

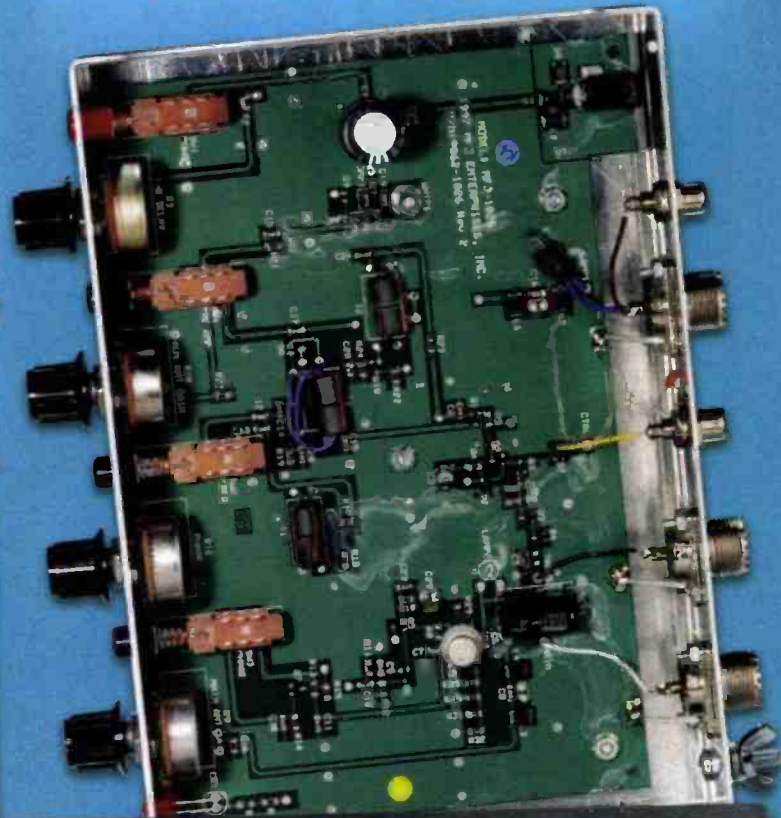
Practical Wireless

PW

amateur radio & more!

RAE COURSES ROUND-UP

The
Alinco
DJ-C5 -
small
and
neat!



Attack that noise with the MFJ-1026!

September 1998 £2.20

PLUS READER SURVEY





Waters & Stanton PLC

FREE-PHONE ORDER LINE

0500 73-73-88

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

Open Mon-Sat 9.00AM - 5.30PM

Web Site:- <http://www.waters-and-stanton.co.uk>



25th YEAR of Service to UK Amateurs

Read the latest Hot News on our Web

Orders: 0500 73 73 88

01702 206835

Enquiries 01702 206835

01702 204965

FAX 01702 205843

E-mail

sales@wspic.demon.co.uk



UK's Best Prices?
Even Lower
Than our Advert
- - on some items!



Call Us Now
ISO 9002
4 Engineers
10 Days Approval

Are You Missing Out?

Get The Catalogue
"Europe's Finest"



176 Pages Full Colour
Crammed with Products
Some never advertised
£3.95 post paid.
Full refund if not delighted

UK's Top Dealer for YAESU, KENWOOD & ICOM

WATSON

Hunter



£59.95 Frequency Counter

Features:

10MHz - 3GHz

Ni-cad Pack

AC Charger

BNC Antenna

150ft Range

Full Instructions

Hora C-150

£99.95

2 Metre Handy



Amazing Offer!

- * 25 / 12.5kHz Steps*
- * 1750Hz Tone*
- * Scanning*
- * 5W (Ext 12V)*
- * Keypad Entry*
- * Antenna*
- * 12 Month Full Warranty*
- * 130 - 170MHz Rx
- * 20 Memories
- * Battery Save
- * LCD Readout
- * 6 x AA cell case
- * Manual

This really is a superb performer. Don't be fooled by the price. Offers with our usual

10 - Day approval.

25 Amp Power Supply

W-25AM

£94.95!



Nothing else comes close!

20 Amps continuous, 25 Amps on SSB - ideal for all HF rigs. variable output 0 - 15V, cigar socket and dual meters.

New Sun Visor Speaker

£19.95!



Simply clips on car sun visor.

A great idea. Just clips onto car sun visor and puts the sound where you want it. Makes for a very tidy mobile installation. The unit is supplied with 5m cable terminated with 3.5mm plug. Also includes a volume control. Natches all transceivers and scanners.

AR-146 2m 50W

£199



- * 3 Power levels - Wideband receive
- * 40 Memories plus call channel
- * 7 Programmable steps
- * Channel or frequency display
- * The best sensitivity in the business
- * Keypad mic and mounting kit
- * CTCSS Encode and Decode!



C-408

From HORA

70cms
Handheld
Full
CTCSS

£89.95!

FREE Postage

SPECIAL OFFER PRICE

Full CTCSS; 20 memories; 1.6MHz repeater shift; Priority channel, Scanning; Dual watch; Dual mode squelch; PTT lock; 12.5/25kHz steps, 230mW output - all from just 2 x AA cells

YAESU

£349

FT-3000M 2m + Wideband RX

Save £50



2m/70cm 70W plus wideband rx including AM aircraft band. 9600 Packet ready. A bargain at this price!



AT-600 Dual Bander

New Low

Price £249



PW says: "an incredibly well priced radio - amazingly sensitive - audio - worked very well with 12.5kHz channel spacing - An Absolute Cracker"

- * 2m / 70cm
- * CTCSS encode/decode
- * Full DTMF + 1750Hz tone
- * Alphanumeric memories
- * Full duplex
- * CTCSS tone reader
- * 29 programmable features
- * AM airband receiver
- * Rx up to 990MHz
- * Ni-cads and charger

AM Air Band

YAESU FT-847 *it's Here!*



Includes 70MHz Transceiver

100W 1.8 - 50MHz * 50W 2m/70cm* SSB - CW - FM - AM * CTCSS * Alphanumeric * 0.1Hz steps * Packet ready 1200 & 9600 * DSP filtering * Dual display * squelch * IF shift * Notch filter * Power control * Tx monitor * Electronic keyer * 12.5 / 25kHz switched FM filtering * Switchable pre-amp * Size 260 x 86 x 270mm * weight 7kg

£1599

1.8MHz to 432MHz

Plus FREE PSU & Base Mic

ICOM Dual Bander New IC-Q7E **£215**

2m & 70cms FM & AM Rx In Stock about NOW

This pocket handheld provides 300mW of FM on 2m & 70cms plus wideband receive FM AM WFM from 30MHz - 1300MHz - no gaps. Runs from 2 x AA cells



ICOM IC-706 Mk II 1.8 - 146MHz **£995**

Plus FREE DSP



DSP Module for existing owners **£59.95**

The IC-706 Mk II transceiver as the best compact hf mobile bar none. It out performs and out specifes any other model. The only choice left is which dealer you buy it from! We offer you an unbeatable price and an unbeatable back-up service plus optional extended 5 year warranty for an extra £98!

YAESU

FT-920 1.8 - 54MHz

£1299



+ Free FM board & AM Filters

* 1.8 - 54MHz 100W * DSP filter * MOSFET PA * Internal ATU * Auto notch * Twin VFOs * Auto glow display * Shuttle jog * Digital voice memory * Electronic keyer * RS-232C converter * Quick memory bank + lots more phone or e-mail for colour leaflet

YAESU

FT-100MPDC (AC £2199)

£1899



* 1.8 - 30MHz 100W * SSB - CW - FM - AM * Rx 100kHz - 30MHz * Message memory * Dual in-band rx * EDSP filter * RF processor * RF pre-amp * Electronic keyer * IF shift width * Collins filters * omprehensive menu system * RS-232 interface and more - send for details

KENWOOD TS-570 1.8 - 30MHz



Kenwoods new transceiver that is earning a reputation for offering one of the best receivers in the business. If you are looking for a hot little number that is not too expensive (Radio we meant), send for brochure.

YAESU VX-1R Dual band

The world's Smallest HT From the UK's Biggest Dealer!

£239

Our best selling dual bander and one we would be happy to own.



ICOM

IC-746 1.8MHz - 146MHz

Superb HF Performance

Our Best Seller!

Free PSU **£1595**
Free Base Mic



YAESU

FT-840 1.8 - 30MHz

£659



Phone for Crazy Price!

If you are looking for a good, reliable 100W transceiver, then this is just the job. Supplied with FREE Base Mic.

YAESU

FT-8100 Dual Bander Mobile

£399.95



Yaesu's top selling dual band mobile transceiver. very thing you could wish for including wideband receiver

ICOM New IC-2100 2M Mobile **£269**

With Switched 12.5kHz & 25kHz

New Model



The IC-2100 Mobile transceiver from ICOM features switched filtering, 55 Watts with 113 memories. And all this at a very competitive price. In stock NOW

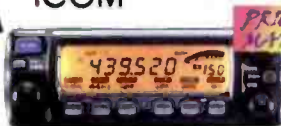
Allinco DX-70 HF Base / Mobile



* 1.8 - 54MHz
* SSB CW FM AM
* 100W HF 10W 50MHz
* CTCSS Tone unit

£599.95

ICOM IC-207H 2m/70cm Mobile



* 2m & 70cm
* 50W / 30W
* Detachable head

£339

Rechargeable Alkaline Cells For Starter Kit

- * Rechargeable Alkaline
- * 1.5V cells
- * No memory effects
- * Charge mid cycle is OK
- * 5 year charge shelf life
- * 3 x capacity of ni-cads
- * Very low cost

In stock now! * Note: you must use the special charger supplied with Starter Kit.

Starter Kit: Comprise 4 x AA cells and dedicated AC wall charger **£13.99 + £2 p&p**

- 4 x AA cells (ready charged) **£5.99 (£1.00 post)**
- 8 x AA cells (ready charged) **£10.99 (£1.50 post)**
- 4 x AAA cells (uses standard charger) **£6.25 (£1.00 post)**

ICOM Stock Clearance IC-T22E **£259**

£149.95



Plus Airband AM Receive!

2 Metre advanced Handy
40 Memories Slim Design
12.5kHz steps Wideband Rx
CTCSS DTMF
Ni-cad Pack AC Charger

MFJ

Ham Radio Accessories

Rotary Inductor ATU



NEW

- * 1.8 - 54MHz 300 Watts
- * Built-in 300W Load
- * Wire - balanced or coax
- * Roller Coaster Inductor
- * Active PEP meter (PP9 Batt)
- * 4-way Antenna Switch
- * Cross Needle metering

£179.95

FREE 48 Page Catalogues
With Discount Vouchers

Just phone, write or e-mail for your copy of the complete 48 page MFJ UK catalogue with discount vouchers. Your chance to see the huge range plus save money on normal prices - and it's completely FREE!



1.8-30MHz 300W ATU



- * 300 Watts PEP 150W CW
- * 1.8 - 30MHz - with ease!
- * Wire, coax or balanced line
- * Balun included for best match
- * 30 / 300W power meter - PEP / RMS
- * Antenna selector, by-pass etc.

£129.95



Same as MFJ-948 above but with internal dummy load.

£149.95

New QRN Noise Filter



See Review

- * Phases out noise at the antenna socket
- * Kills local QRN - lets signals through
- * No more electrical interference!
- * Rf sensed for transceiver use (150W)
- * Up to 20dB noise reduction
- * Recovers signals below the noise!
- * Adjust to suit local problems
- * Kill that thermostat problem

£149.95

1.8 - 30MHz 3kW ATU



- * 1.8 - 30MHz with roller coaster
- * Cross needle VSWR & PEP
- * "T" network with 4:1 balun
- * Long wire, coax and balanced feed
- * By-pass and Antenna select switch
- * 270 x 375 x 115mm

£349.95

The Best DSP Filter in the World!



£239.95

Hear those weak signals - Get rid of the QRM - works better than any internal rig DSP - 16 memories - totally programmable

DSP Data Audio Filter



£139.95

- * CW 50, 100, 200, 500Hz filter
- * Suits all data modes
- * Full adjustable pass band & filter

The DX Machine Ameritron AL-811X



£799.95

UK's Top-Selling Linear

- * 160 - 10 Metres
- * 600 W linear 7.5dB Gain
- * Like a 3 element Monobander!
- * Uses low cost 811A tubes
- * Built-in rugged AC Supply
- * Instant by-pass switch
- * PA V/A meter + Grid meter
- * Over rated variable capacitors
- * Fan cooled for long life

Perfect CW Tutor



"It's an Amazing Idea!"

- * Displays words, letters and numbers
- * 3 to 35WPM with natural CW note
- * Various modes including Farnsworth
- * Enormous vocabulary of words
- * Actually sends QSOs as well!
- * Individual characters or groups
- * Headphone socket; Power from PP3
- * Sends text just like an actual test.
- * A tutor that displays what it sends.

Nothing Compares **£79.95**

Auto ATU Matcher



£59.95

Lets your Auto ATU match any coax aerial.

