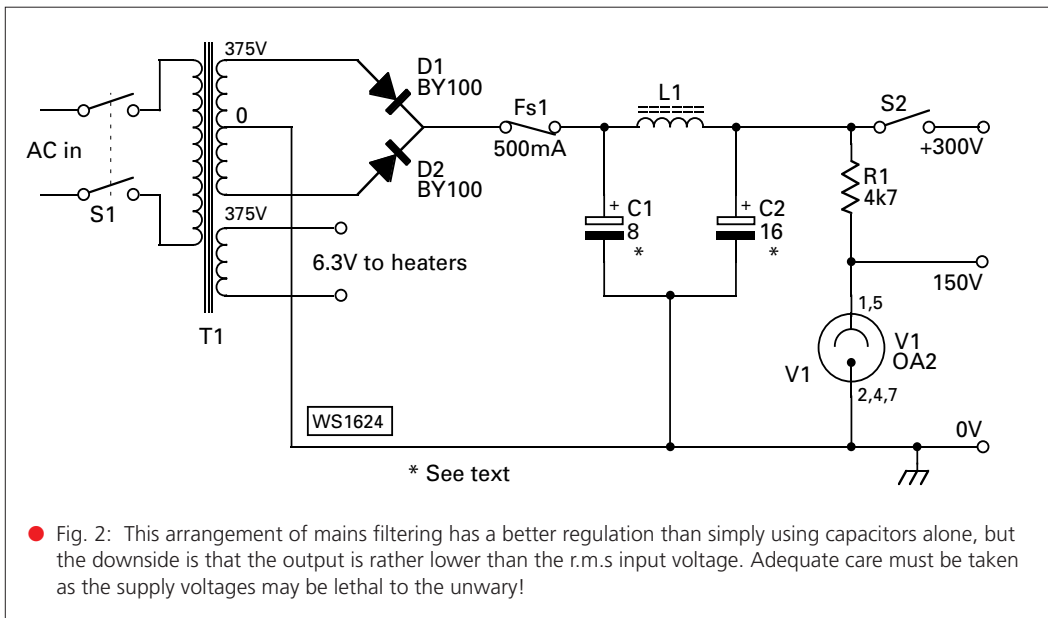


Fig. 2: This arrangement of mains filtering has a better regulation than simply using capacitors alone, but the downside is that the output is rather lower than the r.m.s input voltage. Adequate care must be taken as the supply voltages may be lethal to the unwary!

near the unit.

The circuit diagram of Fig. 2 is the circuit I use, and it has proved adequate to power the transmitter unit. This is the unit that's likely to be the limiting factor in the amount of power that can be generated on the bands.

The choke inductor of L1 must be of a high quality, capable of carrying at least 100mA to be effective. It should also have a low resistance winding. **But more importantly, the capacitors used must be capable of**

withstanding the voltages present.

Off load, the voltage across capacitors C1 and C2 will be over 500V. **So, they must be rated for at least 550V, preferably 600V or more.**

Not Available?

If a choke inductor is not available, then a simpler circuit using a 250-0-250V transformer with just a capacitive filter might be used. Capacitors, capable of withstanding 350V or

more should be used in the C1/2 positions, with a total capacity of around one hundred to two hundred microfarads should be adequate.

The voltage stabiliser valve of V1 may be dispensed with if you cannot get hold of one. But it will help to make the output tone of the transmitter sound better, and could help keep transmitter chirp (slight frequency shifts on keying up) to a minimum.

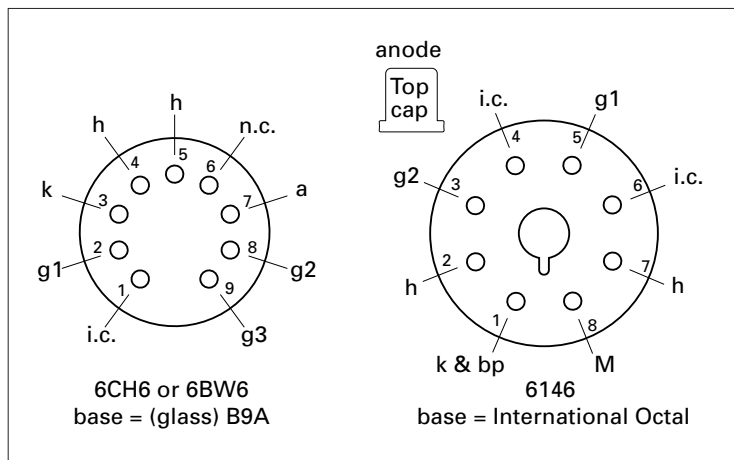
The transformer must also be able to supply sufficient current for both valve heaters. The two valves used in this circuit will need a combined heater current of at least 2A (V2 need 4-500mA, V3 around 1.4A) at 6.3V. If the heater winding cannot cope, then another heater voltage transformer could be used to help spread the load.

PHW

WARNING:

POSSIBLE EMC PROBLEMS

Because of the harmonically rich output nature of the crystal oscillator circuit in this standard (and once extremely popular) design approach for a c.w. transmitter - potential constructors should be aware of possible problems. Even with low transmitter outputs (even with transmitter outputs of 5W or less) a **significant possibility of EMC difficulties is present.** So, to minimise interference to domestic v.h.f. radio and u.h.f. television reception it's advisable to build the unit into an enclosed metal cabinet and provide a really good quality low-pass filter between the Pi output tuning stage and the final antenna tuning unit. With these precautions, the transmitter should - as it did for many of us 30 or more years ago - provide much pleasure on the Amateur bands. **Editor.**



of V2. I've found that a supply of about 200V is adequate for the first valve stage, but up to 450V may be applied to the p.a. stage when, with high drive, as much as 30-40W of r.f. may easily be created.

If two separate high voltage supplies are available then they should be used. In this case the resistor R9 is redundant otherwise, it's best to use a supply of around 350V and a wirewound resistor (of around 5-10kΩ) to drop the supply to the oscillator valve to around 200V.

Power Supply

Now to look at a suitable power supply unit (p.s.u.) for the project. As you will be aware, **the voltages present may be lethal, and great care must be exercised at all times when**

www.g3tux.com

QRP

The
buzz!

Howes Kits

DC2000 Monoband SSB + CW Receiver.....	£24.95
DXR20 80/40/20 + aux. Band SSB/CW RX.....	£43.95
TX2000 Monoband 5W CW Transmitter.....	£26.95
AT160 160/80m DSB/AM/CW 10W TX.....	£44.95
LM2000 Links TX2000 or AT160 with RX kit to form a transceiver.....	£17.95
MA4 Mic. amp.....	£7.50
SWB30 Dummy load/ SWR /Power indicator.....	£14.95
ST2 Sidetone generator/ morse practice osc.....	£10.95
AA2 HF Active aerial kit, 150kHz - 30MHz.....	£9.95
AA4 VHF Active aerial kit, 25 - 1300MHz.....	£20.95
AB118 Air Band active aerial 118-137MHz.....	£19.95
SPA4 4-1300 MHz RX pre-amp.....	£17.50
CTU8 Receiving ATU, 500kHz-30MHz.....	£33.95
RA30 Receiver attenuator, 0, 15, 30 dB steps.....	£4.95
ASL5 Dual bandwidth AF filter.....	£17.95
CSL4 As ASL5, but no AF amp.....	£12.95
XMI Crystal cal.....	£17.95
DFD4 Frequency counter/digital display.....	£56.75
PMB4 DFD4 matrix board to allow IF offset.....	£10.95

All prices include VAT. Carriage is charged extra. VISA/Mastercard payments are welcome. Check our website for full product range and detailed information - sorry, no printed catalogue/data available.

www.G3TUX.com

G3TUX

The QRP Component Company

PO Box 88 Haslemere Surrey GU27 2RF

Tel. 01428 661501

Fax 01428 661794

Ten Tec T Kits

QRP Tetr 3W monoband CW Transceiver. Superhet RX 80, 40 or 20m.....	£94.95
50MHz Transverter, 8W o/p 14 or 144MHz IF.....	£94.95
144MHz Transverter 8W o/p 28-30MHz IF.....	£134.95

- WE STOCK OTHER TEN TEC KITS TOO!

MFJ "Cub"™

QRP Tetr 2W monoband CW truly miniature transceiver. 80,40 or 20m.....	£89.95
---	--------

Benchers Keys

BY1/ST1 Paddles.....	£79.95
BY2/ST2 Paddles.....	£94.95

Kent Keys

Pump kit.....	£48.50
Twin paddle kit.....	£62.50
Single paddle kit.....	£53.50
EK4 Keyer.....	£47.50
EK4M + memories.....	£73.50

Samson Keyers

ETM9COG X3.....	£109.95
ETM9C X3.....	£139.95
ETM SQ paddle.....	£39.95

Swedish Pump key

.....	£89.95
-------	--------

Schurr "Proff" the ultimate twin lever paddle. £129.95



Most advertisements are legal, decent, honest and truthful. A few are not, and, like you, we want them stopped.

If you would like to know more about how to make complaints, please send for our booklet: 'The Do's and Don'ts of Complaining'. It's free.

The Advertising Standards Authority.

We're here to put it right. ✓

ASA Ltd., 2 Torrington Place, London WC1E 7HW

This space is donated in the interests of high standards of advertising.

Amateur Radio Communications Ltd

38 Bridge Street, Earlestown, Newton-le-Willows, Merseyside WA12 9BA

OPEN Tue-Sat
10am-5pm
FREE PARKING

We are the largest stockists of both new and secondhand amateur radio equipment in the north of England – fact not fiction! Our company boasts a full time service department authorised by all the major suppliers.

When you buy from us you have complete peace of mind!

WE STOCK MOST ITEMS ADVERTISED IN THIS MAGAZINE - WE MAY NOT QUOTE THE CHEAPEST PRICE BUT WE DO GIVE THE BEST SERVICE BOTH BEFORE, DURING AND AFTER THE SALE. THAT IS WHY WE HAVE BEEN IN BUSINESS FOR MORE THAN 15 YEARS. ASK ANY OF OUR CUSTOMERS!

SPECIAL PROMOTION

Twin handset pack of Goodmans Tracker with free pair of drop in chargers, 2 sets of hands-free kits and 6 x nicads.....all for **£99.95**

Loko switch mode power supply
25A maximum, variable voltage,
9-16V output. RRP £89.95.

ARC PRICE ONLY £79.95

limited stock

NEW FROM KENWOOD...
TS-2000 ALL BAND, ALL
MODE TRANSCEIVER

Long awaited multi-band transceiver that gives you the world!! No transceiver before has ever covered so many frequencies, the TS-2000 covers top band to 23cms (with UT-20 option), plus a full 50 watts on 70cms give the Class B operator greater range. A first in HF radios, the TS-2000 has a built-in TNC allowing operators to access to DX-cluster reception without the need for a PC.

ARC PRICE £1695.00

or £170.00 deposit and 36 payments of £61.38 per month

NEW FROM YAESU...

FT-817QRP TRANSCEIVER



5W
160m to
70cms
radio,
it's size
making it an ideal portable transceiver to be used anywhere. Combining all mode and a very advanced specification in a compact enclosure.

Estimate RRP £799.00

Finance example: £699 deposit £69,
36 x £25.52 p/m. APR 29.8%.

HP available up to 3 years repayment period

HITACHI WORLDSPACE
DIGITAL
RECEIVER -
KH-WS1

More than just a radio
WorldSpace digital
satellite system
broadcasts are

transmitted via three geostationary satellites which orbit directly over the equator. They include a wide variety of programs including news, sports and music and these programs are broadcast in a multi-language format.

ALL THIS FOR ONLY £99.95!!!

WORLDSPACE EXTERNAL
ANTENNA TO SUIT THE
KH-WS1

Frequency: 1452 -
1492MHz. Complete with amplifier, 4-element Yagi, 25m of coax plus all fittings.

ONLY £49.95



YAESU FT-90R

The smallest dual-band mobile on the market! It is unbelievable that such a tiny radio could produce 50W on 2m and 35W on 70cm. Features include: ★ Auto repeater shift on UK channels ★ Switched 12.5/25kHz deviation. RRP £419.00.

ARC PRICE £305.00

NISSEI PS-300 30 amp/12V power
supply to suit most
radios.
ARC PRICE
£99.00HUGE SELECTION OF USED
EQUIPMENT IN STOCK

BASE STATIONS

Icom 756 boxed in VGC.....	£TEL
Yaesu FT-902DM + FC-901/SP-901/FL-2100Z linear.....	£TEL
Yaesu FT-726R plus HF/2m/70cm.....	£450
Yaesu FT-757GX + FP-757HD.....	£400
Kenwood TS-440SAT.....	£499
Kenwood TS-140S.....	£399

★ ★ ★ STAR BUY ★ ★ ★

Kenwood TS-50 + AT-50 - mint condition.....£TEL

MOBILE RADIOS

Yaesu FT-290RI + FL-2025.....	£225
Icom IC-202 2m SSB/CW.....	£150
Icom IC-402 70cms SSB/CW.....	£175
Icom IC-24G + mic.....	£99
Yaesu FT-211RH.....	£125
Albrecht AE-550 2m mobile.....	£125
Icom IC-245E.....	£TEL

SHORT WAVE/SCANNING RADIOS

Realistic DX-394 receiver.....	£100
NRD-535 receiver.....	£499
Target HF-3 receiver.....	£99
AOR AR8200.....	£199

MISCELLANEOUS

Yaesu FTV-707 transverter.....	£125
Icom IC-PCR100 boxed.....	£TEL
MCL-1100 Easy Reader plus monitor.....	£95
Icom SM-10.....	£80
Icom AT-500 ATU - 500W.....	£299

WE HAVE HAD A BUMPER MONTH ON SALES OF USED EQUIPMENT SO WE ARE IN NEED OF GOOD QUALITY USED RADIOS TO SELL ON COMMISSION FOR CUSTOMERS. PHONE NOW FOR DETAILS!



Tel: 01925 229881/Fax: 01925 229882



Antenna Workshop

A PORTABLE PAIR



David Butler G4ASR takes a look at a pair of smart new portable multi-band vertical antennas to go with the equally smart new portable rig that you've just bought.

I've recently had the opportunity of taking a look at a pair of lightweight vertical antenna designed for the range of portable h.f. and 50MHz transceivers. So, here are a few of my tests that I carried out using the PBX-100 portable h.f. vertical and the ATX-Walkabout portable

unscrewed and the antenna will telescope down to approximately a metre in length when not in use. A plus point, is that the screw-out whips can be easily replaced if damaged.

Two base mounts are included, plus a ground spike and machined aluminium clamps that can be used for fixing the antenna onto a caravan jockey wheel or any vertical pole up to 50mm diameter. You could even clamp the antenna to metal railings of your hotel veranda!

The PBX-100 consists of a telescoping tube at the top of which are fitted various resonating coils and telescopic whips in both the horizontal and vertical plane. At the base of the antenna is an SO239 socket for the coaxial feeder to the transceiver and a connection point for the ground plane wires.

Sufficient wire is supplied to make five radials with lengths ranging between 17m (for use on the 7MHz band) down to 1.25m (for use on the 50MHz band). Operation on the 3.5MHz band requires **all ground radials** to be in place.

Note that it's important that **the ground radials are used** with this vertical antenna. As mentioned earlier the PBX-100 is auto band selecting when operating on the 3.5, 7, 14, 21, 28 and 50MHz bands.

If you want to use the antenna on the WARC bands you simply remove the top 3.5MHz resonating coil and substitute it with either the 14, 21 or 28MHz resonator coil. With a suitable adjustment to the telescopic whip length those coils will now operate on the 10, 18 and 24MHz bands respectively.

Assembling Antenna

Next it was time to start assembling the antenna and see how easy it was to tune up. The telescoping tube was set at the recommended height of 1.16m. To help a locking wheel is mounted on the mast enabling the spacing to be easily set without having to use a screwdriver or spanner. (This is a really neat idea!) The length of the lower tubing really only affects the 50MHz band, having virtually no effect on h.f. band resonance. The mounting spike was pushed into the ground and the antenna mast simply dropped into it. The locking wheel makes this process incredibly simple.

antenna from Yaesu.

The PBX-100 portable h.f. vertical antenna operates on all bands from 3.5MHz through to 50MHz (including the WARC bands). It has a power handling capability of 100W making it very suitable for use with many transceivers capable of running that level of output power.

Of course the PBX-100 antenna can also be used with any low power transceiver such as the new Yaesu FT-817. It features automatic band changing on the 3.5, 7, 14, 21, 28 and 50MHz bands. That means that you can move between these bands without having to touch the antenna.

The PBX-100 vertical antenna comes complete including wire for the ground planes. But for use on the WARC bands of 10, 18 and 24MHz various resonating coils have to be swapped around. However, I'll explain more about that later.

Fully Assembled

The fully assembled height of the PBX-100 is 2.5m. All coils and telescopic whips may be



● The comparative sizes of both the PBX-100 on its mounting spike, and the ATX-Walkabout antenna connected to a Yupiteru MVT-7100 multi-band receiver being used by 16-year old William Butler (G4ASR Harmonic!)

● The ground spike mounting of the PBX-100 antenna is easy to assemble. Note the ground radials needed with this (or almost any) vertical antenna design.

The resonating coils are marked with the relevant frequency bands and these were screwed into a machined collar at the top of the mast. The telescopic whips were then screwed into the coils and adjusted to the length recommended in the instruction sheet. (Remember to take a tape measure with you!)

Finally the wire ground planes were spread out on the ground and attached to the base mounting point with a wing nut. That's it - no tools required at all.

Tuning Up

Having attached a suitable length of coaxial feeder to the SO239 socket it was time to tune up the antenna on the various h.f. bands. Adjusting the whip on each individual resonating coil has no effect on the others. It's therefore a simple matter of increasing the whip length to lower the resonant frequency or similarly decreasing the length of whip to raise the frequency of resonance.

Depending on how or where the antenna is located, this fact will determine how much the whips will need adjustment. In my case I found that most telescopic whips needed to be reduced in length by 50mm or so from that recommended.

Adjustments should be carried out in small increments, a few millimetres at a time. A 6mm change on the 7MHz band for example moved the resonant frequency by 25kHz.

When I measured the bandwidth between the 2:1 v.s.w.r. points (chosen as most modern transceivers will still give full output at this v.s.w.r. limit, as expected the lowest frequency band (3.5MHz) produced the narrowest bandwidth. However, at the centre frequency of 3.750MHz it was only 20kHz.

The bandwidth at 7MHz measured 50kHz covering the s.s.b. (or c.w.) sections of the band. On 14MHz I measured a 2:1 v.s.w.r. bandwidth of 110kHz between 14.090MHz and 14.200MHz. It was flat right across 21MHz and for much of the 28MHz band. Results on the WARC bands were very similar. At 50MHz the v.s.w.r. was very flat covering the entire band.

Portable Results

I decided to test out the antenna under truly portable conditions, operating from farmland near my home. The PBX-100 was quickly mounted on the ground spike with approximately 6m of feeder running back to the car. Using a Kenwood TS-690S h.f. + 50MHz transceiver running 100W output I then proceeded to make some s.s.b. contacts on various bands.

My first QSO was made on the 7MHz band with the station of **Pat Woods G3HLN** (Welwyn Garden City). He was peaking 57 in signal strength and gave me Practical Wireless, July 2001

a report of 55. When I told him I was using an antenna approximately 2m high he said "What a signal, you're really doing well. Isn't it incredible what can be done with a small aerial".

Encouraged by that I decided to try out the higher frequency bands. Moving up to 14MHz I quickly made contact with **IK5WWB** who gave me a 59+ report and mentioned that I was doing a really excellent job with such a small antenna. Then it was up to 21MHz where I found many operators calling the expedition



● The ground spike mounting of the PBX-100 antenna is easy to assemble. Note the ground radials needed with this (or almost any) vertical antenna design.

station **EA9/DJ7ZJ** operating from Ceuta, North Africa. Surprisingly he came back to my first call giving me a 57 report!

Then it was time for me to try out the h.f. vertical on the 28MHz band. The band was open to the east and I quickly made s.s.b. contacts with the stations of **YO5AXB** (Romania), **RV4CT** (Russia) and **4L4C** (Georgia), all giving me 58 reports.

Swapping the coils around, I then made some QSOs on the WARC bands. These included **OM5NU** (Slovakia) on 10MHz, **SV2CCA** (Greece) on 18MHz and **OK1PB** (Czech Republic) on 24MHz.

During the review period the daytime propagation on the 3.5MHz band was very poor so I decided to try out the PBX-100 antenna during the evening. Unfortunately the band was very noisy but I did manage to scrape a brief contact with **Don Still G0OOC** (Horsham, Surrey).

I'm not really surprised at the limitation on the 3.5MHz band as the antenna is really 'small' at this frequency. That aside, I was pleasantly surprised with the overall results produced by the PBX-100 vertical antenna. It has a good performance for its size, it's lightweight, unobtrusive and very easy to install.

The ATX-Walkabout

I also had the opportunity to review the ATX-Walkabout portable antenna which has been designed as an ideal supplement to the Yaesu FT-817 low power multi-band

transceiver. The portable ATX telescopic antenna operates on all h.f. bands from 3.5-28MHz (including the WARC bands) and both the 50 and 70MHz bands. It can also be used as a 5/8 wave antenna on the 144 band and 136MHz (Airband).

The ATX-Walkabout antenna consists of a multi-tapped base resonating coil into which is screwed a 1.3m long telescopic whip. At the base of the antenna is a BNC plug which attaches directly to the transceiver. There's also a version which has a right-angled PL259 plug fitted instead.

Yaesu provide a word of caution when using their FT-817 with whip antennas terminating in a BNC plug so the PL259 version might be a prudent option. Band changing is achieved by manually patching a wire link between various tapping points on the base coil. For correct h.f. operation a groundplane wire should be attached to the grounding post on the transceiver.

To test the ATX-Walkabout antenna I used a Trio TS-120V transceiver running 10W output with the antenna connected directly into the rear antenna socket. I didn't measure the v.s.w.r. bandwidths on the various bands opting instead to adjusting the antenna length to suit the frequency in use. Once I'd worked out where resonance occurred it

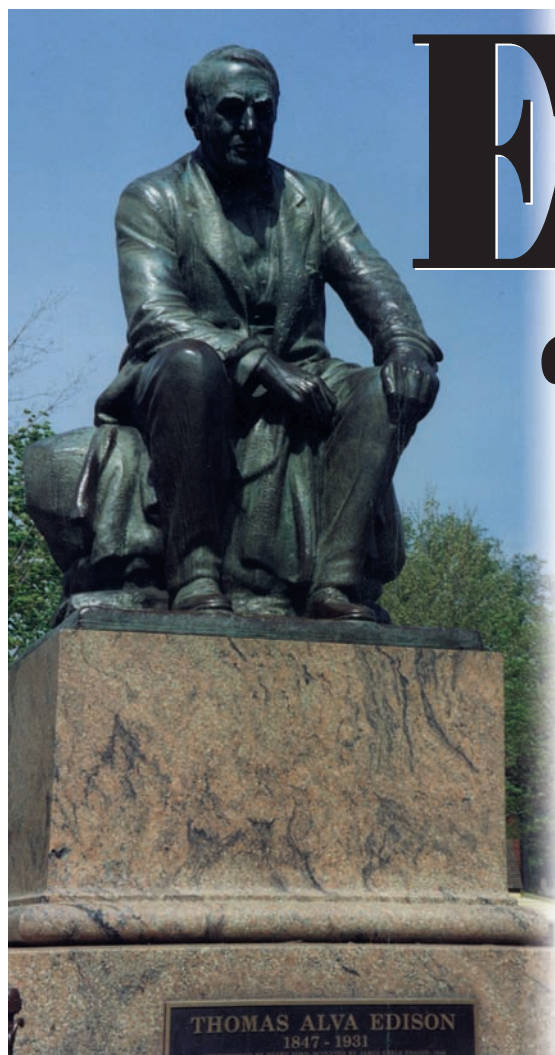
was then a simple matter of tweaking the whip up or down as appropriate.

Listening on the 7MHz band I heard the station of **G0ONH** (Halesowen, West Midlands) calling CQ. I gave him a call but my s.s.b. signal was very weak with him. Running low power into a small antenna is always going to be a challenge so I decided to operate on higher frequencies where the antenna might be more efficient.

Tuning through the 14MHz band I heard the station of **9A4KF** operating from Hvar Island in Croatia. He was 59 with me and came back first call, giving me a 54 report. Then up to the 21MHz band where I found the station of **EA6/DL1XQ** holidaying in Majorca. After calling a few times he also came to me with a 54 report. I was quite pleased!

I have to say it was a struggle but at least I made a few contacts. Then I had the idea of using the antenna with my Yupiteru MVT-7100 hand-held multi-band receiver. The improvement on h.f. over the standard whip was dramatic. Signals just popped out of the noise much, much stronger. So it's not only the transmitting Amateur who can use this antenna - the s.w.l.s may find it useful as well.

Both antennas are available from **Waters & Stanton, Tel: (01702) 206835**. The PBX-100 portable h.f. vertical antenna retails at **£99.95 plus P&P**, while the ATX-Walkabout antenna retails at **£69.95 plus P&P**.



● Thomas Alva Edison...the giant behind thousands of patents which came from the 'Inventions Factory' at Menlo Park in the USA.

Edison

& The Invention Factory

The American inventor and innovator **Thomas Alva Edison** was possibly the first to gather a range of experts in differing fields together to provide a source of excellence to complete experiments...in the 'Invention Factory'. Edison was born on 11 February 1847 in the small town of Milan in Ohio in the United States of America where he spent his early years.

At the age of seven his family moved northwards to Port Huron in Michigan. Thomas's mother

provided much of his limited schooling at home.

By 1859 at the ripe old age of 12 Thomas Edison began selling sweets and newspapers on the Grand Trunk Railroad that ran between Port Huron and Detroit. By the time he was 16 he was already working as a telegraph operator in the South and Midwest of the USA, during the years that the American Civil War was raging far to the south.

First Invention

Edison's interest in electronics and mechanics had been fired by his experience with the railroad and his first invention soon followed! He moved to Boston in 1868 where he managed to arrange a local businessman to finance his experiments and his first patented invention, the **Electric Vote Counter**.

Without doubt Edison's main interest lay in telegraphy. Whilst he lived in Boston he had 'borrowed' space in a workshop. Coincidentally another inventor had also borrowed space there - his name? **Alexander Graham Bell**.

Edison's announced he was to become a "full-time inventor" and moved once again...to New York where he formed his first business - to manufacture telegraph equipment. He was just 22 years old at this time!

Two years later saw the opening of Edison's first factory and laboratory in nearby Newark, New Jersey. Several inventions followed but it wasn't until he opened his 'Inventions Factory' Menlo Park, also in New Jersey that the flow of ideas and patents really started.

Menlo Park Wonder

Menlo Park was considered at the time to be 'One of the Wonders of the 19th Century'. It was here that **Edison acted not only an inventor but also enabled others to do the same by employing staff to invent for him!**

It was at Menlo Park, the reconstructed laboratory is shown in **Fig. 1**, that those inventions that made Edison famous came to fruition. These included the Phonograph, the Telephone Transmitter, and Incandescent Lighting. So successful was he that in **six very short years Edison received over 400 patents.**

In 1887 Edison opened a second laboratory in West Orange, New Jersey making this his base. From 1889 until 1929 his business was one of the major producers of home phonographs and recordings.

Edison was also active in vision as well as sound! He produced the first type of motion picture cameras and viewer in the form of the **Kinetograph** and the **Kinescope**.

More Expertise

As business expanded Thomas Edison employed more experts in the fields where he lacked knowledge. These included Mathematicians, Skilled Machinists, Assayists*, Chemists and even Carpenters and Glass-makers.

Business grew and to the two-story timber-framed building, which housed his laboratory and offices, was added a carpenter's shop, a glass-house and a photographer's studio. Even a blacksmith's shop was considered essential.

During this time Edison sold the rights to his **Printing Telegraph** to finance more research. At this time high-speed telegraphy systems sent messages across the USA to be printed out on strips of paper.

The dots and dashes of the Morse code of the day were imprinted (and cut) onto paper and passed through a machine. An electrical contact was passed over the perforations - thus completing the electrical circuit (the equivalent of the Morse key) and the messages were then transmitted. Edison's system used electrochemical recorders as these could be used at much higher speeds.

**Specialists who determine the amounts of metals in basic ores, etc.*

Light Work

The experimental work with electric lighting which Edison had become closely involved, had started with the electric motors and batteries used in telegraphy. The lamp experiments had started in 1879 with Edison observing the effects of incandescence on rare metals such as Platinum.

Edison was not one to totally rely on his own skills

Dick Pascoe
GOBPS, a PW
author well
known for his
sense of humour,
shares the
enjoyment he
experienced
looking at the
work of Thomas
Edison when on
holiday in the
USA.

References: Source material includes *Working At Inventing* edited by William S. Pretzer. Published by the Henry Ford Museum and Greenfield Park. All photographs by the author, GOBPS..

but often researched other experiments to learn what others had tried. One of his sources of information was the Royal Society of London.

Because his electric light experiments were not proceeding at a satisfactory rate, another expert was brought in to help. The expert - **Francis Upton** - later claimed that he learnt more about electricity from Edison than he had during his scientific course work!

More university educated engineers were enrolled and strong links to expert machinists were also forged (a pun perhaps...but it's appropriate!). This meeting of skills soon solved the problems besetting Edison and his team.

The work force expanded from around 10 or 12 up to 40 people. It became almost an electric obsession with Edison that the lights should be brought into commercial use and his first town application was the electrification of two square miles of Manhattan.

Alexander Graham Bell

I mentioned Alexander Graham Bell earlier and of course he's the chap we all remember as inventing the telephone, which is correct **as he made the first device which transmitted the human voice over a wire link**. However, who was it that converted his crude device into something that could be reliably used by anyone? Yes, you've got it one...it was Thomas Edison.

What is much less known is that Edison took the early device and made it into the commercial success it is now. He invented the carbon microphone which is in use many decades later. And apart from telegraphy and light, the telephone was the other main interest at Menlo Park for over two years.

Without doubt Edison and Menlo Park go hand-in-hand yet it was essentially only in use as an invention centre for five years

Thomas Alva Edison passed away on 18 October 1931 at the age of 84, with him passed away much of the Factory Farming form of inventing.



● Fig. 2: Inside view of the re-created laboratory (see text).



● Fig.1: The reconstructed laboratory from Menlo Park now in Greenfield Village, Detroit, Michigan. The building was rebuilt from the ruined remains, thanks to the actions of Henry (The pioneer of mass produced cars) Ford.

Greenfield Village

The reproduction of Menlo Park at Greenfield Village in Detroit, Michigan is a faithful re-incarnation of Edison's workshop and laboratory, **Fig. 2**, that used to stand in New Jersey. It was a ruin before Henry Ford took an interest in saving the building.

The reconstruction must have been reasonably correct as Edison visited it in 1929 to re-enact the demonstration of the light bulb for the dedication of the Edison Institute. The Edison seal of approval?

Not only the laboratory, but also the machine shop and the local boarding house have been moved. A relative (a lady named **Sarah Jordan**) of Edison's wife who had been widowed had been brought in to provide accommodation for the workers at the centre. The house was demolished and rebuilt at Greenfield Village a few yards away from the laboratory.

Edison Film

The life of Edison was considered so interesting and important that it was made into a film, *Edison, The Man*. This 1940s film starred **Spencer Tracy** as Edison.

I visited the Greenfield Village some time ago, on an extra excursion while on holiday to attend the Dayton HamVention, with the **Rev. George Dobbs G3RJV** and **Ian Keyser G3ROO**. I was immediately struck by the ambience of the building.

As we walked in we were welcomed by the attendant and left to look around. We soon

found the office with several items on the desk. Unfortunately it was locked. However,

a few moments later we were inside because the attendant heard we were Radio Amateurs and British - he promptly opened the door. It was a very quiet day so we had the ground floor to ourselves.

The lab is on the upper floor and is maintained exactly as if everyone had just popped out for lunch. To help create the atmosphere a range of experiments is set up on the benches surrounding the room.

Visitors are normally restricted to the small area at the top of the stairs. Except for us of course! Another chat (we're British, etc.,) and we were given free reign **to look but not touch** as we wandered around the room.

Many "Oohs and Ahhs" were heard as we peered closely at the exhibits. We were left on our own for almost 30 minutes until a quick shout brought us back within the roped off area as more visitors arrived.

Grateful thanks were whispered as we moved on. The highlight of this part of the visit was being able to get close enough for some photographs, which were otherwise unobtainable.

Greenfield Village contains many other exhibits including an English Cotswold 'smithy' transplanted from the United Kingdom. There's also an imported mid-west house from the 19th century which is 'manned' by staff who live in the house during open hours. They work the smallholding, cook on the open fire...all with visitors walking around them asking questions! There's even a vintage style train, hauled by a vintage style steam locomotive called *Edison* which carries visitors around the huge village.

The village is next to the **Henry Ford Motor Museum** which houses hundreds of cars, motorcycles and military vehicles, including the car supposedly carrying Kennedy when he was shot. Both the Village and the Car museum are located in the suburb of Dearborn, Detroit in Michigan and a visit to both is highly recommended.

So, if you ever get round to visiting the Dayton HamVention...why not plan one or tow other excursions? I'd be pleased if you could enjoy the experience as much as G3RJV, G3ROO and I did!

PNW

THE ROYAL INTERNATIONAL

Watch the skies come alive over the weekend of 28/29 July at RAF Cottesmore in Rutland, home to Britain's famous Harrier 'Jump Jet', as the RAIT celebrates its 30th birthday. Enter our competition for the ultimate aviation experience of the year.

To be in with a chance of winning a pair of tickets all you have to do is answer the questions opposite, fill in the form and send your entry to **Practical Wireless, RIAT Competition, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 PW** by **6 July 2001**. Photocopies of the form are acceptable, but please remember to include the corner flash.

So what are you waiting for? Post your entry today!

TRAINING
2001

WOMEN
in aviation

15 PAIRS OF
TICKETS TO
BE WON
WORTH
£870!



Aces High

The RIAT 2001 will feature 350 fascinating aircraft, with old favourites like the *Spitfire*, the classic Hawker *Hunter* jet and majestic *Lancaster* sharing the skies with the next generation Eurofighter. There will also be sensational performances from some of the world's leading Top Guns, including the superstar Red Arrows and other high-flying aerobatic teams. The three main themes of this year's RIAT will be Women in Aviation, Training 2001 and 60 years of the Air Training Corps. So don't forget to take your Airband radio!

Ground Alert

If you can take your eyes off the skies for just a few moments you'll find 250 aircraft in the static-line display, plus a fantastic show-ground party with stalls, exhibitions, roadshows, celebrities, aircrews, entertainers, buskers, marching bands, and flight simulators. This is also your chance to meet the international aircrew face to face and to sit in the cockpit of some of the world's slickest fighters.

Salute to Women in Aviation

Britain's first woman pilot, Mrs Hilda Hewlett, was awarded a pilot's licence in August 1911. Ninety years later RIAT 2001 will pay tribute to women pilots, aircrew and ground staff, representing the Royal Air Force and other air arms across the world. Airshow visitors will also meet some of the women who fly today's civil aircraft, together with members of the Air Transport Auxiliary who served so bravely during the Second World War.