MFJ-914

Auto-Tuner Extender
Connect between transceiver and antenna - no more problems with G5RVs and all those difficult antennas - 160 to 10 metres

MFJ- 901B HF Atu



£69.95

- * 160 - 10 ATU 300W PEP
- * Very easy to adjust and match
- * Wires, Coax and Balanced Feeder
- * Well rated components
- * A really low cost winner from MFJ

Vectronics HFT-1500 ATU



Graphic PEP Meter

- * 1.8 - 30MHz * 1kW Power **£389.95**
- * Graphical PEP Meter * Roller Inductor
- * Wire, Balanced or Coax * 6-way antenna switch * Crosse-needle meter
- * Built-in 4:1 Balun

MFJ-564 Paddle **£59.95**



A high quality paddle designed for use with the modern transceivers with built-in keyers. Fully adjustable and built on a very heavy base.

PRICE MATCH MFJ Ameritron Vectronics

We'll match our competitor's advertised prices provided they have it in stock. PLUS we'll give you a genuine MFJ backed warranty!

MFJ USA wish it to be known that only stock imported by Waters & Stanton PLC and supplied to approved dealers carries the official FREE factory warranty.

All future MFJ stock will carry the official UK warranty cards (which have to be returned to us) and serial numbers. If your item does not have this card or serial number, phone us for guidance. If a product is purchased that does not come through the official channel, you could find yourself at the mercy of a dealer who has no service information, is supplying old versions or non European models, has no access to factory parts or the backing of the UK service team!

PHONE FOR FREE MFJ CATALOGUE

Vectronics VC-300DLP ATU



- * 1.8MHz - 30MHz 300W ATU
- * Balanced, coax, long wire
- * PEP, Average and VSWR
- * 3-way antenna selector
- * Built-in dummy load
- * Thru position * Size 257 x 85 x 197mm

£129.95

4-Way Coax Switch



£49.95

Rated at 1kW with a frequency range from DC - 1GHz. Fitted SO-239 sockets. Ideal for shack antenna switching.

MFJ-260C Dummy Load



300 W Dry Load
DC - 600MHz
SO-239 Socket

£32.95

We stock a wide range of dummy loads up to 2.5kW. Phone for information

Data Decoder



MFJ-462B

- * Decodes CW, RTTY, ASCII, AMTOR FEC
- * LCD 2 x 16 characters
- * 8000 character RAM
- * Key input for CW practice
- * Epson compatible printer port
- * Requires 12V at 300mA DC

£179.95

Waters & Stanton PLC

22, Main Road, Hockley, Essex SS5 4QS
Orders FREEPHONE 0500 73 73 88
Technical 01702 206835

E-mail sales@wspc.demon.co.uk
Web http://www.waters-and-stanton.co.uk

SEPTEMBER 1998
 (ON SALE AUGUST 13)
 VOL. 74 NO 9 ISSUE 1098
 NEXT ISSUE (OCTOBER)
 ON SALE SEPTEMBER 10

EDITORIAL OFFICES

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

Editor

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

☎ (01202) 659910

(Out-of-hours service by answering machine)

FAX: (01202) 659950

ADVERTISEMENT DEPARTMENT

ADVERT SALES & PRODUCTION

(General Enquiries to Broadstone Office)

Chris Steadman MBIM (Sales)

Carol Trevarton (Production)

Steve Hunt (Art Editor)

John Kitching (Assistant Art Editor)

Peter Eldrett (Advert Typesetting)

☎ (01202) 659920

(9.30am - 5.30pm)

FAX: (01202) 659950

ADVERTISING MANAGER

Roger Hall G4TNT

PO Box 948, London SW6 2DS

☎ 0171-731 6222

FAX: 0171-384 1031

Mobile: (0585) 851385

BOOKS & SUBSCRIPTIONS

Michael Hurst

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

15 SPECIAL PRIZE COMPETITION

Win one of two Ten-Tec kits in our easy-to-enter competition.



17 RADIO BASICS

This time Rob G3XFD describes the construction of a traditional tuned radio frequency receiver.

20 YOUR 'TICKET' TO SUCCESS

We 'round-up' the RAE courses that are taking place throughout the country.

23 ANTENNAS IN ACTION

Tex Swann G1TEX presents eight pages of antenna action for all you enthusiasts.

34 SO THANK YOU MR MARCONI, GRANDAD, CLIVE & THE VICAR ...

Peter Norman G0PKS says 'thank you' to all those who he considers helped him to get on the air.

38 THE ALINCO DJ-CSE DUAL-BAND HAND-HELD

Dick Pascoe G0BPS found out that 'good things do come in small packages' when he reviewed the latest in miniature transceivers.



41 READER SURVEY

Let us know your opinions on PW and you could win a HORA C408 u.h.f. Hand-Held transceiver.

45 SOURCES, 'SINKS' AND ELECTROMOTIVE FORCES

Geoff Billington G3EAE looks at the theory behind an aspect of Amateur Radio that confuses many enthusiasts.



52 CARRYING ON THE PRACTICAL WAY

George Dobbs G3RJV describes a project, which is based on the TA7310 integrated circuit.

56 ATTACKING THAT NOISE PROBLEM

Jack King G4EMC tries out the MFJ-1026 noise cancelling signal enhancer in a bid to tackle his QRN problems.



62 VALVE & VINTAGE

Phil Cadman G4JCP has plenty to delight all you valve enthusiasts this month.

67 RADIO SCENE

Regular reports from all your favourite columnists including Chris VK3CE's quarterly report from Australia.



REGULARS

9 KEYLINES

10 LETTERS

12 NEWS

47 RADIO DIARY

48 SUBSCRIPTIONS

54 BOOK PROFILES

75 BARGAIN BASEMENT

80 BOOK STORE

83 COMING NEXT MONTH



67 RadioScene

All the regular band reports from your favourite authors.



Copyright © PW PUBLISHING LTD. 1998. 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 Southampton (Web Offset) Ltd. Distributed by Seymour, Windsor House, 1270 London Road, Northway, London SW16 4DH. Tel: 0181 679 1899. Fax: 0181 679 9807. Telex: 8812945. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd., South Africa - Central News Agency. Subscriptions INLAND £25, EUROPE £30, REST OF WORLD £32 (Airmail), REST OF WORLD £37 (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 £30 per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Royal Mail International, c/o Yellowstone International, c/o Yellowstone International, 87 Burrows Court, Hackensack, NJ 07601 UK. Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/o Yellowstone International, 2375 Pratt Boulevard, Elk Grove Village, IL 60007-5937. The USPS (United States Postal Service) number for Practical Wireless is: 007075.

VHF TOP

Yaesu VX-1R

Because the VX-1R is the smallest Handie in the world, we know that you will take this postage stamp radio with you when you wouldn't bother with the others! One Watt out on 2m & 70cm, wide band RX 0.5-1.7MHz AM & 76-999MHz FM/WBFM. RRP £269 ML Price £make your eyes water! CALL.

IC-821H

The IC-821H has proved to be the best performance 2/70 Base Station money can buy. Whilst the new breed of 'Super-Rigs' offer every frequency from DC to blue light, they obviously compromise on performance somewhere. The IC-821H has

been specifically designed for users who want the best on two bands - 144MHz and 432MHz. If you are serious about VHF operation then the IC-821H is for you.

RRP £1595
ML Price: £1295
or £14.99
Deposit & 54 x
£35 p.m.

STANDARD C5900

Still the only Triple Band mobile on the market with all three bands fitted as standard! 2m, 6m & 70cm with the power output to match. Superb engineering with remote head capability.

RRP £799
ML Price £599
or £16.99 deposit & 29 x
£25 p/m

KENWOOD TM-G707

Dual Band 2/70 Mobile. Fantastic display. Nice and easy to use

in the car. 180 memories and Remote Head.

RRP £349
ML Price £299
or £17.49 deposit & 11 x £28 p/m



ICOM IC-T8E

FREE FINANCE on this product

The only TRIPLE BAND 2/6/70 Handie on the market. Fortunately it's brilliant.

RRP £349
or £49 deposit & 12 x £25 p/m
ZERO FINANCE CHARGES

STANDARD AX-400MkII

Probably the smallest, lightest scanner in the world. FREE MyDel Police style earpiece!

RRP £249
ML PRICE ONLY £169.95
NiCads and Desktop charger now available. £39.95

ALINCO DRM-06

The only 6m FM 20W transceiver available on the market. No frills, simple in operation & which is all you need to get on Six

Metre simplex or through the ever-growing array of repeaters. Available now! Only £239

ICOM IC-207

A very compact Twin Band mobile that works well in the car

or the shack. Remote Head (surprise surprise) Loads power on both bands!

RRP £389
ML Price £339
or £34.15 deposit & 12 x £28 p/m

YAESU FT-8100

A full Dual Bander (i.e. you can receive two bands at once), Remote, 50W on 2m * 35W on 70cm. One of the best in the RX division too!

RRP £449
ML Price £399
or ZERO deposit & 18 x £25 p/m

ICOM IC-PCR1000

Computer-controlled all-mode receiver. 300kHz - 1.3GHz. Uses your own PC operating Windows 95. Thousands sold worldwide.

RRP £349
ML SPECIAL PRICE £249
DSP Module available
£59.95



Call now
0181-566 1120

H

MARTIN LYNCH & SONS, 140-142 NORTH

FAX: 0181 - 566 1207 CUSTOMER CARE: 0181 - 566 0 566

FOR THE LARGEST SELECTION OF NEW

Martin Lynch can also offer finance terms up to 60 months. Deposits from a minimum of £25. We offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Swift

10

YAESU FT-847GX

Calling all Earthlings. We've developed a Transceiver that does everything except make your British cup of tea. We think that the radio will be so much fun you'll probably forget about drinking anyway. HF + 6m + 4m + 2m + 70cm
RRP £1699
ML Price £1599
or £35.86 deposit & 60 x £40 p/m

ICOM IC-746

We like this one. Huge display, brilliant DSP and 100 Watts on HF + 6m + 2m. We've also crammed in an auto ATU to save you twiddling your fingers more than usual.
RRP £1695
ML Price £1595
or £31.86 deposit & 60 x £40 p/m

FT-1000MP/AC

Yaesu's best selling HF Transceiver since the FT-1012D. The ultimate R.F. performer now available at Interest Free.
RRP £2499
ML Price £2199
or £183 deposit & 18 x £112 p/m
ZERO FINANCE CHARGES

FT-920AF

If it's good enough for the Spratly Island Expedition

it's good enough for you. Excellent value HF + 6m at 100 Watts. Now fitted with AM/FM options.
RRP £1499
ML Price £1299
or £18.99 deposit & 54 x £35 p/m

IC-706mk11 DSP

Attention anyone out there that does not understand that this little box REALLY IS an HF, Six Metre & 2 Metre wireless. We won't mention the DSP, wide band FM and extended receive coverage and

optional SSB and CW narrow filters. Still doesn't make Tea.

RRP £1099
ML Price £999
or £22.03 deposit & 60 x £25 p/m

FT-900ATC

Built like a brick out house, if you just want good H.F performance in one compact (but not micro) package then order an FT-900ATC. HF, auto ATU & 'Collins' SSB filter fitted as standard.
RRP £949
ML Price £799
or £15.53 deposit & 43 x £25 p/m

IC-775DSP

The flagship 200 Watt

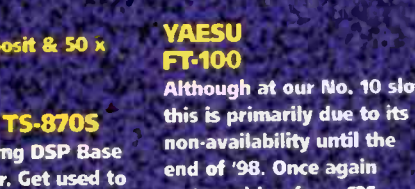
Bruiser. Built in PSU and ATU, if you only want HF operation and can live without every other band between DC & Blue light place your order now!!
RRP £2995
ML Price £2795
or £187.33 deposit & 50 x £75 p/m

KENWOOD TS-870S

Still the reigning DSP Base HF Transceiver. Get used to the operation of the Digital machine and you won't want to go to bed. Unless there is a 6' 2" blue eyed blond waiting for you.
RRP £1999
ML Price £Phone and ask for 'wilky' special!

LINEAR AMP U.K. RANGER 811

Easy to tune minimum 400 Watts out (upto 800!) HF Linear Amplifier. Includes built in PSU and metering. Better still it's made in Great Britain.
Priced at only £895
or £25.77 deposit & 50 x £25 p/m.



YAESU FT-100

Although at our No. 10 slot this is primarily due to its non-availability until the end of '98. Once again we're asking for a £25 deposit to secure earliest delivery, just like all of you that placed a deposit for the FT-847GX and got ahead of the rest of the suppliers! HF + 6m + 2m + 70cm (4m ?? Don't know!) All in a package the size of a Dual Band mobile.

FINANCE EXAMPLE

All examples do not include P&P.

Cash Price	10% Deposit	36 Months@	Total Credit	APR
£289.00	£29.00	£9.44	£368.84	19.9%

Written quotations available on request.

PRICE MATCH!

If you see any products advertised by an authorised dealer in this magazine for a lower price but would rather buy from ML&S give us a call.

USED EQUIPMENT SPOTLIGHT

Yaesu FT-736R



Having just finished a ten-year production run, we have a select quantity of pre-owned examples all offered with a 15-month parts and labour warranty.

- 2m & 70cm as standard
- Optional 6m & 23cm modules available
- built in PSU
- Full satellite operation
- 25 Watts out on 2/70 10W on 6/23
- Fully variable power

From only £895 or £25.77 deposit & 50 x £25 p/m

Yaesu FT-480R

We know its old but what a fabulous machine for all mode operation on 2 metres.

- 10W output
- All mode SSB/CW/FM
- 10Hz tuning steps on SSB
- Dual VFO's
- A receive front end that receives 2m & not pagers!

Only £199 with full 90-day warranty.

Kenwood TR-751E

Still one of the best 2m all mode transceivers available.

- 25W output
- All mode SSB/CW/FM
- Dual VFO's
- Excellent TX audio and RX performance

From only £399 with full 90-day warranty.

Lots more used stock to choose from. See our web site MlandS.co.uk or phone for latest list.

DON'T FORGET!!

ML&S are the only dealer to offer "Morse on Demand" each and every first Saturday of the month. We'll make you feel welcome and calm your nerves with mugs of coffee before the event. Just turn up on the day with two photos, the £20 fee and dp your stuff. Three cheers from the Lynch Team if you pass!

FT TOP 10

We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR 19.9%. Payment protection is also available up to 36 months. All units are brand new and boxed and carry a 12-month warranty. No additional charges for credit cards. Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. £8.0E £10 p&p on all major items.

FIELD AVENUE, EALING, LONDON W13 9SB

WEB SITE: MlandS.co.uk E-MAIL: sales@MlandS.co.uk

NEW & USED EQUIPMENT IN EUROPE

QSL COMMUNICATIONS

UNIT 6, WORLE INDUSTRIAL CENTRE, COKER ROAD
 WORLE, WESTON-SUPER-MARE BS22 6BX
 TEL/FAX 01934 512757

SHOW ROOM OPEN
 10am - 6pm MON-FRI
 9am - 1pm SAT

NEW PRODUCTS (TRADE ENQUIRIES WELCOME)

RECHARGEABLE ALKALINE CELLS



Rechargeable Alkaline.
 No memory effects.
 1.5v cells.
 Charge mid cycle OK
 3 x capacity of nicads.

STARTER KIT INCLUDES
 CHARGER AND 4 X AA CELLS

£13.49 + £2 P&P

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

Extra cells available @
 4 X AA **£5.99**
 4 X AAA **£6.25**
 Plus £2.00 P&P

 ** SPECIAL OFFER **
 ** CABLE BULK PURCHASE **
 ** PER 100M ROLL **
 ** RG213U **£62** + P&P **
 ** RG58CU **£22** + P&P **
 ** 7 CORE ROTATOR **£45** + P&P **
 ** P&P DEPENDANT ON QUANTITY **

MOBILE CABLES

RG188A/U SO239 Snail to PL259 plug
 5m long to fit rb400 mount
 with miniature coax to
 go through door seal

RC - 5MB
£16.99
 P&P £3



MOBILE CABLES

RG58A/U SO239 Snail to PL259 plug
 5m long to fit RB400 mount

RC - ECH
£9.99
 P&P £3



BASE STATION ANTENNA

2m band + 70cm band
 6.0dB gain 8.0dB gain
 200W
 V.S.W.R. less 1.5
 Length 2.5m
 PL fitting

BA - 6200
£59.95



MOBILE ANTENNA

2m band 7/6
 4.2dB gain
 150W
 V.S.W.R. less 1.5
 Length 1.41m
 PL fitting

NL - 2C
£25.95

MOBILE ANTENNA

2m band + 70cm band
 3dB gain 5.5dB gain
 200W
 V.S.W.R. less 1.5
 Length 0.95m
 PL fitting

NL - 770R
£24.95



POWER CORD

To fit Yaesu, Kenwood,
 Icom, Alinco, Standard

RK - 01
£5.99
 P&P £3



HATCH/BOOT MOUNT

Top quality
 adjustable mount
 to fit most models
 of vehicle

RB400
£14.69
 P&P £3



AKD WAVEMETERS

WA1

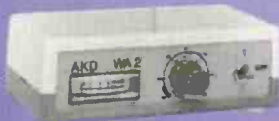
VHF Wavemeter for 2m



£34.95

WA2

Wavemeter for 6m and 4m



£34.95

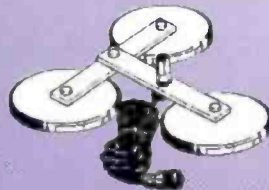
WA3

HF Wavemeter 1.8-92MHz



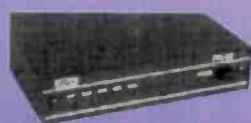
£58.45

MM3401 TRIPLE MAGNET



3 X 5" magnets
 aluminium frame
 3/8" mount
 17ft RG58 cable
£39.99

PK12 Packet controller. Software included

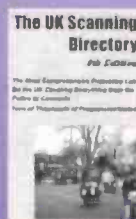


£99.99

SECONDHAND

KENWOOD TS-140S	HF TCVR.....	£499
KENWOOD TS-450SAT	HF TCVR.....	£750
KENWOOD TS-570D	HF TCVR.....	£949
KENWOOD TS-711E	2m multimode.....	£449
KENWOOD PS-31	PSU.....	£149
ICOM IC-R10	Scanner.....	£199
ICOM IC-W2E	Dual handy.....	£229
ICOM IC-2350H	2/70cm mobile.....	£329
YAESU FT-767GX	HF + 2M + PSU.....	£799
YAESU FT-530	Dual handy.....	£249
YAESU FT-290 Mk2	2m multimode.....	£299
YAESU FL-290	Linear 290 Mk2.....	£99
AOR AR3000	Receiver.....	£449
ALINCO DJ-G5	Dual handy.....	£199

UK SCANNING DIRECTORY



£15.00 + £2.50 P&P

TRANSCIVERS & RECEIVERS
 ALSO AVAILABLE

P&P £7 NEXT DAY ALL PRODUCTS UNLESS OTHERWISE STATED

QSL COMMUNICATIONS

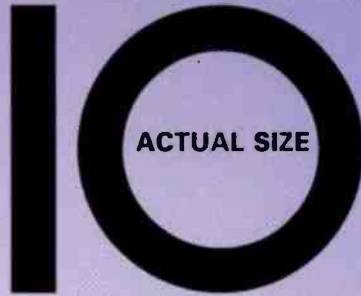
TEL/FAX 01934 512757
PHONE FOR COMPETITIVE PRICE ON ALL MODELS OF
TRANSCIVER & RECEIVERS

YAESU FT-847



PRICEMATCH

FERRITE RING



Pack of
10

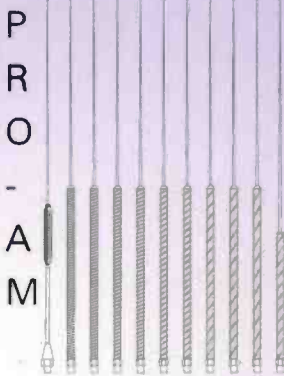
£10.00
INC P&P

ICOM IC-706 Mk2 DSP



£PHONE

★★★★★★★★★ GENUINE PRO-AM ANTENNAS FROM THE USA ★★★★★★★★★★



- 160M = £49
- 80M = £22
- 40M = £20
- 20M = £18
- 17M = £18
- 15M = £18
- 10M = £18
- 6M = £18

DAK-AD

£9.95

P&P £2.50
Dual adaptor
accepts 2 antennas for
vertical or horizontal
dipole. (Note: suitable
for pro-am HF
antennas which are
sold separately).



D270 Duplexer



144-148MHz. 430-450MHz
£26.95 P&P £3.50

EGM 144-430
Dualband on glass
£39.95 + £4 P&P

On glass scanner ant
112-1200MHz
£29.95 + £4 P&P

G5RV HALF SIZE
£16.96 + £4 P&P

G5RV FULL SIZE
£18.95 + £4 P&P

WATSON, TYWAN SERENE, TONNA, CUSHCRAFT ANTENNAS ALSO AVAILABLE

YAESU FT-8100R



2 + 70cm mobile
£Phone
PRICEMATCH

ICOM IC-207



2 + 70cm mobile
£Phone
PRICEMATCH

ALINCO DR-605E



2 + 70cm mobile
£Phone
PRICEMATCH

KENWOOD TM-G707E



2 + 70cm mobile
£Phone
PRICEMATCH

CABLE

PER METRE

- H103 Westflex (10mm)
- Low loss 50 ohm coax.....**95p**
- 213U Low loss
- 50 ohms coax (10mm).....**80p**
- RG58 CU
- 50 ohms coax (5mm).....**30p**
- 7 core
- Rotator cable.....**60p**
- Twin 300 ohms.....**65p**
- Twin 75 ohms.....**25p**
- DC 10 amp red/black.....**25p**
- DC 15 amp red/black.....**30p**
- Doubled screened
- Satellite cable.....**60p**
- 6mm earth cable.....**45p**

Large range of connectors
available, minimum
cable/connector
order £10.
P&P dependant
on weight.

ALTAI AR300XL ROTATOR

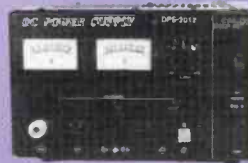


45kg vertical load
only **£49.00**

POWER SUPPLIES

P-2512 'M'

Variable volt (3-15)
Volts & amps meters
25-30 amps.



£89.95

ALTAI

Over voltage/current
short circuit protected



5-7 amp **£24.99**



10-14 amp **£44.99**

EARTH RODS 4FT LONG, ADJUSTABLE BRASS FIXING
SOLID COPPER **£10.99**, COPPER PLATED STEEL **£8.99** P&P £4

QSL CARDS FROM £3.75 PER 100

SEND A LARGE S.A.E.
FOR SAMPLES AND PRICE LIST

FULL SPECIFICATION ON ALL EQUIPMENT AVAILABLE ON REQUEST

INNOVATION FOR THE NEXT MILLENNIUM

ICOM

I
C
W
3
2
E



TRANSCEIVERS

Alinco DJ-190.....	£149.99
Alinco DJ-S41.....	£99.99
Icom ICT-7E.....	£279.99
Kenwood TH-22E.....	£209.99
Alinco DJ-G5.....	£269.99
Yaesu FT-50.....	&Call
Yaesu FT-11.....	&Call
Alinco DR-140.....	£219.99
Alinco DR-430.....	£259.99
Yaesu FT-8100R.....	&Call
Yaesu FT-3000M.....	&Call
Icom IC-207H.....	£439.99
Icom IC-2710H.....	£494.99
Icom IC-W32E.....	£349.99
Icom IC-T8.....	&Call

GARMIN GPS III



GPS 12.....	£129.99
GPS II+.....	£209.99
GPS 12XL.....	£204.99
GPS 48.....	£229.99
GPS MAP130.....	£434.99
GPS MAP135.....	&Call
GPS MAP175.....	&Call
GPS MAP230.....	&Call
GPS MAP220.....	&Call
GPS III new.....	&Call

NIGHT VISION

from £179.99

USR PALM PILOTS

from £149.99

DIGITAL CAMERAS

from £199.99

LASER POINTERS

from £29.99

MAGELLAN GPS

Color
T
R
A
K



GPS Pioneer.....	£89.99
GPS 2000XL.....	£139.99
GPS Tracker.....	£219.99
Color Trak.....	£279.99
GSC 100.....	£1349.99
NAV 1200.....	£229.99
NAV 6000.....	£569.99
NAV 6500.....	£739.99



EST 1985
IMPORT AND EXPORT



MAIL ORDER HOTLINE

0171-637 3727

Fax: 0171-637 3728 E-mail: sales@sun-rise.co.uk

229 Tottenham Court Road, London W1

All prices include VAT. Next day delivery available

YUPITERU

M
V
T
7
1
0
0



SCANNERS

Welz WS-1000.....	£209.99
Icom IC-R10.....	£259.99
Uniden 220XLT.....	£169.99
Uniden 60XLT.....	£49.99
Yupiteru MVT-9000.....	£319.99
Yupiteru MVT-7100.....	£199.99
Uniden BC-80XLT.....	£89.99
AOR AR8000.....	£289.99
Alinco DJX-10.....	£289.99
Yupiteru MVT-3300.....	£154.99
AOR AR3000.....	&Call
Icom ICR-8500.....	£1499.00
Yaesu FRG-100.....	£489.99
Icom PCR-1000.....	&Call

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

As in previous years, a special QSL Card will be available to anyone who has a...

Keylines

As many readers know, from January to October I'm 'on the road' averaging two PW 'Club Visits' a month. Meeting friends, making new ones and sharing the great fellowship of Amateur Radio.