Training 2001

Pilots appearing at RIAT 2001 are products of cutting-edge 21st century training for military aviators, which includes state-of-the-art flight simulators, hi-tech classroom aids and exercise sorties. The Tattoo will be a unique insight into the training techniques that prepare air and ground crews for the increasingly complex demands of modern airpower.

60 Years of the Air Training Corps

What do Linford Christie, one of the world's top athletes, and actor Timothy Dalton, who has played the ultimate action hero James Bond, have in common? They are both past members of the Air

Training Corps (ATC).

The ATC, formed in 1941, is now one of Britain's largest and most successful youth organisations with 37,000 members and they are very active in Amateur Radio too. The RIAT 2001 will celebrate 60 years of ATC achievements.

Free Evening Concert – Just add a picnic

Even when the flying display ends, the entertainment is not over. The Airshow Proms ring up the curtain on a two-hour free concert performed Royal Air Force Bands and guest performers - while you enjoy your family picnic, listen to the music and marvel at the splendid sight of 40 hot air balloons launching into the evening sky.

Timetable

The public gates to RAF Cottesmore, located off the A1 near the market town of Oakham, open at 0730 on Saturday and Sunday 28/29 July. The eight-hour flying display starts at 1000.

Tattoo Admission

Advance adult tickets £23.95, on the day £29.00. Children under 16 free. For bookings and ticket info call (08702) 410303.

For the most up to date information on the RIAT call (09068) 122999 or look at www.airtattoo.com (Calls to 09068 numbers cost 60p per minute, of which 18p per minute is donated to The RAF Benevolent Fund Enterprises, PO Box 1940, Fairford, Glos GL7 4NA).



The winners will be drawn 9th July 2001. The Editor's decision is final and no correspondence will be entered into.

ENTRY COUPON

Q1:
Q2:
Q3:
Q4:
Q5:
Q6:
Q7:

Name
Callsign
Address
.....
.....
Postcode
Tel:
E-mail:

Entries must arrive by 6 July 2001

☐ I do not wish to receive future correspondence and mailings as a result of entering this competition.

Send your entry (photocopies acceptable with corner flash) to: **Practical Wireless July RIAT Competition, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.** Editor's decision on the winner is final and no correspondence will be entered into.

QUESTIONS

- Q1: Which birthday will RIAT be celebrating at this year's show?
Q2: Which woman became Britain's first Aviatix?
Q3: A youth organisation will be celebrating its 60 anniversary, which one?
Q4: Where will RIAT 2001 be held?
Q5: How many aircraft will feature in the static display?
Q6: RAF Cottesmore is home to which famous aircraft?
Q7: What are the three themes for RIAT 2001?

ML&S martin lynch & sons

Suppliers of Communications Equipment

tel: 0208 566 1120
fax: 0208 566 1207
website:
www.hamradio.co.uk
email:
sales@hamradio.co.uk

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

NEW RADIOS

YAESU FT-1000MP MKV RRP £2899 ML&S PAYS YOUR £100 DEPOSIT! 48 * £85.17
FREE FT-50R TWIN BAND HANDIE (Whilst stocks last)

• HF • Base - 234V • All mode • DSP
Two Year Warranty

YAESU VL-1000 SPECIAL PURCHASE - CALL FOR DETAILS
Two Year Warranty

YAESU FT-1000MP/AC RRP £2595 ML&S £1799 £179 DEPOSIT! 12 * £135
ML&S have purchased the VERY LAST of this famous benchmark transceiver.
Retailing at over £2500, SNAP ONE UP TODAY at only £1699

YAESU FT-847 RRP £1699 ML&S £1199 ZERO DEPOSIT! 36 * £44.56
• HF/6/4/2/70 • Base/mobile - 13.8V • 100W • All mode • DSP
Two Year Warranty & microphone, leads & manual.

YAESU FT-920AF ML&S £1099 ZERO DEPOSIT! 36 * £40.84
• HF/6m • Base - 13.8V • 100W • All mode • DSP RRP £1499

YAESU FT-840 RRP £799 ML&S £579 ZERO DEPOSIT! 24 * £29.47
• HF • Base/mobile - 13.8V • 100W • All mode • Simple to use
Supplied with microphone & DC Lead
*optional FM board required

YAESU FT-817 RRP £799 ZERO DEPOSIT! 36 * £29.69
• HF/6/2/70 • Transportable - Batteries • 5W • Wide Band RX • All mode
offered with nicads, charger, antenna & microphone.

YAESU FT-100 RRP £1299 ML&S £849 ZERO DEPOSIT! 36 * £31.55
This is the LAST BATCH of this model. NEW FT100D now available - call for price
• HF/6/2/70 • Mobile - 13.8V • 100W • HF/6 50/40 2/70 • All mode • Remote Head

YAESU FT-90 RRP £475 ML&S £299 ZERO DEPOSIT! 24 * £15.21
• 2/70 • Handie • 50/35W • Remote Head • Micro size
Offered with FREE YSK-90, microphone & 2-year warranty.

YAESU VX-5R RRP £339 ML&S £269 ZERO DEPOSIT! 24 * £13.69
FREE SU-1 BAROMETER PRESSURE SENSOR (Whilst stocks last)
• 6/2/70 • Handie • 5W • Lithium Battery
Offered with Lithium battery & charger

YAESU FT-50R RRP £269 ML&S £150 Pay over 2 credit card payments
• 2/70 • Handie • 2.5W • Wide RX
Supplied with Nicads & charger, 2 year warranty

KENWOOD TS-2000 RRP £1699 ZERO DEPOSIT! 48 * £51.70
NEW "Millennium Communicator"
• HF/6/2/70/23* • Base - 13.8V • 100/100/50/35/10 • All mode • DSP
* Also available with 23cm option at £349,
or TS-2000 c/w UT-20 at £1999.

KENWOOD TS-870S ML&S £1399 ZERO DEPOSIT! 48 * £42.55
• HF • Base - 13.8V • 100W • All mode • DSP RRP £1999

KENWOOD TS-570DGE RRP £999 ML&S £849 ZERO DEPOSIT! 36 * £31.55
• HF • Mobile/Base - 13.8V • 100W • All mode • DSP

KENWOOD TMD-700E RRP £539 ML&S £439 ZERO DEPOSIT! 24 * £22.34
• 2/70 • Mobile - 13.8V • FM + APRS + Packet • Remote Head

KENWOOD TH-D7E RRP £309.95 ML&S £269 ZERO DEPOSIT! 12 * £24.92
• 2/70 • Handie • FM + APRS + Packet • Nicad

ICOM IC-756 PRO RRP £2199 ML&S £1849 ZERO DEPOSIT! 36 * £56.26
• HF/6m • Base - 13.8V • 100W • All mode • DSP

ICOM IC-746 RRP £1699 ML&S £1395 ZERO DEPOSIT! 48 * £42.44
• HF/6/2m • Base - 13.8V • 100W • All mode • DSP

ICOM IC-706G MKII RRP £1299 ML&S ~~£1099~~ ZERO DEPOSIT! 36 * £40.84
STOP PRESS.....CALL FOR NEW LOW PRICE!
• HF/6/2/70 • Mobile - 13.8V • 100/100/50/50 • All mode • DSP • Remote Head

ICOM IC-910H RRP £1399 ML&S £1299 ZERO DEPOSIT! 36 * £48.28
• 2/70/23* • Base - 13.8V • 100/75/10 • All mode • DSP
* optional 23 module available

SO WHY DO MORE RADIO AMATEURS BUY THEIR HF PRODUCT FROM ML&S?

ML&S started in 1990, not as long as some we know, but Martin G4HKS has been selling UK Amateurs with kit since 1978. In that time, not only has built up an enviable customer base of over 30,000 but has gained many friends along the way. WHY? Because Martin and his team want you to be happy with your purchase - above everything else. The comfort of a cheap deal is soon forgotten when it goes wrong. It's small wonder then, that most of the UK's Top DX'ers use our small personal company to do business with.

Haven't tried us yet? Maybe you should.

CUSHCRAFT Ham Radio Antennas

A3-S 10-15-20m 8dB 2kW 3 el 4.27m boom	£389.95
A743 10/7MHz kit	£129.95
A4-S 10-15-20m 9dB 2kW 4 el 5.84m boom	£469.95
X7 10-15-20m 13dB 2kW 7 el 5.48m boom	£549.95
X9 10-15-20m 14dB 2kW 9 el 8.5m boom	£799.95
R-6000 6-20m vert	£299.95
R8 6-40m vert 8.7m	£399.95
TEN-3 10m 3 el	£159.95
D4 10-40m 10.92m 2kW rotary dipole	£259.95
D3 10-20m 7.86m 2kW rotary dipole	£189.95
XM240 40m 2 el	£569.95
XM520 20m 5 el	£629.95
XM515 15m 5 el	£359.95



Icom IC706

We always have a selection of 706s from -

£450.00
upwards



Yaesu FT100

the mobile shack from

£600.00 used
or new at **£849**



Icom IC746

this often overlooked radio is a great radio for an instant multiband shack. With the TS2000 coming in we have had a few of these part exchanged and can offer clean examples from

£749.00



Yaesu FT1000

the original 200 Watt radio from

£1400.00



Icom IC775 DSP

The Icom Flagship 200 Watt radio. These are being part exchanged in large numbers for the new FT1000MP Mk 5 so we have them from

£1499.00



Yaesu FT1000MP

used examples from

£1250.00
and a few new ones left at **£1799.00**



Kenwood TS950SDX

We have some late versions of this model from

£1500.00



Yaesu FT900AT

a great little radio ideal for DXpeditions. From

£499.00

The BEST RADIOS at the BEST

Summer is here

and it is time to

FISH FOR Bargains

ML&S

with MARTIN LYNCH & the BOYS

- ✓ **ALL USED KIT** comes with at least **3 MONTHS WARRANTY** (longer on newer radios)
- ✓ All radios are **checked** and **cleaned** in our workshops
- ✓ We are able to offer **finance** on any used radio over £300.00
- ✓ We are able to offer **extended warranty** on **ALL used radios.**

And Reel In Super Value!



Kenwood TS50S

The original 100 Watt HF mobile radio used examples from - **£399**



Kenwood TS450S

Big enough for base use small enough for mobile. This radio has been very popular over the years and we have clean used examples from **£450**



Kenwood TS870

Available new for £1399.00 you can save money buying a used example for under **£1000**



Kenwood TS570DGE

Currently in stock new at £849.00 this radio is very underrated and we get excellent user reports. Used examples from **£599**



Kenwood TS850S

For many years this was Kenwood's Number One seller and is very popular as a main station Transceiver. One of the best pre DSP radios with clean examples available from **£599** (£699 for the SAT version)



Yaesu Quadra VL1000

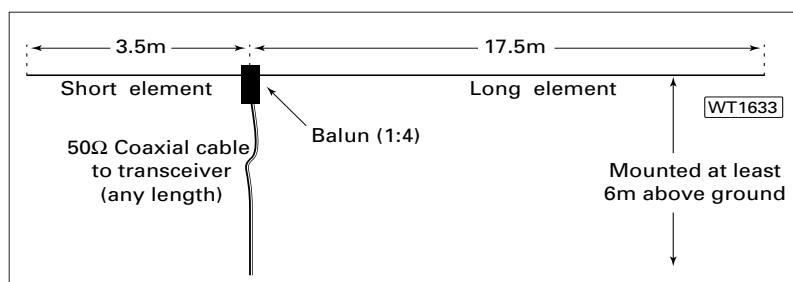
One of the best amplifiers available Used units from **£2995.00**

FULL RANGE of MFJ TUNERS now in stock!

Have a trade in? We pay **TOP MONEY** - call the sales desk or EMAIL your request. sales@hamradio.co.uk

PRICES at ML&S - where else!

One Wire - three bands



● Fig. 1: The simple layout for the asymmetric dipole covering 14, 21 and 28MHz.

**Denis Payne
G3KCR**
describes a
three band
dipole that
has excellent
characteristics
on the three
Amateur
bands of 14,
21 and
28MHz.

I have been using a Windom antenna, fed via a 4:1 balun, for some time on the 14, 21 and 28MHz bands. One advantage of this antenna is the feed-point, being close to one end it reduces the sag and the feeder length. But, in the spirit of experimentation, I decided to try variations as I wanted a better match for all three bands and felt certain that there had to be a better solution.

My Aims

To achieve my aims on all three bands the antenna would have to be about 20m long. Initially, finding a

point off-centre which offered a similar radiation resistance was by 'guesstimation'. The mounting height was also important and six metres was chosen as the starting point.

I also found that I would still require the use of a step-up balun at the feed-point. In the end, I selected the 4:1 balun which would match the 50Ω coaxial cable to the 200Ω feed-point. Having found the best position for 14MHz and adjusted the overall length, I found that it was also close to a match on 21 and 28MHz.

My next step was to adjust the feed position and length for optimum performance on all three bands. After several experiments, I found that the best overall length was 21m as I've shown in Fig. 1. This length gave s.w.r. figures of less than 2:1 when fed 3.5m from one end for all three bands.

Software Aid

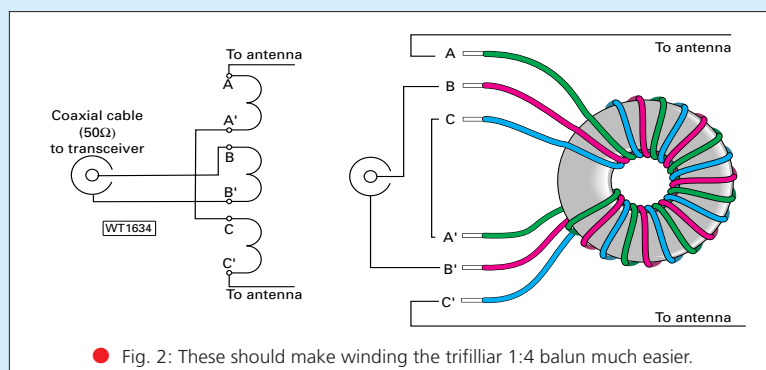
Then, with the aid of software, I calculated the predicted radiation patterns for all the bands. The results appeared to be very good, copies of my printouts are shown in the diagrams. The gains shown in the patterns are with reference to an isotropic radiator (dBi), and so 2.15 should be deducted from the 'dBi' figure to find the gain compared to a dipole (dBd).

For example, the 8.35dBi gain on 28.5MHz is 6.2dBd (6.2dB better than a basic dipole), and similar to the gain of a small yagi antenna. The patterns and angles of the lobes, are subject to change due to height and nearby objects.

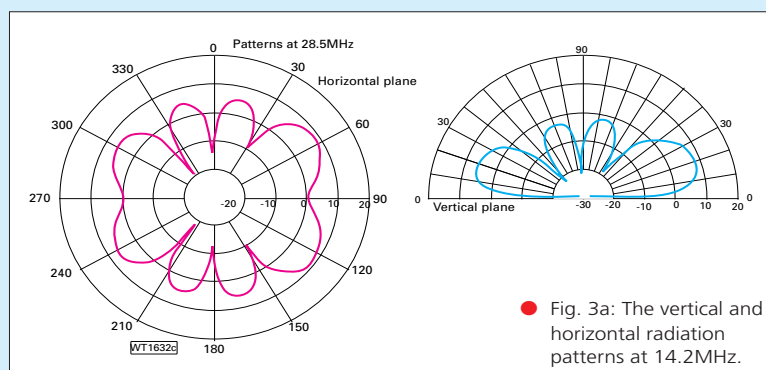
I found that on the 7MHz band, I had an s.w.r. reading of less than 2:1. But computer modelling showed the radiation pattern and maximum radiation were mainly vertical. To reduce the launch angle would require mounting the antenna at a much greater height than I could achieve.

Balun Building

Now to build the 4:1 balun, which consists of a toroid (Fair-Rite 43)



● Fig. 2: These should make winding the trifilar 1:4 balun much easier.



● Fig. 3a: The vertical and horizontal radiation patterns at 14.2MHz.

with a diameter of 35mm. It's trifilliar wound with seven turns of (24/0.2mm) insulated flex. I used three wires with different colour insulation, which I find makes it easier to identify the windings.

The centre winding (of the three forming the balun) is connected to the coaxial cable. The other two windings in series become the feed to the antenna. The balun should be fitted into a small, but strong, plastic box.

The circuit and the general wiring are shown in the illustration of **Fig. 2**. To complete the unit, I used a long grommet through the box for the coaxial cable to prevent water entering. I also used stainless steel screws for the antenna connections to prevent corrosion.

Top Ring

I also included a fixing ring in the top of the box. This allows the antenna to have an alternative support at this point, leaving the short end to be angled downward, making the installation shorter overall. I found that this made very little difference to the s.w.r. readings and performance. However, both end should be kept clear of any metal objects such as masts.

So that's it, an easy antenna covering three popular bands with the minimum of fuss! I wish you good DX.

PW

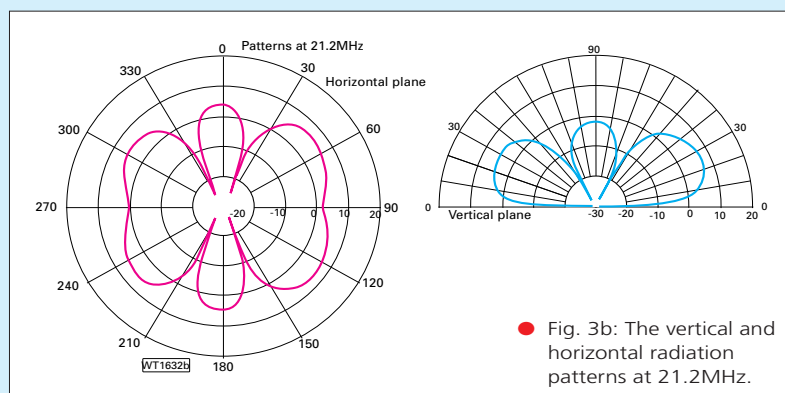


Fig. 3b: The vertical and horizontal radiation patterns at 21.2MHz.

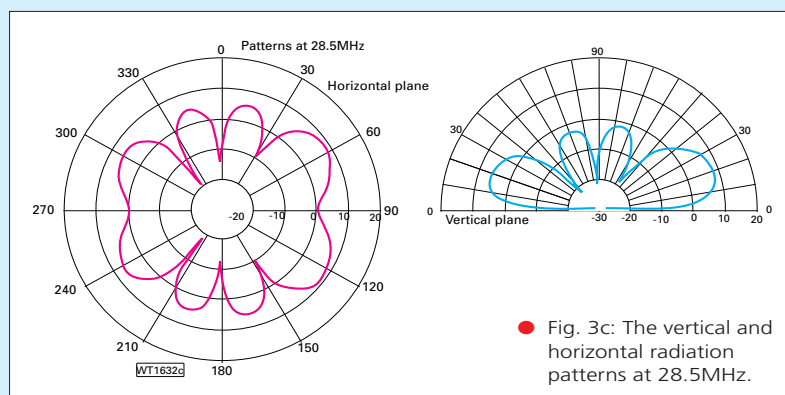


Fig. 3c: The vertical and horizontal radiation patterns at 28.5MHz.

Errors & Updates

I'm sorry to report that the Gremlins have obviously been hard at work on recent issues of *PW*. Please note the following changes need to be made.

Looking At ...

On pages 19 and 20 of the May 2001 issue of *PW*, the article **Looking At ... The Signal Strength Meter** by **Gordon King G4VFF**, every instance of a signal level value given in millivolts (mV) should in reality have been microvolts (μ V). A problem of final computer text translation caused the error.

Windfall Antenna

Also in the May 2001 issue, on page 28, in **The Windfall Antenna** article by **Tony Harwood G4HHZ**, the paragraph in the left hand column (alongside Fig. 3) beginning, "Initially the design aimed ..." should actually read: "Initially the design aimed for a non-reactive dipole impedance at the arithmetic mean frequency of each band ie. 14.174 and 21.225MHz. The calculated lengths being 10.05 (5.025 for each leg) and 6.87m (3.435m for each leg) for the two bands of 14 and 21MHz. Calculation of the characteristic impedance gave values of 890 Ω on 21MHz and 940 Ω on 14MHz, with reactances at band edges of $\pm j15\Omega$ on 21MHz and $\pm j18\Omega$ on 14MHz. These impedance values give calculated s.w.r. values of 1.2:1 (21MHz) and 1.36:1 (14MHz) on the 75 Ω feeder."

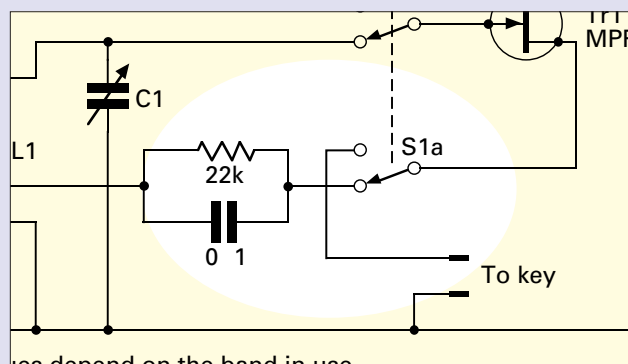
The error was caused by a misunderstanding with Tony's original manuscript in preparation for publishing.

Carrying On

Now the final problem to be reported, occurred in the June 2001 issue of *PW*. On page 44 of the June 2001 *PW* a problem crept into the circuit diagram of Fig. 1 in **George Dobbs G3RJV's** article **Carrying On The Practical Way**. The error concerned the connections to S1a in Fig. 1. A corrected circuit is published here, please amend your own issues to show the change highlighted.

My apologies to all readers and authors for these errors.

Rob Mannion G3XFD, Editor



It's A Classic.....

The Trio TR-2300 144MHz Transceiver

Richard Newton
G0RSN looks at
a truly classic
transceiver and
he says it's
another review
item he's not
parting with!

Our hobby is by definition, forward looking, always trying to break barriers and achieve new goals. But sometimes it's good to stop and reflect on the days and radios gone by that have either shaped us in our hobby or the hobby itself. There are some equipment on which we look back and smile. And for me the Trio TR-2300 narrow band f.m. hand-sized portable transceiver is one such radio.

I think that Amateur Radio is more than a hobby; it's more of a passion. The bug bites you and that's it, although your interest may wane and other priorities may present themselves in little bundles of joy, when all is said and done, it's still there, the love of radio.

Looking back is all part of the hobby for me and I thoroughly enjoy writing for the *It's a Classic* series. On this occasion I get to share my own personal passion for the Trio TR-2300.

Trio Revolution

The Trio TR-2300, was part of a revolution, made by Kenwood and badged with their then UK trading name, Trio. It was a self contained narrow band f.m. (n.b.f.m.) only transceiver with a double conversion superhet receiver covering the Amateur 144MHz band, incorporating its own battery pack and telescopic antenna.

When introduced, the '2300 was at the cutting edge of technology when it appeared on the market in 1979*. Using 10 NiCad cells, **Fig. 1**, and in place in **Fig. 2**, it delivered 1W of output power. When being used on an external 13.8 volt d.c. supply, a matching 10W linear amplifier was also available. The VB-2300 (on the right in the heading

photograph and the rear view can be seen in **Fig. 1**).

The Trio TR-2300 was supplied with a myriad of accessories. This included a dynamic microphone, **Fig. 3**, and this small and extremely well made

microphone would not look at all out of place on a modern item of equipment.

One of the big selling points of the TR-2300 was portability, it was called a 'Handy Transceiver' and as such Kenwood/Trio supplied it with a soft case and carry strap. You also got a power lead, wall charger, battery cases and a dummy battery (more about the dummy battery later). And I mustn't forget to mention the hook for the microphone that you could screw on the side of the radio, and even a jack plug for an extension speaker!

**The first advert we could find was in Short Wave Magazine March 1979. Editor.*

Eighty Channels

The TR-2300 covers 144MHz to 145.975MHz using 80 channels in 25kHz steps provided by the internal synthesiser. The front dial on the radio has 40 click-effect positions and is labelled with the numbers 00 to 95 in multiples of 5 with dots in between, to signify the next channel.

A switch on the front panel then designates either 144 or 145MHz by the numbers 4 or 5. So, if you wanted 145.500MHz you would select the position labelled 5 on the band switch and dial round to 50. (It's easy when you get the hang of it).

The third position on the band switch is **RPT**. This means that the radio will receive across the 40 channels as in the 145MHz selection, but when transmitting it will put in the minus 600kHz repeater shift.

The rather good thing about the main dial is that it has a large notch on the zero position. Interestingly, a very special job was soon found for this switch (and whether this was intended or not I'm uncertain!) because I knew of several operators who were sight impaired and loved the TR-2300 for just this reason.

My friends with sight problems knew if the notch was at the bottom, the radio was tuned to the calling frequency. And because the dial rotated - producing pronounced clicks, they could move channels with ease. Who needs voice synthesisers!

Power Supplies

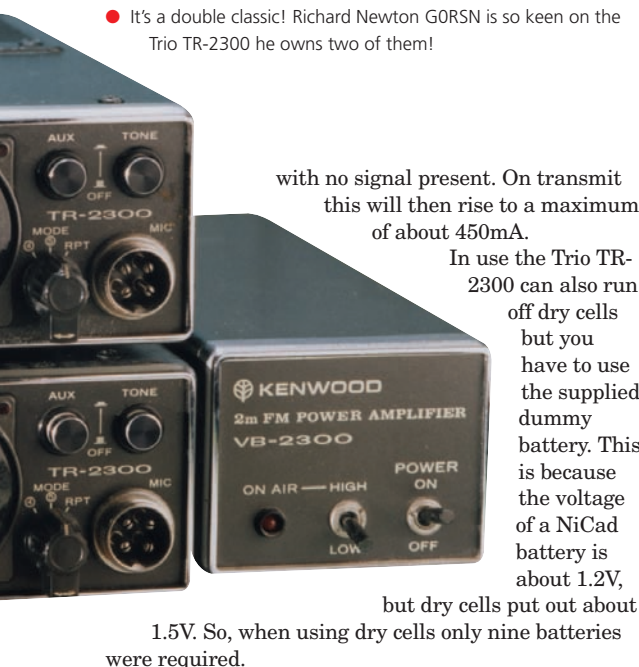
The Trio TR-2300 can work from an external supply of 13.8V d.c. but the main claim was that it could run from its own batteries. Ten NiCad batteries are required to power the unit, the space for these can be seen in the inside view of **Fig. 2**, and in my experience they last a long time.

Current drain is about 45mA in squelched receive

● Fig. 1: The TR-2300 can operate off internal NiCad batteries, a 12V (nominal) external source and dry batteries. If dry batteries are used - a dummy cell has to be employed to reduce the voltage (see text).



- It's a double classic! Richard Newton GORSN is so keen on the Trio TR-2300 he owns two of them!



with no signal present. On transmit this will then rise to a maximum of about 450mA.

In use the Trio TR-2300 can also run off dry cells but you have to use the supplied dummy battery. This is because the voltage of a NiCad battery is about 1.2V,

but dry cells put out about

1.5V. So, when using dry cells only nine batteries were required.

Straightforward Radio

The TR-2300 is a very straightforward radio with only a few functions. It has an in-built quarter-wave telescopic antenna; and although a little cumbersome for hand portable use it has proved to be a very effective.

A rather impressive helical antenna with a special screw fitting can replace the telescopic and was available as an optional extra. The Trio TR-2300 also has a SO239 fitting on the back for a base or mobile antenna.

Despite what I've just said (only a few functions) the Trio TR-2300 also has some advanced features for its age! These include a backlight for the dial and an a 1750kHz tone burst feature and an auxiliary button.

Incidentally, on some TR-2300s the **Tone** button toggles on and off, the tone being transmitted at the beginning of every transmission when in the **On** position. Others versions have been modified so that the button is push-to-make with no latch and therefore will then only transmit the tone when pressed.

The **Auxiliary** function on the TR-2300 is there for the addition of an additional frequency; this is achieved by adding a crystal of the desired frequency - suitable for a local net making it independent of the transceiver's internal synthesiser. The Auxiliary function has also been used for a reverse repeater function on some 2300s, this was a very easy modification. So if you do pick up second-hand Trio TR-2300 it would be worth looking into what, if anything, the Auxiliary button does on the version you have.

Young Richard!

I first saw a Trio TR-2300 as a young boy in the 1970s. I remember being amazed at the fact it was completely self-contained, Dad had it installed in his car but could easily take it out and use it as a hand portable.

You could get a mobile mount for the Trio TR-2300 which held the radio in place with two clasps, making it a very simple operation to take in and out. I remember being impressed at the look of the radio; it was and is a really good-looking bit of kit.

I finally got my licence in the late 1980s and the first transceiver I bought was a second hand Trio TR-2300. I'd bought the rig from a guy in London and stayed over in the city for a day or so and being unable to stop myself as I just had to get on the air!

My first two contacts were just with the telescopic antenna and bare 1W using the internal batteries. So I wonder if **Peter G0KLR** and **Alex G0MWO** remember the QSO I had with them using my gorgeous Trio TR-2300 from a flat in Cricklewood on the 1 March 1990! (I very much doubt it as they were both mobile somewhere in North London!).

My Trio TR-2300 then saw lots of use, I used it in the car - the 1W into a 5/8l wave antenna did the job just fine, bringing many enjoyable simplex and repeater contacts. I also used it to good effect with a home-brewed 10W linear amplifier.

Preparing this article got me pawing back through the dog-eared pages of my first logbook. That in itself brought back some memories!

During the early part of 1990 I used my Trio TR-2300 in the shack, a modest shack in those days too!

My family and I had just moved and I had a corner in the junk, oops, I mean...box room. I had no external antenna at all.

A friend had loaned me a publication with an article describing making a Slim Jim antenna out of 300Ω ribbon balanced feeder cable. I remember that I spent the morning measuring and cutting and finally, I proudly hung my home-made Slim Jim tuned to 145MHz from the light fitting in the box room.

I connected it to the Trio TR-2300 and with the full 1W pumping into the internal walls I put out a CQ call on 145.500MHz. I was then amazed to contact **G3CMJ** near Salisbury, a trip of about 32km.

After the success I was somewhat

impressed, however, I've never really been quite sure whether this was a tribute to the Trio TR-2300 or my antenna construction, but what the heck! It worked! Unfortunately I do not have a record of G3CMJ's name but I remember being astounded that I should get so far with 1W from a home-brewed antenna mounted indoors!

Along with my friend **Norman Allen** (then **G7GDZ** but now **G0RCN**) I took my Trio TR-2300 onto the Purbecks, the best hills this part of Dorset has to offer.



Fig. 2: Ten NiCad batteries are required to power the unit, and these can be seen fitted in this internal view (see text).

Product

Trio TR-2300 144MHz Transceiver

Summary

Hill Topping on 144MHz seems to be increasing in popularity again, and a little radio that takes hardly any current and rejects pagers like the Trio TR-2300 does, may well see a renaissance! This is another review when I get to keep the radio at the end of the *PW* commission...and I'm certainly not parting with my TR-2300!

Price

Scour the second-hand markets for TR-2300s, expect to pay anything between £50 and £100.

It's A Classic..... The Trio TR-2300 144MHz Transceiver

● Fig. 3: The supplied accessories included a dynamic microphone which would not look at all out of place on a modern item of equipment. The loudspeaker grill is behind the microphone, and also seen in this illustration is the original internally mounted telescopic whip antenna (see text).

I cannot recall what Norman took; I think it may have been a Yaesu FT-290. We had great fun tramping round the hills talking to Norman's Dad, **Gordon G3JTK** back in Poole.

With the advent of smaller hand-held radios and smaller people - I said good-bye to my Trio TR-2300 and bought a dual-band hand-held. But I've never seemed able to work Salisbury on 1W with an internal antenna since!

Two TR-300s!

I missed my Trio TR-2300 so much that I had to get one again. So, several years ago lucky GORSN managed to acquire two, fully functional Trio TR-2300s, including one with its matching Trio VB-2300 linear amplifier. So, as you can probably imagine, these are now kept as working cherished radios, and I've used them for everything from QRP hilltop contacts to running packet stations.

One of my TR-2300 transceivers now sits in my shack constantly monitoring our local chat frequency 24 hours a day, seven days a week. It's connected to an old 5/8 wave Revco mounted mobile whip screwed to the side of my mast about 2m above the ground and I can talk all over the Bournemouth conurbation on 1W! Anyone who has owned a '2300 will tell you that one TR-2300 watt seems to go further than any others and no, I've no scientific evidence to support that!

Classic & Cheddar

Just to prove that the Trio TR-2300 was still a worth while radio as well as being a classic rig, I decided to take it on a short weekend break in the family caravan to Cheddar in Somerset. I went with

my Father-in-law, **Terry Wood G7VJJ**. Terry also owns a Trio TR-2300 and always takes his transceiver away with him, using it as his main rig in his caravan.

Cheddar is nestled in the Mendip Hills and as such is not a particularly good r.f. take off point for the 144MHz band. However, undaunted Terry and I set up a mast on top of which we placed a 5/8λ wave mobile whip and connected up the TR-2300.

We hooked up with my brother **William G7GMZ**, Fig. 4, and

managed a contact with him with the telescopic whip and using the batteries. William lives in Bridgwater; he was about 24km away with nothing much in between us. This proved the radio worked, what we wanted now was a contact with someone outside of the family!

At the 11th hour we got our out-of-the-family QSO. Using just 1W on battery power and the mobile whip on the portable mast we made contact with **Tom G1WQU** in the Cathedral city of Wells. Tom was only about 12km away but the path was very challenging.

I had a wonderful chat with Tom who said that he knew the Trio TR-2300. He described it as "almost a collector's item". He was also very complementary about the signal, describing it as "Excellent".

Tom went on to say that the Trio TR-2300 always was a "very good radio" and seemed quite impressed that we should have made the trip to him using just the 1W. The final comment was that the audio was "very nice indeed".

Test Of Time

So the Trio TR-2300 really has stood the test of time. It's fondly remembered by many and still cherished by people like myself, Fig. 5. I'm of the opinion that a transceiver should be more than the sum of its components...and the Trio TR-2300 is certainly that kind of radio.

There are still some Trio TR-2300s about on the second-hand market. I've also noticed that they are very reasonably priced these days, going for anything between £50 and £100. pw

● Fig. 5: Richard GORSN says that the TR-2300 "Has stood the test of time" and he uses his rigs on a regular basis.



● Fig. 4: Richard GORSN (left) and William Newton G7GMZ and their children enjoying using the TR-2300 on a caravanning weekend.



DID YOU KNOW?