In the nine years or so since my 'PW Club Visits' really came into demand as I developed my natural 'up-front' approach as Editor I've averaged the 12 to 14 or so visits each year - occasionally even going abroad. There's no charge or fees connected with my attendance and I often drive over 400km (record for one visit - in the UK - taken over two days was just under 1500km) or more in a day to attend a club.

On the vast majority of occasions I thoroughly enjoy the evening, but sometimes I come away somewhat despondent - thinking 'why did I bother?' But recently my spirits have been raised through the roof so to speak by the attendance, the welcomes, reactions and generosity of several clubs in their donations to the charity I support - the **Radio Amateur Invalid & Blind Club (RAIBC)**.

The RAIBC assists disabled, blind and house-bound radio enthusiasts to learn about and enjoy our hobby. And in my very small way I hope the pleasure I get from my work provides benefit for others too...so when a donation is made I'm always very grateful.

Hereford Heroes
The 'up-lift' started on Friday June 19th when I visited the **Hereford Amateur Radio Society (HARS)** on Friday June 19th and they became real 'heroes' - with the support of the Abergavenny Club who joined in for the evening.

Despite the forbidding look of the building where the HARS meets - in the aptly named Gaol Street, within the substantial old Civil Defence Headquarters directly under the Magistrates Court, the welcome from the large number of people present was tremendous. We all had a marvellous evening and were joined by many young people who listened to my talk, and enjoyed the (often hilarious) 'Questions & Answers' session afterwards.

However, the great surprise came when I was presented with a cheque for £50 to present to the RAIBC on behalf of everyone present. I was overwhelmed with gratitude. And the generosity of the two clubs really took me by surprise.

As I'm provided with a 'Travel Budget' there are no expenses involved with my club visits, so whenever I am offered expenses I suggest the club send a donation to the RAIBC. I also suggest this in my letters accepting invitations. However, the £50 raised at Hereford was (at one stroke) more than the total sent on my behalf to the RAIBC in the last two years. So, you may well realise how delighted I felt - particularly when I presented - as the photograph shows - the cheque to **Shelagh Chambers, Treasurer of the RAIBC**, at the Longleat Rally on June 28th.

Incidentally, I finally left Hereford at 11.45pm, arriving back in Dorset at 1.45am Saturday morning...very tired, but pleased and happy that the generous spirit in our hobby lives on. However, there was more to come!



Wrexham's Willing!
My second up-lift came when I visited the **Wrexham Amateur Radio Society** on July 7th who also showed willing in every way. Again there was an excellent turn out and I was privileged to meet a group who had travelled from as far away as Stoke-on-Trent for the evening.

Again there were a number of young people present in the well-filled community centre - always an encouraging sign I think - along with the club's latest group of RAE successes. They got a round of applause - which after sitting the May examination - was richly deserved!

The enthusiasm, drive and tenacity of the members of the WARS was infectious - I greatly enjoyed their company and bearing in mind that the area has employment problems and is semi-rural - the efforts members make attending meetings was impressive.

The meeting over-ran, and in fact we were all still talking in the car park after the

The time has come for us to conduct a full survey on behalf of PW. It's some years since we had a full survey published in the magazine and on behalf of the Editorial team and everyone working on the magazine I ask you to spend some time in completing the survey form in the centre of this issue and returning it to the address given. Armed with your information everyone working on PW can then work to produce the magazine which best suits your needs.

To show our appreciation for your time - and to act as an appropriate encouragement - every completed survey sent to the address on the form enters our special free draw. The winner will be presented with a **HORA C-408 430MHz hand-held**, kindly donated by **Waters & Stanton PLC**. So - get busy writing as we need your opinion!

caretaker had locked up! And although I enjoyed the evening in every way possible - it was truly crowned by a donation of **£60** for the RAIBC. Well done Wrexham!

Well done Hereford (with guests from Abergavenny too!). Your enthusiasm proves that a club can rebuild on previous success and I wish you all well and continuing growth in Membership. And I also now know that a 'Welsh Welcome' will be waiting for me next time I go to Wrexham. **Thanks everyone** - you were marvellous hosts.

The Sky At Night
Even though I realise that the programme content, style of 'presentation' and indeed the 'style' and presentation of the host **Patrick Moore** won't appeal to everyone - I strongly recommend that readers look out for the BBC's *Sky At Night* programme. I say this because this fascinating programme recently outdid its already impressive

reputation when a special item on the Sun was broadcast.

The *Sky At Night* is a very long established programme. And although to many people the presenter reflects the persona of the archetypical 'Eccentric Englishman's approach to a special subject (perhaps providing us with an idea of what dedicated Radio Amateurs look to the 'outside world') - it's well worth watching.

Recently the programme featured (unusually) 'The Sky In The Day' when Patrick Moore and a guest discussed the Sun and the effects on the Earth, radio communication, electrical power transmission and Auroras.

I thoroughly enjoyed the special feature and I've no doubt that there will be more of the same as the Sun enters an even more active part of its 11-year cycle. So, please keep an eye on the TV schedules and you won't miss the chance of seeing a fascinating up-date on the Sun.

Rob Mannion G3XFJ

Letters

COMPILED BY ROB MANNION G3XFD

Amateur Radio Amateurs

Dear Sir

Are there any other 'amateur' Radio Amateurs as fed up as I am with professional radio electronics and computer engineers lording it over the pure hobbyist in Amateur Radio? I

recognise the situation has been exacerbated by the apparent need for professional involvement in relation to repeater and packet nodes, etc., on professional communication sites thus creating a 'guru' status for local amateurs.

With regard to 'class distinction' (August 1998 Keylines editorial), we have a local GM7777 professional radio engineer who is looking forward to the abolition of the Morse test and favours the introduction of multi-layered licensing based on technical ability, thus going from what some would consider the bottom of the Amateur Radio pile to the top.

How can we get the 20% (RSGB statistics) of professionals to take up gardening or some other non work related hobby in their spare time? This would let the non-professional get on with and enjoy 'amateur' radio without encountering superior attitudes?

**Jim Stewart GM4DHJ
Scotland**

STAR LETTER

Editor's Plight & GEE

Dear Sir

I see in the Editor's 'Keylines' editorial (July issue) the reference to criticism from certain quarters of his presentation of some circuits in G3XFD's 'Radio Basics' series. Although I have never been aware of the points raised these are probably the penalty achieved by many an editor.

In over 50 years of reading various radio/electronic magazines including all the *Practical Wireless* magazines, I have seen such criticism crop up at lower levels. In the case of Amateur Radio club magazines, by members prepared to criticise the (usually unpaid) editor but not prepared to submit any ideas themselves. Someone once said "You can please some people some of the time...", etc.!

However, I write to comment on the excellent article on the Second World War GEE radio navigational system by Brian Kendal, presenting the principles of a wartime aid in a simple and yet coherent and interesting manner. Any collectors of Second World War equipment and other interested readers may like to know that the equipment used in the GEE system sometimes still appears at radio rallies. It consists of plug-in front-ends containing tuned r.f., mixer and local oscillator stages, the R1355 (not R1155) 7.5MHz i.f./video unit and the Indicator type 62.

Basically there are four front-ends, the RF24, 25 and 27 in the range 25-85MHz, the RF24 and 25 lower frequency units using SP61 valves with a Yaxley type switch changing frequencies in discrete steps and the higher frequency RF26 and 27 using EF54 and EC52 valves with three gang tuning capacitors. However, I have a RF61B with the same mechanical plug-in format which may have been a prototype, using SP61s but with three separate tuning capacitors in the three stages. These r.f./i.f. Indicator combinations plus a p.s.u. were used by amateurs for the early TV receivers, the six inch green screen VCR97 cathode ray tube giving the earliest (one) colour TV, and the r.f. units were often modified for 28 and 144MHz converters.

It's interesting that a similar hyperbolic navigational system was LORAN (Long Range Aid to Navigation) seen in USA APR/APN4 equipment and available as surplus. I believe that this system was upgraded and continued for some time after the war on commercial airlines.

Similarly, OBOE, mentioned in the article, was a beam guidance system used in a bombing capacity. Two ground beams guided an aircraft to a target and at the point of interception of the two beams the bombs were unloaded. This system was, however, restricted by only being able to guide one aircraft at a time - although the aircraft involved could be used as marker bomber. To overcome this, G-H was introduced, where the aircraft transmitted pulses to two ground stations and then measured the duration and separation of the pulses received by the aircraft after transmission by the ground stations. Like GEE and OBOE it was fairly close range but allowed many aircraft to access it simultaneously, its penalty being that like other radio/radar signals transmitted by aircraft they could be intercepted by the enemy and used to locate it.

**Norman Smith
Stoke-on-Trent**

Editor's comment: More fascinating insights to Second World War technology Norman - thank you. Many people I meet at club talks remember - as I do - that their first TV pictures were seen on 'green screens' (the VCR97). I actually saw the Queen's Coronation in 1953 on a TV made from a R1355 unit - complete with green state coach and horses! And I also understand (from his book *Most Secret War*) that the late Professor R. V. Jones suggested the 'R' prefix for the unit (suggesting it was a standard RAF communications receiver) rather than the video unit it was. It was a clever ploy - confusing the enemy and others ever since!

Is The Future....?

Dear Sir

A recent issue of *PW* carried a picture of a Kachina PC receiver, asking 'Is this the future of Amateur Radio?' A report in another magazine carried the shattering news that the *ARRL Handbook* will soon only be available on CD and some comment on the Winradio.

I do not propose to replace or extend my computer system in order to be able to read one book. My handbooks are read using an 'organic computer' of unknown maximum capacity (though it is estimated that no human has ever used more than 10% of its potential), an optical interface, a warm fire and a comfortable chair, and when I can no longer read that way, I shall simply not buy any more.

I have followed the advice I gave a new s.w.l. a few months ago and purchased a manually operated, small, easy and likeable receiver. As I get older, I shall undoubtedly enjoy listening to it in that same chair. I do not view a computer screen front panel as 'likeable', however good the presentation, and it is only with considerable amounts of filtering and screening that the noise is kept out of the receiver front end. Electrical noise now surrounds most houses to the point that shielded feeders to beyond the 'noise zone' are recommended for serious listening.

The physical effects of operating computers at work for long periods are now well known and measures taken to alleviate them. I do not believe it necessary, to have fun with radio

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.

Thanks From Successful Students

Dear Sir

May I, through your excellent magazine, pass on to **Bert Hammett G3VWK** and his wife **Cheryll 2E1ADQ** the sincere thanks and admiration of Sandra, Bob, Derek, Owen, and myself for the enthusiasm and skill by which they changed five people of various backgrounds into five students who readily took and passed the RAE in May of this year.

Had it not been for Bert and Cheryll we would have been unable to succeed. Our situation reflects one of the subjects in 'Keylines' (August 1998), regarding access to the RAE. Truro College has the usual policy of minimum numbers before running a course so had it not been for Bert and Cheryll opening up their home every Tuesday night throughout the winter, with additional sessions if required, I doubt if the hobby would have been about to receive an increase in numbers. Their determination to enable access to the RAE is most commendable, and if it wasn't for people like them doing it informally the hobby would suffer.

No matter how the RAE is structured in the future (another aspect mentioned in 'Keylines') training for it has to be obtained. Could not the RSGB formalise or co-ordinate training? It would be more difficult than running the Morse test but could ensure that one class is available in each area and would mean that prospective amateurs are not turned away or have to rely on long serving members opening up their homes. Well done Bert and Cheryll, thanks again!

Mike Dickinson (licence application in post)
Cornwall

or enjoy reading a technical article, to subject myself to a similar regime at home. My s.w.l. friend remarked "Isn't it wonderful that such a small instrument can bring in so much information from around the world." I suggest that so long as people like him get that much fun from one simple pursuit, the answer to that cover question is **no**, and that many people will continue to use methods and equipment appropriate to their communication **needs**. Those needs may not include a number crunching typewriter!

Peter J Brent G4LEG
West Sussex.

Editor's comment: First time I've heard of the brain being called an 'organic computer' Peter. I only wish I could 'access' and 'upgrade' mine! However, to me the traditional book is sacred - like you I enjoy a sit down and read...especially after sitting in front of a computer v.d.u. all day. Long may the book read!

What - No 'Top Band'?

Dear Sir

I read with interest **Dick Pascoe G0BPS's** 'Antenna Workshop' in *PW* for April. I was rather disappointed though, that all of the antennas he mentioned seemed to ignore the existence of 1.8MHz 'Top Band'. Surely, with the history of Amateur Radio as it is, there must be a plethora of information regarding lower frequency antennas. I for one need some good information on antennas for 1.8MHz - can I be the only one?

Please Dick, can we have some words on 'Top Band' antennas? Incidentally, I wonder if there's any chance of us ever getting access to even lower frequencies again? I'd love a dabble on, say, 620m!

David Perry G4YVM
Salisbury

Editor's reply: Your plea will be passed on David, and readers are encouraged to write directly to our authors and Tex Swann G1TEX (who compiles 'Antennas In Action') suggesting future ideas.

Callsign G2BNG

Dear Sir

As a regular reader of the *PW* magazine, I wonder whether you, or any readers, could help me trace any information concerning, what I believe to be, my late father's Amateur Radio Callsign: **G2BNG**, which was issued during the 'Artificial Aerial' days and given then by the Post Office. I did have documentation from the then GPO, but have unfortunately misplaced them. I also had a QSL card with my late father's address at the time:- **53 Shardeloes Road, Lewisham, London SE13**, bearing the callsign **G2BNG**, this I have also mislaid.

My father did apply after the Second World War for renewal of his licence and because he was a Radio Mechanic in the RAF, all he had to do, I believe, was to carry out the Morse test to obtain his licence again. Anyway, he decided not to reapply due to other commitments at the time.

I contacted the RA with reference to this callsign as I wished, as my father's next of kin, to permit a friend of mine (a current 'A' licensee) to adopt this callsign. I was informed that providing the necessary forms were completed, that this would be no problem, providing that I put in letter form that, as next of kin, I gave my permission for this reallocation.

The necessary forms were duly completed and sent off. To my friend's amazement, and myself, she was told that my father had never held that callsign

and that due to the Data Protection Act, the person that held or still holds the callsign could not be divulged. To me, this is a complete mystery, one of which I hope you can be of assistance.

The only other piece of information I have, is that a close friend of my father, **G2HP** also now a silent key, was living in the near vicinity and a member of the Old Timers Club. I do not wish to get involved with the Data Protection Act, but it would be nice to know whether this callsign was ever allocated at all. Trusting readers can put my mind at rest I thank you for any help you can provide.

Mr E. C. Thew
London.

Editor's reply: It's over to you readers. Can you help?

Novice Licence

Dear Sir

In reply to the letter entitled 'Novice Licence' by **R. E. Jones GW4FCV**, in July *PW*.

I agree, the novice licence is/was one of the most significant advances over the past few years. It enables those who are not sure, or the younger generation, to 'dip their toes in at the shallow end' and examine our hobby. However, this is all it does and all it was intended to do. The Novice has access to 50MHz, 430MHz (if only part of the bands) and, with 5wpm, some of the h.f. spectrum.

There has to be something set aside to tempt them into taking a full RAE and obtaining a Class A or B Full licence. I, myself, along with many others, have recently taken the RAE in order that I may operate on all bands below 30MHz. Why should this privilege automatically be given to a Novice anyway? I suppose you may as well give access to h.f. for all Class B licences as well.

Letters Received Via The 'Internet'

Many letters intended for 'Receiving You' now arrive via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! All letters intended for publication on this page must be clearly marked 'For Publication'. Editor

Haydon Goes Europe-Wide

Members of **Mike Haydon's** emporium have recently returned from one of the largest 'Ham' Radio Shows in Europe that they have ever exhibited at. Over 35,000 people graced the Friedrichshafen three day radio show and sales of Haydon's Q-TEK range of antennas were booming.

Customers from all over Europe visited Haydon's stand and a lot of interest was shown in Yagi antennas for 50MHz, as this band is being opened in Germany later this year due to their

diminishing old TV

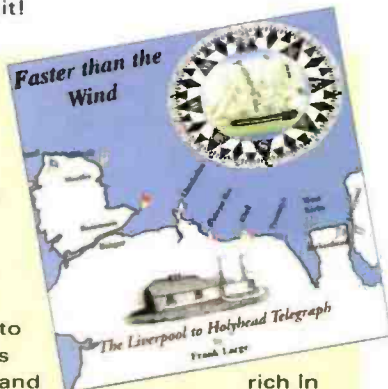
allocation. Overall Haydon Communications say it was a superb show and definitely one they would recommend as well worth a visit!

a real feel of life as a Telegraph operator in the mid-1800s.

The book also discusses even earlier forms of communication spanning from circa 200-118BC to 1907AD. It covers from the smoke and fire signals that the Greeks used through the use of torches and alphabet tablets used by the Greeks and the Romans (circa 200-118BC) to the Electrical Telegraph in 1907.

Some examples of chapter content include 'The People of the Telegraph', 'The Workings of the Telegraph' and 'Vocabulary: Coding and Operation', showing that the book covers an extensive area all culminating in a look at 'The Coming of the Electrical Telegraph'.

Faster Than The Wind does not skimp on illustrations either, in fact it is as



rich in diagrams and pictures as it is in written explanation. Frank Large uses a wealth of different types of illustrations in order to aid understanding.

In conclusion even if you were not interested in the use of Telegraphs before reading of this book, then you will be by the time you have finished it! Copies of *Faster Than The Wind - The Liverpool to Holyhead Telegraph* are available from **Avid Publicatons, Garth Boulevard, Higher Bebington, Wirral Merseyside L63 5LS. Tel/FAX: 0151-645 2047 for £8.95 plus £1.50 P&P.**

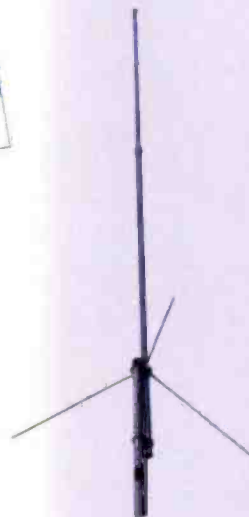
QSL Communications

QSL Communications who are based in Weston-Super-Mare cater for all aspects of Amateur Radio and are in fact approved agents for many of the major equipment manufacturer's including Alinco, Kenwood, Icom and Yaesu. The proprietors, **Graham G4TJB** and **Jayne Patterson** have been in business as QSL Communications for the past 15 years and have been based at their present location for the past 11.

Graham, who has been licenced since 1983, (Incidentally he has just purchased his call sign number plate) started QSL from his garage in Birmingham after he'd ordered a selection of QSL cards and decided that he could set-up his own card business. From that point on the business has gone from strength-to-strength and is now housed at Unit 6 Worle Industrial Centre, Coker road, Worle, Weston-Super-Mare BS22 6BX in a building covering 1250 square feet!

A small selection of the products that QSL have on offer are pictured here and include:

The **BA-6200** dual-band antenna offering 6db gain on 144MHz and 8db gain on 430MHz which retails for **£59.95.**



The **RC-ECH** RC58A/U SO239 snail to PL259 plug retails

at **£9.99** and fits the **RB-400** hatch-boot mount costing **£14.69.**

There's also the **RC-5MB** RC188A/U



SO239 snail to PL259 plug 5m long mount for use with the **RB-400** which costs **£16.99.**



The **RK-01** power cord, costing **£5.99**, is designed to fit Alinco, Icom, Kenwood, Standard and Yaesu equipment



Other equipment in the QSL range includes a selection of antennas such as the **NL-770R** 144/430MHz mobile antenna and the **NL-2C** 144MHz 7/8 mobile antenna. These cost **£24.95** and **£25.95** respectively. For a wider picture of what QSL Communications can offer you why not pop along and see Graham and Jayne or call them on **(01934) 512757?**

Receiving You!

Please remember that when sending letters to PW, which are intended for consideration for inclusion on the letters pages to mark them as such!

FOR A FREE MENTION ON THESE PAGES SEND YOUR NEWS & PRODUCT INFORMATION TO DONNA G7TZB TODAY!

NEWS

NEWS

Watson Power

Five new models have just been introduced to the **Watson** power supply range. All have been completely redesigned and now have clear and distinctively marked front panels and all fully comply with CE legislation.



The new models are as follows: The **W-3A** 3A continuous, 5A peak fixed voltage power supply; the **W-5A** 5/7A peak fixed voltage power supply; the **W-10AM** 10/12A variable power supply with V/A meter; the **W-25AM** 25/30A

variable power supply with meters and finally the **W-30AM** 30/35A variable power supply with meters. The price of these meters range from **£22.95** up to **£119.95** inc. VAT.

To find out more you're invited to contact **Waters & Stanton PLC, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, FAX: (01702) 205843.**

Changes at Chester

The **Chester & District Radio Society** have recently changed their meeting place. The new venue is **Burley Memorial Hall, Waverton, Chester** with meetings being held from **8pm on Tuesday evenings** (with the exception of the 2nd Tuesday in the month).

The club, who are now in their 51st year, will be taking a break for the summer during August but will resume again on 1 September. For more details contact **Niels Foster GOONQ** on **(01244) 347930**.

Prize Winners' Gallery



Pictured here are the latest **PW** competition winners.

First in the 'gallery' are **Bernard and Joy Fowler** who were the lucky recipients of the **Pioneer Hi-Fi System** from the **Subscribe & Win** draw as run in the Jan, Feb and April issues. Bernard and Joy are both licensed and hold the callsigns **2E1FYX** and **G7MHT** respectively, although Bernard is currently awaiting is 'B' Class callsign. Behind the camera is their Son Glyn who holds the callsign **G0WST** and is the longest serving



Radio Amateur in the 'Fowler Family'.

Secondly, congratulations go to **Roy Quantick G3UGL**, a retired Airline pilot who is now the proud owner of a **Garmin GPS III** 'personal navigation' unit. Roy is really pleased with his prize, (which he won by entering our April



competition) as he holds a Flight Navigators licence has quite an interest in knowing exactly where he is!

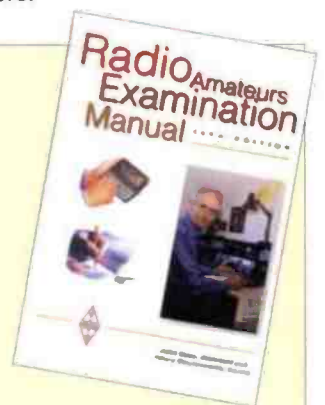
And last but by no means least is **Steve Elliott G0WEX** who won the **Yaesu VX-1R** dual-band transceiver. Steve says he has never won anything before, despite several attempts and therefore the news that he was about to become the owner of one of smallest and most sought after radios came as quite a surprise!

The **PW** 'team' would like to thank **Yaesu UK** and **Waters & Stanton PLC** for donating the prizes and also to pass on congratulations to our lucky winners.

New Book

Just in time for all you budding RAE students the **RSGB** have completely revised and reprinted the **Radio Amateurs Examination Manual**. The revisions take into account the changes to the RAE syllabus that took effect from May of this year and also now incorporates a selection of sample questions, which were originally published in **How to Pass the RAE**, together with a complete sample paper from **City & Guilds** to help familiarise candidates with the examination format.

The **RAE Manual** has also been given a new look and is now produced in a larger format, just slightly smaller than A4 which should make it easier to read and understand. The syllabus topics included are: Licensing conditions, Transmitter interference, Electromagnetic compatibility, Propagation and antennas and measurements. Copies of the **RAE Manual** are available now from the **PW Book Store** priced **£12.75 plus P&P**.



SPECIAL PRIZE COMPETITION!

WIN!

ONE OF TWO TEN-TEC KITS!

In last month's *PW* Clive Hardy G4SLU built and reviewed the Ten-Tec RF Ground Counterpoise 1251 and SWR/Wattmeter 1202 kits. The Ten-Tec kits were supplied by Phil Godbold G4UDU of Adur Communications and Phil has now very kindly donated the completed units as prizes.

So, to be in with a chance of winning one of these useful accessory items (first correct answer out of the 'hat' will win the 1251 and the second the 1202) all you have to do is 'arm' yourself with a copy of last month's Ten-Tec review (back copies of *PW* August are available from our Post Sales Dept. for £2.30, call (01202) 659930 to order) and re-read Clive's thoughts and findings and then answer the questions on this page.

Simple isn't it? So go on then ... what are you waiting for?



**WORTH
£49⁹⁵
EACH**

SPECIAL PRIZE COMPETITION! WIN! - ONE OF TWO TEN-TEC KITS!

Questions:

- Q1:** Name the road, with country music connections, where Ten-Tec, USA, have their factory.
- Q2:** What did Clive G4SLU say was the first and major construction task when building the counterpoise kit?
- Q3:** The SWR/Wattmeter 1202 has two independent circuits - what are they?

Answers:

Q1:

Q2:

Q3:

Name

Callsign

Address

.....

.....

Postcode

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

Send your completed entry coupon to **Ten-Tec Competition, Practical Wireless, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**. The Editor's decision on the winner is final and no correspondence will be entered into. Please do not include other correspondence in with your entry (photocopies are acceptable). Entries to reach us by **Friday 25 September 1998**.



C.M. HOWES COMMUNICATIONS

www.howes-comms.demon.co.uk

Mail Order to: Eydon, Daventry,
Northants. NN11 3PT
☎ 01327 260178



Build Your Station in Easy Stages!



An easy-to-build low power (QRP) station

DC2000 SSB & CW Receiver Kit

Great for the beginner as well as the experienced QRPer. Plug-in band system. DC2000 Kit: £22.90 (one band module included). Extra band module kits: £7.90 each, from 160 to 10M. HA22R hardware (pictured top left): £18.90.

TX2000 QRP Transmitter Kit

5W CW RF output (adjustable) on 160 to 20M bands, about 1W on 10M. Plug-in band filter. Very clean signal. Use with Rx and linking module for transceive. TX2000 Kit: £24.90 (with one band filter). Extra band filter kits: £6.90 each. HA23R hardware pack (pictured lower left): £16.90.