There is more to **WiNRADIO**[®] than just this:



Portable external receivers



Card-based receivers



Antenna distribution units



Multichannel systems



Wideband antennas



Directional antennas

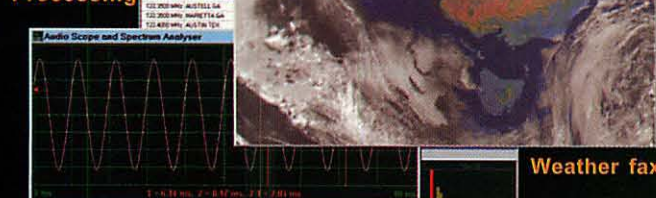
There is also our extensive software support:

Virtual control panel

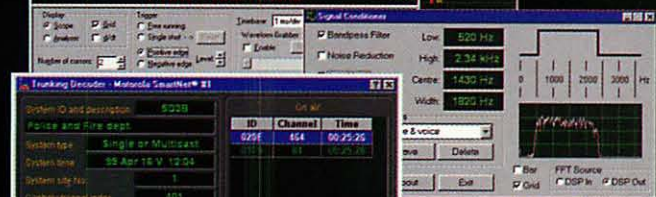
Software Plug-ins



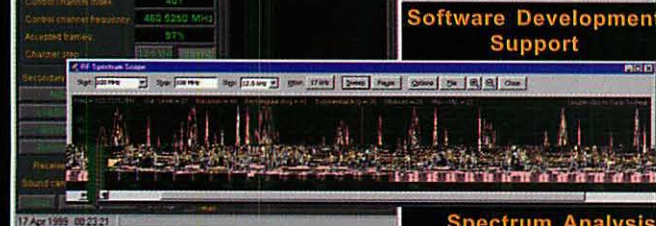
Signal Processing



Weather fax



Software Development Support



Spectrum Analysis

Trunking

The future of radio.™

For further product information and to download free software, visit our website
www.winradio.com

Falcon Equipment and Systems
Importers and System Integrators

PH: +44 (0) 1684 295807 EM: winradio@sda-falcon.co.uk

Web: www.sda-falcon.co.uk

★ ★ ★ NEW VENUE ★ ★ ★

McMichael 2001, 15th July RADIO RALLY AND CAR BOOT SALE

New location: Reading Rugby Football Club
Sonning Lane (B4446, just off A4)
near Reading, Berkshire.

Opening times: 9.00am till 3.00pm

Entrance: £1.50 under 18's free.

New larger venue, lots of on-site parking, licensed bar and food available. Talk-in: GB6MMR 145.550MHz FM.

Web site: <http://go.to/mcmichaelrally>

Further details: Dave G4XDU. Tel: 01628 625720

E-mail: g4xdu@amsat.org

SUSSEX AMATEUR RADIO AND COMPUTER FAIR

Sunday July 8th 2001

10.30am to 4.00pm

BRIGHTON RACECOURSE

Trade stands for: New and used amateur and CB radio equipment, computers and component sales, bring and buy stall, picnic area, refreshments and free car parking.

- - Admission £2.50 - -

For details telephone (01424) 428064

Please mention

Practical Wireless

when replying to
advertisements.



LAR COMMUNICATIONS

SUPERSLAB CB CENTRE

★ ★ The complete radio suppliers ★ ★

CONTACT STEVE POUNDER

BRADFORD ROAD, EAST ARDSLEY, NR. WAKEFIELD WF3 2DN

Tel: 0113-252 4586 Fax: 0113-253 6621

The SHORTWAVE Shop

18 FAIRMILE ROAD, CHRISTCHURCH, DORSET BH23 2LJ
Phone/Fax 01202 490099 SHORTWAVE HOTLINE: 07000 CQDXCQ (273927)

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-Free Family Radio ● Business and security radios

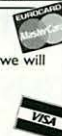


WORLDSPACE

digital satellite radios now in stock.
From £99.00

SHORT WAVE ADVICE LINE
01202 490099

ALINCO, AOR, AKD, BEARCAT,
COMTEL, DRAKE, FAIRHAVEN,
ICOM, KENWOOD, JRC, LOWE,
MAYCOM, MFJ, OPTO, WELL-
BROOK, YUPIITERU, YAESU



Call for latest second-hand list or visit our website
<http://www.shortwave.co.uk>

4 MILES FROM BOURNEMOUTH INTERNATIONAL AIRPORT ON B3073
300 YARDS FROM CHRISTCHURCH RAILWAY STATION. FORECOURT PARKING FOR DISABLED

Amateur Radio Abroad

Drake Discovers The Canary Islands!



● The Drake's progress stopped! If Jack Drake GM4MOX had driven any further he would have been in the Atlantic! This view shows Jack operating as EA8/GM4MOX/M north of Cista Teguisse on the Island of Lanzarote.

Well not quite, but Jack Drake GM4MOX did discover he could have an excellent holiday and enjoy Amateur Radio at the same time when visiting the Spanish Canary Islands off the coast of North Africa!

Operating from another country is good fun and stimulates your interest in the hobby and this is often clearly shown in the various "Look what I did on holiday" articles which appear in *PW*. Our hobby is tremendously flexible and along with providing a fascinating pastime in

itself...can add that very special extra ingredient to make your holiday a memorable one indeed.

For example, if you're fortunate enough to go on holiday in The Canary Islands, just try driving a couple of kilometres from your resort and you'll get away from all the electronic smog and work parts of the world you have never reached before, as well

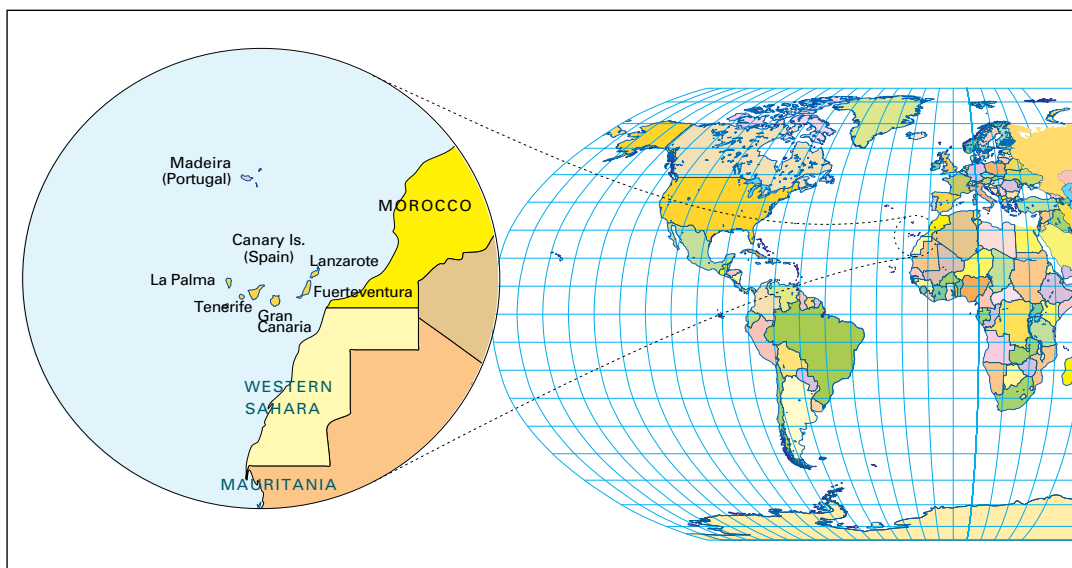
will be helpful - and provide extra encouragement to anyone already considering taking their Amateur Radio equipment abroad. However, before departing, a good idea is to read the information entitled **Operating Abroad** in the Radio Society of Great Britain's *Yearbook*.

You should also take your UK Licence Validation Document and also have a copy of the foreign country's licensing regulations. The - **extremely useful** - section in the *Yearbook* also provides full contact details for the Spanish Amateur Radio Licensing department and the address of the national society.

Security & Customs

Personally speaking, I've never experienced any problems with airport security or customs, but my advice is that you should keep your Licence Validation Document handy along with appropriate receipts. I also suggest that you carry your transceiver on the aircraft as hand luggage.

On my trip I arranged that the remaining equipment, with the exception of the mobile



● Map showing the relationship of the Canary Islands to North Africa. Although located only a few hundred miles off the North African Coast, the Canary Islands are very close to Europe by fast modern jet aircraft. Ideal for Amateur Radio DX chasing holidays says Jack!

as keeping in touch with your friends back home. You could also end up being an Ambassador for Amateur Radio when you come across officials, but more about that later!

Following the enjoyment of I've experienced on holiday, it's hoped that the following information

antennas, went into the suitcases. Incidentally - to give you yet another idea, my wife **June** has very kindly tailor-made a padded Denim bag for the five mobile antennas and this goes in the hold of the aircraft. The check-in staff invariably think that the antennas are fishing rods and wish me good luck - Fishing For DX perhaps?

Clips & Checks

Before you leave for your holiday, here are a few things to remember under the heading 'Clips &

Checks. Firstly, remember to fit large crocodile clips to the power lead for attachment to the car battery and to take a small torch which will prove useful when connecting to the battery in poor light.

Avoid hiring a car with a sunroof and its also preferable for it to have a manual gearbox. Don't forget it's not possible to bumpstart an automatic car if you inadvertently drain the battery, as I have almost done by spending too much time on 28MHz n.b.f.m!

Mount the antenna in the centre of the roof in order to get a good ground-plane effect - protecting the paint work by placing thin plastic (cut from a plastic carrier bag) between the mag-mount and the roof itself. But bear in mind that a magnetic mount does not achieve an earth, so it will be necessary to earth the outer screen of your coaxial cable to the metalwork of the car. A simple solution is to run an earth lead from the casing of the transceiver to a door striker on the car*.

***Editorial note:** When operating /P from my car - using the Pro-AM mobile whips mounted on a mag-mount base, I often use an insulated wire groundplane counterpoise radial. This wire - approximately 20 metres long - can be laid out very quickly and efficiently and greatly assists DX working when you're operating from a site with poor sandy soils - such as the Dorset heathlands where I often operate from. If operating from a car park - the radial can be carefully placed along the bottom of a fence so as not to inconvenience other users. I have also thrown the radial wire up into small trees and bushes to great effect. **G3XFD.**

Awesome Lanzarote

While on holiday in Lanzarote, which is an awe-inspiring volcanic island, I was active on all h.f. bands from 14 to 28MHz normally having a couple of operating sessions per day. Conditions at sunrise were particularly good with 59+20 reports received from Japan, New Zealand & Australia!

To my surprise there was a pile-up of stations from the Far East and most were amazed to learn of my modest equipment especially the mobile antenna set-up. Very satisfying and enjoyable DX!

The Pro-Am no-compromise mobile

antennas work superbly and it's certainly worth the effort of changing them when shifting bands. However, having read **Rob Mannion G3XFD's** interesting Antenna Workshop article in the February 2001 issue of *Practical Wireless* he described, I intend experimenting with the system - the Funktechnik Fibreglass 'fishing rod' portable mast - during my next holiday.

The afternoons brought many contacts



● Jack Operating h.f. mobile from a lay-by overlooking the town of Funchal on the Portuguese Island of Madeira. He found that finding a site was rather more difficult than the drier, more barren landscape of Lanzarote, but the DX worked made it worthwhile.

from across the Atlantic with some excellent conditions on 28MHz n.b.f.m. During my many visits to Lanzarote I have logged hundreds of QSOs as EA8/GM4MOX/M.

Madeira Mobile

Other holiday locations have proved to be a challenge and finding a suitable operating site in Madeira on one December trip proved more difficult. Fortunately however, a lay-by overlooking the picturesque town of Funchal did the trick and many more exciting contacts were made from this magnificently beautiful and verdant island.

Incidentally, the h.f. beacon **CS3B** is

located on Madeira and operates on the International Beacon Project frequencies of 14.1, 18.110, 21.500, 24.930 and 28.200MHz. The Editor tells me that CS3B puts a consistently good S9+ signal into Southern England and he often hears the beacon's transmissions when it's switched down to its 100mW output level.

Yes, Madeira is a superb place for an h.f. holiday and the Island is of course

Portuguese, bringing the benefits of the long historical friendship between the Portuguese and the United Kingdom to the fore. In other words, you'll be made extremely welcome and if you have enough time to explore them the ancient freshwater 'Lavada' canals which abound on the steep hillsides around Funchal are fascinating things to see but you do need good walking legs and a head for heights so I'm told!

Drake's DX Gear

The equipment I've taken on holiday comprised my beloved Kenwood TS-50 with its microphone gain set to high (Menu B 66), an MFJ-945 mobile antenna tuning unit (a.t.u.) and a magnetic mount weighing less than 500 grams with a diameter of 90mm.

Note: Please bear in mind the following safety point regarding the use of a mag-mount. The 90mm diameter base on the mag-mount proved sufficient to keep the Pro-Am antennas on the roof even in high winds **but I did not risk using it while in motion.**

A final word of advice - one morning just before sunrise on Lanzarote when I was operating along the coast from our Hotel, the Guarda Civil (Spanish

Police) approached me. They were quite happy when I produced my Licence Validation Document along with a copy of my passport and a few QSL cards (one of which they kept!). So, to ensure a happy and trouble free holiday...make sure these documents are with you at all times.

Should you require any further information or advice, please contact me: **Jack GM4MOX** on (01592) 267512 or via e-mail: jack@gm4mox.co.uk

In the meantime I hope that you too get as much out of your holidays with the extra special 'Added Extras' that Amateur Radio can bring as I have. I look forward to meeting you on the DX bands on my next trip!

PH

TELEPHONE SALES ON:
01922 414796

Ask for Dave (G1LBE)
 Open Mon-Fri 9.30 - 6.00pm. Sat 9.30 - 4.00pm

WEB SITE: <http://www.radioworld.co.uk>
 E-mail: sales@radioworld.co.uk

There is NO CHARGE for
 using credit cards



E&OE

Main dealers for Alinco, Icom, Yaesu & Kenwood
 Manufacturers warranty on all new equipment

YAESU ROTATORS IN STOCK

ROTATORS

G-1000DXC Rotator 1100kg/cm CE c/w control box & 25m cable
 RRP £599**RWP £509.00**

G-2800SDX Rotator HD 0.2 degree CE c/w control box & 40m cable
 RRP £1229**RWP £999.00**



G-450C Rotator light duty CE c/w control box & 25m cable
 RRP £379**RWP £325.00**

G-650C Rotator medium duty CE c/w control box & 25m cable
 RRP £499**RWP £425.00**

OPTIONS

GC-038B Mast clamp (brown)**RWP £25.00**

GC-038G Mast clamp (green)**RWP £25.00**

GC-048 Mast clamp for G-2800SDX**RWP £39.00**

GS-050 Stay bearing (small type)**RWP £29.00**

GS-065 Stay bearing (medium type)**RWP £45.00**

About Us

Map

Adonis

Alinco

AOR

Bearcat

Comet

Cushcraft

Daiwa

Diamond

Garmin

Icom

Kent

Kenwood

MFJ

Roberts

Sirio

Sony

Tokyo

Watson

Yaesu

Yupiteru

ICOM

IC-756 PRO



Icom's flagship. Colour screen, 32 bit processor. Absolutely fabulous.

£1895



IC-746
 HF/VHF all mode transceiver, 6m/2m, 100W with tuner built in. 2 years warranty.

£1299.00



IC-706 MKII G
 Smallest DSP radio on the market. HF, 6m/2m/70cm. Detachable front.

£959.00

IC-R8500



Probably the best wide band receiver available, coverage from 0.1-2GHz. Many 'top-end' features, 2 years warranty.

£1199.00



IC-821
 2m, 70cm base flexible main/sub band operation. Advanced CW features, separate VFO & 10 memory channels for satellite operation & connection for 9600 packet operation. Limited stock.

£999.00



IC-2800
 Dual band mobile, colour display. Full duplex, inc. CTCSS, 50W output. Detachable front. List price £449.00. OUR PRICE **£395.00**

KENWOOD

TS-870S



Kenwood's top HF radio, DSP & IF. No need for filters, transmit Tx audio, fully adjustable, broadcast audio on SSB. A CW's operators dream. Plus Rx antenna tuner.

BARGAIN AT **£1299.00**



TS-50S
 The first and still one of the best little mobile radios, dedicated for HF users. Don't miss out! Brand new with UK warranty.

£599.00

TS-570DG



Still the only HF monoband mobile radio with DSP and ATU built in for under £1000.00.

RADIOWORLD PRICE **£829.00**

TM-D700E



The latest dual bander, dual display, built-in TNC, APRS locating system, alpha-numeric. List price £519.00.

OUR PRICE **£429.00**



TM-V7E

Cool blue display, dualband, packet ready, detachable front. List price

OUR PRICE **£379.00**

TM-G707



Dual band, detachable front, clear display. No

squinting! Bullet proof front end. List price £319.00.

OUR PRICE **£279.00**



TH-D7E

The world's first handie with built-in TNC, plus APRS, CTCSS searching system, metallic silver finish. List price £309.95.

OUR PRICE **£279.00**



TH-G71E

Dualband handie, reliable and rugged. List price £279.00.

OUR PRICE **£210.00**
 while stocks last

KENWOOD TS-2000



All mode multi-bander HF/6m/2m/70cm optional 23cm, DSP, built-in keyer, large amber coloured backlit LCD.

RWP **£1649.00**

WANTED
 USED EQUIPMENT
 PX WELCOME
 BEST PRICES PAID!

PRICE MATCH

Up to 5% extra discount may be available on selected items.

RADIO WORLD

BOOK LANE GREAT WYRLEY,
L, WEST MIDLANDS WS6 6BQ

E&OE

sales & service: 01922 414796 Fax: 01922 417829

USED EQUIPMENT PRICE LIST

MAKE	MODEL	PRICE	MAKE	MODEL	PRICE	MAKE	MODEL	PRICE
ADI	AR-146 2m FM 50W MOBILE	£130.00	KENWOOD	SP-120 LOUDSPEAKER	£30.00	SMC	T3-170L SWR & POWER METER	£20.00
AKD	4001 4m TRANSCEIVER	£130.00	KENWOOD	SP-430 LOUDSPEAKER	£40.00	SML	SWR-25 SWR & POWER METER	£20.00
AKD	6001 6m FM TRANSCEIVER	£135.00	KENWOOD	SP-950 LOUDSPEAKER	£90.00	SOMMERKAMP	FT290R 2m MULTI-MODE TRANSCEIVER	£180.00
ALINCO	DJ-G1 HANDY TRANSCEIVER	£120.00	KENWOOD	TH-25E HANDY TRANSCEIVER	£49.00	SSB ELECTRONICS	LT-23 23cms TRANSVERTER	£450.00
ALINCO	DJ-G5EY DUAL BAND HANDY	£199.00	KENWOOD	TH-47E HANDY TRANSCEIVER	£100.00	ST3 HEADPHONES	DELUXE HEADPHONES	£45.00
ALINCO	DJ-X1 RECEIVER	£90.00	KENWOOD	TH-79E HANDY TRANSCEIVER	£189.00	STANDARD	AX-700E WIDE BAND RECEIVER - BASE	
ALINCO	DJ-X10 WIDE BAND RECEIVER	£275.00	KENWOOD	TH-D7E 2m / 70cms HAND HELD BUILT-IN TNC	£195.00	SCANNER	PS-1220VU 20 AMP POWER SUPPLY	£60.00
ALINCO	DR-150E 2M 50W MOBILE TRANSCEIVER	£140.00	KENWOOD	TL-120 100W LOW DRIVE HF AMPLIFIER	£150.00	SYNCRON	22AMP POWER SUPPLY	£70.00
ALINCO	DR-M06 6M FM TRANSCEIVER	£140.00	KENWOOD	TL-922 HF LINEAR AMP 1Kw (AS NEW!)	£999.00	TAGRA	DSP-599ZX TOP OF THE RANGE DSP UNIT	£250.00
ALINCO	EDX-1 ATU	£140.00	KENWOOD	TM-251E MOBILE TRANSCEIVER	£140.00	TIMEWAVE	DSP-9+	£125.00
AMERITRON	AL-1500 1.5KW AMPLIFIER	£1,499.00	KENWOOD	TM-255E 2m MULTI-MODE MOBILE TRANSCEIVER	£400.00	TOKYO HY-POWER	HL-166V 6m 160W LINEAR AMPLIFIER	£175.00
AOR	AR-3030 HF / VHF RECEIVER Inc converter VHF	£450.00	KENWOOD	TM-455E 70CM MULTIMODE MOBILE TRANSCEIVER	£495.00	TOKYO HY-POWER	HL-30V 2M and 25W AMPLIFIER	£75.00
AOR	AR-3030 HF RECEIVER	£399.00	KENWOOD	TM-D700E 2/70 DUALBAND APRS Built-in TNC TRANSCEIVER	£375.00	TOKYO HY-POWER	HL-37V LINEAR AMPLIFIER	£60.00
AOR	AR-7030 TOP RECEIVER	£550.00	KENWOOD	TM-V7E MOBILE TRANSCEIVER	£290.00	TONNA	7000E TERMINAL	£130.00
AOR	AR-7030-HF RECEIVER (With AM Filter, Optical Encoder)	£650.00	KENWOOD	TR-9000 2m MULTIMODE MOBILE TRANSCEIVER	£240.00	TRIO	TR-2300 2M PORTABLE TRANSCEIVER	£60.00
AOR	AR-8000 WIDE BAND RECEIVER	£199.00	KENWOOD	TS-120 HF SOLID STATE MOBILE	£225.00	TRIO	TR-9130 2M ALL MODE TRANSCEIVER	£250.00
BEARCAT	UBC-860XLT SCANNER	£120.00	KENWOOD	TS-430 HF BASE / MOBILE INCLUDING FM	£375.00	TRIO	TS-940SAT HF TRANSCEIVER	£750.00
BEARCAT	UBC-9000XLT RECEIVER	£199.00	KENWOOD	TS-450SAT HF TRANSCEIVER	£600.00	WELZ	AC-38M 200W MOBILE MATCHING NETWORK	£50.00
BNOS	LP-50 50MHz 50 Watt AMPLIFIER	£99.00	KENWOOD	TS-50S SMALL HF MOBILE 100W	£425.00	WELZ	SP-15M SWR & POWER METER	£20.00
DAIWA	CN-1001 AUTO ANTENNA TUNER	£140.00	KENWOOD	TS-570D HF / DSP / ATU MOBILE-BASE TRANSCEIVER	£650.00	YAESU	FC-102 1.2KW ATU WITH 4 WAY SWITCHING UNIT	
DAIWA	CNW-518 1KW AUTO ATU	£199.00	KENWOOD	TS-570DGE HF DSP BASE / MOBILE TRANSCEIVER	£725.00	YAESU	FC-20 AUTO ANTENNA TUNER FOR 847/FT100	
DAIWA	NS-660P SWR & PWR MTR	£40.00	KENWOOD	TS-711E 2m MULTIMODE BASE TRANSCEIVER	£399.00	YAESU	FC-757AT FULLY AUTOMATIC ATU	£180.00
DAIWA	CN-540 SWR & PWR MTR	£30.00	KENWOOD	TS-790E 2m / 70cm MULTIMODE BASE TRANSCEIVER	£799.00	YAESU	FC-902 ATU 500W	£140.00
DAIWA	CN-630 SWR & PWR MTR	£40.00	KENWOOD	TS-811E 70cms MULTIMODE BASE TRANSCEIVER	£399.00	YAESU	FEX-767-2M 2m MODULE for the FT-767GX	£140.00
DATONG	FL3 FILTER	£75.00	KENWOOD	TS-830S HF TRANSCEIVER	£325.00	YAESU	FEX-767-6M 6m MODULE for the FT-767GX	£140.00
DATONG	D-70 MORSE TUTOR	£25.00	KENWOOD	TS-850SAT HF BUILT IN ATU EXCELLENT TRANSCEIVER	£800.00	YAESU	FEX-767-70CM 70cms MODULE for the FT-767GX	
DATONG	AUTOMATIC RF SPEECH PROCESSOR	£80.00	KENWOOD	TS-870SAT HF / DSP-IF-100W BUILT IN ATU TRANSCEIVER	£999.00	YAESU	FL-2100Z HF AMPLIFIER	£450.00
DATONG	FL-2 FILTER	£60.00	KENWOOD	TS-90SAT HF BASE STATION BUILT IN ATU (CLASSIC)	£700.00	YAESU	FP-107E POWER SUPPLY	£120.00
DAWA	PS-304 PSU 20amp	£75.00	KENWOOD	TS-950SD HF / 150W DSP BASE TRANSCEIVER	£1,100.00	YAESU	FP700 POWER SUPPLY	£100.00
DRAKE	R7 HF RECEIVER	£550.00	KENWOOD	TS-950SDX HF / 150W MOSFET DSP TRANSCEIVER	£1,749.00	YAESU	FP-757HD HEAVY DUTY POWER SUPPLY	£120.00
DRAKE	SW-2 HF RECEIVER	£299.00	KENWOOD	TSU-8 TONE SQUELCH UNIT	£25.00	YAESU	FRG-100 HF RECEIVER	£300.00
FAIRHAVEN	RD-500 WIDE BAND RECEIVER	£575.00	KENWOOD	VFO-120	£50.00	YAESU	FRG-7 HF RECEIVER	£99.00
HARRIS	RF-590 TOP CLASS RECEIVER	£2,250.00	KENWOOD	VFO-180 EXTERNAL VFO	£75.00	YAESU	FRG-7700 HF RECEIVER	£220.00
HOWES	CTU8 ANTENNA TUNER UNIT	£20.00	KENWOOD	VS-1 VOICE SYNTHESISER	£30.00	YAESU	FRG-8700 60-905MHz All mode Receiver	£199.00
ICOM	AT-180 AUTOMATIC ANTENNA TUNER	£200.00	KENWOOD	VS-2 VOICE SYNTHESISER	£30.00	YAESU	FT-1000MK5 200W DSP HF TRANSCEIVER	£2,600.00
ICOM	FL-100 500Hz CW NARROW FILTER	£40.00	KENWOOD	YG-455CN-1 270Hz CW CRYSTAL FILTER	£100.00	YAESU	FT-1000MP AC HF BASE DSP TRANSCEIVER (Late serial no)	£1,550.00
ICOM	FL-222 1.8KHz SSB NARROW FILTER	£100.00	KENWOOD	YK-88A-1 AM FILTER	£40.00	YAESU	FT-1000MP DC BASE TRANSCEIVER	£1,200.00
ICOM	FL-223 1.9KHz SSB FILTER	£40.00	KENWOOD	YK-88C-1 500Hz CW NARROW FILTER	£40.00	YAESU	FT-101 TRANSCEIVER MINT!	£200.00
ICOM	FL-52A 500Hz CW NARROW FILTER	£99.00	KENWOOD	YK-88CN1 270Hz CW FILTER 8.83MHz IF	£40.00	YAESU	FT-101ZDmk111 HF TRANSCEIVER inc FM	£375.00
ICOM	FL-53A 250Hz CW FILTER	£100.00	KENWOOD	YK-88S-1 2.4KHz SSB NARROW FILTER	£40.00	YAESU	FT-23R HANDY TRANSCEIVER	£89.00
ICOM	IC-2100H 2M MOBILE TRANSCEIVER	£150.00	KENWOOD	YK-88M 1.8K SSB FILTER (TS-440 / R5000)	£40.00	YAESU	FT-2500M MOBILE TRANSCEIVER	£190.00
ICOM	IC-229H 2M 50W FM Mobile TRANSCEIVER	£130.00	KENWOOD	YK-88SN-1 1.8KHz SSB NARROW FILTER	£40.00	YAESU	FT-290RMK1 2M ALL MODE TRANSCEIVER	£180.00
ICOM	IC-229H FM TRANSCEIVER	£140.00	KENWOOD	YK-88SZ IF	£40.00	YAESU	FT-290RMK1 Includes Bracket + FL-2010 LINEAR AMP	
ICOM	IC-251 2m MULTIMODE TRANSCEIVER	£295.00	KENWOOD	PS-430 POWER SUPPLY	£120.00	YAESU	FT-290RMK11 MOBILE 2M MULTIMODE	£275.00
ICOM	IC-275E 25W TRANSCEIVER	£525.00	KENWOOD	TM-G707E MOBILE TRANSCEIVER	£220.00	YAESU	FT-3000M 2m 70W MOBILE TRANSCEIVER	£175.00
ICOM	IC-290 2m MULTIMODE TRANSCEIVER	£240.00	KENWOOD	MCL1100 EASY READER	£75.00	YAESU	FT-41R HANDY TRANSCEIVER	£120.00
ICOM	IC-2KL AUTOMATIC LINEAR AMPLIFIER + PSU	£999.00	KENWOOD	MFJ-1020B INDOOR ACTIVE ANTENNA	£40.00	YAESU	FT-470 DUALBAND HANDIE TRANSCEIVER	£150.00
ICOM	IC-490E 70cms MULTIMODE MOBILE TRANSCEIVER	£265.00	KENWOOD	MFJ-1278 MULTI MODE DATA CONTROLLER	£199.00	YAESU	FT-690MK11 6M MULTIMODE MOBILE	£295.00
ICOM	IC-725 HF TRANSCEIVER	£375.00	KENWOOD	MFJ-1462B MULTI READER	£140.00	YAESU	FT-7 MINT! CONDITION	£275.00
ICOM	IC-728 HF TRANSCEIVER	£399.00	KENWOOD	MFJ-1462B MULTI-READER	£100.00	YAESU	FT-726R 2 / 70 / 6m TRANSCEIVER	£575.00
ICOM	IC-735 HF TRANSCEIVER	£400.00	KENWOOD	MFJ-956 SWR AND ANTENNA TUNER	£30.00	YAESU	FT-730R 70CM MOBILE TRANSCEIVER	£120.00
ICOM	IC-737 HF BASE BUILT IN ATU 100W	£595.00	KENWOOD	MFJ-986 ANTENNA TUNER	£195.00	YAESU	FT-736R 2m / 70cm TRANSCEIVER	£650.00
ICOM	IC-756 HF / 6m All Band Transceiver	£999.00	KENWOOD	MFJ-989 3KW ROLLER COASTER ATU	£230.00	YAESU	FT-736R 2m / 70cm / 6m TRANSCEIVER	£750.00
ICOM	IC-765 HF BASE TRANSCEIVER	£950.00	KENWOOD	MFJ-959B RECEIVER ANTENNA TUNER	£55.00	YAESU	FT-7400 70cm MOBILE TRANSCEIVER	£160.00
ICOM	IC-821H VHF / UHF MULTIMODE TRANSCEIVER	£699.00	KENWOOD	PT-135 POWER SUPPLY	£80.00	YAESU	FT-747GX HF TRANSCEIVER	£399.00
ICOM	IC-R10 HANDY WIDE BAND RECEIVER	£199.00	KENWOOD	MICROWAVE MODULES MML-144/100 2m 100W LINEAR AMPLIFIER	£129.00	YAESU	FT-757MK1GX HF TRANSCEIVER	£375.00
ICOM	IC-R7000 RECEIVER MINT! CONDITION	£550.00	KENWOOD	MICROWAVE MODULES MML-144/50S 2m 50W LINEAR AMPLIFIER	£80.00	YAESU	FT-767GX HF BASE 100watt built-in ATU	£599.00
ICOM	IC-R72 RECEIVER	£399.00	KENWOOD	MICROWAVE MODULES 28/144 TRANSVERTER 28/144 £125.00	£125.00	YAESU	FT-790R 70CM MULTIMODE MOBILE TRANSCEIVER	
ICOM	IC-R75 HF / 6m RECEIVER	£475.00	KENWOOD	NAIGAI NAG-144XL 2m 400W PEP LINEAR AMPLIFIER	£325.00	YAESU	FT-7B HF 50 W MOBILE TRANSCEIVER	£199.00
ICOM	IC-T81E QUAD BAND HANDY	£250.00	KENWOOD	OPTOELECTRONICS SCOUT FREQUENCY COUNTER		YAESU	FT-80C 0-30MHz COMMERCIAL TRANSCEIVER	
ICOM	IC-T8E HANDY TRANSCEIVER	£175.00	KENWOOD	Inc MEMORIES	£220.00	YAESU	FT-840 HF MOBILE TRANSCEIVER	£450.00
ICOM	IC-W21E HANDY TRANSCEIVER	£199.00	KENWOOD	PAC RATT PIC-232 Multimode, dual port data controller	£175.00	YAESU	FT-847 HF / 2 / 6 / 70cm BASE TRANSCEIVER	£999.00
ICOM	PS-15 20A POWER SUPPLY FITS ALL ICOM	£110.00	KENWOOD	PACCOM TNC-320 TNC	£90.00	YAESU	FT-900AT HF / DETACHABLE FRONT BUILT IN ATU	
ICOM	PS-85 POWER SUPPLY	£175.00	KENWOOD	PANASONIC DR-49 RECEIVER	£125.00	YAESU	FT-980 HF TRANSCEIVER	£495.00
ICOM	SP-21 LOUDSPEAKER, BOXED	£55.00	KENWOOD	QAM 70	£100.00	YAESU	FT-ONE HF BASE TRANSCEIVER	£450.00
ICOM	UT-102 VOICE SYNTHESISER	£20.00	KENWOOD	SAGRA AMP-600 2M 1KW PEP MAINS AMPLIFIER	£750.00	YAESU	FTV-901 TRANSVERTER Inc 2m Mod	£165.00
ICOM	UT-84 TONE SQUELCH UNIT	£25.00	KENWOOD	SEM TRANSMATCH Z MATCH ATU INC 160m	£75.00	YAESU	MD-1 DESK MICROPHONE	£75.00
ICOM	AT-120 ANTENNA TUNER	£200.00	KENWOOD	SEM ANTENNA TUNING BRIDGE	£30.00	YAESU	SP-5 LOUDSPEAKER Including Audio Filters	£100.00
ICOM	IC-R71E RECEIVER	£399.00	KENWOOD	SHURE SR-444 CLASSIC BASE MIC	£35.00	YAESU	SP-767 LOUDSPEAKER Including Audio Filters	£80.00
JRC	NRD-535 HF RECEIVER	£600.00	KENWOOD			YAESU	SP-8 LOUDSPEAKER Including Audio Filters	£100.00
KANTRONICS	KAM PLUS TNC	£220.00	KENWOOD			YAESU	SP-980 LOUDSPEAKER Including Audio Filters	£55.00
KANTRONICS	KP-3 TNL	£89.00	KENWOOD			YAESU	VX-5R 2 / 70 / 6 HANDIE 5W	£220.00
KENWOOD	AT-250 AUTOMATIC ANTENNA TUNER	£200.00	KENWOOD			YAESU	XF-114SN 2KHz SSB FILTER	£60.00
KENWOOD	AT-50 AUTO ANTENNA TUNER	£175.00	KENWOOD			YAESU	YO-100 SCOPE VERY RARE!	£150.00
KENWOOD	AT-50 AUTO ATU	£175.00	KENWOOD			YAESU	YS-60 SWR METER 1.6 - 60MHz	£30.00
KENWOOD	DFC-230 FREQUENCY CONTROLLER	£70.00	KENWOOD			YAESU	B-132 10 / 11m LINEAR AMPLIFIER, MAINS	£60.00
KENWOOD	PS-20 10A POWER SUPPLY FITS TR-9130 ETC	£55.00	KENWOOD			ZETAGI		
KENWOOD	PS-50 POWER SUPPLY	£145.00	KENWOOD					
KENWOOD	PS-52 POWER SUPPLY	£150.00	KENWOOD					
KENWOOD	SM-220 SCOPE 830 etc	£200.00	KENWOOD					

Carrying On The Practical Way

This time Rev. George Dobbs G3RJV tells us he's got "Some more minimalist ideas" sent "From Russia with love". Intrigued? Find out more after you've read this month's appropriate quotation!