LM2000 Linking Module

Fits in receiver to link to transmitter. Side-tone, muting, IRT, CW filter. Kit: £16.30

Total to build this QRP Station: £99.90 (plus postage)



Multiband SSB Receiver

DXR20. Covers SSB and CW on 20, 40 & 80M bands as standard. Optional extra plug-in band modules available. Can link to TX2000 or AT160 for transceive (by adding LM2000 linking module). Versatile and popular, with great performance!
DXR20 Kit: £39.90. DCS2 "S meter" Kit: £10.90. HA20R hardware pack: £28.90

Great projects for Holiday, Portable and the Home Station!



Audio Filter - £29.80!

Clean up your reception!

- Reduce noise and interference! • Sharp SSB/Speech filter with faster roll-off than IF crystal filters! • 300Hz bandwidth CW filter • Printed and punched front panel • All aluminium case
- Simply connects between radio and external loudspeaker or headphones • Suits receivers & transceivers • ASLS Kit plus HA50R hardware: £29.80



Top Value Receiving ATUs

CTU8: covers 500kHz to 30MHz. Efficient, flexible "T match" circuit. SO239 sockets. Improve your antenna performance!

Factory Built: £49.90. Kit (including case and all hardware): £29.90.

CTU9: as CTU8 plus balun, bypass switch and terminal posts. The fully featured Rx ATU
Factory Built: £69.90. CTU9 Kit (including case and all hardware): £39.90.

ACCESSORY KITS

AA2	Active Antenna. 150kHz to 30MHz	£8.90	DFD4	Add-on Digital Readout for superhets	£49.90
AA4	25 to 1300MHz Active Antenna	£19.90	DFD5	Digital Frequency Counter/Readout	£54.90
AB118	118 to 137MHz Active Antenna	£18.80	SPA4	Scanner Preamp. 4 to 1300MHz	£15.90
AS08	Rx Antenna Selector/Attenuator	£27.90	ST2	Morse Side-tone/Practice Oscillator	£9.80
CSL4	Internal SSB & CW Filter for our RXs	£10.50	SWB30	SWR/Power Indicator. 30W 1-200MHz	£13.90
DCS2	"S Meter" for direct conversion RXs	£10.90	XM1	Crystal Calibrator; 8 Intervals + ident	£16.90
CBA2	Counter Buffer (fit to Rx to feed DFD5)	£5.90			

(optional hardware packs are available to suit many of the above kits, please enquire)

Please add £4.00 P&P, or £1.50 P&P for electronics kits without hardware.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets, or you can browse this information on our Internet Website (URL at top). UK delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

No Nuts Limited

Come and see us at a
Radio Fair.

2 Chase Cottages
New Road
Aldham
Essex
CO6 3QT
Tel: (01206) 213322
Fax: (01376) 561373

Suppliers of quality electronic
things at very friendly prices.

OsziFox Probe

20MHz Oscilloscope	£75
Laser Pointer Pen	£15
Laser Pointer 10 in 1	£20
CCD Camera module B/W	£50
CCD Camera module colour	£145
Camera Scart kit B/W	£85
Camera Scart kit colour	£175
Date & time module	£45
4 channel switcher	£50

Post & Packing £2

Surplus electronic goods purchased

ALL MONEY, CHEQUES, POSTAL ORDERS, VISA & ACCESS ACCEPTED

B.S.I. Regd. stockist
ISO 9002 RS33906

Electrovalue

addac
Member

Siemens franchised distributor

We supply

Capacitors	Diodes & rectifiers	Books
Resistors	Transistors	Boxes & Cases
Thermistors	Integrated Circuits	Breadboards
EMC filters	Semiconductors	Connectors
Inductors	Lamps & LEDs	Cable
Suppressors	Power supplies	Fans
Varistors	Regulators	Switches
Potentiometers	Thyristors	Relays
Knobs	Sensors	Transformers
Ferrites	Crystals	Hardware
Fuses	Panel meters	Headphones
Spark gaps	Test gear	Soldering equip
Batteries	Valves	PCB materials
Terminals	Flash tubes	Service aids

Electrovalue Ltd.

Tel: 0161-432 4945 Fax: 0161-432 4127

680 Burnage Lane, Burnage, Manchester M19 1NA

e-mail: sales@electrovalue.demon.co.uk

web site: www.electrovalue.com

CHELMER VALVE COMPANY

If you need Valves/Tubes or other
electronic components etc.
... then try us!

We have vast stocks, widespread sources and
35 years specialist experience in meeting
our customers requirements.

Dept PW, 130 New London Road, Chelmsford, Essex CM2 0RG. England
Tel: 44-01245 355296/265865 Fax: 44-01245 490064

SYON TRADING

16 The Ridgeway, Fetcham, Leatherhead
Surrey KT22 9AZ

Tel: 01372 372587 Fax: 01372 361421

Callers by appointment only.

Try us for:

Resistors - Capacitors - Switches - Semiconductors -
Cable connectors etc.

Plus all those hard to find parts for the constructor.

Send or phone today for your catalogue

★ See us at the rallies ★

COMPONENTS AND AMATEUR RADIO
EQUIPMENT PURCHASED

Robin G3NFV

Geoff G4ECF

This month to help you take a few more steps further in the practical learning process I'm going to describe the construction of a type of receiver once very popular in valved form - brought up-to-date as far as possible by using transistors. It's simple and straightforward to build but I can tell you, it takes skill to get the best results 'on-the-air' but you'll learn a great deal and enjoy the process very much indeed!

But before I launch into the description, circuit details and instructions for the tuned radio frequency receiver (t.r.f.) receiver I'm going to acknowledge some of the feedback from readers regarding coil construction. Many of you found coil winding difficult and the formers required caused confusion, so in this project (as you'll need to wind several coils) I've decided that we're going to make the formers ourselves by using paper!

Paper Formers

You may be surprised at the suggestion of using paper formers for coils - but in fact they've been used for many years. All you need is a little patience, a sheet of A4 paper, a standard sized round bodied pencil and some adhesive (I used Pritt Stick adhesive which comes in a handy tube applicator).

To start, just cut a strip 30mm (2in) wide from the short side of the A4 sheet if you have the standard typewriting 'weight' (70 to 80g). If it's thinner than this cut your strip from the long side.

The technique is to gently but firmly roll the paper onto the pencil body - not too tight or you won't be able to slide it off afterwards - to form a tube. Before you start rolling the tube it's best to apply the adhesive to the last 30mm of the paper so that it automatically sticks as you roll it up.

If you have any difficulty (I managed it easily) you can always recruit a nearby Blue Peter enthusiast to help! Then

release the tube and leave to dry for an hour or so. It's best to push the centre of the roll back into position if it starts to 'telescope' outwards as you release it from the pencil.

The Coils

Winding the coils is a simple process. Place the former back onto the pencil (use the sharpened end to limit the possibility of deforming the paper tube) and you're ready to start once you've got hold of some 0.315mm diameter enamelled wire.

If you're not sure what diameter the wire you have to hand is - don't worry! Providing your wire is not much thicker than standard sewing cotton thread it will do the job okay, the only problem could be that the frequency

coverage (my prototype covers 3.650 to 7.8MHz approximately using a 'standard' Polyvaricon miniature tuning capacitor) could be different. But your radio will work!

For the (t.r.f.) coil, L1, you should wind 60 turns of wire side-by-side, neatly but not too tightly. Start your winding from the left or right - holding the wire tail under your 'free' thumb and wind away from the thumb.

Make a centre tap at 30 turns (to provide input for the antenna signal) by making a loop, twisting the wire around itself - just like a little 'pigtail' - and then continuing the winding.

I anchor the start of the wire temporarily by using a tiny blob of beeswax from old capacitors. When the job is done you can seal the winding with melted candle wax - applied by dripping the melted wax (melted by the soldering iron) onto the coil.

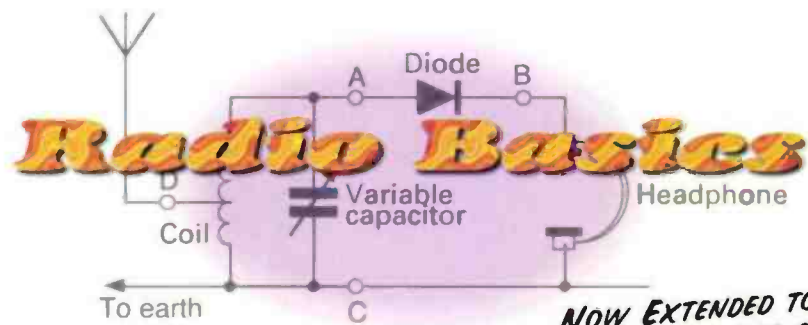
The main detector stage coil is a little more complicated but still straightforward. So, please don't be discouraged!

The main winding (A in) L2 also consists of 60 turns but

coil consists of 10 turns spread over three-quarters of the main winding. Again, start the winding at the left or right and wind in the same direction as the main winding. Make sure you can identify the windings, and then seal them with wax.

The Circuit

The circuit, Fig. 1, shows the simple lay-out of the t.r.f. receiver minus the audio



NOW EXTENDED TO TWO PAGES BY POPULAR DEMAND!

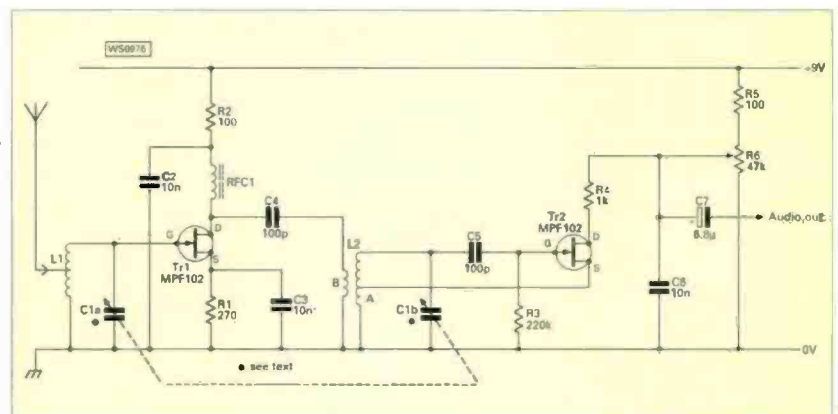


Fig. 1: Circuit of the two transistor tuned radio frequency receivers using MPF102 field effect transistors. The receiver is designed to work with the audio amplifier module described in the June issue of PW.

this time a loop for a 'tap' should be made at 20 turns. This 'tap' on the coil provides part of the feedback circuitry for the regenerative detector.

If possible you should use slightly thinner wire for the coupling winding on L2 (this is shown as 'B' on L2). The reason it's referred to as B is because it's wound over the top of the first winding. This

amplifier stage. There's no amplifier provided because, as previously mentioned, this project will use the audio amplifier featured on page 16 of the June issue of 'Radio Basics'. So, if you've not built it yet, get busy!

When built, the signal pathway in the circuit in Fig. 1 is as follows: With the antenna connected and an earth in

Radio Basics is continued on page 18

This month Rob Mannion G3XFD describes the next stage of the learning process - a traditional tuned radio frequency receiver. Well known in 'grandfather's day' it's still capable of good results in the 1990s also providing valuable 'hands-on' experience and a lot of pleasure!

Interested?

Want to join in with 'Radio Basics'? You can - if you send in an s.a.e. with a 50p stamp requesting the free 'Radio Basics' Information Sheets 1 & 2 to Donna Vincent G7TZB at the Editorial offices. Also available are reprints of G3XFD's original 'Getting Started the Practical Way' 5-part series which was first published in 1986. If you require this please enclose a cheque (payable to PW Publishing Ltd.) or Postal Order for £2.50.



place, the incoming signals in the range (approximately) of 3.6 to 7.8MHz are amplified by Tr1, an MPF102 field effect transistor (f.e.t.). The radio frequency choke (r.f.c.) offers a high impedance pathway to the amplified r.f. which then finds an easier route and is coupled via the 100pF* capacitor to the input winding on L2 transferring its energy in doing so.

*Nominal value only - experiment with values from 100 to 750pF for best results.

One side of C1 tunes the r.f. stage and the other side tunes the regenerative detector stage. The incoming signal is 'regenerated' by passing through the circuit many times providing feedback similar to what can be heard when an amplifier is too close to a speaker in the same circuit!