"In dwelling, live close to the ground. In thinking, keep to the simple".

Tao Te Ching

Last month's column looked at a very minimalist idea for a transceiver. As the editor of *Spratt*, the journal of the **G QRP Club**, I'm lucky enough to be sent circuit ideas by many avid Amateur Radio constructors. They are the sort of people who enjoy trying out and building ideas and sharing them with others.

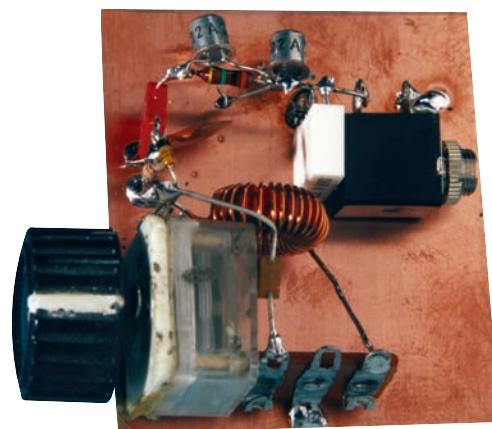
Some of the most interesting projects are the simplest ideas – the ideas for doing the most with the least. Many of the simplest suggestions come from Radio Amateurs who live in countries where commercially made Amateur Radio equipment is hard to come by, or simply just too expensive.

Many of the ideas have come from G QRP Club members in Eastern Europe. One such contributor has been **Oleg Borodin RV3GM**. It was Oleg who designed the **Micro-80** transceiver, a very simple, but ingenious, c.w. transceiver for 3.5MHz.

The Micro-80 Circuit

The Micro-80's circuit is shown in **Fig. 1**. It was this circuit that led to the **Pixie** transceiver, a design that is been much built in the USA and even turned into a kit. You may remember that I discussed the Pixie in this column for June 1997.

Incidentally, the circuit in Fig. 1, originally used Russian transistors but almost any generic types would work. In fact Tr1 and Tr2 often appeared with 2N222A transistors in the Pixie version, although some constructors used a more beefy device for Tr2.



● "From Russia With Love." This month George Dobbs G3RJV discuss a minimalist transmitter-receiver project based on the work of Russian QRP enthusiast Oleg RV3GM.

In practice all the transistors, Tr-4 could be the same, or similar, bipolar devices. Inductor L1 was a suitable value to tune the band.

As a transmitter, the operation is simple and starts with a crystal controlled oscillator, Tr1, feeding a power amplifier, Tr2. When the key is depressed Tr2 conducts and delivers the r.f. power to the antenna via the tuned circuit.

The receiver however is rather more cunning! When the key is lifted, the oscillator remains running and feeding a signal to Tr3.

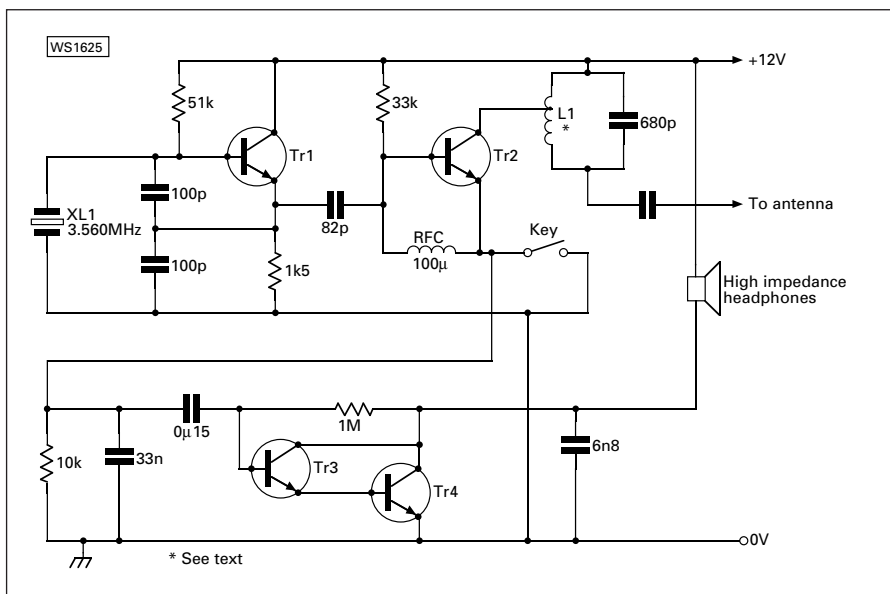
Now, when you sit back and think, you'll remember that a transistor is really just a couple of diodes physically set back-to-back and the collector of Tr2 is still connected to the antenna. Thus Tr4 can function as a simple mixer – mixing the signals from the antenna with the local oscillator.

So, the circuit shown forms a direct conversion (DC) receiver and an audio signal can be taken from the emitter of Tr4. **Very simple**, even crude, **but it does work!** The transmitter output is **low** and the receiver is **rudimentary** but it's about the simplest transceiver possible. As the forerunner of the Pixie transceiver, Oleg's little circuit has its place in Amateur Radio history.

Recently Oleg reminded me of another circuit he sent in to *Spratt* some years ago. This was a minimalist receiver for the **ONER** transmitter.

Another Famous Design

The **ONER** is another famous simple design. It came from **George Burt GM30XX**, and was a transmitter that could be built on a one inch square printed circuit board (p.c.b.). The **ONER** has been a kit in the Kanga Products range for many years and hundreds of them have been built. Some have produced amazing results and I've worked the USA using a **ONER** on 14MHz!



● Fig. 1: The Micro-80's circuit by Oleg RV3GM, which led to the Pixie transceiver, a design that has been much built in the USA and even turned into a kit (see text).

● Table 1: Low-pass filter designs with values, based upon the W3NQN 'standard value capacitor' low-pass filter data (see text).

Band (MHz)	C1, 7 (pF)	C3, 5 (pF)	L2, 6 (turns)	L4 (turns)	Core	Wire Dia. mm (s.w.g.)
3.5	470	1200	25	27	T37-2	0.38 (28)
7.0	270	680	19	21	T37-6	0.46 (26)
10.1	270	560	19	20	T37-6	0.46 (26)
14.0	180	390	16	17	T37-6	0.56 (24)

[WT1629]

Value & Vintage

The faint smell of Brasso metal polish and the spare vintage cavity magnetron on the counter tells us Charles Miller's on duty in the shop.... continuing his memories of his early radio days.

Welcome to the *PW* vintage 'wireless shop' where I now continue my story from where I left off in the April issue, dressed in RAF blue in Ventnor on the Isle of Wight. The episode at Ventnor (and my time in the RAF) was, of course, still in the future at the time I built my first oscilloscope. National Service was, admittedly, a small black cloud on the distant horizon but those of us who would be eligible for it tended to hope that it might be abolished before we reached our 18th birthdays.

The then Liberal Party had announced that if it came to power it would indeed tear up the National Service Act, and multitudes of young men hoped most earnestly that it might triumph if a snap General Election were to be called. It wasn't and the Liberals didn't!

A second method of avoiding the call to duty was to have yourself taken on as an apprentice by your employer. This action brought about a five or seven-year deferment, by the end of which time there would be an even better chance of National Service becoming just history.

In fact, my boss had intimidated to me that he intended to sign me on as an apprentice, and since I was daft enough to believe him I pushed the call-up threat to the back of my mind. In any case, there were lots of better things to think about because in the late 1940s British radio manufacturers were producing some very interesting sets indeed.

In fact, had we known it at the time, we were witnessing a sort of final flowering of the industry before it withered away over the next decade. But that thought never troubled anyone at the time.

All Sizes

Late 1940s sets came in all sizes from tiny to enormous. An idea imported from America was that of 'personal' receivers, small sets that could be carried about and used almost anywhere for private listening.

One of the earliest and, in its way, most ingenious designs was the Romac Handbag set, **Fig. 1**, which

looked just like that with a black body and shoulder strap. The 'works' of the set and the batteries were contained in the body whilst the strap doubled as the aerial - it actually was a length of flat multi-core cable which acted like the frame aerial in conventional portables.

The set's price, however, **was not small** - with purchase tax the set cost £21, or about nine weeks' wages as far as I was concerned. Thus when one of our junior shop assistants began ostentatiously to carry around a Romac it caused the rest of us to harbour deep suspicions.

First, from where or how had he obtained the money to buy it? Secondly, because young men definitely did not carry handbags in those days, was he perhaps of the Bulgarian tendency, as Auberon Waugh used delicately to put it?

Less likely to provoke sideways glances at their owners were the Marconi P17B and Ever-Ready

Model B personal sets. These resembled folding cameras and thus might safely be carried by red-blooded males. The prices, too, sorted the men from the boys since both sets cost around £17.

If it was difficult to tell which set was which of the two brands, that was not surprising, since both of them were produced by Plessey, Ltd. In fact, the latter firm made most of the personal sets sold at the time with the honourable exception of the Vidor CN353.

However, my comments aren't intended to disparage the Plessey offerings because they were, like all that firm's products, well designed and constructed. It was

just that by comparison the Vidor was a little masterpiece, put together like a well-made watch.

As instances, its tiny two-gang tuning condenser was built up by hand, using tiny grub screws. And both the condenser and the volume control were operated via slow-motion drives whose ingenuity and simplicity have never been equalled.

When an example of the Vidor arrived in the showroom we in the service department gazed upon it with awe, but not for long. Within a couple of days of its arrival some light-fingered individual nicked it, and I personally never saw another until earlier this very year, when one turned up at a *Radiophile* Special Auction.

I couldn't resist buying the Vidor for myself and apart from a little corrosion around the l.t. battery holder it's almost as good as when it left the factory. I do hope that it isn't the actual example that

THE ROMAC MODEL 126
"Personal" RECEIVER



The Romac Personal Receiver is an entirely new departure in portable radio. The shoulder strap method of carrying has ingeniously been used to provide an "invisible" aerial. **This convenient feature is exclusive to Romac Models.**

Price £17 3s. 8d. Plus £3 16s. 4d. Purchase Tax
 Complete with 1 H.T. and 2 L.T. Batteries.

Home and Export Enquiries should be directed to
ROMAC RADIO CORPN. LTD.
 THE HYDE · HENDON · LONDON. N.W.9
 Tel. No. : COLindale 5401 (Three lines).

Fig. 1: The Romac Model 126 'Personal' receiver - much admired by Charles Miller over the years, he recently acquired one much to his delight (see text).

disappeared all those years ago, but I can't help wondering...?

Mighty Radiograms

At the other end of the size scale were the mighty radio-gramophones built by Decca, EMI and RGD. These weren't just **big**, they were **colossal**!

When I tell you that our showroom, a converted dance hall, had to be approached via two flights of stairs with an awkward centre landing, and that someone (guess who) usually had to lug such behemoths up from the street below, you'll appreciate that we viewed them with mixed feelings.

Maybe I'd been on holiday when a 'Beau Decca' arrived because I'd not seen it coming. One morning, pounding up those stairs on my way to work, I heard the then familiar sound of *The Dream of Olwen*, a piano-piece used as the theme music for a currently popular film called *Take My Life*.

How on earth, I asked myself, had they contrived to get a piano up into the showroom? I was totally amazed when I found that the sound was in fact coming from the Beau Decca; it was the first and only time I have heard anything so completely life-like.

Certainly the reproduction of RGD's current offering (model 1046G) although it was extremely good, could nowhere near match the Beau Decca's despite costing around £100 more. Of course, the Beau Decca had the advantage of being equipped with the latest Decca moving-coil pick-up, which in conjunction with the Decca 'FFRR' recording system gave astonishingly good quality from 78r.p.m. records over a range from 40c/s (Hz) to 14,000c/s (kHz).

Liked To Boast?

Mind you, if you were of the type who liked to boast of how much you paid for things, the RGD won hands down at over £260. This, by the way, was just double what the firm had charged for its premier model of 1935, which had made it dearer than the contemporary Ford Model C two-door saloon car.

Carrying on the tradition, the 1046G cost more than the Ford 5 hundredweight (254kg) carrying capacity van which might have been used to deliver it to its owner. As it happened, the example in our showroom failed to attract a buyer until our employer, tried desperate measure to get rid of it.

The 1046G was put on show in the window of the retail shop downstairs (guess again who had to carry it) with a notice that its price was to be reduced by £10 a day until someone snapped it up. It had gone down to £180 when it was bought by an executive of a well-known oil company who lived locally in a fabulous Tudor manor house complete with a crystal-clear spring in the cellar which had never been known to dry up in hundreds of years. This we learned when (no prizes for guessing who was involved) we delivered the monster.

For all that, neither the Beau Decca nor the RGD 1046G came anywhere near the HMV Model 1612 for sheer size and price. The biggest set EMI ever made, the 1612 shown in **Fig. 1**, was a mammoth 16-valver with numerous wavebands and motor-driven tuning.

The 1612 weighed in at two and a half hundredweight (127kg) and cost, almost unbelievably, over £400. That was only for the radio, mind you; if you wanted to play records you had to pay a further £32 for the auto-changer unit and sacrifice the sliding drawer which otherwise held glasses ready for post-

prandial chota pegs*!

At a later stage one might be persuaded to fork out even more to have an f.m. adapter fitted, making the final total cost around £500. Mind you, if they had sold radio sets by weight the 1612 would have worked out at half the price of the Vidor CN353, at £1.85 per lb. and £3.50 per lb. respectively.

You certainly got a lot of cabinet for your money. The thing was five feet long, four feet high and would only just pass through a standard 29 inch door!

Incidentally - should anyone wish to snitch on me to our Prime Minister Mr. Blair's thought police for wilfully using Imperial measurements I would be pleased to supply them with a free road map to Sunderland, where they may go jump in the Tyne!

**Note: for those readers who are (unlike Charles) unfamiliar with the habits of the officer class in the former British Colonial Indian Army - a chota peg was usually a well travelled and equally well matured Scotch Whisky! Editor Sahib.*

Losing A Fight!

Only once did I ever had to handle one of these 1612 sets, after losing a fight to get out of the job. The sheer bulk of the 1612 meant that a big van had to be used with a loading deck height of nearly three feet, and my companion and I found ourselves totally unable to lift it that high, even with the aid of the set's owner, a lady of formidable physique.

Fortunately, working nearby was a builder who happened to have by him a device used for moving pre-packed loads of bricks. He happily joined in the fray with an air of "I'll show them how it should be done" about him.

However, once we had manoeuvred the set onto the lifting device, and he'd started to raise it from the ground, he became visibly apprehensive, because the balance was far from perfect and it began to sway alarmingly. Regardless of the lady owner's feelings in the matter I said bluntly that if the set should start to topple our only option would be to make a run for it, since otherwise it would break our legs.

It seemed an age before the perspiring builder jacked the thing up high enough for the rest of us gently to shunt it forward sufficiently to get about four inches of the cabinet onto the deck of the van. From then on we were able to move it an inch or two at a time until all, as the old hymn has it, was safely gathered in, and never were thanks for this achievement uttered more sincerely!

Of course, one problem still remained: the set was going to have to be off-loaded at the end of our return trip. But dear reader you'll not be surprised to hear that I took the easy way out!

Instead of heading back to the workshop I drove directly to the premises of a friend of mine who had a great snorting beast of a diesel-engined fork lift truck. So, amidst billowing clouds of sulphurous exhaust fumes the 1612 was eased out onto a pallet for al fresco examination and for easy re-loading for its next journey. Mercifully, I was spared that experience! *PW*



Fig. 2: The truly mammoth HMV 1612 radiogram. Charles Miller and colleagues did not enjoy delivering these massive units (see text for his full adventures!).

VHF DXER

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

TEL: (01873) 860679

E-MAIL: g4asr@btinternet.com

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

For over a decade I've been trying to explain to readers that there are v.h.f. propagation modes that exist way above the troposphere. However, I'm afraid the message is not getting through to some people!

Putting it simply, there are still operators who think that long distance v.h.f. contacts can only be made when the weather patterns are favourable and high pressure dominates the country. The reason I'm mentioning this is that I recently spoke to a station who informed me that he had worked into Zimbabwe. I thought he meant on the 50MHz band but I was mistaken. He claimed to have achieved this remarkable contact on the 430MHz band whilst operating mobile through a local f.m. voice repeater! To back up his claim he asserted that there was a high pressure weather system extending a long way south of the UK at the time.

I believe that the misunderstanding lies with operators who only use the v.h.f. and u.h.f. bands for local f.m. communication. Occasionally they might hear a station further away on a simplex channel or open up a repeater in another area.

It's true that tropospheric conditions has caused this extension in the working distance but these enhancements are the **only** propagation mode they ever hear. Consequently some operators think that's the 'be all and end all' of v.h.f. communications.

However, if you switch to a weak-signal mode such as c.w. or s.s.b. you'll soon discover that there is life beyond the

troposphere! It's the propagation modes in the ionosphere where the real DX contacts can be made.

Up in the E-layer, at a height of around 100km, there are transitory 'mirrors' that can reflect your v.h.f. signal up to 2000km or further away. This is where you'll find auroral back-scatter (Au), auroral-E (Au-Es), Sporadic-E (Sp-E) and meteor scatter (m.s.) propagation. Even higher, in the F-layer at around 400km, you'll find modes such as trans-equatorial propagation (t.e.p.) and F2-layer propagation

(t.e.p.) into Africa were interspersed with numerous periods of auroral back-scatter propagation enabling contacts to be made over large areas of Europe. On the 144MHz band and higher frequencies there was very little tropospheric propagation reported. However, the ionospheric auroral conditions did have a major impact on the 144 and 430MHz bands and surprisingly on the 1296MHz band.

I'll turn first to your reports regarding t.e.p. on the 50MHz band and then deal with reports detailing the auroral openings during April.

THIS MONTH DAVID BUTLER G4ASR HAS REPORTS OF TRANS-EQUATORIAL PROPAGATION AND AURORAL BACK-SCATTER OPENINGS ON THE VHF BANDS.

that can produce world-wide contacts on the 50MHz band.

So please, next time you hear some long-distance v.h.f. signals don't automatically assume there's a bit of a 'lift' on because it happens to be sunny. The Sun's geomagnetic influences on the ionosphere are infinitely greater than the warming effect on the troposphere.

IONOSPHERIC PROPAGATION

Propagation on the 50MHz band during April was very similar to that which occurred in March. Days of trans-equatorial propagation

There were at least ten days during the period when openings to southern Africa were reported from the UK. Some of these were quite brief but events on April 2, 9 and 13 were very good.

The station of **Jamie Ashford GW7SMV** (Monmouthshire - IO81) reported that the 50MHz band was open at his QTH on and off between 1045-1615UTC on April 2. He mentioned hearing or working the stations of ZS4NS, ZS6AXT, ZS6DX, ZS6JON, ZS6WB, ZS6TWB (beacon) and G0KZG/MM.

Andy Adams G0KZG/MM on board the RRS *Charles Darwin* has been sending me daily reports of his 50MHz activity. He left Southampton in March and arrived in Durban, South Africa on April 12 having sailed via Madeira, Tenerife and Cape Town.

Leaving Durban the RRS *Charles Darwin* sailed via Reunion Island (FR) arriving at Mauritius (3B8) on April 23. The next working area was in the vicinity of Rodriguez Island (3B9) and the Agalega Islands (3B6).

Paul G7KES joined the ship in Durban and helps Andy out with the operating when he can. They are using a Yaesu FT-847 transceiver running 100W on h.f. and the 50MHz band.

The antennas are a Capco loop fitted at the front end of the ship for h.f. and a 5-element F9FT Yagi for 50MHz at the stern of the ship. Both antennas had to be positioned to minimise r.f. interference rather than for good take-off positions.



Fig.1: Hungarian DXer HA6NY worked in the recent aurora on the 144MHz band.

At the time of writing this (April 30) Andy had worked 50 countries and made over 700 contacts on the 50MHz band. During the excellent t.e.p. opening on April 2 GOKZG/MM (JG28) located 545 nautical miles west of Walvis Bay (V5) made 193 QSO's with stations located in England, Guernsey, Wales, Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Italy, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland and Yugoslavia. Phew!

SPARSE ACTIVITY

Unlike Europe, the activity on the 50MHz band in the African continent is very sparse. In many countries there may only be one or two active operators.

For example, V51KC (Namibia), Z2ZJE (Zimbabwe), 7Q7RM (Malawi) and 9J2BO (Zambia). There are more operators in South Africa (ZS) but you're more than likely to work the same half dozen or so active stations such as ZS6AVP, ZS6AXT, ZS6BTE, ZS6PJS, ZS6WB or ZS6XJ.

From the UK the main catchment area during t.e.p. openings is the ZS6 call area in the Transvaal. It's only during the more intense openings that you will normally work other ZS call areas and perhaps some other rare DX morsel. One such opening on April 9 was quite unusual insofar that the only stations worked from central and southern England were V5/ZS4NS and ZS1AGF.

No other African stations were heard during the opening which lasted between 1425-1445UTC. The station of V5/ZS4NS (JG77) was operating from Namibia during a short expedition whereas ZS1AGF (JF96) is located near the Cape of Good Hope, right on the southern tip of the African continent.

One of the best t.e.p. openings during the month occurred on April 13. Although it only lasted for about one hour, from 1320UTC, signals were unbelievably strong. Stations located through much of England and Wales were heard making c.w. and s.s.b. contacts with operators in Mozambique (C9), Namibia and South Africa (ZS1, 4, 5 and 6 call areas).

At my QTH (Herefordshire - IO81) s.s.b. contacts were made with V5/ZS4NS, ZR6ZL, ZS6LU, ZS6PJS, ZS6WB and ZR1AEE (JF96) located in Cape Town at 9740km. **Tony Jones GW4VEQ** (Anglesey - IO73) reported contacts with the stations of C91CF in Mozambique and V5/ZS4NS. At 1350UTC he also contacted A45XR (Sultanate of Oman - LL93) on a really obscure beam-heading. Other notable DX worked on the 50MHz band during the month included the stations of FR1AN and FR1GZ (Reunion Is.) by GJONYG (Jersey - IN89) on April 14 and ZD7MY (St. Helena) at 1710UTC on April 20 by G3FPQ (IO91).

The first glimmer of the summer Sporadic-E (Sp-E) season was detected on April 23 although some stations claimed to have heard an event on the previous day. The confusion was caused by the Lyrids meteor shower which peaked during the morning of April 22. At frequencies as low as 50MHz it doesn't take

much additional ionisation, in this case from a meteor shower, to give the impression of a Sp-E opening.

There were two phases to the Sp-E opening on April 23. The first between 0925-1100UTC and the second between 1730-1800UTC. Both were in the same general direction, the Mediterranean area, and gave contacts for UK stations with operators in Italy (I), Sardinia (ISO), Croatia (9A) and Malta (9H). Some of the contacts included IA5/I2ADN operating from the Archipelago of Tuscany, ISO6QX, 9A3FT and 9H1AW, better known as Alan Wright GW3LDH operating from his holiday home.

CQ AURORA!

Last time around I mentioned the tremendous auroral back-scatter event that occurred on Saturday March 31. The 50, 70 and 144MHz bands were open for over 12 hours during four distinct phases which occurred between the early morning and midnight.

On the 144MHz band c.w. and s.s.b. contacts were made with stations as far afield as Austria (OE), Croatia (9A), Czech Republic (OK), Hungary (HA), Italy (I), Kaliningrad (UA2), Latvia (YL), Lithuania (LY), Poland (SP), Slovakia (OM) and Slovenia (S5). It beats tropo extensions into Belgium, Germany and The Netherlands doesn't it!

One report I missed last time around was a c.w. contact between the stations of G3LTF (IO91) and 9A2SB (JN95). Nothing particularly extraordinary about that except that the 1603km contact was made on the 430MHz band! The station of 9A2SB was only running 100W and a single Yagi apparently.

During April there were numerous auroral openings on the v.h.f. bands. Most were fairly weak but there were two really good events that took place on April 11 and 22. The opening on April 11 commenced in the UK around 1600UTC and continued on and off for over eight hours.

At my QTH I detected the on-set of the aurora almost immediately. Between 1614-1850UTC I made 61 c.w. contacts on the 144MHz band with stations in 16 countries. The following very small selection of contacts should give you a flavour of what can be worked on the 144MHz band when using this exciting ionospheric mode.

Over 30 QSO's were completed with paths in excess of 1000km and amongst these were the stations of HA1BC (1515km), HA6NQ (1680km), HA6NY at 1685km (shown in the QSL card, **Fig. 1**), LY2SA (Lithuania - 1740km) and LY2WR (1790km). Other contacts included HB9DAX, I1DMP, IZ2CPO, LA4YGA, OE3JPC, OE5KE, OK2AB, OZ1DD, SM4IVE, SM5BUZ, SP2CNW, 9A1CAL and 9A2RD.

WORLD FIRST

What was probably the World's first authenticated auroral contact on the 1296MHz band took place during the event on April 11 2001. Incidentally, I've been waiting exactly one Solar Cycle since I first reported a one-way contact 11 years ago between the UK and Hungary.

The stations of SM3AKW (JP92) and SM5QA (JO89) exchanged 33A reports during the c.w. contact which took place at 1650UTC. Signals over the 360km path exhibited a +5kHz doppler shift and sounded quite broad. The antenna equipment at SM3AKW consisted of a 2.3m parabolic dish whereas SM5QA was using a group of four 26-element quadloop Yagis.

Both stations were running 500W output on the 1296MHz band. They had been trying for this unusual contact for many years and are to be congratulated for their tenacity and perseverance.

Another good auroral backscatter opening occurred on Sunday 22 April when the Earth's magnetic field was unsettled following a day of minor storming. The magnetic storm began when the interplanetary magnetic field near our planet turned south, a condition that renders Earth's magnetosphere vulnerable to solar wind gusts.

The Lyrids meteor shower also peaked on April 22 but fortunately the auroral opening started approximately one hour after the Lyrids shower had disappeared below the horizon. The 50, 70 and 144MHz bands were open between 1400-1900UTC enabling many long-distance c.w. and s.s.b. contacts to be made around Europe. On the 144MHz band UK stations were heard making contacts with stations located as far away as Norway, Sweden, Kaliningrad (UA2), Latvia and Lithuania

Colin Smith GM0CLN (Midlothian - IO85) caught the last hour or so of the opening. Running a Trio TR-751E transceiver, a 100W amplifier and 14-element Yagi he made 19 contacts on the 144MHz band. His best DX included the stations of ON4YZ (818km), F6FAI (825km), F5HRY (891km), DK9TF (865km) and DF7OG (951km).

For a change I spent more time tuning around listening rather than staying on one frequency calling CQ. On the 50MHz band my c.w. contacts included the stations of LA6HL (JO28), LA8AV (JO59), OZ0XX (JO54) and OH3XA (KP21) at 1945km. Up on the 144MHz band I found LA2AB (JO59) 1209km, SM1FMT (JO97) 1505km and best DX of the day, RK2FWA (KO04) at 1580km. This station in Kaliningrad was very strong, peaking 59A and was heard to work many UK stations.

DEADLINES

That's it again for another month. We're now at the peak of the Sporadic-E season so I hope to receive many reports regarding the wonderful DX you've been working on the v.h.f. bands. Please forward your reports, comments or photographs to the address and by the date given at the top of the column.

Thanks for your letters and good luck with the DX See you again next month.

73, David G4ASR

HF HIGHLIGHTS

CARL MASON GW0VSW

12 LLWYN-Y-BRYN
CRYMLYN PARC
SKEWEN
WEST GLAMORGAN SA10 6DZ

Tel: (01792) 817321 E-MAIL: carl@gw0vsw.freemove.co.uk

REPORTS, INFORMATION AND PHOTOGRAPHS TO ME PLEASE BY THE 15TH OF EACH MONTH.

This month I spent a few days onboard HMS *Belfast* in London operating **GB2RN** with fellow members of the Royal Naval Amateur Radio Society. Members travel from far and wide to take part in this annual event.

During Easter week, the Bridge Wireless Office (BWO) is the scene of much activity and it is not unusual to find all four operating positions in use at the same time. Visiting members included **Jurgen HB9ANE**, **Roger ON6WR**, **Harm PA3CTK**, **Ian VE2DOH** and **Colin GM6HGW** the 'Master of Magical Mirth' who entertained our group with some of his illusions.

Visitors from all over the world were able to see first hand Amateur Radio in operation under the watchful eye of London Group chairman **Bob Wilson G0FEK**. The BWO as you would expect, is full of equipment, with many of the original receivers and transmitters in working order.

The Amateur station includes the Yaesu FT-726, 847 and 990 alongside a Kenwood TS-870. As a first class example of a Second World War warship, *Belfast* is well worth a visit. Further information on the RNARS can be found at www.rnars.org.uk and for HMS *Belfast* try www.hmsbelfast.org.uk

DX NEWS

On now to some DX news now starting with **Pierre HB9AMO** who will be in the Democratic

Republic of Congo. He will be operating as **9Q5BQ** and plans to stay until July. Pierre has already been worked with c.w. on 18 and 24MHz between 1400 and 1800UTC.

Those of you who need to work the Solomon Islands should have a listen on 24MHz where **Bernard H44MS** has been very active lately. Look for him between 24.937 and 24.955MHz around 1000UTC.

My holidays are coming and I will be on

PROPAGATION REPORT

Mixed band conditions again this month according to **Don McLean G3NOF** in Yeovil, Somerset who say's "At the time of writing band conditions have been very good one minute and extremely poor the next. Often what appears to be a dead band would have good DX on it with very few takers! 28MHz was particularly strange, often open in the early evening while 18 to 24MHz had faded

CARL MASON GW0VSW PRESENTS A BUMPER BACKED EDITION THANKS TO YOUR REPORTS AND ENTHUSIASTIC OPERATING THIS MONTH.

the island of **Rhodes EU-001** operating as **SV5/GW0VSW** between 16 and 30 June. The rig will be an IC706 with dipole antennas. Activity, family permitting, will be mainly c.w. on all bands 7 – 28MHz around 0500 and 1600UTC.

A Danish special event station **OZ2OOI** will be operating until the end of the year on all bands celebrating the clubs 70th anniversary. A special numbered QSL card will be issued to those who work the station or send in a short wave listeners report. Please QSL via the bureau or direct to **POB 351, DK-8900 Randers, Denmark**.

out. Good openings to pacific areas over the North Pole were heard between 0800 and 1000UTC especially on 14 and 18MHz".

YOUR REPORTS

By far the largest log received so far is that of **Roy Walker G0TAK** in Cleveleys near Blackpool, who has been extremely busy on all bands this month. On 7MHz using a QRP Plus, 5W or less of c.w. and a MFJ1621 antenna Roy worked **PA2WJZ** (Netherlands), **GW0MYQ** (Wales), **G/OM2NW/P** on holiday in London and **GH0STH** (Jersey) between 1000 and 1230UTC.

A little later on were **DL7UX/P** (Germany) 2040, **RX3AMG** (European Russia) 2216, **OK1NR** (Czech Republic) 2237 and **OZ1EQC** (Denmark) at 2326UTC. One s.s.b. contact was made with **EI9FN** (Ireland) at 1104 UTC using just 1.5W!

THE 14MHZ BAND

On to 14MHz now and welcome to new reporter **Paul Morrison G0VHT** in Bromsgrove, Worcestershire. Paul has been enjoying PSK31 using just 2W QRP for a few weeks now and say's "I have recently made an internal low power modification to my TS-50S and have been having a whale of a time using PSK31.

Paul continues "The antenna is an 'invisible' inverted V antenna with the wire elements laid over the tiles of my roof. No

● Carl GW0VSW spent some time on HMS *Belfast* this month operating **GB2RN** with fellow members of the RNARS.



complaints from my neighbours! I have been amazed at the results that can be achieved from what can only be described as a 'challenged' operating position. The mode has taken a little time to grips with but is proving very addictive".

Paul's best contacts this month include 4Z5AO (Israel) 2120, RU3AT (European Russia) 2205 and K4FAZ in Huntsville, Alabama at 2321UTC. Glad you're enjoying the new mode Paul and look forward to more reports from you soon.

Another PSK31 user is **Robin Trebilcock GW3ZCF** in Bishopston, near Swansea, who operated in the evening and worked VU2ATN (India) 1835, A45XR (Oman) 2043, JA3KM (Japan) 2113, JW4WJ (Svalbard) 2258, HS0ZBS (Saudi Arabia) 2237 and 9Y4NED (Trinidad) at 0029UTC using his IC775 and 50W into a 40 metre horizontal loop. Robin also logged FM5GU (Martinique) 0005, A61AJ (United Arab Emirates) 0018 and P40A (Aruba) at 0022 using s.s.b. and 100W in conditions described as "Quite good" despite some massive solar events which wiped out the band on several occasions!

Mike Baker G3SUK in Stowmarket, Suffolk, spent a week in the Mull of Kintyre, Scotland operating as GM3SUK/mobile. Over 300 stations were worked including one, who knew the location, and insisted on singing the well known song by Paul McCartney. All this in the middle of a pile-up!

Using s.s.b. and 60W to a whip on the car roof Mike worked LX1GA/M (Luxemburg), PA3CWQ (Netherlands), OY4TN (Faroe Islands), OH3GZ (Finland), SV9CVY (Crete), 4Z5GV (Israel) and 5Z4FZ (Kenya) between 0945 and 1845UTC. Nice going Mike. I'm glad you enjoyed the week.

THE 18 & 21MHz BANDS

Not so many of you worked on 18MHz this month judging by your reports. One reporter who did was **William Sampson M5WNS**, Chudleigh, Devon who found this band much better in the evenings around 2000UTC. Using s.s.b. countries worked included CP6XE (Bolivia), HI9/DL7DF (Dominican Republic), DS5USH (South Korea) and JH4FEB (Japan).

The Ten Tec Omni 5 and HF6 vertical of **Ted Trowell G2HKU** were working hard on 21MHz. Highlights included ZL6QH (New Zealand), VQ9VK (Chagos), BA0AA (China), VU2TMP (India), HL1CG (South Korea) and JX8XM (Jan Mayen) all with 70W of c.w. between 1300 and 1700UTC.

Also on 21MHz was Don G3NOF who used s.s.b. from a TS-950 and trapped dipole antenna to reach ZD7K (St Helena) 0930, 3W2DF (Vietnam) 1553, OX3LG (Greenland) 1615, HH2SJR (Haiti), AL0E (Alaska) 1833 and KG4IZ (Guantanamo Bay) at 2035UTC.

THE 24 & 28MHz BANDS

On 24MHz William M5WNS worked PJ6/PA3GIO/M (St. Maarten) 1913 and ZD8K (Ascension Island) at 1913UTC. The rig was an FT-1000MP with 100W into a G5RV.

Also operating on 24MHz, using an FT-1000MP, 100W of c.w. and 4-element Mosley

beam was **Brian Parsons GW0KZK**, Skewen. Brian lists EL1DA (Liberia), KC1XX (U.S.A.), LU1VM (Argentina) and PP5JD (Brazil) amongst his contacts between 1230 and 1525UTC.

Over to Northern Ireland now and **Peter Lowrie M15JYK** who managed some weekend operating on 28MHz using his FT-101ZD and 5W of s.s.b. to a dipole antenna. Between 1035 and 1400UTC Peter worked 5B4KH (Cyprus), E4/OE1GZA (Palestine) and EA9PD (Ceuta & Malilla).