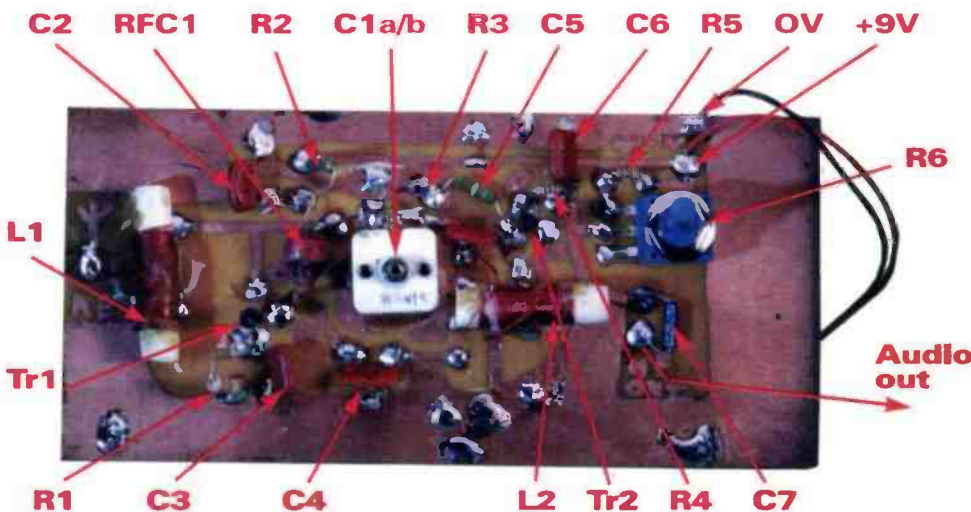
In this case you can control the 'stage gain' by (very!) careful adjustment of the 47kΩ variable resistor. As it's adjusted you can hear the circuit 'plop' in and out of oscillation. For short wave amplitude modulation transmissions (a.m.) you adjust the control to the critical point just before oscillation. For c.w. and s.s.b. reception you let it enter oscillation.

Audio output is via the 6.8μF (this capacitor can be of any value between 2 and 20μF - depending on what you've got to hand. With the 'Basics' amplifier I found either 6.8 or 10μF worked well). There's just enough output to run a very sensitive

pair of good quality headphones - but the amplifier provided excellent output from a large hi-fi extension loudspeaker.

Building The Project

You should start building the project by making the p.c.b. and then etching it - after you've carefully checked your copy of my hand-drawn lay-out. It's a very simple process and as you become more familiar with the technique you will learn the short-cuts!



The large area of unetched copper on the right of the in the photograph of Fig. 2, (which shows the etched design ready for component placing) is where I mounted the audio amplifier module. Incidentally, when large areas of unetched copper track are required on a p.c.b. it's best to 'mask' it with pvc tape. This stops the etchant from dissolving the copper laminate and also makes a neater job (and saves etch resist!) than can be achieved using an etch-resist pen.

Assemble the detector stage (Tr2) first and connect the antenna (earth connected to the 'ground' or chassis side of the project) to the 'B' winding end

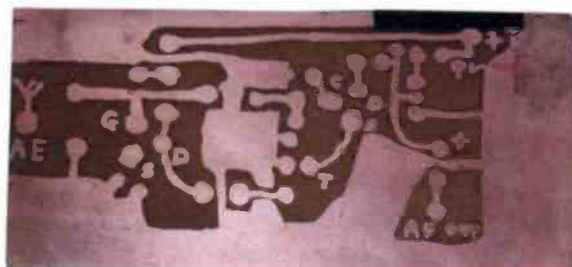


Fig. 2: The 'home-brewed' p.c.b. design for the receiver project. The pvc masking tape (top right) is left in position to illustrate how you can cover larger areas and save on etch resist. Make your own copy of this design by using a combination of etch resist (from a 'Dalo' pen or equivalent) and masking tape - but make sure you allow room for the components you are to use by 'placing' them temporarily as you draw.

of L2. Make sure the 100Ω resistor in the 'Drain' circuit of Tr1 is out of circuit and that the 100pF (nominal) capacitor is also out of circuit.

When listening (using the add-on amplifier) you should hear a loud plop and hiss at various points as you tune across the band and come across signals.

If you don't hear anything - check your antenna and coil connections. There's little to go wrong and provided you've used a heat-sink when soldering the MPF102, you

values as high as 1MΩ. Experiment and learn!

Great Fun

Although, in the form as presented, this receiver is only a training and learning exercise it can be great fun to build and use. It receives broadcasting stations from all over the world and on 7MHz ('Forty metres') I heard many c.w. and s.s.b. stations. On Sunday 5th July I heard great 'DX' from local station G0DDI (next village to me!) calling 'CQ TVI Test' and

Fig. 3: Annotated photograph of the completed project ready for use with off-board amplifier. Note that the L1 (antenna tuning coil) paper former is held by wax just above the board surface. To prevent possible r.f. 'feedback' L2 must be mounted (at right angles to L1) as shown and stabilised by melted wax. The control knobs on the polyvaricon and reaction control are removed for clarity. (See text for suggested values for nominal 100pF coupling capacitor, C4, and 220kΩ resistor R3).

should soon be on air.

You'll note that once you've found a good signal and got the adjustment just right you'll have to re-adjust at the next frequency. That's normal for this type of receiver!

If all is okay you can place the 100Ω resistor for Tr1 in circuit and connect the 100pF capacitor in place. This couples the (amplified) r.f. to the

detector stage. You should now hear a great improvement in signal levels.

Try experimenting with different values for the 100pF (up to a maximum of 750pF for best results). Additionally, the 220kΩ resistor in the gate circuit of Tr2 is a nominal value can be adjusted in value. Improvements can be quite marked - try 470kΩ and

despite the fact the t.r.f. is prone to overload his strong signals were resolvable on s.s.b.

You'll need a lot of patience and practice to tune and adjust the receiver as presented. However, if you want to, you can build it with a sturdy metal-framed two-gang variable capacitor with slow motion tuning control and a good quality 47kΩ variable resistor. Built this way it will be more stable in action for long term use and provide many hours of fun and exciting listening - and you'll be surprised at the receiver's sensitivity although selectivity is not so good!

Built in the 'Basics' fashion the receiver will teach you a lot and then you'll be prepared to build the next project - a 'Converter', which turns an ordinary car radio into a sensitive short wave receiver with a beat frequency oscillator (b.f.o.) for c.w. and s.s.b. listening.

So, until next time - good building and happy listening! PW

1



Technical productsyours for under £4

The Electromail CD-ROM Catalogue provides a virtual technical superstore, product encyclopaedia, and a help line with round-the-clock service - the moment you slip it into your computer!

It's quite amazing just how much you can get out of it. Products from batteries to bearings, fuses to fans, semi-conductors to computers, hand to power tools. On-line advice, and access to a full library of data sheets, providing detailed information on almost every product in our range. But the best thing about Electromail, is that it's open just when you want to go shopping. 24 hours a day. 365 days a year.

And in most cases your order will be despatched on the very



a more professional choice

same day you order (failing that, the next working day).

The Electromail CD-ROM Catalogue offers you more products and services than any of the alternatives. Send for your copy and get a head

start in your business, your home or hobby ... and at just £3.99 with free delivery, it's not worth struggling on without it!

HOW TO ORDER



Tel 01536 204555 or Fax 01536 405555

When ordering by fax or phone quote stock no. 313-6988 and have your credit card details handy. Alternatively, you can open your own Electromail account - please ask for details.

Electromail, P.O. Box 33, Corby, Northants, NN17 9EL. Tel: 01536 204555 Fax: 01536 405555

MONITORING TIMES

For the ~~true~~ state-side perspective on the world of radio monitoring, *Monitoring Times* is must for your shack

with its variety of topical articles, news, views and extensive English language short wave broadcast guide. Published monthly.



Sub Rates (1 year):
E38.....UK

E43.....Europe
(Airmail)
E49.....Rest of World
(Airmail)

SATELLITE TIMES

Satellite Times is the only magazine to explore all aspects of satellite communications and covers commercial, military, broadcasting, scientific, broadcast, personal communications and private satellite systems. If it's in orbit, it's in *Satellite Times*! Published monthly.



**What are you waiting for?
Subscribe NOW!**

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

Tel: (01202) 659930. Fax: (01202) 659950. E-mail: bookstore@pwpublishing.ltd.uk

It's that time of year again! Yes - it's time for all you 'would-be' Radio Amateurs to get yourselves enrolled on a Radio Amateurs Examination course and get studying for that all important licence. To help you find a course in your area we've put together a list of all the RAE, Novice RAE and Morse courses that we've been told about and to make it easy the list is laid out alphabetically by college or centre (please note that the addresses given are not necessarily the 'home' of the various clubs but the location for the course).

Of course, the PW list is not exhaustive and there are many courses that are not mentioned here. For details of other courses that are running this year contact the City & Guilds at 1 Giltspur Street, London EC1A 9DD. Tel: 0171-294 2468 or FAX: 0171-294 2400.

For more information on becoming a Radio Amateur contact the Radio Society of Great Britain on (01707) 659015 or if you have a query regarding licencing, etc., then please get in touch with the Radiocommunications Agency (RA) on 0171-211 0211. The RA can also supply a range of leaflets of the services they provide, to find out more contact their Information and Library Service on 0171-211 0502/0505.

So, what are you waiting for? Look at our list, pick a course, get enrolled, start that studying and who knows your name may be among the next batch of new licensees!



Your 'Tick'

21 Willow Walk, Culverstone, Meopham, Kent DA13 0QS.

Len Buck GODLR will be running an RAE course starting on Friday 5 October running through until the May 1999 exam. Arrangements have been made for students to sit the exam at the North West Kent College of Technology, Dartford. If you're interested in joining Len's course, you should write to him at the above address or call him on (01732) 823483.

Bexley College, Tower Road, Belvedere, Kent DA1 6JA.

An evening RAE course will start in September running through to the May 1999 examinations. The course tutor will be Colin Turner with the course covering Morse, transmitting theory, licence regulations and operating procedures - no previous radio knowledge is necessary. To enrol telephone the Guidance & Admissions Centre on (01322) 404000 or 404001, leaving your name, address and telephone number so an enrolment form can be sent to you.

Bedford & District ARC, HQ, Ravensden Church End, Bedford.

A Novice RAE course will start in September and will run through to examination time. Contact Steve Down G3USE on (01234) 270738 or Nick Ward G4DDQ on (0831) 310870.

Bradford & Ilkley Community College, Great Horton Road, Bradford, West Yorkshire BD7 1AY.

Ralph Turner G3VRX will be tutoring an RAE course starting in early September on Tuesday evenings between 6 - 9pm. Enrolment is taking place during the first week in September. For more details call (01274) 753371.

Colchester Radio Amateurs, Room 22, St Helena School, Sheepen Road, Colchester.

RAE and NRAE courses start on 8 September at 7pm at the above address. Further details from G3FIJ on (01206) 851189.

City of London ARS, Elephant & Castle Area, London.

An evening RAE and Introduction to Morse course starts early September running through to the May '99 exam. For more information call Tony Hearn G1UFX on 0171-928 3481.

East Cleveland ARC, Jubilee Hall, Gurney Street, New Marske, Nr. Redcar.

Enrolment for this Novice RAE course is on 4 September with the course running

on Friday evenings thereafter. Contact Alistair G4DLK on (01642) 475671 for more details.

Flight Refuelling ARS, Wimborne, Dorset.

The 29 September sees the start of an RAE course for FRARS members, although newcomers will be welcomed. Full details from Ian Brotherton G2BDV, Course Administrator on (01202) 886887.

Glenrothes & District ARC, Balwearie High School, Kirkcaldy.

An RAE course will be on offer on Monday evenings, 7.30pm and a Morse course on Tuesday evenings, 7pm from late September. Both courses are open to beginners and advanced candidates and enrolment for both is 28 September from 7 - 8pm. Contact Ken Horne GM3YBQ on (01592) 265789 (after 7pm) for more details.

Hastings Electronics & Radio Club, Hastings & St. Leonards-on-Sea, East Sussex.

From October the Hastings club will be running RAE and NRAE courses. For the RAE course contact G. Parsons M1ABB, Gull Cottage, Briar Close, Fairlight TN35 4DP. Tel: (01424) 813040. For the Novice course details contact D. Mephem G4ERA, 8 The Close, Fairlight, East Sussex TN35 4AQ. Tel: (01424) 812350. The courses will be held at the respective addresses.

Hastings College of A & T, Archery Road, St. Leonards-on-Sea, Sussex TN38 0HX.

A NRAE course will be running from September at this college. For more information call (01424) 442222 Ext. 279 or E-mail: dgrandfield@hastings.ac.uk

Herefordshire College of Technology, Folly Lane, Hereford.

An RAE course starts early September at this college. Those interested in joining should call (01432) 352235.

Leeds College of Technology, Room H2, Cookridge Street, Leeds LS2 8BL.

An NRAE course lasting 10 weeks starts on 16 September and an RAE course lasting 20 weeks starts on 2 December. Enrolment for both courses is 7-9th September. Contact course tutor Michael Schonborn on 0113-243 0381 Ext. 2043.

Llandovery College Amateur Radio Society, Wales.

RAE courses covering everything from 'basic electronics' to Amateur Radio are on offer every Thursday in Wales. Details from Peter 2W1FAJ, Eileen

The PW RAE C

COME ON FOLKS - IF YOU HAVEN'T GOT YOUR LICENCE - HAVE A GO!

et' To, Success

2W1BPS and **Wyn GW8AWT, QTHR** or **Tel: (01550) 777234.**

Merton College, London Road, Morden, Surrey SM4 5DX.