It's a while since **Jon Wheeler G0IUE**, Melksham, Wiltshire has been able to operate. A new addition to the family in December has meant Amateur Radio has taken a 'back seat' over the past few months. However, during a rare evening operating YY5ACM (Venezuela) was logged at 1833UTC using s.s.b. followed by VP9KK (Bermuda) 1820 and EA8AGQ at 1944 on f.m.. Glad to hear Matthew is doing well Jon.

Finally to **Brian Waddell GM4XQJ**, Laurieston, Falkirk. Brian used his Ten-Tec Argonaut and 5W c.w. into a 3-element tri-bander to work JT1BH (Mongolia), BQ9P (Taiwan) and CX3EU (Uruguay) around 1030UTC. This was followed a little later by P49V (Aruba) at 1500 and ZA1BA (Albania) at 1630UTC. The only s.s.b. contact was YB0ABB (Indonesia) at 1539UTC.

QSL CORNER

Here is this month's list of QSL information which I hope you are all finding useful?

7X2RO via OM3GCN, 9G5MD via F5VCR, DA61AQ via N1DG, AX8AV via UA9XC, CO8CY, CX2AQ, CX5AO and CE2LZR via EA5KB, CT9L via DJ6QT, ED5MUC via EA5VM, FK8GJ via F6CXJ, H44AA via POB G-11, Honiara, Solomon Islands, H44MS via DL2GAC, J79WW via N4USA, OT1H via ON4ACT, T15BX/8 via T14JHQ, VP6CW via ZL3CW, YW4M via W4SO.

SIGNING OFF

Most of our reporters have been describing unusual conditions on the high frequency bands in their reports. The largest sunspot in 10 years was crossing the sun's surface this month. Called AR9393 this fast growing spot was already 13 times the size of Earth!

An eruption near AR9393 hurled a coronal mass towards us with forecasters estimating a 15 to 25% chance of severe geomagnetic storms. No wonder the bands were effected. If you would like more information and updates on this check out the website

www.spaceweather.com

There was a lot to fit in this month but I think I just about made it. Many thanks to all our h.f.. reporters. They have all shown that DX can still be worked, whatever the band conditions! My thanks also to **Bernie McClenny W3UR** and *The Weekly DX* and **Tedd Mirlotta KB8NW** and the *OPDX Bulletin* for the DX information.

73, Carl G7W0VSW

PW LISTENING & OPERATING WATCH LIST. (ALL TIMES UTC)

Sean Gilbert G4UCJ operates most days around 0700-1100 and 2200-0200 on all bands using an IC-746 and 50W into a half-size G5RV, WARC inverted vee or HF6 vertical.

Rob Mannion G3FXD listens and operates weekdays and weekends, 1800-1830 on 3.7MHz with 100W s.s.b. and 3.530 or 3.560kHz and 18.105KHz QRP c.w. using an Alinco DX-70 transceiver and a long wire or mobile whips.

Carl Mason GW0VSW listens and operates on 14060 and 21060 most evenings at 1800 with a Ten Tec Argonaut 2 and inverted G5RV.

Don McLean G3NOF operates 1030 Saturdays on 3.685KHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net on 3.665kHz using a Kenwood TS-950 and trapped dipole antenna.

Leighton Smart GW0LBI operates on some weekdays and Sunday mornings on 28.555KHz s.s.b. regardless of conditions, at 1030 using a President Lincoln transceiver with 20W to a 11m half-wave vertical.

Brian Williams GW0GHF operates most afternoons around 1400. He also simultaneously monitors 70.200KHz s.s.b. and 51.510kHz n.b.f.m. at this time and is looking for weekly skeds especially on 70MHz. Contact Brian, QTHR.

George Woods G3LPT operates an open net on 29.630kHz n.b.f.m. 0930 Tuesday to Friday.

Jon Wheeler G0IUE monitors 29.600kHz n.b.f.m. every evening between 1730 and 2230 regardless of conditions using a Yaesu FT-920 transceiver running 100W and 2-element tri-band beam.

Brian Parsons GW0KZK listens and operates on 14.250kHz 1000-12000 and 7075KHz 1400-1600 most days using an Yeasu FT-1000MP and 100W into a 4-element Mosely beam.

Trader's Table

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 IC706 HF/6M/2M TRANSCEIVER	£525
ICOM IC751 FM HF TRANSCEIVER	£395
YAESU FT920 HF TRANSCEIVER	£795
KENWOOD TS870S TCVR USED RX ONLY	£995
KENWOOD TS 830S TRANSCEIVER	£395
KENWOOD TS 520 TRANSCEIVER	£195
KENWOOD TS 850S TRANSCEIVER	£695
ATLAS 110 HF TCVR MINT CONDITION	£255
KENWOOD TS700S ALL MODE VHF TCVR	£295
KENWOOD TS700G ALL MODE VHF TCVR	£195
KENWOOD TRIO TR9130 VHF	£285
ICOM IC28 VHF FM TRANSCEIVER	£125
YAESU FT290R Mk1 VHF MULTIMODE	£135
YAESU FT8000R MOBILE VHF/UHF	£725
YAESU FT708R UHF 70cm HANDIE	£65
KENWOOD TR7800 VHF FM TRANSCEIVER	£125
ALINCO DJ120 VHF HANDIE WITH S/MIC	£85
KENWOOD TH205 VHF HANDIE	£85
KENWOOD TR8400 UHF/FM TCVR	£85
AKD 2001 VHF TRANSCEIVER	£95
ICOM U16 UHF THE ENGINEERS RADIO	£95
YAESU VX100 MARINE TRANSCEIVER	£135
NAVICO MARINE VHF TRANSCEIVER	£85
SEALINE MARINE VHF TRANSCEIVER	£75

RECEIVERS and SCANNERS

ICOM R70 HF RECEIVER	£295
ICOM R72 HF RECEIVER	£325
ICOM R71 HF RECEIVER	£385
NRD JRC 535 HF RECEIVER	£495
NRD JRC 345 HF RECEIVER	£295
YAESU FRG 7700 HF RECEIVER	£175
YAESU FRG8000 HF RCVR with VHF	£250
AOR 3000A WIDE BAND RECEIVER	£495
YUPITERU MVT7100 WIDE BAND RCVR	£165
AOR AR8200 H/H WIDE BAND RCVR	£225
RACAL RA17 HF RECEIVER MINT	£295
REALISTIC DX394 SHORTWAVE RECEIVER	£80
ROBERTS R861 VHF/SW PORTABLE	£125
SANGEAN AT909 VHF/SW PORTABLE	£99
OPTO R10 INTERCEPTOR N/F RECEIVER	£135
PRO 2006 BASE VHF/UHF SCANNER	£125
MAYCOM AR108 AIR/MARINE SCANNER	£45
LOWE LX10 VHF MARINE HANDIE RX	£45
2 ONLY HITACHI WORLDSPACE RADIOS	
EX DEMO/NEW BOXED 12 MONTH G/TEE	£79

ACCESSORIES

KENWOOD SP30 SPEAKER	£65
KENWOOD AT230 HF ATU	£135
YAESU FT102 HF ATU	£135
YAESU FP 707 SPEAKER POWER SUPPLY	£85
GPO TELEGRAPH KEY	£45
DIAWA SW110A SWR/PWR METER	£35
DIAWA 620 1.5-200MHz SWR/PWR METER	£35
DIAWA CL65 HF ATU 300 WATT	£65
HANSEN W205 VHF/UHF SWR/PWR MTR	£25
KANTRONICS KPC3 PACKET MODEM	£99
YAESU FR1700 HF ATU for 7700/8800	£49
YAESU FRV7700VHF CONVERTER	£49
SEM TRANSMATCH ANTENNA TUNER	£85
DC1435-10C UHF BANDPASS FILTER	£75
AEA MICROREADER	£65
DATONG D70 MORSE TUTOR	£45
DATONG FL2 AUDIO FILTER UNIT	£65
DATONG FL3 AUDIO FILTER UNIT	£85

Call for our latest Second Hand Items or visit our Website www.shortwave.co.uk

NEVADA

023-9231 3090

ADI AR446 70CM FM TRANSCEIVER	£129
AKD 2001 2M FM TRANSCEIVER	£125
ALINCO ALM-203E + ACC 2M MTR HANDHELD TRANSCEIVER	£75
ALINCO DR-430E 70CM MOBILE TRANSCEIVER	£169
ALINCO DR510E 2M/70CMS MOBILE TRANSCEIVER	£179
ALINCO DR-M06 6M 10W MOBILE TRANSCEIVER	£149
ICOM IC-2100H 2M FM MOBILE TRANSCEIVER	£159
ICOM IC-2500E 70/23CM MOBILE TRANSCEIVER	£329
KENWOOD TH-79E 2M/70CM HANDHELD TRANSCEIVER	£159
KENWOOD TH-D7E 2M/70CM HANDHELD + TNC	£169
KENWOOD TM-231E 2M FM MOBILE TRANSCEIVER	£139
NAVICO AMR1000S 2M MOBILE TRANSCEIVER	£75
PALSTAR KH-6 6M HANDHELD TRANSCEIVER	£59
STANDARD C-8900 2MTR MOBILE TRANSCEIVER	£159
TRIO TR751E 2M MULTIMODE TRANSCEIVER	£325
YAESU FT2200 2M MOBILE TRANSCEIVER	£139
YAESU FT221R 2M MULTIMODE BASE	£199
YAESU FT-225RD 2M MULTIMODE BASE	£359
YAESU FT-41+ ACC 2M HANDI TRANSCEIVER	£125
YAESU FT411 2M HANDI TRANSCEIVER	£125
YAESU FT5100 2M/70CM MOBILE TRANSCEIVER	£269
YAESU FT736R 6M/2M/70/23CM BASE TRANSCEIVER	£999
YAESU FTL204 VHF PMR TRANSCEIVER	£75
YAESU VX-5R+SU1 6M-70CM HANDHELD TRANSCEIVER	£229
YAESU VXM-100 25W MARINE MOBILE TRANSCEIVER	£159
BEARCAT UBC9000XLT BASE SCANNING RECEIVER	£199
COMTEL COM 510 HAND HELD SCANNER	£139
YUPITERU MVT-7100 HANDHELD SCANNER	£169
GRUNDIG SATELLIT 800 MULTI-BAND RADIO RECEIVER	£399
GRUNDIG YB-400 SHORTWAVE RECEIVER	£79
ICOM IC-R72 HF RECEIVER	£399
LOWE HF-150 HF RECEIVER	£199
REALISTIC DX-302 SHORTWAVE RECEIVER	£69.95
SONY ICF-2001 SHORTWAVE RECEIVER	£75
ICOM IC-725 HF 100 WATT TRANSCEIVER	£395
ICOM IC-765 100W HF TRANSCEIVER	£899
KENWOOD TS-440SAT 100 HF TRANSCEIVER	£399
KENWOOD TS-850SAT 100W HF TRANSCEIVER	£699
YAESU FT1000 200W HF TRANSCEIVER	£1295
YAESU FT-77 100W HF TRANSCEIVER	£299
AEA PK-12 1200 BAUD PACKET TNC	£79
AMDAT ADC-60 FREQUENCY STANDARD CLOCK	£99
DATONG PC-1 HF CONVERTER	£59
DEWBURY SUPA-TUTA+ MORSE TUTOR	£39
HIMOUND BK100 BUG KEY	£49
HIMOUND HK-802 BRASS HAND KEY	£49
ICOM PS55 POWER SUPPLY	£125
KENWOOD DRU3 VOICE RECORDER TS-870	£69
KENWOOD MC-85 BASE MICROPHONE	£69
KENWOOD PS-52 BASE POWER SUPPLY	£145
KENWOOD SO-2 TCXO UNIT FOR TS950	£65
KENWOOD VS2 VOICE BOARD	£40
M W MODS MM4001KB MWMODS RTTY RX/TX INC KB	£49
MFJ-784B DSP FILTER	£149
MWM MMT 432/144 2M-70CM TRANSVERTER	£59
PALSTAR AT-300 HF ANTENNA TUNER	£69
PC LEADS FOR AR8200	£35
SWAN WM6200 50-150 POWER/SWR METER	£30
SYMEK TNC24+RF UNIT 9K6 TNC+10W UHF MOBILE	£179
TIMESWAVE DSP-59+ DSP FILTER	£249
TOKYO HL100B/21-28 100W AMP 21-28MHZ	£129
TOKYO HL-700B HF 600 W LINEAR AMP	£595
TOKYO HX-240 2M-HF TRANSVERTER	£99
TONO Q-550 DATA TERMINAL	£125
YAESU FC-1000 AUTO ATU FT757 ETC	£189
YAESU HF232C VAN COMPUTER INTERFACE (FT736)	£79

SOUTH EAST COMMUNICATIONS

00353 51 871278

STATION ACCESSORIES

Watson 25amp PSU with twin meters	£79
Diamond SX100 SWR/PWR meter 3kw	£65
Uniden 360 laser radar speed detector	£99
Garmin GPS3 road map as new	£249
Revox WS40 2m/70cm SWR/PWR meter	£49
MFJ949E 300watt tuner + dummyload	£119
Keypad for HF225 or Lowe HF150	£29
Pakrat PK232MBX multimode decoder	£149
Kenwood SP-31 matching speaker TS85 etc	£69
Kenwood CW filters YK-88CN-1 also YK-88CN-1 each	£45
Yaesu G-5500 azalea rotator boxed new	£399

VHF/UHF TRANSCEIVERS

Yaesu FT2600 60w 2m mobile as new	£169
Uniden Marine VHF h/h inc nicads new	£119
Alinco DJG5 2m/70cm hand held dual display	£189
Yaesu VXSX 62/70cm handheld 5 watt	£199
ICOM IC281H 2m/70cm multimode base station work phase 3D	£699
Yaesu FT50R 2m/70cm hand held	£139
Kenwood TH711E 2m multimode base 25watts	£499
Kenwood TM-25SE 45watt 2m multimode	£399
Kenwood TH-G71E 2m/70cm with Kenwood mic	£169
Rexon RL-102 2m hand held wide RX/TX	£69
ICOM IC275H 100watt multimode 2 meter	£599
ICOM IC280H colour display and remote kit	£299
Kenwood TM241E 50watt 2m mobile new	£149

HF TRANSCEIVERS

Yaesu FT890 auto ATU 0-30mhz all mode	£599
ICOM IC706 mk11 HF+6M+2M all mode	£599
Yaesu FT100 HF+6M+2M-70CM DSP etc	£799
Yaesu FT920 HF+50mhz auto ATU DSP etc	£899
President Lincoln 10m Amateur transceiver new	£199
Kenwood TSS0S 100watt all mode mobile HF rig	£399
Kenwood TSS0SAT auto tuner filters etc	£799
ICOM IC738 auto ATU 100watt all mode mint	£699
ICOM IC728 0-30mhz all mode mint	£399

SHORTWAVE RECEIVERS

AOR 7030 0-30mhz remote control	£499
Yaesu FRG100 0-30mhz boxed and mint	£299
Target HF-3 shortwave RX 0-30mhz AM/SSB	£109
JRC NRDS45 with VHF converter 0-2000mhz	£999
JRC NVA 319 matching speaker for NRDS45	£119
Hitachi worldspace satellite RX for radio stations	£99
Lowe HF225 0-30mhz boxed PSU mint	£249
Lowe HF150 0-30mhz all mode and mint	£229
JRC NRDS345 0-30mhz all mode new	£399

SCANNERS BASE/MOBILES

AOR 8000A 0-190mhz all mode RX	£199
ICOM IC9000 cost new today £7000 plus, a bargain	£2999
Realistic Pro2014 66-512mhz 30mhz base/mobile	£79
ICOM PCR1000 computer Radio 0-1300mhz mint	£249
Yupiteru MVT7100 0-1650mhz all mode nicads	£179

All prices in Sterling

WATERS & STANTON

01702 206835

HF TRANSCEIVERS

ICOM IC-725 Base Transceiver with Gen.Cov. 100W 12V	£399
ICOM IC-730 Base Transceiver with Gen.Cov. 100W 12V	£449
Kenwood TS-430S Base Transceiver with Gen.Cov. 12V + MC-60E399	
Kenwood TS-430S Base Transceiver with Gen.Cov. 12V + MC-80E399	
Kenwood TS-440S Base Transceiver with Gen.Cov. 12V	£449
Ten-Tec Scout 555 "Mobile CW/SSB 50W with 10.20.40.80m"	£399
SGC SG-2020 "QRP Transceiver SSB,CW 20W 12V"	£485
Yaesu FT-767GX "HF,6m,2m All Mode with Gen.Cov. Main"	£649

VHF/UHF BASE/MOBILE TRANSCEIVER

AKD 2001 2m FM Mobile Channelised 25W	£145
Alinco DR-430E 70cm FM Mobile 35W	£169
Alinco DR-M06DX 6m FM Mobile 35W	£175
Kenwood TM-241E "2m FM Mobile 50, 10, 5W"	£195
Kenwood TS-711E 2m All Mode Base Transceiver 25W mains	£495
Kenwood TS-811E 70cm All Mode Base Transceiver 25W mains	£495
Yaesu FT-225RD 2m All Mode Base 25W with Muck Mains/12V/449	
Yaesu FT-290R 2m All Mode Portable 2.5W	£159
Yaesu FT-290R II 2m All Mode Portable 2.5W	£249
Yaesu FT-3000M 2m FM Mobile 70W	£249

VHF/UHF HAND HELD TRANSCEIVER

ADI AT-400 70cm FM Battery box 420-465MHz RX	£99
Alinco DJ-120 2m FM H/Held	£85
Alinco DJ-160 2m FM H/Held	£79
Alinco DJ-480 70cm FM H/Held	£99
ICOM IC-25ET 2m FM H/Held	£99
ICOM IC-P4E 70cm FM H/Held	£99
ICOM IC-T7E 2m/70cm FM with wide RX	£199
Trio TH-41E 70cm FM H/Held	£85

SHORTWAVE RECEIVERS

JRC NRD-525 x2 90kHz-34MHz All Mode Receiver 200Ch. Mains	£529
Lowe HF-250 x2 30kHz-30MHz Receiver 12V PC Computable	£325
Singram AT518 Portable Receiver with FM stereo and SSB	£999
Sony ICF-SW77 "Mini Receiver + FM stereo, SSB & "One Touch"	£169
Tatung TMR-7602 Portable Receiver with FM stereo and SSB	£59

SCANNERS BASE/MOBILE

AOR AR-2001 "25-550MHz AM/FM, WFM 20Ch. 12V"	£145
AOR AR-2500 "5-550, 800-1300MHz All Mode Mobile 1984Ch. 12V"	£249
AOR AR-3000A 100kHz-2036MHz All Mode 400Ch. 12V with PSU	£459
Alphavon RD-500VX "10kHz-1750MHz All mode, 13000+ Ch. 12V + PSU"	£599
Realistic Pro-2004 "25-520, 760-1300MHz AM/FM, WFM 300Ch. 1175"	

SCANNERS HAND HELD

ICOM IC-R2 "0.495-130MHz AM/FM+CFM 450Ch."	£109
Netnet Pro-44 "68-88, 108-174, 380-512MHz AM/FM 50Ch."	£59
Opto R-11 30MHz-2GHz FM Nearfield Receiver	£199
RadioShack Pro-60 "30-512, 760-999MHz AM/FM, WFM 200Ch."	£89
Yaesu VR-500 100kHz-1300MHz All Mode Receiver 1000Ch.	£179

STATION ACCESSORIES

AKD WA-120 450MHz VHF Wavemeter	£25
AKD WA-250 210MHz VHF Wavemeter	£25
AKD WA-3 18-92MHz VHF Wavemeter	£39
BNOS CLP-144-100 "2m Linear Amp 10W in, 100W out with Preamp"	£139
BNOS CLX412-10-50 "70cm Linear Amp 10W in, 50W out"	£199
Bremi BR5-31 13.8V 5A Regulated PSU	£15
Datsun ANF CW Automatic Notch Filter	£69
ICS FAX-1 "Weather Fax, NAVTEX, RTTY Decoder"	£125
JPS NTR-1 "x2 DSP Noise Reducer"	£99
Kantronics KPC-3+ Packet TNC + WEFAX	£109
Kent KMK Morse Keyer	£35
Kenwood LF-30A HF 1kW Low Pass Filter	£29
Kenwood MC-85 "Electric Desk Mic with Preamp/Compressor"	£99
Kenwood PS-50 12V 20A Matching PSU	£149
Linear Amp Hunter 750 "HF Linear 100W in, 750W out"	£799
MFJ MFJ-48C Memory Keyer	£89
MFJ MFJ-46B "RTTY/ASCII/CW/AMTOR with Display"	£119
MFJ MFJ-49J Menu Driven Menu Keyer + Keyboard Input	£199
MFJ MFJ-49H Deluxe Morse Keyboard Keyer	£179
MFJ MFJ-90 B 1.8-30MHz 200W ATU	£39
MFJ MFJ-1030B 30MHz Indoor Active SWL Antenna	£65
MFJ MFJ-127B TNC switching interface 8 pin plug	£29
MFJ MFJ-16 0 Theory Tutor (Novice)	£4
Microna 21-522 3-30MHz SWR/PWR/Modulation meter 0-500W	£10
Microset PT-107A 12V Stabilized 7A PSU	£39
M Modules MML-144-30-LS "2m 1-3W in, 30W out Linear with Preamp"	£69
M Modules MML-432-30-L "70cm 1-3W in, 30W out Linear with Preamp"	£120
M Modules MML-432-50-10 "70cm 10-15W in, 50W out Linear with Preamp"	£99
Opto 2600HA 1MHz-2.6GHz Frequency Counter	£299
Opto CD-100 10MHz-1GHz Multi-Counter + Tone Decoder	£299
Opto Micro-RF Pager sized micro RF Detector	£69
Opto Model 40 Scout 10MHz-1.4GHz Freq Counter	£225
Ramsey WGR DSP Audio Filter	£119
Sudelta Bravo Pro CB Base Desk Microphone + Pre-amp	£49
Star Master Memory Keyer	£49
Toto THETA-550 RTTY & CW Decoder + Modulator output	£75
Yaesu FL-7025 70cm clip-on 25W Linear (for FT-700R II)	£119
Yaesu SB-10 Microphone Switch Box + MFJ-1A3B Boom Mic	£25

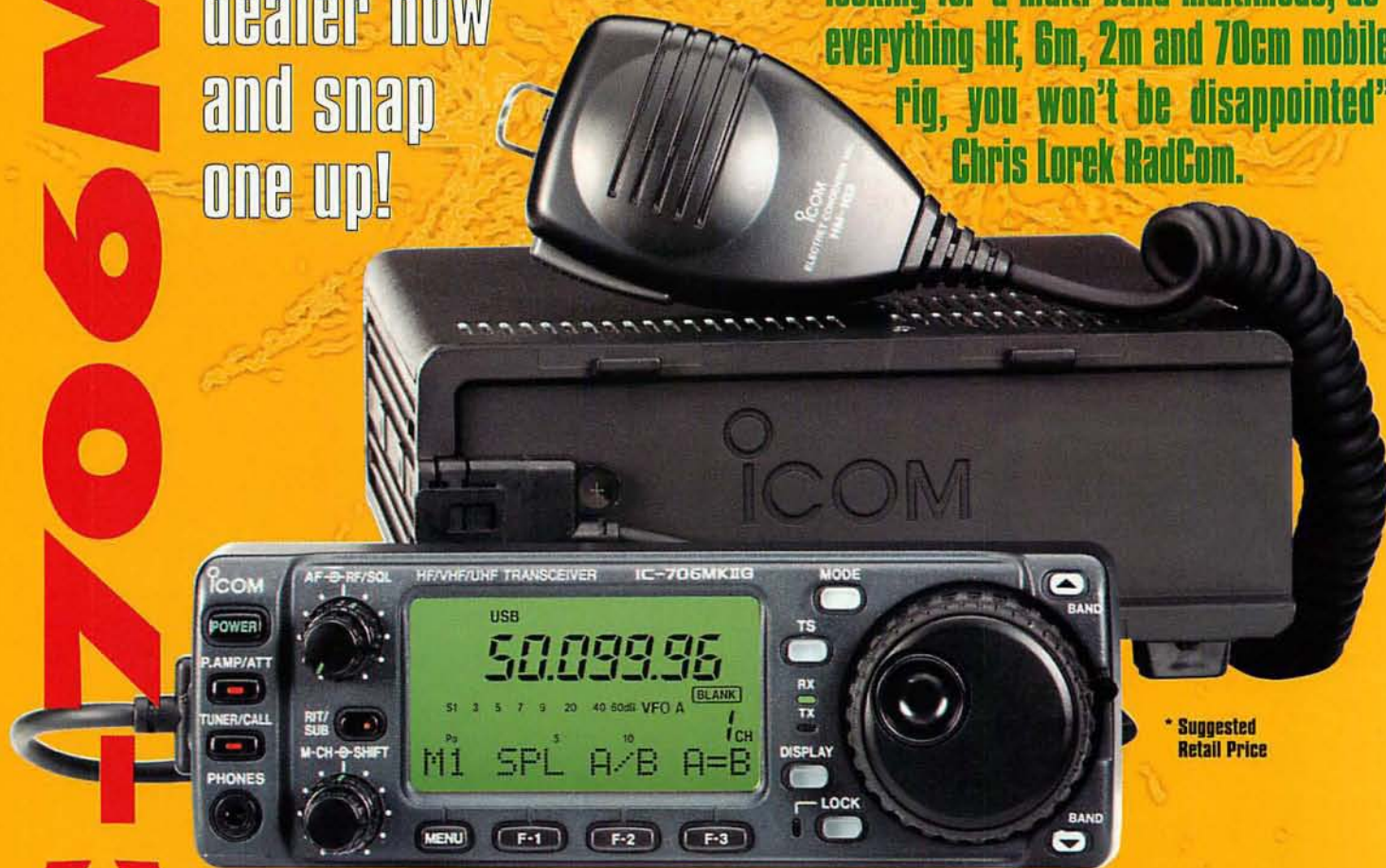
MISCELLANEOUS

Academy WT-2C Pair of 2Ch. FM CB Hand Held Transceivers	£30
Albrecht AE-2850 40ch 4w CEPT Hand Held	£50
Albrecht AE-3260 40Ch. 4W FM CEPT CB Mobile	£45

The Best Just Got Better!

You can now buy a fabulous IC-706MKIIG for **£999.99 SRP!*** Don't hang about, get down to your Icom dealer now and snap one up!

What the Critics say: "Simply the best mobile around" Chris Taylor ML&S. "100% proven performance from this thoroughbred rig" Mark Francis W&S. "It will give most operators everything they would want in one magnificent little unit" Richard Newton PW. "If you're looking for a multi-band multimode, do-everything HF, 6m, 2m and 70cm mobile rig, you won't be disappointed" Chris Lorek RadCom.



* Suggested Retail Price

Improved operation for local and DX use, as a base or mobile • Compact body for flexible installation • UT-106 DSP unit supplied as standard, providing noise reduction and auto-notch functions • Narrow FM is available on ALL bands • Separate call channels for 2m and 70cm • More scan edge channel pairs • and much, much more...

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742. e-mail: info@icomuk.co.uk ...or visit our website at: www.icomuk.co.uk

Count on us!

RADIO WORLD

**42 BROOK LANE, GREAT WYRLEY,
WALSALL, WEST MIDLANDS WS6 6BQ**

E&OE

Tel sales & service: 01922 414796 Fax: 01922 417829



YAESU FT1000 MkV

200W output comes with external supply.

£2799.00



YAESU FT-847

Best selling multiband. 160-6m/100W, 2-70cm/50W, 4m/10W. All mode satellite operation. Base/mobile.

£1199.00



YAESU FT-920AF

HF and 6m base station. Built-in ATU, DSP, 100W outputs, 2 antenna sockets,

large amber display. High-tech front end receiver adopted from the FT-1000MP.

£1099.00



YAESU QUADRA AMP

The amplifier adored through the industry. 1kW, solid state transmit power on HF-500W, 6m, LCD read-out. Price smash.

£3999.00



YAESU FT-8100

Dual band, cross repeat, dual read-out. Detachable front, wide band receive. Packet ready.

£359.00



YAESU VX-1R

The world has never seen a dual-band amateur hand-held transceiver which provides such an incredible small size combined with ultra-wide frequency coverage until now. Weighs just over 4 ounces. 1W output. 10hrs of operation, wide band receive.

£169.00



YAESU FT-1500M

- 50W output power
- Four power levels
- Rugged construction
- Keyboard entry from microphone
- 175

memories • Built-in CTCSS • Smart search
• Wide/narrow deviation select • Packet ready

RWP £219.00



YAESU FT-817

The all new multi-band manpack, 5 watts, multi-mode, transceiver with lithium pack and charger, smaller than the FT-290, but can replace the whole shack!

Radioworld price **£799.00**



YAESU FT-1000MP

Stands alone as a unique flagship to the Yaesu range. truly fabulous HF

base station with DSP, dual receive, Collin's filters and built-in power supply. A must at

£1795.00



YAESU FT-840

HF and mobile base. An absolute joy to use. Excellent front end, 100W, 100 memories.

Easy to use. A bargain at

£569.00



YAESU FT-100D

Yaesu's latest mobile transceiver. HF, VHF, UHF, DSP, TX, RX, built-in CW filter, TCXO & larger speaker. For that tailored transmit audio derived from the FT-1000MP.

£999.00



YAESU FT-90R

The smallest dual bander available. Packed with many features: 50W output, detachable front. The most versatile high power dual bander.

£299.00



YAESU VX-5R

Tri-band transmission. Short wave to microwave reception. 5W output off the lithium battery, spectrum scope, dot matrix, LCD, CTCSS, optional barometric pressure sensor.

£265.00



YAESU FT-50R

- 2m/70cm hand-held
- 5W output on 13.8V DC
- CTCSS encode/1750Hz tone
- 25/12.5kHz steps
- 30 memory channels
- AM airband receive
- Nicad cells and charger.

RWP £199.00

RADIOWORLD SPECIAL OFFERS ON SELECTED USED EQUIPMENT FOR ONE MONTH ONLY!

KENWOOD TS-950SDX

Kenwood top-of-the-range HF
radio with 150 watt output/
mains/DSP base transceiver.
TS-950SDX from **£1399.00**
TS-950SD from **£999.00**



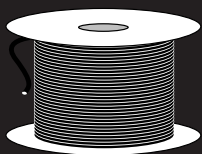
YAESU FT-1000MP

A classic with top Dxr's. Includes
DSP/twin VFOs. A top base radio.
FT-1000MP AC from **£1299.00**
FT-1000MP DC from **£1099.00**



SPECIAL OFFERS ON COAX

RG-8 COAX

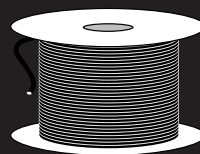


76 meter, 250ft, 50Ω of
American
ULL-RG8 thick heavy duty
coax.
£39.99 per roll including

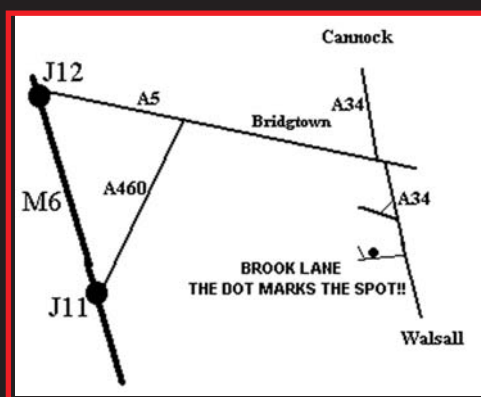
carriage. Boxed ready to ship. Limited
stock. *First come first served.*

ABSOLUTE BARGAIN!!

RG-58 COAX



150 meters, best quality
American coax.
£24.95 per roll
+ £10.00 P&P



KEYBOARD COMMS

BY ROGER COOKE G3LDI

TEL: (01508) 570278

E-MAIL: rcooke@g3ldi.freemove.co.uk

PACKET: G3LDI @ GB7LDI

The International Space Station (ISS) *MIR* has now been delegated to history, with a fiery death over the Pacific Ocean. It had a chequered history, but considering it outlived its original life-span by a number of years and also helped in Space technology, it was an object of pride and an unparalleled success. Amateur Radio was involved with *MIR* over the years, many contacts on voice and data were made with visiting Amateurs, and lots of QSL cards were distributed.

Now the ISS is in orbit, and the first astronauts are on board, Amateur Radio is again involved. It's now commonplace for amateurs to communicate via satellite, either on voice or using the Low Earth Orbiters (LEOs) via data. This can be achieved in two ways.

You can use the satellite indirectly by using a Satellite Gateway; in the UK you have a choice of two, GB7SAT and GB7LDI. Using the REQSAT server, mail to most countries on the planet can be delivered in a respectable time, sometimes comparable or even better than the Internet.

You can also set up a station yourself and contact other such stations direct on the satellite, using the store and forward mailbox facilities. You can also download high definition pictures from UO-36, as described in Keyboard Comms *PW* November 2000.

Cosmonauts Day took place on 12 April, marking several occasions in Space history. These included the 40th anniversary of the first human space flight by Yuri Gagarin, the 30th anniversary of the first space station (*Salyut 1*) and the 20th anniversary of the first launch of the first reusable space vehicle, the space shuttle.

Amateur operation on board the ISS is conducted in duplex mode. Ground stations listen on 145.800MHz. For packet operation you transmit to the ISS on 145.990MHz. For voice operation, you should transmit to the ISS on 144.490MHz.

The gear on board the ISS is generally a hand-held 144MHz transceiver and a PacComm PicoPacket TNC. Unfortunately the back-up battery has failed and the programmed callsign that you should see, RZ3DZR, shows up as NOCALL. This will be fixed as soon as a computer can be spared to hook up the TNC and re-initialise the parameters and insert a callsign.

The digipeater is on though, so you can

use it to send short messages to other Amateurs within the footprint of the ISS. The VIA call to use will depend on whether this problem has been fixed by the time you read this, but bear in mind it could still be NOCALL.

If you need up-to-date sightings and you live near a capital city, look at <http://spaceflight.nasa.gov/realdata/sightings>

If the DCC issue a bulletin outlining the rules, it would save a lot of hassle. A statement in plain English without recourse to the usual legal jargon would be useful. Having said that, it has made use of the network by debating this topic, albeit not seen by most users if sent to Sysop only.

Until we have a backbone network

ROGER COOKE G3LDI KEEPS YOU UP TO DATE WITH THE LATEST DATA COMMS NEWS.

For a description of how to use the ISS packet system go to <http://www.rac.ca/arisspak.htm> or for an introduction, go to <http://www.rac.ca.ariss.htm> (Thanks to the *Australian Amateur Packet Newsletter (AAPRA)* for supplying some of this information).

MAKE UP YOUR MIND

Over the past few weeks, there has been a lot of waffle being passed around on the network, some of it becoming personal in as much that insults have been traded. I must have killed off around 50 messages to sysop, all with the same topic.

Discussions have included sub-section x of paragraph y of section xx of the BR68, plus the legality of whether the sysop will be responsible for the content of these newly allowable messages, and would they be allowed to be forwarded to the next BBS down the line, etc. All this talk over whether Joe Bloggs should be allowed to advertise his FT-900 on the network! With the network falling apart due to migration to the Internet (where you can advertise free and have a circulation of millions, with no petty rules) and we have to argue over something as pathetic as this!

If the RA condones it, so be it, if they don't, then why worry? If the advert stops on my BBS, assuming the adverts are read by 30% of the user base the advertiser will have a circulation of about 10, big deal!

If it's passed around the UK network, you can probably say that it will be read by a maximum of around 1000 and that's being generous. Putting the advert into *Free-ads*, *PW*, *Radcom*, or similar would reach many more.

running at a speed greater than the Internet, we will always be the 'second service'. We need to show that we are committed to having a senior service, but that requires a lot of thought, planning, skill and money.

We need to ask ourselves if it is going to be worth it. Hopefully it will be, but it will also require support from you.

HARD DRIVE TECHNOLOGY

There have been huge improvements in computer technology over the past 20 years, but the hard drive has remained the main storage medium. This technology has been proven, is relatively cheap to produce and can hold far more data than the nearest solid storage equivalent. Value for money has also improved, I remember paying £140 for my first 10Mb hard drive, now you can get a 40Gb drive for less than £100!

Despite an overall improvement in speeds and capacities the basic technology remains the same. A magnetic layer is manipulated by read/write heads to represent the digital 0s and 1s used by computers.

Externally, the drives look somewhat dull, but lifting the lid reveals a complex mechanical beast! All hard drives are made from the same components, platters, a spindle motor, heads and a controller.

DATA PLATTERS

Data is stored in platters. These are round disks, fixed on a spindle. They tend to be made out of an aluminium alloy. But IBM recently deviated from this when it started using glass. A magnetic layer, called the media, is applied

to either side of the platter. Typically, this is a thin coating, only a few microns thick.

The amount of data that the disk is capable of housing is referred to as its Areal Density. This is the number of gigabits per square inch that the media can support. Finally, a protective lubricating layer is applied that protects the drive if any foreign matter, or the drive heads, make contact with the surface.

Organisation of the platters is broken down into tracks and sectors. Tracks are concentric rings that run around the spindle, similar to a tree's rings. Sectors divide the disk into pie-like portions. Using the platter number, the track and sector, it's possible for the disk to find any given piece of data.

SPINDLE MOTOR

The spindle's role is to spin the disks around as fast as possible. As the heads are only capable of moving across tracks, the disk spins sectors around by means of the spindle motor. Its power is represented by rotations per minute (r.p.m.).

Top-of-the-range server drives are usually capable of 10,000r.p.m., although Seagate has developed a 15,000r.p.m. drive. With faster spindle speeds, the drive's performance is improved considerably.

HEADS

For each disk surface, there is one head. The heads are mounted on arms so that they can move across tracks. Sectors only come under the head due to the spinning of the disk.

The heads don't ever make contact with the drive surface. Instead, they are aerodynamically designed to 'fly' just above the surface. This protects the disk's magnetic surface from being wiped off.

It's the job of the head to read the magnetic surface and return the information stored there. While most heads were once magneto-resistive (MR), the current trend is towards Giant Magneto Resistive (GMR). GMR offers greater sensitivity to the magnetic field. This allows data to be squeezed tighter together to improve the Areal Densities of disks, as well as improving performance.

CONTROLLER

Computers store data digitally, while hard drives use magnetic pulses. This involves some kind of conversion when the computer asks the drive to return a file. The controller's job, therefore, is to sit between the physical drive and the computer.

For example, when the computer sends a read request, the controller instructs the drive to where the file is stored and converts the incoming magnetic pulses into a digital format that the computer can understand.

While the hard drive has been around for many years, we are only now experiencing the

technology at its best. The latest drives on the market are capable of holding up to 180Gb of data. Obviously, in an era of multi-media and high bandwidth applications, this will soon seem like a drop in the ocean.

IMPROVEMENT

Improving the capacity of a hard drive is what worries the average user. There are currently two techniques for improving drive capacity; increase the number of platters, or increase the areal density.

Increasing the number of platters requires a bigger case, more heads and a more powerful motor. A more sensible method is to improve the areal density.

Improving areal density affects the performance of the drive and forces the price down, as fewer platters are needed to create higher densities. With higher densities, a better head is needed to distinguish between the tracks and this in itself is a large part of the design of hard drives.

A final consideration is the choice of interface. While all hard drives are built around a common architecture, there are two main types of interface: integrated drive electronics (IDE) and small computer systems interface (SCSI). The IDE finds its place in the home and

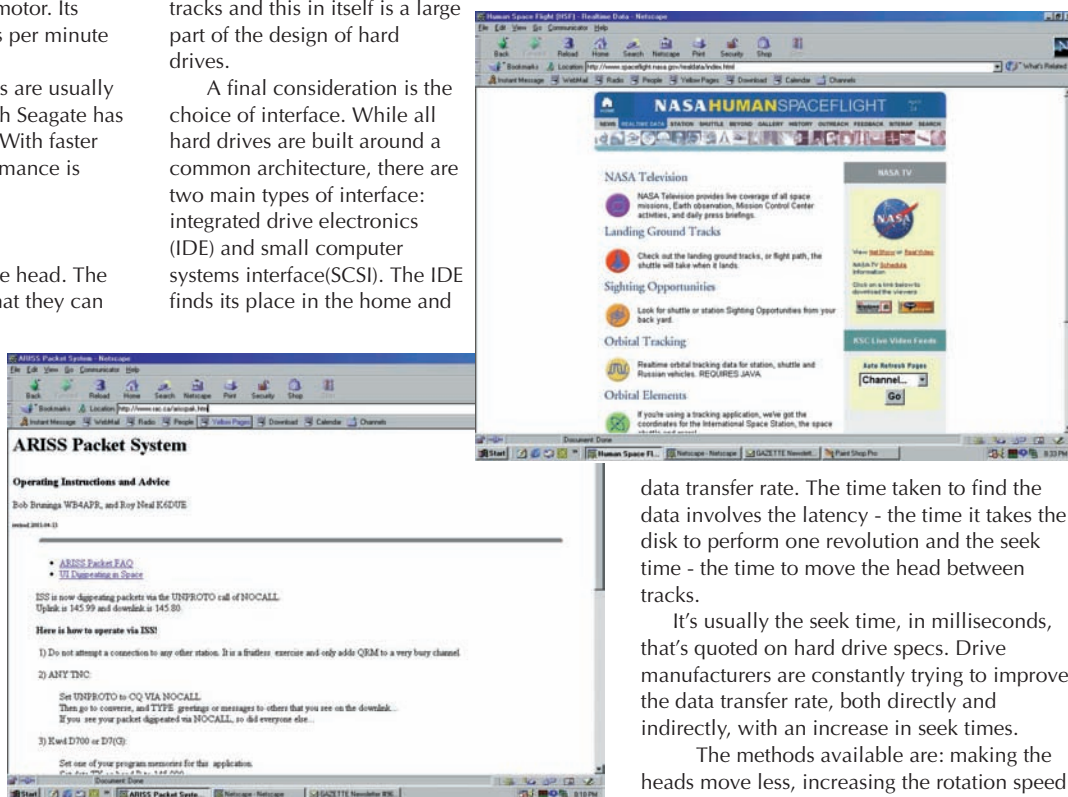
gives a transfer rate of 100Mbps. The alternative is to go for the more technologically advanced SCSI interface.

A SCSI is a parallel interface that supports both internal and external devices. These don't have to be just storage, because devices such as scanners are also supported.

In addition, SCSI, through the use of Ids, can support more than two devices per channel. The initial specification allowed for eight, while the current revision supports sixteen.

The other advantage of SCSI is the speed of the interface. SCSI started out with an 8-bit wide interface, narrow SCSI, capable of sustaining 5MPs. As the standard progressed, the data width became 16-bits wide and the interface can sustain 160Mbps – Ultra160 – with 320Mbps just around the corner.

Performance of hard drives is measured on two fronts: time taken to find the data and the



data transfer rate. The time taken to find the data involves the latency - the time it takes the disk to perform one revolution and the seek time - the time to move the head between tracks.

It's usually the seek time, in milliseconds, that's quoted on hard drive specs. Drive manufacturers are constantly trying to improve the data transfer rate, both directly and indirectly, with an increase in seek times.

The methods available are: making the heads move less, increasing the rotation speed of the platters, or both. Part of this can be achieved with an increased areal density, because this packs the data closer together, meaning the heads need to move less to get to the data.

Other than this, it's a matter of improving the head electronics and the rotation speed of the drives, which isn't easy, as a faster drive will generally use more power and create more heat. Also, once the drive is moving faster, it's harder for the head to spot where the data starts and ends.

My data must end here too, but before I finish, just a reminder about the following contests: 21/22 July: North American RTTY QSO Party; 28/29 July: Russian RTTY WW Contest and 18/19 August: SARTG WW RTTY contest. Cheerio for now.

Roger G3LDT

DX DESTINATION

BY ED TAYLOR G3SQX
C/O PW EDITORIAL OFFICES
ARROWSMITH COURT
STATION APPROACH
BROADSTONE
DORSET BH18 8PW

E-MAIL: g3sqx@email.com

This column is mainly about setting up a station while you're away from base, not so easy at the moment, because Foot and Mouth problems have curtailed portable operation. Nonetheless, there's an ideal opportunity to make plenty of QSOs in July, both for anyone who can get away and also for those who are staying at home. I'm talking about the Islands on the Air (IOTA) contest, organised by the Radio Society of Great Britain (RSGB).

I'm an enthusiast for radio contests, and although you may not be, the IOTA contest is aimed at anyone who likes just going on the air and having some contacts. It's also true to say that some of the leading contesters in the world will be striving to win their sections, but there are always hundreds of smaller stations active, who are just joining in for fun. Some are at home, some are portable, some are hoping to work lots of DX and some are just having a look round for any interesting or unusual operations.

You might say that IOTA is not for you as it's an h.f. event, and you are a Class B licensee. No problem! Just find someone with an h.f. licence, and join forces.

The IOTA contest is specifically designed to be a combination of DXpedition, QSO party and competition. Be sensible about access to farmland, the RSGB's official position is that, this year, "the Society is not supporting 'field day style' operations, and some of the rarer islands are privately owned (e.g. Treshnish, Monachs, etc) and operators should have the owner's permission before landing". So many types of expedition are still permissible in this contest.

● Fig. 1: Web resources for DX Destination readers

The RSGB's Islands on the Air web site
www.rsgbiota.org

Software for the IOTA contest and other events, from EI5DI
www.ei5di.com

Take a DX holiday in Bermuda - VP9GE explains
www.qsl.net/vp9ge

Tips from the Radio Society of Bermuda
www.bermudashorts.bm/rsb

More information about Bermuda
www.bermuda.com/info
www.bermudatourism.org

NO MAN IS AN ISLAND

The idea of IOTA was formulated almost 40 years ago by a British short wavelistener, Geoff Watts, and later taken over by the RSGB. He thought that it would be interesting to encourage activity world-wide, by creating awards for various levels of achievement in contacting stations on different islands. The scheme has worked better than anyone could

continent designator (e.g. EU, AF), and a three-digit number.

Anyone planning to make a special trip for the contest would be advised to check which IOTA Reference is involved, from the *RSGB IOTA Directory*. This publication also contains lots of additional information about the whole IOTA programme and the way it's organised. The IOTA web site is helpful too,

THIS TIME ED G3SQX OFFERS SOME SUGGESTIONS FOR GETTING OUT AND ABOUT, INCLUDING A WEEKEND OF DXING IN THE ISLANDS ON THE AIR CONTEST.

have imagined, with year-round operation from DXpeditions and island chasers.

The IOTA contest came along in the 1990s and it has had the effect of bringing together top contesters and IOTA fans for a concentrated weekend of feverish activity. This year the contest starts on 28 July at 1200UTC, ending at the same time the next day, on the 3.5, 7, 14, 21 and 28MHz bands.

The scoring in the contest is related to the number of IOTA References that you contact, counting separately for each band and mode. To avoid the inclusion of rocks and smaller islands, groups are created and given a reference number. These numbers are allocated by the RSGB's IOTA Committee, and consist of a

look here for the complete rules of the contest, see **Fig. 1**.

BRITISH ISLES

We're in a special position here in the UK, simply because we live on an island. For IOTA purposes, we represent extra value to the other competitors because we have an IOTA Reference, whereas they probably do

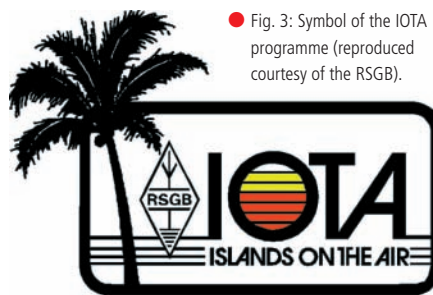
not. We also have the ability to become quite sought after in the contest, by travelling off the mainland. Lots of British Amateurs do this, and you'll hear plenty of strange callsigns and unusual QTHs!

Shown in

Fig. 2 are IOTA references for various parts of the British Isles. A cursory look at this partial list will show that some of these islands are not hard to get to. There are opportunities to set up stations at a friendly guest house or camp site, then become DX for a Day. You will be very popular with the other participants and you'll have a great time yourself!

In fact, there's a special category for amateurs who set up their stations specifically for the contest, and run 100w or less. You can choose to operate either c.w. or 'phone, or both.

A portable h.f. rig with a doublet and a.t.u. will do very well in this category, and the /P callsign and uncommon IOTA



● Fig. 3: Symbol of the IOTA programme (reproduced courtesy of the RSGB).

● Fig. 2: IOTA References around the British Isles

EU-005	Mainland (G, GW, GM)
EU-120	Isle of Wight (G)
EU-011	Scilly Isles (G)
EU-123	Ailsa Craig, Bute, Arran (GM)
EU-012	Shetland (GM)
EU-008	Skye (GM)
EU-009	Orkney (GM)
EU-124	Caldey, Skomer (GW)
EU-115	Ireland (EI, GI)
EU-116	Isle of Man (GD)
EU-114	Guernsey (GU)
EU-013	Jersey (GJ)
EU-121	Arranmore, Dalkey, Bear (EI)

Reference will attract plenty of attention. The IOTA logo, used by many enthusiasts on their QSL cards is shown in **Fig. 3**.

If you're still not convinced to go on the air for a few hours on 28-29 July, here's an offer for anyone who has a computer. **Paul O'Kane EI5DI**, has produced software which will log stations worked in the IOTA contest and check for duplicate contacts, IOTA References, and many other things. It's available free of charge from his web site, see



● Fig. 4: Bermuda and its location in the Atlantic.



● Fig. 5: VP9GE's apartments in Bermuda.

Fig. 1 for details. Surely that must be enough to tempt you get out and about for this interesting event!

FEATURED QTH - BERMUDA

Imagine a great place for a holiday, a good location for Amateur Radio, and an easy flight from the UK. That's Bermuda in a nutshell.

There are some common misconceptions about Bermuda, people think it's in the Caribbean, which is not the case and that it's too expensive for the average Radio Amateur, which it doesn't have to be. Look at the map in **Fig. 4** and you'll see that Bermuda is well separated from the Caribbean islands and is actually in the western part of the North Atlantic.

It's true that Bermuda is an island where the very well-heeled are frequently seen. They stay in accommodation and eat in restaurants which ordinary mortals do not frequent. However, there are many lower-priced places within reach of those without bulging wallets. By using self-catering and shopping where the locals go, you can reduce costs significantly. As far as travel is concerned, there are direct flights from London, which can be quite reasonable in price, if you are prepared to be flexible about the time of year and dates.

Bermuda is self-governing and is one of the few remaining British colonies. This means it has its own parliament, but relies on the UK for defence and foreign policy.

There is a mixture of American and British influences, with a little West Indian flavour. This mixture is illustrated by the fact that traffic drives on the left, but the currency

is dollars and cents. The climate is generally mild, with winters being similar to a good Spring day in England and summers being warmer, but not too oppressive. Rain can fall at any time of year, but it is usually in the form of short-lived showers and the sun soon returns.

Enough of the travelogue! What's the attraction from the radio point of view? As with many other countries having a small amateur population, Bermuda can be considered fairly well sought-after, although by no means rare DX. You will have no trouble finding QSOs, and these can easily develop into pile-ups, if that's what you like.

The most interesting thing about Bermuda is that one of the resident Amateurs, Ed Kelly VP9GE runs some holiday cottages, and welcomes Radio Amateurs to come and stay. Several cottages are suitable for use as shacks and there is plenty of room for antennas. I have operated there during the IOTA contest and had a great time, both on the air, and as a tourist.

Ed is mainly active on h.f. RTTY. Equipment and antennas are available, but if you want to take your own, that's fine.

Ed can help in getting wires over trees. I put up several dipoles around 15 metres high when I was there, in the large (100m long) garden. I had help from VP9GE and his angling skills, he's pretty good at getting fishing line over some useful branches!

YOUR VP9 QTH

I found VP9GE to be an excellent host, who was ready with any help and suggestions that you might need. He will meet you at the airport, and hand over your VP9 licence, which he has already obtained. Then you'll

enjoy the drive along the North Shore to Tarrafal Apartments, shown in **Fig. 5**. Bermuda is not very large, so the journey takes just a few minutes.

If you get tired of radio, just look out at the view of this picturesque island, see **Fig. 6**. You will certainly want to allocate a bit of time to sight-seeing, snorkelling, sunbathing, wining, dining, and so on.

Since no rental cars are available, mopeds and bicycles can be rented by visitors who want to get around Bermuda. This is part of the fun of the holiday for me, but does not appeal to everybody. Fortunately, there is a good bus service, which passes the road at the end of VP9GE's drive.

From the radio point of view, I would recommend VP9 for h.f. operation. On v.h.f. and u.h.f. it is too far away from any other land to be viable, unless you are lucky with openings.

I had hundreds of QSOs on all nine h.f. bands, mostly on c.w.

I found 10-28MHz to be most successful, with particular demand on the newer bands (10, 18 and 24MHz).

On the lower bands, 1.8, 3.5 and 7MHz things were slower. Because of Bermuda's location, there is generally static on these bands, lasting into the evening. The best times were between 2100 and 0600 hours, when it eased off and the problem is reduced considerably during winter. Still, I had many summer-time contacts, even on 1.8MHz, with my 100W reaching Wyoming to the west, and the Czech Republic to the east.

CORRESPONDENCE

My request for information last time received a good response, thank you. I've been reminded to ask those operating temporarily outside their own country to arrange QSL cards.

Please publicise your QSL route and send envelopes to the appropriate bureau. If operating from a club station, make sure the club does not have to deal with your QSLs received, it will cost them money, and your contacts probably won't get the cards they expect.

In the next DX Destination, I'll go into more detail about the organisation of a trip and in particular antennas. You might think that other aspects of a DX holiday are more important, but it is usually the antennas that are most trouble to carry and set up, and are most critical to a successful operation.

I hope to contact you in the IOTA contest this year, I'll be at a DX Destination myself! If you have any notes about a trip that you've made, or have advice for DX holidaymakers or need help, let me know. Write to me at the PW offices or E-mail me. The deadline for the October column is the middle of July.

73, Ed G3S2X

Armstrong Communications

Where the customer really matters!

Visit us on the web at <http://www.armstrong.demon.co.uk>

Phone: 01452 531648 (after 3.15pm weekdays please); or mobile: 0796 744 1113
FAX: 0870 056 1421 or Email: sales@armstrong.demon.co.uk

Wanted! Collins, Drake, Eddystone, Hallicrafters, Hammarlund, National, Rascal, Skanti receivers, transmitters and optional extras. WHY? Must be in good condition both electrically and physically. Worldwide customers waiting to buy. Also wanted: broken, damaged, not working examples of Icom, Kenwood, Yaesu etc. Ring us today!

FOR SALE

HF EQUIPMENT
Drake TR4 line up. Complete with AC-4, DC-3, MN-4 and MS-4 500 Heathkit HW101 Complete with matching PSU 150 Heathkit HW5400 Complete with matching PSU. Rare!.....£250
Eddystone 820 In excellent condition. No Eddystone collection is complete without one!.....£100
Yaesu FT102 In very good order throughout.....£250
Kenwood TS690S In excellent condition. Boxed, manual leads etc.....£550
Kenwood TS850S In nice condition. Boxed, manuals, leads etc.....£675
Kenwood TS850SAT In beautiful condition with ATU fitted.....£725
Kenwood TS940S In excellent order throughout.....£725
Kenwood TS940S In nice condition. A bargain at this price! Be quick.....£550
Rascal RA17 An exceptional example! Almost as new.....£450
Rascal RA17 Various examples, prices from.....£150
Ten-Tec Century 22 50W CW transceiver. SSB receiver inc matching PSU.....£225
Trio JR599 Amateur band receiver. Mint condition.....£75
Trio R2000 HF receiver with optional VHF board fitted.....£225
Trio TS830S Choice of 2 from.....£300
Trio TS830M In almost mint condition. Complete with MC-50 desk mic.....£375
Yaesu FT840 Almost 22 months warranty left on this one! Mint!.....£475

HF AMPLIFIERS
Kenwood TL922 10-80m, 1.2kW output. Reduced!.....£850
Yaesu FLDX2000 10-80m, upto 600W output. Reduced!.....£300
Yaesu FL2500 10-160m, 1kW output. Reduced!.....£400

VHF EQUIPMENT
Plessey repeaters OK for 23cms with manual. Last few.....£250
Motorola repeaters OK for 2m but no conversion info.....£50
Yaesu PTC1044 2 ch. VHF complete with FP-16 PSU. Brand new.....£100
Yaesu FT202 Pair of handies with PA-1 battery saver. New!.....£100
Yaesu FT290R II 2m multi-mode. In nice condition.....£225
Yaesu FT790 70cms multi-mode. Good working order.....£175

ACCESSORIES
Heathkit HM102 2kW HF SWR/PWR meter.....£40
Hansen FS50HP 2kW 1.6-60MHz SWR/PWR meter.....£45
Icom PS15 20A PSU. Nice condition.....£100
Icom PS85 20A PSU. In excellent condition.....£150
Yaesu FV101Z External VFO.....£90
Kenwood VFO240 External VFO. Reduced!.....£90
Tono 550 RITTY terminal.....£35
Yaesu MD100 Desk mic. Almost brand new.....£90

TEST EQUIPMENT
Levitt G200DM RC oscillator. Good working order.....£20
Levitt TM3A MicroVolt meter.....£25

Wanted!! HV components. Transformers, Capacitors, Rectifier stacks etc Complete HV PSU's always sought!

Transmitting valves required. WHY??

Part exchanges always welcome. EASY PAY OPTION AVAILABLE ON REQUEST. WE ARE OPEN 7 DAYS A WEEK TILL LATE

(ANYTIME PHONE MAY BE IN USE AT TIMES). CALLERS BY APPOINTMENT ONLY, PLEASE.

**Armstrong Communications, 44 Armstrong Road,
Barnwood, Gloucester. GL2 0SJ**

Lake Electronics

The Kits with ALL the Bits!

For radio amateurs and short wave listeners

Single-band CW transceivers for 80, 40 or 20m.

Kit £97.80 or £168.00 ready built to order. P&P £4.00

3-band (80, 40, 20m) receiver kit.

£69.50. P&P £4.00

TU4 ATU Built-in highly sensitive SWR meter and Balun.

Kit £68.00 or ready built £88.00. P&P £4.00.

TU3 ATU 1-30MHz, ideal for listeners.

Kit £44.00 or ready built £54.00. P&P £4.00.

TU3-LF ATU 200kHz-30MHz for listening or QRP Tx.

Kit £58.00 or ready built £68.00. P&P £4.00.

PM20 Power Meter 25mW-20W, up to 430MHz.

Kit £22.50 or ready built £35.00. P&P £1.50.

TUA1 SWR Meter very sensitive, 30W.

Kit £20.00 or ready built £32.50. P&P £1.50.

AF2 Audio Filter A sharp 'active' filter for CW.

Kit £16.50 or ready built £26.00. P&P £1.50.

NRF2 Audio Filter Passive Noise Reduction for SSB/AM.

Ready to use £16.50. P&P £1.00.

'Novice' Receivers Medium or Short wave (specify).

'Novice' Crystal Set No soldering required!

'Novice' Amplifier Ideal for use with the above.

All 'NOVICE' kits are £8.00 each. P&P £1.00 for 1, 2 or 3 kits.

CPO5 Code Practice Oscillator An 'easy to build' project.

Kit £16.50 or ready built £25.00. P&P £1.50.

Lake Electronics

7 Middleton Close,
Nuthall, Nottingham NG16 1BX

SSAE for ILLUSTRATED CATALOGUE

Web: www.lake-electronics.co.uk

Telephone

0115-938 2509



HAM RADIO

Europe's No.1!

26th International Amateur Radio Exhibition

29.06.-01.07.2001

Friedrichshafen/Germany

in association with the 52nd DARC
Lake Constance Meeting

..... Europe's leading ham radio event

..... Presenting the best and the latest from the
world of radio, electronics and CB technology

Messe Friedrichshafen (Exhibition Centre)

Friday to Sunday 9 a.m. - 6 p.m.

www.messe-friedrichshafen.de



...with...HAMronic...Electronics...Internet...Computer...

PHONE 0208 684 1166 LANGREX SUPPLIES LTD
FAX 0208 684 3056
DISTRIBUTORS OF ELECTRONIC VALVES
TUBES AND SEMICONDUCTORS AND I.C.S.
1 MAYO ROAD • CROYDON • SURREY CR0 2QP
24 HOUR EXPRESS MAIL ORDER SERVICE ON STOCK ITEMS

AZ31	£ p	KT66 China	10.00	5Z4GT	3.00	6U8A	1.50
CL32	6.00	KT88 China	12.00	6AQ5	2.00	6V6G	10.00
E80CC	15.00	N78	8.00	6AR5	20.00	6V6GT	6.00
E180F	8.50	0A2	3.00	6AS7G	7.50	6X4	3.00
E180F	3.50	0B2	3.00	6AU6GT	4.00	6X5GT	3.00
E180F	20.00	0C3	3.00	6AU6	2.00	12AT7	3.00
EABC80	4.00	0D3	3.00	6AW8A	4.00	12AU7	5.00
EB91	1.50	PCF80	2.00	6B4G	22.00	12AX7	3.00
EBF80	1.50	PCL82	2.00	6BA6	1.50	12AX7A	7.50
EBF89	1.50	PCL85/80S	2.50	6BE6	1.50	12AX7WA	6.00
EBL31	25.00	PCL86	2.50	6BH6	2.00	12BA6	2.00
ECC33	15.00	PD500	6.00	6BQ7A	2.00	12BE6	2.00
ECC35	15.00	PL36	3.00	6BR7	4.00	12BH7A	12.00
ECC81	3.00	PL81	2.00	6BR8	4.00	12BY7A	7.00
ECC82	5.00	PL504	3.00	6BW6	4.00	12DW7	15.00
ECC83	3.00	PL508	3.00	6BW7	3.00	12E1	10.00
ECC85	5.00	PL509/519	10.00	6BX7GT	7.50	13E1	85.00
ECC88	6.00	PL802	4.00	6BZ6	3.00	57ZB	30.00
ECC808	15.00	PY500A	3.00	6C4	2.00	805	45.00
ECC80	1.50	PY800/801	1.50	6CB6A	3.00	807	7.50
ECH35	3.50	QQV02-6	12.00	6CD6G	5.00	811A	10.00
ECH42	3.50	QQV03-10	5.00	6CL6	3.00	812A	55.00
ECH81	3.00	QQV03-20A	10.00	6CG7	7.50	813	27.50
ECL82	5.00	QQV06-40A	12.00	6CH6	3.00	833A	85.00
ECL86	5.00	U19	8.00	6CV4	6.00	866A	20.00
ECL800	25.00	UABC80	1.50	6D05	17.50	872A	30.00
EF37A	3.50	UCH42	5.50	6D06B	10.00	931A	25.00
EF39	2.75	UCL82	2.00	6F6G	6.00	2050A	12.50
EF40	4.00	UCL83	2.00	6FQ7	7.50	5687VVB	6.00
EF86	5.00	UF89	4.00	6GK6	4.00	5751	6.00
EF91	2.00	UL41	12.00	6J5G	6.00	5763	6.00
EF183/4	2.00	UL84	4.00	6J5M	4.00	5814A	5.00
EL33	15.00	UY41	4.00	6J7	3.00	5842	12.00
EL34	5.00	UY85	2.00	6J86A	27.50	6072A	6.00
EL34G	5.00	VR105/20	3.00	6J86C	27.50	6089	6.00
EL36	5.00	VR150/20	3.00	6J86C	27.50	6146B	15.00
EL41	3.50	Z759	10.00	6K6GT	4.00	6201	8.50
EL84	3.00	Z803U	15.00	6L6G	15.00	6336A	35.00
EL95	2.00	ZD21	3.50	6L6GC	17.50	6550A	25.00
EL360	15.00	3B28	12.00	6L6WGB	10.00	6883B	15.00
EL509/519	7.50	4CX250B	45.00	6Q7	3.00	7025	7.50
EM34	25.00	SR4GY	7.50	6SA7	3.00	7027A	25.00
EM81A/7	5.00	SU4G	10.00	6SC7	3.00	7390	25.00
EN91	7.50	SU4GB	10.00	6SG7	3.00	751A	15.00
EZ80/81	5.00	SV4G	5.00	6S7J	3.00	7586	15.00
GZ32	8.50	SY3GT	2.50	6SK7	3.00	7587	20.00
GZ33/37	15.00	SZ3	5.00	6SL7GT	5.00		
KT61	15.00	SZ4G	6.00	6SN7GT	7.50		

OPEN TO CALLERS MON - FRI 9AM - 4PM. CLOSED SATURDAY.

This is a selection from our stock of over 6000 types. Please enquire for types not listed. Obsolete items are our speciality. Valves are new mainly original British or American brands. Terms CWO/ min order £10 for credit cards.



P&P 1-3 valves £2.00. 4 - 6 valves £3.00. Add 17.5% VAT to total including P&P.

E-mail: langrex@aol.com



TUNE-IN

TOM WALTERS

P.O. BOX 4440

WALTON

ESSEX

CO14 8BX

E-mail: tom.walters@aib.org.uk



Where do you listen to international radio? In the living room? In a bedroom/bedsit? On the move; in the privacy of your own shack? Overseas? In the office? And how do you listen? Radio, satellite, rebroadcast, internet?

I only ask, because that haunting statement that just won't go away - that the internet is the way of radio life in the future - is still with us. No apologies for coming back to it once more, in the light of the news in my previous column that **Swiss Radio International** has now taken the plunge and decided to pull the plug on short wave altogether.

In Australia, **Bob Padula** of the **EDXP** laments that shortwave cutbacks are affecting services to Australia. The latest casualties are not only Switzerland, but also the **Far East Broadcasting Company**, South Korea, some broadcasts from the Vatican, Austria, and Germany.

In despair, Bob has set up a new electronic club called **Shortwave Australia** - an "innovative hobby club intended to support

jams, high access costs, tiny audiences compared to radio, and lack of portability are all still unsolved difficulties.

All-in-one TV plus Internet plus E-mail are here, but these are separate activities not easily combined. Is the family really going to stop viewing while you surf the 'net for international radio?

SHORT WAVE SCHEDULES

Enough of that! While there is still some sanity out there, **Radio Switzerland International** has a not unreasonable short wave schedule, up to the end of October, when the rot starts to set in. It's not that much of a schedule for Europe, mind you, as it's concentrated on Africa and America.

Europe is strictly regionalised, so good results may be difficult there. Europe: 0400-0430 and 0500-0530 on 9.610; 1000-1030 on 15.315 and 1200-1230 on 15.315 and 1900-1930 on 6.110MHz. Americas: 0100-0200, 0230-0300, 0400-0500 on 9.885, 2300-0000 on 9.885, 11.905MHz. Middle East/Africa: 0730-0800 on 15.545, 17.685, 21.750; 0830-0900 on 2.1770; 1730-1800 on 15.220,

1930 on 6.025, 7.130; 2100-2130 on 6.025; 2130-2200 on 3.975MHz. North America: 0100-1030 9.560 and at 0230-0300 on 9.570MHz.

For more on Radio Budapest schedules write to, **Brody Sandor u. 5-7, H-1800 Budapest, Hungary** or E-mail: **ANGOL1@kaf.radio.hu** Website: **www.kaf.radio.hu**

Radio Ecclesia, the Angolan Catholic broadcaster may be back on short wave. Try listening at 0500-0600 and 1700-1800 on 15.775MHz. This service, via Juelich in Germany, is intended for internal listening in the wide open spaces of Angola, backing up the f.m. transmissions in the capital Luanda. The language is that of Angola, Portuguese.

WIDE SPREAD

Radio Australia, infused with a new supply of money, is now able to spread itself out a bit once more. Of course, their broadcasts are primarily aimed at their South East Asian neighbours and the Pacific Islands. Nonetheless, it has often proved possible to hear some transmissions much further afield, such as in Europe.

So see what you make of these listen at: 0000-0130 on 17.775, 0530-0800 on 17.750, 0930-1100 on 17.750, 0900-1400 on 21.820, 1330-1700 on 11.660, 1530-1900 on 9.475, 1900-2130 on 9.500 and at 2200-0000 on 11.880MHz. Let me know if you can catch more than a whiff of sound.

For more info on Aussie broadcasting schedules contact: **Australia. GPO Box 428G, Melbourne 3001, Australia** or E-mail: english@radioaus.abc.net.au Website: **www.abc.net.au/ra/**

And finally, the latest printed schedule from **Radio Sweden** invites you to take part in strange dances around poles garlanded in flowers and greenery, to celebrate the return of summer. If you'd rather do this from a distance, tune in as follows (Europe/Africa/Middle East schedule, there are others for the Pacific and North America).

Try listening at: 1330-1400 on 17.505; 1730-1800 on 6.065 (Mon-Sat) 13.580 (Sun); 1930-2200 and 2130-2200 6.065MHz. More details from **Radio Sweden, S-105, Sweden**. E-mail: **info@rs.se; www.rs.se/rs/**

Finally for this month, for a total round-up of English international broadcasting check out the latest edition of the *Global Broadcasting Guide* which is available direct from **AIB, PO Box 4440, Walton, CO14 8BX, Website: www.aib.org.uk** for £3.50 for two 6-monthly issues.

Tom

TOM WALTERS ASKS HOW DO YOU LISTEN INTERNATIONAL RADIO? BEFORE ROUNDING UP THE LATEST SCHEDULES.

shortwave radio monitoring and listening from Australia". The services include free membership, electronically delivered news and support and postal-mailed references and publications at a nominal cost. You can find out what he's up to on <http://members.tripod.com/~bpadula/SW.AUS/>

All right, so I say in one breath that the internet is not good enough and then I tell you to go looking for information on it! But that is **just the point** - the internet originated as, and still is, a wonderful medium for transmitting data, that is, words in print and images. It was **not** ever intended to transmit 'streamed' (continuous) audio, let alone video. The boffins are struggling to get their 'streaming' to work effectively and economically, but they are well and truly up against it.

Perhaps in some distant, as yet unimagined future, we will all be able to access international broadcasting by some method more predictable and reliable than the internet or short wave, but it won't be for a good while yet. Meanwhile, internet bandwidth, traffic

17.640, 21.720 and 1930-2030 on 13.770, 15.220, 17.580, 17.735MHz. Make the most of it while you can.

Another long-running technical dispute is over the transmission of internet and other data via electric power lines. Germany's upper house of parliament has now approved the frequency ranges to be used for system transmitting internet and other data over electric power lines. Those frequencies would include shortwave, and the data would be transmitted through unshielded electric lines. Peter Senger, head of engineering at **Deutsche Welle**, is not amused.

Back to short wave now. If all that yodelling from Switzerland is not to your taste, one of the huge delights of international listening is that you can travel so easily in your imagination to other stations..

An old faithful from Central Europe, **Radio Budapest**, offers listeners in Europe and North America a daily mix of news, sport, culture, tourism, history etc. Avail yourself, perhaps thinking of a pleasant holiday by a Hungarian lake as you do so, listen for: Europe: 1900-

SEND YOUR ADVERT TO PRACTICAL WIRELESS, BARGAIN BASEMENT, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW

Bargain Basement

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** for your contact details on the form provided and send it together with the 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 **donna@pwpublishing.ltd.uk** (If you don't want to include your credit card details on your E-mail, just 'phone us on **(01202) 659910**).

Please help us to help you by preparing your advert carefully. Any advert which contains ?? marks indicates that the Editorial staff could not read/interpret the wording.

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

3-gang (0.0003) tuning cap with s/m gear train at least 100:1. £5 plus postage. David G4HFL, Bucks. Tel: (01844) 346274.

ADI AR147 2m (144MHz) transceiver complete and in good condition prefer buyer to inspect and collect (Morpeth), £110 o.v.n.o. Tel: (01670) 760511.

Butternut vertical antenna HF9VX 80-6m (3.5 - 50MHz), 7.9m high with CPK counter poise KET, as new, £120. Tony, Kent. Tel: (01689) 836929.

Capco BLT 6000 high power AMU for balanced lines only, as new, £150. 150KW 107 Z-match with 160m (1.8MHz), little tatty, £40. Ken, Waltham Cross. Tel: (01992) 632434.

Classic and other books of interest collected personally over 60 year period gradually being disposed of, for next list send name and address to: Richa d Marris, 35 Kingswood House, Farnham Road, Slough, Berks SL2 1DA.

Complete station perfect w.o., £1650 o.n.o. Kenwood p.s.u., £65. Ameritron 811 6000W, £495. Spare valves, £15. MFJ-962 1.5kW tuner, £175. Butternut HF6V vertical, £175 reluctant sale, ill health. Prefer collect or deliver for £30 if near M25. Tel: (01634) 379140.

Cushcraft R7000 vertical, excellent condition, only few weeks use, £130 buyer collects. Also Cushcraft 80m (3.5MHz) add-on kit, never used, still in sealed carton, £120. Both items open to offer. Tel: Wiltshire (01380) 850586 anytime.

Eddystone 830 RX 15 valve double supe het 300kHz 30MHz in nine bands, tunable first i.f. v.g.c. and g.w.o. with home-brew matching plinth speaker, £200. Prefer buyer collects. Jim McGowan M5AIP, Essex. Tel: (01708) 340304.

Eddystone 1650/6 software/ha dware upgraded to u.s.b./l.s.b., spin-tune, 99 memory channels, scanning, remote control, monitor, speaker, 10kHz to 30MHz in 5Hz steps. Excellent r.f. performance and v.g.c., £425 plus carriage or delivery. Tel: Geoff on (01132) 696527 or E-mail: 100664.3417@compuserve.com

Eddystone 1837/2 table model u.s.b./l.s.b., a.m., excellent, £350. FRG880 fitted v.h.f., £220. Trio R600 like new, £120. Sony 2001D air band excellent radio, mains, battery, £150. Inspect, collect or pay postage. Tel: London area 0208-571 7962 or (07939) 396830.

FT-290R MkII 2m (144MHz) multi-mode transceiver, £200. FT-790R 70cm (430MHz), multi-mode transceiver, £175. Microwave modules 2m (144MHz) linear amplifier/pre-amp 100W output, 10W drive, £100. All good condition with manuals, mic, leads etc. Shaun GBVPG, Bristol. Tel: (01225) 873003 office hours or (01225) 873098 evenings and weekends.

Hallicrafters SX42 receiver a.m./f.m. 0.5-110MHz original manual, £120. Icom 737a TXCVR, new, boxed, £585. Kenwood TM-707 2m/70cm (144/430MHz), new boxed, £240. Icom IC-970H 2m/70cm base, all-mode RX 50-905MHz, new boxed. Ephone or p/px for h.f. IC-756, TS-

2000. G4AFY, Kidderminster. Tel: (01562) 747480.

HRO 5T WWII receiver and power unit, very good condition, nine coils in boxes, £345. Also Textronix 2225 double beam scope, 50MHz with probes, £265. Modern, very nice. Tel: (01872) 862291.

Icom IC-202S v.g.c. as received in April PW, all in good condition, £130 or swap for 2m/70cm (144/430MHz) hand-held with wide RX or w.h.y. St. Austell, Cornwall. Tel: (07765) 432568.

Icom IC-251E 2m (144MHz) multi-mode with Mutek front-end. Matching IC-451E 70cm (430MHz) multi-mode. Both with manuals and mics, £199 each Tel: Staines (01784) 458583 or E-mail: g3wwt@thersgb.net

Icom IC-706 MkII d.s.p, excellent condition, original packing including 10W tuner control and manual, £575, buyer collects. Tel: Wilts (01380) 850586 anytime.

Icom IC-W2E hand-held for 144/430MHz, extras, boxed, excellent, £195. Mizuho MX-7 portable s.s.b./c.w. transceiver for 7MHz, portable antenna, case, excellent, £120. Clive G4NVX, QTHR, Hereford. Tel: (01432) 343309.

Icom R85000 receiver, boxed with manual, as new condition, little used, Global 1000 a.t.u., ext. speaker, c/w 2 ICS VX programmes, sw ant., various books, good starter kit, £850. Tel: (02392) 383663 pm.

JRC NRD-525 receiver, £450. Fai haven RD500 radio database,

£495. Lowe HF-150 Europa, £275. HF-225, £200. Trio TS-711E, £425. R-5990, £95. FT-23R/73R, £220 pair. FT-726R, mint condition, £450. Collect. Tel: Stockport (07974) 953018 after 6pm. Enquiries for many smaller items s.a.e. G00ZK, QTHR.

Kenwood R-5000 receiver with 118-174MHz converter complete with manual long wire antenna and balun. Also Lowe Modemaster V20 disks and handbook, *Short Wave Frequency Guide*, £465. Tel: Chester (01829) 250284.

Kenwood TM-G707E dual-band 2m 45W dual-band 2m (144MHz) 45W 70cms (430MHz) 35W one year old, used once, boxed, £150 priced to sell. Tel: Michael on 0207-771 0309 weekdays or (01273) 880287.

Kenwood TS-530S, £280. Kenwood a.t.u. AT-230, £140. Kenwood desk mic MC50, £40. Hi-Mound Morse key HK707, £30. Manuals and circuits, all excellent, talk to the world for under £500. Tel: G4TLE on (01797) 230678 evenings.

Kenwood TS-870 showroom condition, only trans five times, £1000 o.v.n.o. going QRT. Tel: (01962) 878106.

Kenwood-Trio TL9222 h.f. amplifier, mint condition. Buyer to test/collect, £850. Tel: (01472) 840862 or E-mail: roy.g4whq@ntlworld.com

Linear Amp, superb Henry classic 2KD, nice unmarked condition, two 2kW output still current model made in USA check website for full spec, £500 buyer collects. Tel: (01673) 849470.

Marconiphone 55, early battery portable, 1929, internal cone speaker, frame aerial, working, £140. Denco Maxiq plug-in coils, thirteen, £20. Heathkit valve voltmeter, £15. Transistor tester, £8. Army meter 1940s, £7. Tel: Geo ge on (02476) 672438.

Matched set of three 6146B GE valves, £30. Also Codar At-5 TX surplus to needs, £20. Tel: Uxbridge (01895) 270772.

MFJ-9406 6m (50MHz) s.s.b. transceiver, perfect, two years old, hadly used £180. G7NHB, Plymouth. Tel: (01752) 343177.

National HRO receiver 10 sets coils, v.l.f. to 50MHz p.s.u. and spare valves working but needs tidying, £100 o.n.o. must collect, Stoke-on-Trent area. Tel: (01782) 744721 Ext 3139 (daytime Mon-Fri) or (01782) 412527 eves/weekends.

Navico Rig AMR 1005 2m (144MHz), £130. 2m hand-held, no batteries, Kenwood Trio model TR240, £49. a.t.u. MFJ Versa Tuner V, 3150. AKD WA3 wave meter, £35. Mr Brouder G3ZJH, Bristol. Tel: 0117-969 1025.

NRD-535 ECSS, BNC upgrade, Lowe specification, boxed, instructions, immac, £675. Tel: 0121-422 4407.

PK232 all-mode t.n.c. c/w manuals, cables and PC Pakratt software, as new condition, £100. Samson ETM-9COG memory keyer as new with full instructions, £95 plus postage. Walter GM4YAU, Arbroath. Tel: (01241) 879155.

Realistic PRO-2045 base scanner, very good condition, comes with telescopic antenna, adapter and manual, £175 o.n.o. Darren, Herts. Tel: 0208-449 7446

Several old valve radios for sal, wooden cabinets, some working, all complete, valves etc. Tel: Dennis Pell on (01832) 733314.

Silent key sale: Heathkit HW12 with p.s.u., £25. Yaesu FT-290R MKI, £100. Yaesu FT-73R plus charger, £50. KW Ezee match a.t.u., £40. BC221 frequency standa d, £15. AOR AR-22 2m (144MHz) RX, £10 o.n.o. John G3ZOC, Preston. Tel: (01772) 516176.

Syncon p.s.u. model 1220 20A continuous 25A su ge. Twin meters, variable voltage multiple outlets inc cigar lighter socket. Heavy duty construction, £50, prefer buyer collects or pay carriage. Tel: Du ham 0191- 389 2822 or (07980) 137617 (mobile).

Trio 530S narrow c.w. filter fitted, £75. Yaesu FRG-7 not modified, £25, manuals for both rigs. Tel: Woking (01932) 345174.

Trio AG-202A sine/sq audio signal generator 600Ω output, very good condition, very stable output, £50 o.n.o. Maxcom MX-9300 all-in-one test station as new, £250 o.n.o. Tel: Roy G4CDR on (01254) 55939 or E-mail: g4cdr@btinternet.com

Trio HF-830S 0-30MHz boxed with manual, £250. Kenwood a.t.u. AT-230, manual, £80. Kenwood digital frequency controller DFC230, manual, £40. Kenwood mic/MC50, £35. Tel: (01302) 859451.

B.B. JUL '01

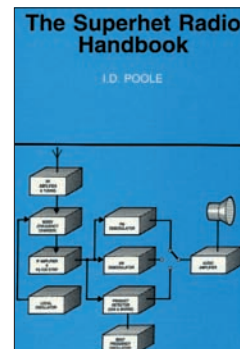
Book Store

**BUY
of the
MONTH**

The Superhet Radio Handbook

Published by Babani publishing and written by well known PW author **Ian Poole G3YWX** this pocket sized publication explains the operation of the Superhet in easy to understand terms. Topics covered within its 104 pages include Introduction and Historical Perspective, Basic Concepts, Sensitivity and Overload, Selectivity, Local Oscillator and Operation. A very handy reference guide.

The Superhet Radio Handbook can be yours for the special price of **£4.95 inc. P&P (UK), £4.95 plus £2.50 P&P (overseas). Offer closes 11 July 2001.**



To order either use the form on page 76 or please call the PW Book Store on (01202) 659930 and quote PW 07

LISTENING GUIDES

	Pages	Price
Airband		
AIRBAND RADIO GUIDE 5th Edition.....	112	£8.99
AIR TRAFFIC CONTROL (abc) 8 h Edition.....	112	£8.99
AIRWAVES 2001	134	£9.95
CALLSIGN 2001.....	168	£9.95
CIVIL AIRCRAFT MARKINGS (abc).....	384	£7.99
FLIGHT ROUTINGS 2001. Williams.....	160	£7.95
MILITARY AIRCRAFT MARKINGS (abc).....	224	£7.99
NORTH ATLANTIC FLIGHT COMMUNICATIONS 2nd Edition (inc. software).....	172	£16.50
UNDERSTANDING ACARS		
3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn.....	80	£9.95
WORLD AIRLINE FLEET & SELCAL DIRECTORY.....	300	£16.00
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY		
2nd Edition. Robert E. Evans.....	260	£19.95

Datamodes

FAX & RTTY WEATHER REPORTS. Philip Mitchell.....	88	£11.50
KLINGENFUSS 2001/2002 GUIDE TO WORLD-WIDE WEATHER SERVICES		
20th Edition Joerg Klingenfuss.....	436	£20.00
WEATHER REPORTS FROM RADIO SOURCES 3rd Edition. Philip Mitchell.....	32	£7.50

DXTV

DXTV FOR BEGINNERS. Simon Hamer.....	31	£3.95
GUIDE TO DXTV. Keith Hamer & Garry Smit h.....	36	£3.95
GUIDE TO WORLDWIDE TV TEST CARDS.....	60	£4.95
MASTS - PRACTICAL IDEAS FOR THE DXER. Kei h Hamer & Garry Smit h.....	36	£4.95
THIS IS BBC TV - FIRST 30YRS OF TV GRAPHICS. Kei h Hamer & Garry Smit h.....	38	£4.95
THE FIRST 30 YEARS OF BBC-2. Kei h Hamer & Garry Smit h.....	60	£4.95

Frequency Guides

2001 SUPER FREQUENCY LIST on CD-ROM. Joerg Klingenfuss.....	n/a	£16.00
FERRELL'S CONFIDENTIAL FREQUENCY LIST, 12 h Edition.....	450	£19.95
GLOBAL BROADCAST GUIDE 2001	32	£1.95
GUIDE TO UTILITY RADIO STATIONS 2001. 19th Edition. Joerg Klingenfuss.....	580	£26.00
PASSPORT TO WORLD BAND RADIO 2001	528	£15.50
PROMA SCANNING SCENE CD.....	n/a	£4.75
RADIO LISTENERS GUIDE 2001	128	£5.25
SHORTWAVE FREQUENCY GUIDE 2001 - 5 h Edition. Joerg Klingenfuss.....	564	£23.00
SHORTWAVE INTERNATIONAL FREQUENCY GUIDE.....	176	£12.95
WORLD RADIO TV HANDBOOK 2001	640	£19.95

General

BUYING A USED SHORT WAVE RECEIVER - New 4 h Edition. F. Osterman.....	78	£5.95
GETTING ON TRACK WITH APRS. Stan Horzepa WA1LOU	165	£11.50
POP WENT THE PIRATES. Kei h Skues.....	568	£16.95
RADIO COMMUNICATIONS HANDBOOK. 7th Edition. Dick Biddulph/Chris Lorek.....	580	£29.99
RADIO SCIENCE OBSERVATION Volume 1 (inc. CD-ROM). Joe Carr.....	414	£26.95
SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD.....	187	£4.50
SHORT WAVE EAVESDROPPER CD-ROM.....	n/a	£16.50
SHORT WAVE RADIO LISTENING FOR BEGINNERS.....	174	£14.95
SHORTWAVE RECEIVERS PAST & PRESENT (3rd Edition).....	450	£25.95

Satellite

AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326. F.A. Wilson.....	230	£5.95
ARRL SATELLITE ANTHOLOGY 5 h Edition.....	150	£11.50
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson.....	371	£19.95
SATELLITE HANDBOOK (ARRL) New Edition Martin Davidoff K2UBC.....	370	£15.50
SATELLITE PROJECTS HANDBOOK. Lawrence Harris.....	174	£14.99
SATELLITE TELEVISION. A layman's guide. Peter Pearson.....	73	£1.00
WEATHER SATELLITE HANDBOOK. 5 h Edition. Dr Ralph E. Taggart WB8DQT.....	192	£15.50

Scanning

AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I.D. Poole.....	152	£4.99
SCANNER BUSTERS 2. D.C. Poole.....	100	£6.00
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD.....	261	£12.95
SCANNERS 4 SCANNING INTO THE FUTURE. Bill Robertson.....	245	£9.95
SCANNING THE MARITIME BANDS. 2nd Edition.....	158	£9.75
UK SCANNING DIRECTORY New 7 h Edition.....	604	£19.50
ULTIMATE SCANNING GUIDE. Richard Allport.....	640	£19.99

AMATEUR RADIO

Amateur Television

THE AMATEUR TV COMPENDIUM. Mike Wooding G6IQM	104	£3.50
AN INTRODUCTION TO AMATEUR TELEVISION		
Mike Wooding G6IQM & Trevor Brown G8CJS.....	156	£5.00

Antennas & Transmission Lines

25 SIMPLE AMATEUR BAND AERIALS BP125. E.M. Noll	63	£1.95
25 SIMPLE INDOOR AND WINDOW AERIALS BP136. E.M. Noll	50	£1.75
25 SIMPLE SHORT WAVE BROADCAST BAND ANTENNAS BP132).....		£1.95
25 SIMPLE TROPICAL AND MW BAND AERIALS BP145. E.M. Noll	54	£1.75
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Caron	195	£15.50
ANTENNA TOOLKIT (inc. CD-ROM). Joseph J. Carr	214	£25.00
ARRL ANTENNA BOOK 19 h Edition	732	£24.00
ARRL ANTENNA BOOK ON CD-ROM	n/a	O/P
ARRL ANTENNA COMPENDIUM Volume One	175	£10.50
ARRL ANTENNA COMPENDIUM Volume Two.....	208	£10.50
ARRL ANTENNA COMPENDIUM Volume Three. Edited by Jerry Hall K1TD.....	236	£11.50
ARRL ANTENNA COMPENDIUM Volume Four.....	204	£16.50
ARRL ANTENNA COMPENDIUM Volume Five	200	£16.50
ARRL ANTENNA COMPENDIUM Volume Six (inc. CD-ROM).....	200	£18.50
BACKYARD ANTENNAS. PeterDodd G3LDO.....	200	£18.99
BEAM ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX.....	268	£8.95
BUILDING & USING BALUNS. Jerry Sevik.....	125	£18.95
CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX.....	110	£8.95
EXPERIMENTAL ANTENNA TOPICS BP278. H.C. Wright.....	70	£3.50
G-QRP CLUB ANTENNA HANDBOOK.....		
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GW0LNQ	155	£7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LOI.....	233	£9.99
HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN	322	£7.99
MORE OUT OF THIN AIR PWP).....	112	£6.95
"ONAUIN'S" LOW BAND DXING (ARRL). J. Devoldere	330	£23.00
PHYSICAL DESIGN OF YAGI ANTENNAS (Hardback) D.B. Leeson W6QHS	200	£15.50
PRACTICAL ANTENNA HANDBOOK 3rd Edition. (inc. software) Joseph J. Carr	580	£33.45
RADIO ANTENNAS & PROPAGATION. William Gosling	260	£19.99
RADIO AMATEUR ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX.....	188	£8.95
RECEIVING ANTENNA HANDBOOK. Joe Carr	189	£17.50
SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS.....	224	£8.95
THE RIGHT ANTENNA. How To Select & Install Antennas For Entertainment & Communication Devices. 2nd Edition. Alvis J. Evans.....	78	£16.95
THE TRUTH ABOUT CB ANTENNAS. (Orr & Cowan) W.I. Orr W6SAI & S.D. Cowan W2LX	188	£8.95
VERTICAL ANTENNAS. W.I. Orr W6SAI & S.D. Cowan W2LX	192	£8.95
VERTICAL ANTENNA CLASSICS (ARRL). R. Schetsen	123	£11.50
W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB.....	123	£8.00
WIRE ANTENNA CLASSICS (ARRL)	144	£11.50
YOUR ANTENNA COMPANION. Paul Danzer	130	£7.50

Beginners (inc RAE)

AN INTRODUCTION TO AMATEUR RADIO - New Edition. Ian Poole G3YWX.....	150	£4.99
BASIC RADIO PRINCIPLES & TECHNOLOGY. Ian Poole G3YWX.....	262	£15.99
BASIC RADIO & ELECTRONIC CALCULATIONS. Ray Petri GOOAT.....	160	£13.95
AN RAE STUDENTS NOTEBOOK. Bob Griffiths G7NHB.....	76	£6.95
PRACTICAL RECEIVERS FOR BEGINNERS RSGB). John Case GW4HWR.....	165	£14.50
PRACTICAL TRANSMITTERS FOR NOVICES. John Case GW4HWR.....	126	£12.50
RADIO AMATEURS EXAMINATION/END OF COURSE TEST PAPERS. Ray Petri GOOAT.....	104	£13.95
RAE MANUAL (RSGB). New Revised Edition.....	127	£15.00
THE NOVICE LICENCE STUDENT'S NOTEBOOK. John Case GW4HWR.....	124	£6.00
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK BP375) Ian Poole G3YWX.....	150	£4.95
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL.....		
5 h Edition. Ray Petri GOOAT.....	208	£13.95
TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR RSGB).....		
John Case GW4HWR.....	101	£6.75
YOUR FIRST AMATEUR STATION. RSGB) Colin Redwood G6MXL.....	120	£5.75

Callbooks

JOINT INTERNATIONAL & NORTH AMERICAN CALLBOOK (CD-ROM).....	n/a	£30.00
PV UK & EIRE AMATEUR CALLSIGN (CD-ROM).....	n/a	£7.50
RSGB YEARBOOK 2001 Edition.....	460	£15.99

Computing

AN INTRODUCTION TO THE WORLDWIDE WEB FOR PC AND MAC USERS.		
(BP390) D.C. & O. Bishop.....	148	£6.99
HOW TO EXPAND & UPGRADE YOUR PC BP450 R.A. Penfold.....	170	£6.99
INTERFACING PCs AND COMPATIBLES BP467. R.A. Penfold.....	86	£4.99
NEWNES COMPUTER ENGINEER'S POCKET BOOK 3rd Edition. Michael Tooley	256	£12.95
PERSONAL COMPUTERS IN THE HAM SHACK (ARRL).....	284	£11.50
THE INTERNET AND WORLD WIDE WEB EXPLAINED. J. Shelley.....	130	£5.95
WINDOWS '98 ASSISTANT (BP454) I. Sinclair.....	160	£6.99
WINDOWS '98 EXPLAINED (BP456). N. Kantaris & P. Oliver.....	160	£6.99
WINDOWS '98 - HARD DISK & FILE MANAGEMENT. BP455) J. Gately.....	160	£6.99

EMC

ARRL RFI BOOK (Practical Cures For Radio Frequency Interference).....	316	£15.50
INTERFERENCE HANDBOOK. William R. Nelson WA6FG.....	250	£9.50
RSGB GUIDE TO EMC. 2nd Edition. Robin Page-Jones G3JWL.....	204	£18.50

	Pages	Price
Historical		
100 RADIO HOOK UPS. 2nd Edition (reprinted).....	48	£3.35
1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback.....	260	£11.85
COLLECTOR'S GUIDE TO ANTIQUE RADIO 4 h Edition. Marty & Sue Bunis.....	248	£19.95
COLLECTOR'S GUIDE TO TRANSISTOR RADIOS (2nd Edition). Marty & Sue Bunis.....	320	£16.95
COMMUNICATIONS RECEIVERS - THE VACUUM TUBE ERA. R.S. Moore.....	141	£17.95
DOUBLE TESLA-ODUDIN COIL.....	24	£3.95
GUIDE TO OLD RADIOS, POINTERS, PICTURES, PRICES. David & Betty Johnson.....	278	£19.95
Crystal Set Books (Xtal Set Society)		
HENLEYS 222 RADIO CIRCUIT DIAGRAMS (1924).....	271	£9.45
HOW TO BUILD THE TWINPLEX REGENERATIVE RECEIVER. Lindsay.....	63	£5.75
HOW TO BUILD YOUR FIRST VACUUM TUBE REGENERATIVE RECEIVER. T.J. Lindsay.....	127	£7.30
HOW TO BUILD YOUR RADIO RECEIVER (A4) Popular Radio Handbook No. 1).....	100	£6.95
HOW TO MAKE A NEUTRODYNE RECEIVER. Webb.....	63	£5.00
MARCONI'S ATLANTIC LEAP (H/B).....	96	£6.99
RADIO TESLA.....	36	£5.95
SAGA OF MARCONI OSRAM VALVE (Paperback). B Vyse.....	346	£25.00
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey).....	127	£7.95
SEEING BY WIRELESS - THE STORY OF BAIRD TELEVISION. Ray Herbert.....	27	£4.95
TESLA - THE TRUE WIRELESS.....	16	£3.95
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 & 1934).....	94	£6.95
TRANSISTOR RADIO! - A COLLECTOR'S ENCYCLOPEDIA & PRICE GUIDE.....	170	£19.95
David & Robert Lane.....	170	£19.95
VISION BY RADIO (1925) (Jenkin).....	140	£7.85
WATCHERS OF THE WAVES. Brian Faulkner.....	118	£13.50
Maps & Log Books		
THE XTAL SET SOCIETY NEWSLETTER. Volume 1 & 2 Combined. Phil Anderson W0XI.....	96	£14.00
THE CRYSTAL SET HANDBOOK & VOL. 3 XTAL SET SOCIETY NEWSLETTER.....		
Phil Anderson W0XI.....	134	£8.00
THE XTAL SET SOCIETY NEWSLETTER. Volume 4. Phil Anderson W0XI.....	88	£7.00
CRYSTAL SETS. The Xtal Set Society Newsletter, Volume 5. Phil Anderson W0XI.....	88	£7.00
CRYSTAL RADIO HISTORY, FUNDAMENTALS AND DESIGN. P.A. Kinzie.....	122	£8.00
CRYSTAL SET LOOPERS, A3 TUBER & MORE. Volume 8 Xtal Set Society Newsletter.....	128	£10.50
Morse		
AMATEUR RADIO LOGBOOK (RSGB).....	50	£3.75
AMATEUR RADIO WORLD ATLAS (A4 size).....	20	£8.00
GREAT CIRCLE MAP 600mm x 600mm.....	n/a	£1.50
NORTH ATLANTIC ROUTE CHART 740 x 520mm.....	n/a	£9.00
QTH LOCATOR MAP OF EUROPE. New Edition due Sept 2001 1080 x 680mm.....	n/a	£7.00
RADIO AMATEURS MAP OF THE WORLD. New Edition 980 x 680mm.....	n/a	£7.00
Microwaves		
SECRETS OF LEARNING MORSE CODE Mark Francis.....	84	£6.95
Operating & Handbooks		
AN INTRODUCTION TO MICROWAVES (BP312). F.A. Wilson.....	134	£3.95
ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL. Various Au hors.....	446	£15.50
ARRL UHF/MICROWAVE PROJECT MANUAL VOL 2.....	160	£11.50
ARRL UHF/MICROWAVES PROJECT MANUAL (ARRL).....	352	£15.50
MICROWAVE & WIRELESS COMMUNICATIONS TECHNOLOGY. Joseph J. Carr.....	436	£35.00
MICROWAVE HANDBOOK - COMPONENTS & OPERATING VOL 1 (RSGB).....	110	£12.00
MICROWAVE HANDBOOK - CONSTRUCTION & TESTING VOL 2 (RSGB).....	120	£18.99
MICROWAVE HANDBOOK - BANDS & EQUIPMENT VOL 3 RSGB).....	140	£18.99
Packet		
ALL ABOUT HAM RADIO. Harry Helms.....	290	£16.50
AMATEUR RADIO OPERATING MANUAL (RSGB).....	257	£24.99
ARRL HANDBOOK 2001 77th Edition.....	380	£25.00
ARRL OPERATING MANUAL New Edition.....	420	£18.50
ARRL RADIO BUYERS SOURCEBOOK VOL 1 (QST Reviews 1981-1991).....	280	£11.50
ARRL RADIO BUYERS SOURCEBOOK VOL 2 (QST Reviews 1991-1993).....	240	£11.50
ARRL VHF/UHF RADIO BUYER'S SOURCEBOOK.....	120	£11.50
COMPLETE DX'ER. Bob Locher.....	204	£9.50
DISCOVERING DXING (2nd Edition). John Zondlo.....	90	£7.50
GUIDE TO VHF/UHF AMATEUR RADIO. Ian Poole G3YWX.....	106	£8.99
HAM RADIO MADE EASY (ARRL). Steve Ford.....	204	£11.50
HINTS AND KINKS FOR THE RADIO AMATEUR.....		
Edited by Charles L. Hutchinson & David Newkirk.....	129	£9.50
LOW PROFILE AMATEUR RADIO (ARRL). Jim Kearman KR1S.....	124	£7.50
SETTING UP AN AMATEUR RADIO STATION BP300. I.D. Poole.....	81	£3.95
TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED.....		
Joseph D. Moell & Thomas N. Curlee.....	325	£24.95
RSGB PREFIX GUIDE.....	34	£6.95
LF EXPERIMENTERS HANDBOOK.....	112	£18.99
Propagation		
HF DIGITAL COMPANION. Steve Ford.....	120	£7.50
NOS INTRO: TCP/IP OVER PACKET RADIO. Ian Wade G3NRW.....	356	£11.50
PACKET RADIO PRIMER (RSGB). Dave Comber G8UYZ & Martyn Corft G8NZU.....	266	£8.95
PACKET, SPEED & MORE SPEED APPLICATIONS (ARRL).....	148	£10.50
PRACTICAL PACKET RADIO. Stan Horzepa.....	140	£10.50
YOUR PACKET COMPANION. Steve Ford WB8IMY.....	170	£7.50
QRP		
AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293. J.G. Lee.....	116	£3.95
YOUR GUIDE TO PROPAGATION (RSGB) Ian Poole.....	88	£6.95
Test Equipment		
ARRL LOWER POWER COMMUNICATIONS - THE ART & SCIENCE OF QRP.....		
Richard Arland K7SZ.....	204	£11.50
LOW POWER SCRAPBOOK (RSGB).....	320	£12.99
QRP POWER (ARRL).....	188	£11.50
INTRODUCING QRP. Dick Pascoe G0BPS.....	48	£6.95
W1FB's QRP NOTEBOOK (ARRL). 2nd Edition. Doug DeMaw W1FB.....	175	£8.00

	Pages	Price
VHF		
ALL ABOUT VHF AMATEUR RADIO. W. I. Orr W6SAI.....	163	£8.95
GUIDE TO VHF/UHF AMATEUR RADIO.....	180	£8.99
VHF/UHF HANDBOOK (RSGB). Dick Biddulph G8PDS.....	180	£19.99
YOUR MOBILE COMPANION. Roger Butch.....	190	£8.50
YOUR VHF COMPANION. Steve Ford.....	230	£7.50
ELECTRONICS		
General		
BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285.....	166	£4.99
CIRCUIT SOURCE BOOK 1 - BP321. R.A. Penfold.....	182	£4.95
CIRCUIT SOURCE BOOK 2 - BP322. R.A. Penfold.....	214	£4.95
DIGITAL ELECTRONICS (CD-ROM). Mike Tooley.....	n/a	£45.00
ELECTRONIC PROJECT BUILDING FOR BEGINNERS. R. Penfold. (BP392).....	110	£4.95
ENCYCLOPEDIA OF ELECTRONIC CIRCUITS Vol. 7.....	1128	£32.95
FAULT FINDING ELECTRONIC PROJECTS BP391.....	133	£4.99
GETTING STARTED IN PRACTICAL ELECTRONICS BP345. Owen Bishop.....	198	£4.95
HOW ELECTRONIC THINGS WORK...AND WHAT TO DO WHEN THEY DON'T, Goodman.....	390	£16.95
HOW TO TEST ALMOST EVERYTHING ELECTRONIC.....	326	£16.95
LADDER CRYSTAL FILTERS. John Pivnichny N2DCH.....	134	£14.95
NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK 3rd Edition. Vivian Capel.....	210	£14.95
PARTS GALLERY & ELECTRONICS CIRCUITS & COMPONENTS (CD-ROM). Mike Tooley.....	n/a	£35.00
PICTUTOR (CD-ROM). John Decker.....	89	£3.99
POWER SUPPLY PROJECTS BP76. R.A. Penfold.....	89	£3.99
PRACTICAL DIGITAL ELECTRONICS FOR TECHNICIANS. Will Kimber.....	262	£12.99
PRACTICAL ELECTRONIC FILTERS BP299. Owen Bishop.....	89	£4.95
PRACTICAL ELECTRONICS HANDBOOK. Ian Sinclair.....	439	£14.95
PRACTICAL OSCILLATOR CIRCUITS BP393. A. Flind.....	136	£4.99
RADIO ENGINEERS FACTFINDER FOR WINDOWS (Floppy Disk) John Davies.....	n/a	£18.00
RADIO FREQUENCY TRANSISTORS, PRINCIPLES & PRACTICAL APPLICATIONS.....		
Dye/Granberg (Motorola). Hardback.....	235	£39.95
SCROGGIES - FOUNDATIONS OF WIRELESS & ELECTRONICS. 11 h Edition.....	292	£19.99
TECHNICAL TOPICS SCRAPBOOK (RSGB). 1995-99. Pat Hawker.....	310	£13.50
THE ART OF SOLDERING BP324. R. Brewster.....	84	£3.99
THE SUPERHET RADIO HANDBOOK I.D. Poole.....	104	£4.95
UNDERSTANDING BASIC ELECTRONICS (ARRL).....	314	£15.50
UNDERSTANDING DIGITAL TECHNOLOGY. F. Wilson. (BP376).....	110	£4.95
W1FB's DESIGN NOTEBOOK (ARRL). Doug DeMaw W1FB.....	195	£8.00
Data		
ARRL ELECTRONICS DATA BOOK. Doug DeMaw W1FB.....	260	£8.95
ELECTRONIC HOBBYIST DATA BOOK BP396. R.A. Penfold.....	242	£5.95
PRACTICAL ELECTRONIC DESIGN DATA BP316. Owen Bishop.....	327	£5.99
PRACTICAL RF HANDBOOK (2nd Edition). Ian Hickman.....	302	£19.99
RF CIRCUIT DESIGNS. Chris Bowick.....	176	£18.99
SECRETS OF RF CIRCUIT DESIGN. New Edition (Hardback) Joseph Carr.....	405	£41.95
SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL).....		
Les Hayward W7ZOI & Doug DeMaw W1FB.....	256	£11.50
SPREAD SPECTRUM SOURCE BOOK.....	320	£15.50
TOWERS INTERNATIONAL MOSPOWER & OTHER FET SELECTOR.....	140	£19.95
TOWERS INTERNATIONAL TRANSISTOR SELECTOR - UPDATE 5.....	476	£24.95
TRANSISTOR DATA TABLES (BP401).....	178	£5.95
Projects		
33 SIMPLE WEEKEND PROJECTS/CQ.....	68	£7.95
BUILD YOUR OWN INTELLIGENT AMATEUR RADIO TRANSCEIVER. Randy L. Henderson.....	350	£25.95
COIL DESIGN & CONSTRUCTION MANUAL BP160. B.B. Babani.....	106	£3.95
HOW TO DESIGN & MAKE YOUR OWN PCBs BP121. R.A. Penfold.....	66	£3.99
MORE ADVANCED POWER SUPPLY PROJECTS BP192. R.A. Penfold.....	92	£2.95
PROJECTS FOR RADIO AMATEURS & SWLS BP304. R.A. Penfold.....	92	£3.95
RADIO RECEIVER PROJECTS YOU CAN BUILD.....	312	£20.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275. R.A. Penfold.....	88	£3.95
Valves/Tubes		
ELECTRON TUBE LOCATOR. George H. Fathauer.....	350	£21.95
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS.....	60	£3.45
RADIO VALVE GUIDE BOOK VOL 1.....	54	£3.45
RADIO VALVE GUIDE BOOK VOL 2.....	42	£3.45
RADIO VALVE GUIDE BOOK VOL 3.....	40	£3.45
RADIO VALVE GUIDE BOOK VOL 4.....	48	£3.45
RADIO VALVE GUIDE BOOK VOL 5.....	44	£3.45
MASTER INDEX TO VALVE TYPES, BOOKS 1-5.....	40	£1.50
TUBE SUBSTITUTION HANDBOOK.....	150	£15.50
VALVE AMPLIFIERS. Morgan Jones.....	374	£25.00
VALVE & TRANSISTOR AUDIO AMPLIFIERS. John Lindsay Hood.....	310	£19.95

Telephone
(01202) 659930

E-MAIL: bookstore@pwpublishing.ltd.uk

FAX: (01202) 659950

OR USE THE ORDER FORM ON PAGE 76

Please note:
Cash not accepted with mail orders.



To advertise on this page see the booking form below.

Classified Ads

Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

For Sale

TECHNICAL MANUALS, AR88, CR100, R210, HR0. £5 each. Circuits £1.50. Hundreds available. SAE list. Bentley, 27 De Vere Gardens, Ilford, Essex IG1 3EB. Tel: 0181-554 6631.

VINTAGE SERVICE DATA. Radio, Audio, Electrical, TV & Cinema - 1900 to 1970s. Complimentary Newsheet.

50 Meddon St, Bideford, Devon, EX39 2EQ. Tel/Fax 01237 424280.

E-mail: savoy.hill@virgin.net

Web Site: <http://freespace.virgin.net/>

tudor.gwilliam-rees Visa & Mastercard.

THE RF-KIT CATALOGUE. send 2x 2nd class stamps or browse www.rf-kits.demon.co.uk

Hands Electronics, Tegryn, Llanfyrnach, Pembro SA35 OBL. Tel 01239 698427.

QUARTZ CRYSTALS 1MHz/£2.95, 1.4MHz/£3.95, 3.2768MHz/£1.95, 3.932160MHz/£3.75, 4.0MHz/£1.00, 4.194304MHz/£0.75, 6.0MHz/£1.54, 7.03MHz/£3.95, 8.9985MHz/£2.95, 9.0MHz/£2.95, 9.0015MHz/£2.95, 10.0MHz/£1.54, 10.106MHz/£3.50, 10.245MHz/£1.54, 10.7MHz/£1.54, 11.155MHz/£3.50, 16MHz/£1.54, 21.04MHz/£4.75, 21.06MHz/£4.75, 28.060MHz/£3.75, 45MHz/£1.75, 9MHz X-Tal filters for SSB & CW from £30.00/unit. 5MHz, 6MHz, 10MHz OXCO's £12.50/unit. X-Tal circuits, applications booklet/£5.00. Ceramic resonators, applications booklet/£3.50. Wanted freq. sweep generator to 25MHz. Good price paid. IQ-Electronic Design. Tel: 020-8391 0545. E-mail: japj69@netscapeonline.co.uk

PROMAC P3 PROGRAMMER very good condition with logic engine. £100 o.n.o. G.P AP100 programming system with P600 module as new. £250 o.n.o. GP8000 Eprom Programmer good condition. £75 o.n.o. Complete with manuals. Roy (G4CDR) 01254 55939. E-mail: g4cdr@btinternet.com

PHILIPS PM3065 DIGITAL SCOPE in immaculate condition. Auto ranging dual trace. 100MHz. Asking price £250. Tel: 07970 270171 Bedfordshire.

DISCLAIMER

Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. Practical Wireless advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of Practical Wireless wish to point out that it is the responsibility of readers to ascertain the legality of or otherwise of items offered for sale by advertisers in this magazine.

Valves

VALVES GALORE Most valves available from stock. Otherwise obtained quickly. Please send SAE stating requirements or telephone. **VALVE & ELECTRONIC SUPPLIES** Chevet Books, 157 Dickson Road, Blackpool FY1 2EU.

Tel: (01253) 751858 or Fax: (01253) 302979.

E-mail: chevet@globalnet.co.uk

VALVES:- OVER 50000 STOCKED Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, (Jim Fish G4MH), 28 Banks Ave., Golcar, Huddersfield, West Yorks HD7 4LZ.

Tel: 01484 654650/650725.

Mobile: 07733 283084.

Fax: 01484 655699.

E-mail: wilsonvalves@surflink.co.uk

Visa etc. Fast & personal service.

VALVES AND ELECTRONIC COMPONENTS

Large stocks. Send for list to: Stuart Scott, 19 Portway, Steyning, W. Sussex BN44 3QF. Tel/Fax: 01903 815118.

E-mail: triumph.76@btinternet.com

VALVES WANTED NEW AND BOXED!! KT66 GEC £35, KT88 GEC £60, EL34 & EL37 Mullard £27, EL84 £4, DA30, DO30, PS25 all at £120 each. PX4 globe shape £70. DA100 GEC £150, ECC83 Mullard £5, GZ32 & GZ34 Mullard £10, ECC32 & ECC33 Mullard £15. Other types wanted.

Colomor (Electronics) Ltd. Tel: 01403 786559.

E-mail sales@colomor.demon.co.uk

THE SUPPLY OF VINTAGE COMPONENT PARTS/VALVES Valve communications receiver service. Also vintage radio/audio equipment service. A one year guarantee on service. Write to: Vintage British Radio Components, 132 Lincoln Way, Corby, Northants NN18 9HW.

TOP PRICES PAID

for all your valves, tubes, semi-conductors and ICs.

Langrex Supplies Ltd.
1 Mayo Road, Croydon Surrey CR0 2QP.

TEL: 0181-684 1166. FAX: 0181-684 3056.

Holidays

NORTH WALES HOLIDAYS - Caravan - bunkhouse - camping. Elevated rural site, two miles from beach, use of shack and antennas, open all year. Tynrhos, Mynytho, Pwllheli. Tel: 01758 740712.

E-mail: tynrhos@btinternet.com

Wanted

WANTED FOR CASH Valve or solid state communication receivers Pre-1980. Preferably working and in good condition. Non working sets considered also domestic valve radios. Items of Government surplus wireless equipment and obsolete test equipment. Pre-1965 wireless and audio components and accessories. Pre-1975 wireless and TV books and magazines. Also, most valves wanted for cash. Must be unused and boxed. CBS, 157 Dickson Road, Blackpool, FY1 2EU.

Tel: (01253) 751858 or Fax: (01253) 302979.

E-mail: chevet@globalnet.co.uk

WANTED FOR CASH Quantities of RF coaxial relays (DC-18GHz for example). Solid state or electromechanical. With SMA connectors ideal. New or used. G3LZM. Tel: 01432 271162 after 5.30pm.

EURO Electronic Services

Wanted: all types of communication and test equipment. Any quantity, any condition. Tektronix, Hewlett Pack, Firebird, B.T., W&G and others.

Euro Electronic Services.

Tel/fax 01782 768848.

E-mail: mbutters@euro.bissnet.co.uk

Miscellaneous

INTERESTED IN VINTAGE TECHNOLOGY?

The OTS Vintage Technology Catalogue is packed with lots of interesting items for the vintage wireless, television and telephone enthusiast, collector and restorer. Send 2 x 1st class stamps to: Old Time Supplies, P.O. Box 209, Banbury, Oxon OX16 1GR.

WIRELESS SET FAULTY? I am able to repair any old valve radio, valve Hi-Fi amp, crystal set, communication receiver, etc. Enquires R. B. Kerr. Tel: 01349 852332 (Invergordon).

ORDER FORM FOR CLASSIFIED ADS

Please photocopy this form if you prefer
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: (01202) 659920, Fax: (01202) 659950

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:

MEDIUM DUTY ROTATOR



New Channel Master Medium Duty Rotator
2" main mast. 1 1/2" stub mast.
Vertical load carrying 113kg.
Colorotor **£89.95**

Alignment Bearing
Allows greater/higher head loads.
Fitted above rotor. **£18.95**
Carriage £7.00

AERIAL TECHNIQUES
59 Watcombe Rd, Southbourne, Bournemouth, Dorset BH6 3LX
Tel: 01202 423555
Fax: 01202 425055
E-mail: atech@dircon.co.uk

COMPREHENSIVE CATALOGUE AVAILABLE BY RETURN @ £1.50

J. BIRKETT

SUPPLIERS OF ELECTRONIC COMPONENTS

19 SET SPARE 60 POTENTIOMETER Type 2A 3349 for Mkl & II @ £2.
CAN TYPE ELECTROLYTICS 16 + 16µF 350v.w. @ £2, 32 + 32µF 450v.w. @ £3.
I.F. AMPLIFIER MC1350 @ £1, MC1310P stereo decoder @ £1.
OLD HUNTS WIRE ENDED PAPER CAPACITORS 0.001µF 600v.w. @ 15p, 0.001µF 1000v.w. @ 15p, 0.1µF 400v.w. @ 25p.
VHF-UHF TRANSDUCER DTR175 Ex-airc aft with 4 x 150 valve, dynamotor, etc., with some details @ £45 (P&P £10).
WIRE ENDED R.F. CHOKES 10µH @ 20p, 14µH 2 amp @ 15p, 7µH 3 amp @ 15p, 7µH @ £1 20, 10µA 100mA @ £1 20, tag ended 22µH 100mA @ 40p.
FERRANTI VARI-CAP DIODE ZC824B @ 6 for £1, mos fet ZVNL120 @ 5 for £1.
100 ASSORTED VARI-CAP DIODES unmarked for £1.
R.S. COMPONENTS HIGH SPEED TRANSIENT SUPPRESSOR No 192-913 (5KP 15A) @ 50p, 5 for £2.
SMALL RADIAL WIRE ENDED POLYESTER CAPACITORS 400v.w. 0.01µF or 0.02µF @ 20p each.
PARCEL OF VALVES REMOVED FROM WORKSHOP MU14 (4), RL7 (2), OS75-20 (4), U154 (2), 5U4G (5), 5Y3GT (5), 6AK5 (12), 6H6 (4), 6J5G (10), 6S17 (3), 6Y6G (4), 12AU6 (4), 12E1 (2), 85A2 (2), 85A2 (2), 6080 (6), total of 69 for £70 (P&P £10).
R.F. FERRITE TUBES 17.5 x 5.5mm int. dia 3mm @ 6 for 50p, 25 x 12mm int. dia 5mm @ 5 for 50p, 30 x 5.5mm int. dia 3mm @ 6 for 70p, 4 x 8mm int. dia 3mm @ 8 for 50p, 7 x 9mm int. dia 7mm @ 6 for 50p. Two hole block 11 x 6 x 5mm @ 20p, 6 hole ferrite tube @ 4 for 60p.
MOVING IRON METER 130mm dia 300 volt AC @ £12, post paid.
SMALL WIRE ENDED ELECTROLYTICS 1µF 500v.w. @ 30p, 2µF 350v.w. @ 30p, 4.7µF 450v.w. @ 35p, 10µF 250v.w. @ 40p, 10µF 350v.w. @ 75p, 33µF 450v.w. @ £1.15, 5 for £5.

ACCESS, SWITCH, BARCLAYCARD & AMERICAN EXPRESS cards accepted. P&P £2 under £10. Over Free, unless otherwise stated.

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@chelmervalue.com
Web site: http://www.chelmervalue.com

HATELY ANTENNA TECHNOLOGY

4 Redwood Crescent, Milton of Leys, Inverness IV2 6HB
TEL/FAX: (01463) 772169

DUAL LOOP ANTENNAS

We market a series of visually covert, yet highly efficient, radio transmitting aerials for the amateur HF frequencies.
There are some dual conductor loops, which are monoband and are only 1% of a wavelength in diameter. There is also a multi-band loop which is only 67cm in diameter (2' 4"), and yet operates on all nine HF bands.
There are also two multi-band Delay-Line Radiators which require no support, as they can be laid on the roof tiles, or clipped to the balcony of an apartment.
For further technical information, delivery estimate, etc., telephone 01463 772169.
Payment by cheque.

DETAILS:- CROSSED FIELD LOOPS FOR 100W

Antenna	Diameter	Weight	Working bandwidth	Price inc
CFL 1.9	90cm	1kg	50kHz	£120
CFL 3.6	67cm	800g	120kHz	£90
CFL 7	40cm	500g	7kHz	£75
CFL 14	30cm	450g	150kHz	£60
CFL 18	24cm	400g	200kHz	£60
CFL 21	18cm	400g	250kHz	£55
CFL 28/27	15cm	350g	300kHz	£50
CFL 50	12cm	250g	400kHz	£45
CFL 1	67cm	1.9MHz - 29MHz with 9m feeder		£280
CFL 1	67cm	1.9MHz - 29MHz with 15m feeder		£290
ELECTROMAGNETIC DELAY-LINE RADIATORS FOR 100W				
EMDR 1	8.5M long (28')	All HF bands	Complete	£250
EMDR 2	15.5m long (50')	All HF bands	Complete	£275

Proprietor:- MAURICE C HATELY, M Sc, C Eng, FIEE (GM3HAT)

Sycom

P. O. Box 148, Leatherhead Surrey KT22 9YW
Phone 01372 372587
Fax 01372 361421

Robin G3NFV
Geoff G4ECF

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

Send or phone for our catalogue today

QUARTZ CRYSTALS

CUSTOM MANUFACTURED CRYSTALS AND OSCILLATORS

FUNDAMENTALS FREQUENCY RANGE	PRICE	OVERTONES MODE	FREQUENCY RANGE	PRICE
1.5 to 2.0 MHz	£9 50	3 d OVT	21 00 to 60 00 MHz	£7 50
2.0 to 4.0 MHz	£9 00	3 d OVT	60 00 to 75 00 MHz	£8 75
4.0 to 6.0 MHz	£8 75	5 h OVT	60 00 to 110 0 MHz	£8 50
6.0 to 22.0 MHz	£7 50	5 h OVT	110 00 to 125 0 MHz	£10 00
22 to 26.0 MHz	£9 00	7 h OVT	125 00 to 175 0 MHz	£13 50
		9 h OVT	170 00 to 225 0 MHz	£13 75

1.5 - 2.0 MHz available in HC6/U or HC33/U only
2.0 - 10.0 MHz available in HC6/U HC33/U HC18/U or HC25/U only
10.0 - 225.0 MHz HC6/U HC33/U HC18/U HC18/TT HC25/U HC25/TT and HC45/U.
Where the holder is not specified, crystals above 2.0 MHz will be supplied in HC25/U.
For HC18/TT and HC25/TT (11.7mm ht.) add £1.00. For HC18/TT (9.6mm ht.) and HC45/U add £5.00.
Delivery approx 2 weeks. For 5 day EXPRESS service add 50% to above prices.
Prices include P&P and VAT. **Minimum order charge £10.00. All major credit cards accepted.**
Unless otherwise requested fundamentals supplied for 30pF load & overtones for series resonant operation.
Where applicable please state the make and model number of the equipment for which the crystals are to be used. This will assist us in providing the correct specifications.
Custom Manufactured TTL and CMOS oscillators 3.5 - 85MHz £20.35 each 1 - 4 pcs.

QuartSlab Marketing Ltd
PO Box 19, Erith, Kent DA8 1LH
Phone 01322 330830 Fax 01322 334904
e-mail: sales@quartslab.com
web: www.quartslab.com
SAE with enquiries please

Masts for sale

Domestic and commercial applications
Available direct from Tennamast or from Waters & Stanton plc.

Prices from £250.00

The demonstrator Adapt-A-Mast will be on display on the W&S stand at various shows around the country.
Quality products from quality companies.
Tennamast and Waters & Stanton are registered to ISO 9000 quality standards.
Ordering a mast has never been easier.
CONTACT W&S ON 01702 206835 OR WRITE, FAX OR E-MAIL FOR FURTHER INFORMATION.
See the Tennamast products on: www.tennamast.com

Tennamast (Scotland) Ltd,
81 Mains Road, Beith, Ayrshire KA15 2HT.
Tel/Fax: 01505 503824 - 24 hrs.
E-mail: nbrown@tennamast.com or tennamast@btinternet.com

B.S.I. Regd. stockist
ISO 9002 RS33906

ElectroValue

Siemens franchised distributor

We supply

- Capacitors
- Resistors
- Transistors
- Integrated Circuits
- EMC filters
- Semiconductors
- Inductors
- Lamps & LEDs
- Suppliers
- Power supplies
- Varistors
- Regulators
- Potentiometers
- Thyristors
- Knobs
- Sensors
- Ferrites
- Crystals
- Fuses
- Panel meters
- Spark gaps
- Test gear
- Batteries
- Valves
- Terminals
- Flash tubes

Books
Boxes & Cases
Breadboards
Connectors
Cable
Fans
Switches
Relays
Transformers
Hardware
Headphones
Soldering equip
PCB materials
Service aids

Electrovalue Ltd. See us at web site: www.electrovalue.co.uk
Mail order: Tel: 01784 433604. Fax: 01784 433605. E-mail: sales@electrovalue.co.uk
Unit 5, Beta Way, Thorpe Industrial Park, Egham, Surrey TW20 8RE

Photocopies of this page are acceptable

Order Form

Check out our Web Pages at:
<http://www.pwpublishing.ltd.uk>

FOR ALL MAIL ORDER PURCHASES IN
PRACTICAL WIRELESS



SUBSCRIPTION RATES

Practical Wireless – 1 year.

- ☐ £30 (UK)
☐ £38 (Europe Airmail)
☐ £42 (Rest of World Airmail)
☐ £49 (Rest of World Airmail)

Special joint subscription with

Short Wave Magazine – 1 year.

- ☐ £60 (UK)
☐ £73 (Europe Airmail)
☐ £81 (Rest of World Airmail)
☐ £93 (Rest of World Airmail)

Monitoring Times – 1 year (12 issues).

- ☐ £38 (UK)
☐ £43 (Europe Airmail)
☐ £49 (Rest of World Airmail)

BUY OF THE MONTH

☐ Please send me copy(ies) of **The Superhet Radio Handbook** at the special price of **£4.95 inc. P&P (UK), £4.95 plus £2.50 (overseas).**
Offer closes 11 July 2001.

£

Book Orders

..... £
 £
 £
 £
 £
 £

Binders: £6.50 per Binder

Postal charges:

UK: £1.25 for one item, £2.50 for two or more items.

Overseas surface: £2.50 for one item, £4 for two items, three or more add an additional 50p per item. Airmail prices on application.

Binders P&P: £1.25 for one, £2.50 for two or more.

Thank you for using PW for your purchases

PAYMENT DETAILS

CREDIT CARD ORDERS TAKEN ON (01202) 659930

between the hours of 9.00am - 5.00pm. Outside these hours your order will be recorded on an answering machine.

FAX ORDERS TAKEN ON (01202) 659950

or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your beloved copy!

**To: PW Publishing Ltd., Arrowsmith Court, Station Approach,
Broadstone, Dorset BH18 8PW**

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.



Expiry Date.....

or please debit my Switch card No.



Date.....Switch Issue Number (if on card.....

Switch Expiry Date.....

Signature

Name

Address.....

.....

.....

.....

.....

Postcode.....Daytime Tel. No.....

.....

Orders are normally despatched by return of post but please allow 28 days for delivery.
 Prices correct at time of going to press. **Please note:** all payments must be made in
 Sterling. Cash not accepted.



topical**talk**

The weekend of April 21st/22nd saw radio enthusiasts once again queuing outside Alexandra Palace in North London. More than 20 years after the last radio show on this site, RadioSport brought the London Radio & Computing Show to this historic venue.

The first day of the show saw a long queue stretching down the hill. To ensure things moved as quickly as possible for those in the queue when the doors opened at 1000 hours, pre-ticketing had been arranged. During the day, groups of 20 visitors were able to visit the original BBC TV studios, which seems to have been enjoyed by all those who went on the tour.

Sunday was quieter, which is usual, but still plenty of visitors to keep many of the exhibitors busy. The two days of lectures were on a wide range of subjects and were well attended. With such topics as Sir Jules Thorn, Windows ME vs 2000, Tesla coils and Instant Morse, there was something for everyone. The Tesla coil lecturer brought a coil that produced showers of sparks at least 6ft long with a deafening noise to accompany it! A truly spectacular indoor lighting display.

When the clock struck four and it was time for the exhibitors to re-load their vehicles - with fewer boxes than came out - and head for home. Southgate ARC and RadioSport then set about clearing the hall. Hard work, but good fun!



We're unsure whether the wonderful surroundings made this Morse candidate any more confident, but it must be the best-decorated Morse testing area the examiners have ever been in!



The lull before the storm! The Southgate ARC do a great job every year with the Bring & Buy. Hundreds of items are booked in, viewed, sold and change hands over the two days. On Sunday afternoon all unsold and uncollected items are auctioned for club funds.



The Radiocommunications Agency stand always had lots of visitors. Whether that was because visitors to the show had lots of questions about radio regulations or because the RA had a huge number of free gifts we're not sure! They also had copies of their information booklets available for visitors. It is helpful to have the opportunity to discuss various points on the radio regulations with the people who put them into practice and to pass on the opinions of users.

Waters & Stanton had their usual huge line of tables with an equally impressive amount of stock. One of the busiest stands over the two days, visitors seemed to have some with their shopping lists and gone home happy! From scanners to amateur radios to PMR446 and accessories, they seemed to have at least one of everything.



nextmonth

Looking forward to the next issue of *Practical Wireless*? Take a look at what's on offer!

PRACTICAL WIRELESS

**THE UK'S BEST AND ONLY INDEPENDENT
AMATEUR RADIO MAGAZINE**

**Next Month in *Practical Wireless*,
the magazine that brings you
Amateur Radio & So Much More**

32-PAGE MAINLINE CATALOGUE

INCLUDING 500 NEW PRODUCTS.
Tons of surplus electronic
components and lowest possible
prices!

REVIEWED

Carl Mason GW0VSW gets to grips with the Yaesu FT-1000 Mk V h.f. all-mode transceiver.



ANTENNA BUILD

Want an h.f. antenna for 14-30MHz?
Derek Bunday G3JQQ says try his design for
a zig-zag log periodic

FEATURE

Dick King takes a look at the history of the International Short Wave League

TIPS & TRICKS

More handy hints and topical tricks presented
by **Tex Swann G1TEX**

STOP PRESS!

We are preparing to publish RAE course details in the Sept issue so post those details to us **now!**

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

CAN YOU AFFORD TO MISS IT?
AUGUST ISSUE ON SALE
12 JULY
PLACE YOUR ORDER TODAY!

YOUR LOCAL DEALERS

W. 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.

DORSET

To advertise in
Practical Wireless
telephone

Chris Steadman on
(01202) 659920

TODAY!

MID GLAMORGAN

SANDPIPER COMMUNICATIONS

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.

LONDON

MARTIN LYNCH & Son

For all your amateur radio needs

140-142 Northfield Avenue
Ealing London W13 9SB

Tel:

0181-566 1120

Fax:

0181-566 1207

BIRMINGHAM

FREE CB RADIO CATALOGUE

PHONE

0121-457 7788

SRP RADIO CENTRE

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

NOTTINGHAMSHIRE

KANGA PRODUCTS

QRP kits and components including the
MK484 with data sheet at £1.00 each

SEND TWO FIRST CLASS STAMPS FOR OUR
FREE CATALOGUE TO:

Sandford Works, Cobden Street, Long Eaton,
Nottingham NG10 1BL

Tel: 0115-967 0918 (evenings/weekends)

Mobile: 07710 898970 Fax: 0870-056 8608
http://www.kanga.demon.co.uk

EASTERN ENGLAND

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

WARWICKSHIRE

Ptech

PO Box 8653, Alcester, Warks B49 5DG

Tel: (01789) 400004 www.ptech.org.uk

The Philips Pronto replaces all existing infra-
red controllers. Free software and more
information on the Philips website -

www.pronto.philips.com X10 devices simply
plug into mains sockets to transmit Pronto's
commands to lights and appliances anywhere in
the house or garden - www.X10.com

DORSET

THE SHORTWAVE SHOP

Novice/C.B./Amateur/SWL Equipment.

Full range secondhand equipment
always available.

18 Fairmile Road, Christchurch,

Dorset BH23 2LJ

Tel/Fax: 01202 490099

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

SCOTLAND

TISPW

MIDINBANK FARM, RYELANDS,
STRATHAVEN ML10 6RD

Tel: 01357 440280 for full details

Circuits - any VCR £8, CTV £6.

Service manuals lent for £5.
Sold from £8, repair from £5.

P&P any order £2.50

WEST MIDLANDS

RADIOWORLD

42 Brook Lane, Great Wyrley,
Walsall, West Midlands WS6 6BQ

Tel: (01922) 414796

Fax: (01922) 417829

WE ARE 5 MINS AWAY FROM J11, M6

LONDON

HAYDON COMMUNICATIONS

For all your amateur radio equipment.

NEW, SECONDHAND, EX-DEMO

Unit 1, Thurrock Commercial Park, Purfleet Ind.

Est, London Rd, Aveley, Essex RM15 4YD.

Tel: 01708 862524 Fax: 01708 868441

Open Mon-Fri 8.00am - 4.30pm. Sat 8.00am - 1.00pm

NORTHWEST

ARC Ltd.

Everything for the radio
amateur under one roof!

38 Bridge Street, Earlestown, Newton-
le-Willows,
Merseyside WA12 9BA

Tel: 01925 229881

Fax: 01925 229882

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

Index to Advertisers

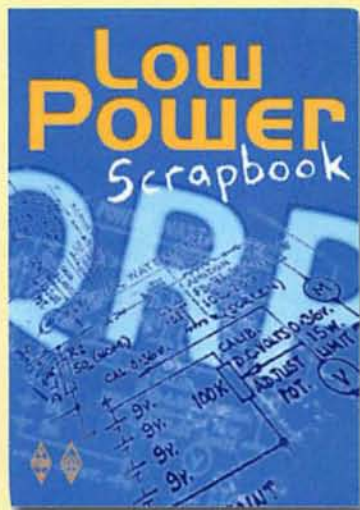
Aerial Techniques.....	75	Icom (UK) Ltd.....	61	RSGB.....	79
ARC Ltd.....	33	Lake Electronics.....	68	SDA Falcon.....	47
Armstrong Communications.....	68	Langrex Supplies.....	68	Short Wave Magazine.....	27
Birkett, J.....	75	Leeds Amateur Radio.....	47	SRP Trading.....	8
Castle Electronics.....	5	Martin Lynch & Sons.....	40, 41	Sussex ARC.....	47
Chelmer Valve.....	75	McMichael Rally.....	47	Sycom.....	75
Electrovalue.....	75	Moonraker (UK) Ltd.....	14, 15, 16	Tennamast.....	75
Freidrichshafen.....	68	Nevada.....	28, 29	The Shortwave Shop.....	47
G3TUX.....	33	QuartSlab.....	75	Waters & Stanton.....	2, 3, 4
Hateley Antennas.....	75	Radio Active.....	27	Yaesu UK Ltd.....	80
Haydon Communications.....	19, 20, 21	Radioworld.....	50, 51, 62, 63		

NEW

FROM THE RSGB

Low Power Scrapbook

The G-QRP Club are renowned as the leaders in Low Power and this book contains 133 of the very best projects from the Club's magazine *Sprat*. This book is 320 pages of the original material, brought together in a handy A5 book.



Choose from dozens of simple transmitter and receiver projects for the HF bands and 6m, including the tiny Oner transmitter and the White Rose Receiver. Sample the many VFOs, tuners, accessories and antennas on offer. Learn from the construction techniques of experienced constructors.

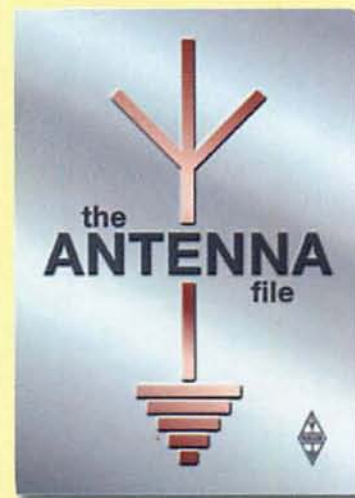
Ideal for the experimenter or someone who likes the fun of building and operating their own radio equipment.

A5 publication

ONLY £12.99 + p&p

The Antenna File

The Radio Society of Great Britain produces some of the best works on antennas and this is a collection of that work from the last ten years. This book contains 288 pages of articles drawn from the *Radcom* magazine and includes:



- 50 HF antennas, 14 VHF/UHF/SHF antennas, 3 receiving antennas, 6 articles on masts and supports, 9 articles on tuning and measuring, 4 on antenna construction, 5 on design and theory, and 9 Peter Hart antenna reviews.

- Every band from 73kHz to 2.3GHz

- Beams, wire antennas, verticals, loops, mobile whips and the G2AJV Toroid

In fact everything you need to know about antennas and how to get the best out of them.

A4 publication

ONLY £18.99 + p&p

NEW

1000 QSL CARDS FOR ONLY £9.99 (+£2.95 p&p)

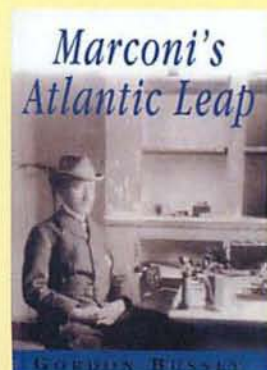


To celebrate Marconi's first radio transmission across the Atlantic, the RSGB has teamed up with Marconi to produce a full colour gloss card at a special low price.

Cards are available overprinted with your information for only **£24.99** plus the cost of the cards, or you can inkjet them yourselves.

(example shown overprinted)

Size 140 x 90mm



£6.99 + p&p



£24.99 + p&p

MARCONI £2 COIN GIFT SETS

The RSGB has a small quantity of Royal Mint sets of the new £2 coin celebrating the 2001 Centenary of Marconi's first Transatlantic transmission. The sets are delightfully presented with information on the coin and Marconi's achievement. The sets are available in a brilliant uncirculated version, Sterling Silver and 22 carat Gold versions.

Prices

UNCIRCULATED GIFT PACK

STERLING SILVER

22 CARAT GOLD

£6.95

£28.50

£295.00

All items will be despatched by Recorded Delivery at £1.50 per set
Overseas £2 (Gold £5 - Overseas £15)



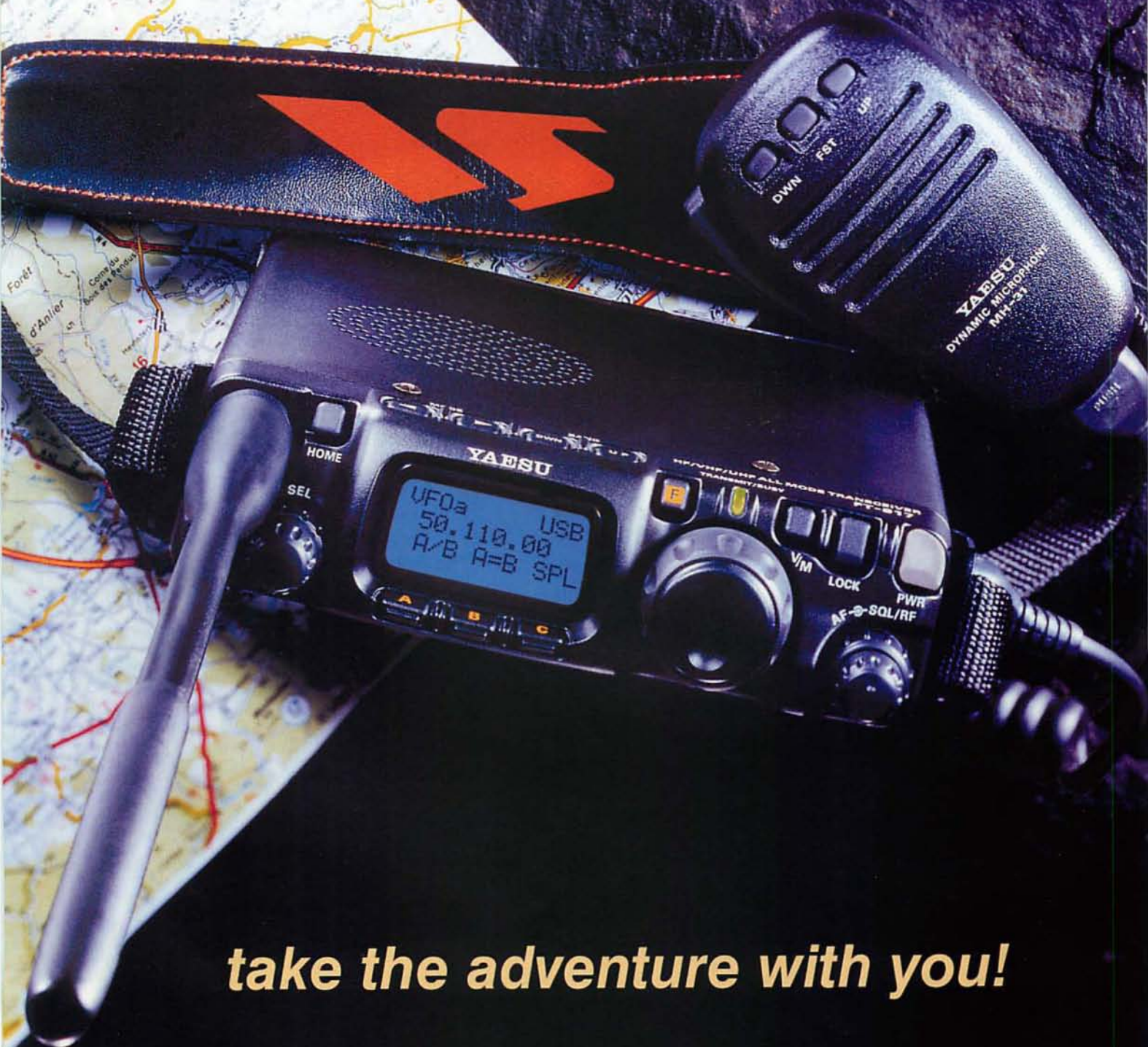
www.rsgb.org/shop or Tel 0870 904 7373

Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

ALL MODE PORTABLE TRANSCEIVER

FT-817

HF/50/144/430 MHz Multimode Transceiver



take the adventure with you!



YAESU

© YAESU UK Ltd, Unit 12,
Sun Valley Business Park,
Winnall Close, Winchester,
Hampshire, SO23 0LB, U.K.

Visit us on the internet! <http://www.yaesu.co.uk>