David Bowman **GOMRF** is the course tutor for an RAE course running at the above college from September. The course fee is waived at this college for those in receipt of specific benefits such as retirement, disability, unemployment, etc. Details from the college on **0181-640 3001.**

Murray Park Community School, Murray Road, Mickleover, Derby DE3 5LD.

An RAE course starts on **23 September** and the tutor will be **Frank Whitehead G4MLL.** For further details either, contact Murray Park School on **(01332) 515922** or Frank direct on **(01332) 515922.**

Newbury Technical College, Newbury.

On **Thursday 10 September** an RAE course starts and will run from **7 - 9pm** on subsequent Thursdays (Course no: **99018A**). In addition to this, a **12v.p.m.** Morse course will start on **Tuesday 5 January 1999** from **7 - 8.30pm** (Course no: **99208B**). Contact **Newbury College** on **(01635) 35353** or **Ray Oliver G3NDS** on **(01672) 870892** for more details.

Newstead Woods School, Avebury Road, Orpington, Kent.

An RAE course will begin on **Monday 14 September** at **7.30 - 9.30pm** running through until the May 1999 exam. To enrol on this course please write to **Bromley Adult Education College, Church Lane, Prince's Plain, Bromley BR2 8LD** or phone **0181-462 9184.** To find out more contact the course tutor **Alan Betts G0HIQ** on **(01689) 831123.**

North Cheshire Radio Club, Morley Club, Mobberey Road, Morley Green, Wilmslow, Cheshire.

Enrolments and commencement of NRAE and RAE courses takes place on **Sunday 13 September** at **7.30pm** at the Cheshire club. Further details from **Gordon Adams G3LEO** on **(01565) 652652.**

North Trafford College, Talbot Road, Stretford, Manchester M32 0XH.

An RAE course will begin on **7 September** and run on **Monday evenings** from **6 - 8.30pm** through until the December exam (this is for re-sits in December). There will also be an RAE course running on **Wednesdays** afternoons. Enrolment takes place from **1**

- 3rd September inclusive or any Wednesday afternoon in July & August.

For more information please contact **John Beaumont G3NGD, North Trafford College, Talbot Road, Stretford, Manchester M32 0XH.** Tel: **0161-886 7077** or **Admissions** on **0161-886 7000.**

Oldham ARC, Moorside Conservative Club, 633 Bippenden Road, Oldham.

An RAE course is starting on **Thursday 17 September** at **7.30pm** at this location. For more information call **0161-652 4164.**

Plymouth Radio Club, Royal Fleet Club, Morice Square, Devonport.

Starting on the **first Tuesday** in **September** an RAE course will run in the Plymouth area. Enrolment for this course is on the **4 & 18th August** from **7.30 - 9pm** at the above address. More details are available from **G7NHB** on **(01752) 343177.**

Redborne Community College, Amphil, Bedfordshire.

Enrolment details for this RAE course are available from **Nigel Reynolds** on **(01525) 404412.** Course information from **Steve Down G3USE** on **(01234) 270738.**

Rugeley Adult Education Centre, Taylors Lane, Rugeley, Staffs WS15 2AA.

Brian Smith G4EOC will be tutoring this RAE course, which starts in **September** on **Tuesday evenings** from **7 - 9pm.** All are welcome, no previous knowledge is required and external candidates are welcome. More details are available from **Brian** on **(01543) 663030** or the college on **(01889) 578738.**

Sawston Village College Community Centre, Cambridge.

Peter Buchan G3NBR is tutoring an RAE course which starts in **September.** For more information please call **(01223) 834492.**

South Normanton Alfreton & District ARC, New Street Community Centre, South Normanton, Alfreton, Derbyshire.

An NRAE course starts on **7 September** and is open to all. The course instructor **Andy Gilbert M0APH** can be contacted on **(01246) 502501** for more details, as can **Russell Bradley G0OKD** on **(01773) 863892.**

South Notts College, Greythorn Drive, West Bridgford, Nottingham.

An RAE course starts on **16**

September and will run on subsequent Wednesdays from **6 - 9.30pm** in preparation for the May 1999 exam. If you're interested please contact the course tutor **Alan Lake G4DWW** on **0115-938 2509.**

Swindon Technical College.

On **Monday 21 September** an RAE course starts and will run from **7 - 9pm** (Course no: **UFF30S**). Contact **Swindon College** on **(01793) 498300** or **Ray Oliver G3NDS** on **(01672) 870892** for more details.

The Hill College, The Hill Lane, Coventry CV4 9SU.

Morse and RAE courses will be starting in **September** on **Thursday evenings** at the above centre. More details can be obtained from **Mike Dixon G4GHJ, Student Services, Tile Hill College, The Hill Lane, Coventry CV4 9SU.** Tel: **(01203) 694200 Ext. 337.**

Warrington Collegiate Institute,

Winwick Road, Campus, Warrington, Cheshire.

Enrolments take place on **3, 4 & 5th September** for an RAE course starting on **Thursday 17 September** at **7.30pm.** For more details contact either the college on **(01925) 494494** or from **Gordon Adams G3LEO** on **(01565) 652652.**

Welwyn Hatfield ARC, Welwyn Garden City, Herts.

Starting in **September** a **30 - 36 week** RAE course will run from **7.30 - 9.30pm** leading to the May 1999 exam. Contact **David Rogers G1LLW** on **(01707) 331983** for further details.

The Widnes & Runcorn ARC, The Beacons, Simmons Lane, Frodsham, Cheshire.

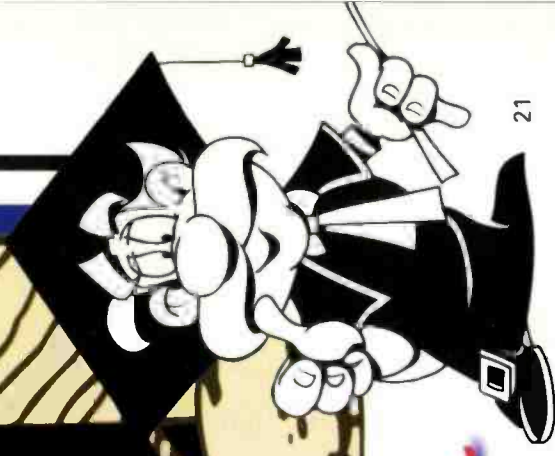
RAE & NRAE courses will be taking place from early **September.**

Enrolment takes place on **Friday 4**

September from **7.30pm.** Further details can be obtained from course tutors **Dave Bibby G1PIX** on **(01928) 581401** or **Dave Wilson G70BW** on **(01270) 761608.**

Yns Mon Radio Users Group, Llangefni Scout Hall, Wales.

A **32 week** RAE course starts on **Friday 11 September** from **7 - 9pm.** For more details contact **Tony Anziani GW4ZWN** on **(01407) 832197.**



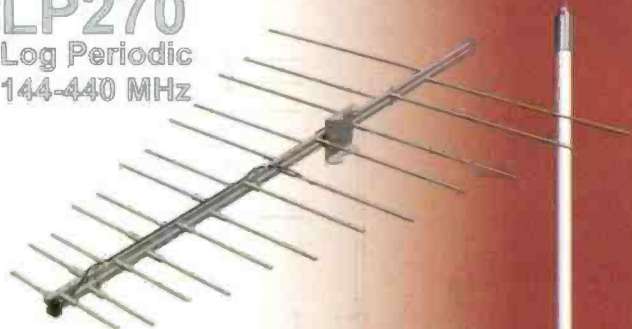
course Round-Up

Practical Wireless, September 1998

CHELCOM

AERIAL DESIGN & MANUFACTURE

LP270 Log Periodic 144-440 MHz



The LP270 is a log periodic antenna covering the 2 metre and 70 centimetre amateur bands, and all frequencies in between. Designed for amateurs who need directional, dual band coverage from a single antenna, the LP270 offers 8.5 dB forward gain and 19-23 dB front to back. Boom length is only 1440mm and longest element is 1062mm (maximum width of antenna).

The LP270 offers the following advantages:

- Easy to install
- Single antenna
- Single coax feed
- Low visual impact
- Low maintenance
- Requires only a lightweight rotator

Supplied complete with mounting bracket and hardware for mounting

£79.90 inc. VAT
Carriage £8.00 UK mainland

2 x 5/8 Colinear 144-146 MHz Vertical

High specification 2 metre colinear constructed of polyurethane coated fibreglass, stainless steel, and heavily chromed brass. Completely waterproof. Chelcom colinears will withstand the worst of British weather conditions to provide years of maintenance free service. Each antenna is individually tuned on our testing mast, at three stages during its manufacture, to ensure the maximum 6.5 dB gain and low VSWR is achieved.

Supplied complete with anodised mounting tube, brackets and hardware for mounting on masting up to 55mm diameter.

£49.95 inc. VAT
Carriage £8.00 UK mainland



For more information on these and other Chelcom products, including wire aeriels, yagis, quads, HF verticals and VHF/UHF colinears, send two first class stamps to receive our 1998 catalogue.

You can also visit our comprehensive web site,
www.chelcom.com

Tel/fax 01242 680653

Riverside House, Homecroft Drive,
Cheltenham GL51 9SN
Email sales@chelcom.com

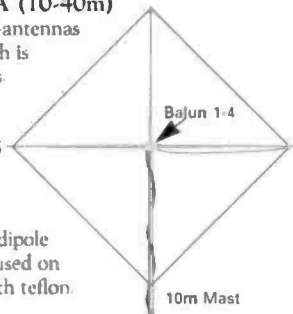
FUNKTECHNIK PRODUCTS (GERMANY)

FIBREGLASS TELESCOPIC MAST

The Fibreglass Telescopic Mast with an overall length of 33ft is designed to construct antennas for portable purposes, such as field day events, during holidays and weekends away. Unassembled it is compact and light (3.3lbs/1.5Kg) and only 3ft 10ins in length. The telescopic segments need only to be pulled out and twisted to lock. No tools required. £57.95

VERTICAL LOOP ANTENNA (10-40m)

Loop antennas are very effective DX-antennas due to their low radiation angle which is achieved at relatively low heights. As opposed to long wire antennas this solution OFFERS good signal levels on all the bands. (7-28MHz). £56.95



PORTABLE W3DZZ ANTENNA

The W3DZZ antenna is a half wave dipole for 40m-80m. With an ATU can be used on 10m-30m. Total length 99ft, traps with teflon coated cable (max 150W). £39.95

SUPER QUICK DIPOLE (10-80 METRES)

May be used in many configurations. Complete with balun (300W). £31.95

DUOBAND LOG PERIODIC 2m-70cm

4EL for 2m, 4el for 70cm, 50 ohm feed with BNC connector. £52.95

See them at the rallies on the SYON TRADING stand

SYCOM (SYON TRADING)
16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ
Tel: 01372 372587 Fax: 01372 361421

HATELY ANTENNA TECHNOLOGY

1 Kenfield Place, Aberdeen AB15 7UW
TEL & FAX 01224 316004 GM3HAT

LATEST NEWS ON CROSSED FIELD ANTENNAS

There are now three Miniband Crossed Field Loops available ex-stock. These are:-
1) CFL 3.6 for 80 metres, 100W capability, diameter 67 cm (2ft 4in) priced at £75 incl recommended 18m coax feeder to give almost whole band operation.
2) CFL 7 for 40 metres, also 100W, diameter 40 cm (1ft 4in) priced at £60 incl the 7.5m feeder of 50 ohm coax and postage and VAT.
3) CFL 14 for 20 metres, 100W, diameter 30 cm (1ft) priced at £44 inc. No feeder but feeder of 50 ohms impedance of any length may be used and the bandwidth is the full band.

EARLIER DESIGNS of Ground Plane Crossed Field Antenna which caused so much controversy in the *Electronics World* magazine in the period 1989-90, are now being used in much medium wave AM broadcasting in Egypt. Listen out for the 20kW station after dark at Tanta (arabic male speaker) on 864kHz audible with good clear signal in spite of co-channel stations of ten times the power from Sofia and Moscow using conventional mast antennas.

TECHNICAL SPECIFICATIONS ON ANY OF OUR COMPACT AND COVERT AMATEUR BAND ANTENNAS ON REQUEST.

Best seller...the bargain priced Adapt-A-Mast

- Lifts to 25ft • Wall mounting
- Complete with all brackets, cable and winch
- Accepts 2in stub mast • Adaptable to tilt-over
- Available hot dip galvanised BS729
- Simple four bolt installation

MANY OTHER MASTS AVAILABLE

Call (01505) 503824

Mobile (0374) 951660

or write to

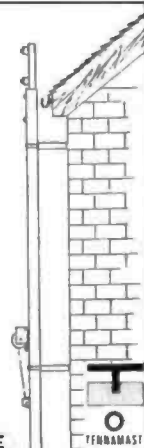
TENNAMAST SCOTLAND LTD

81 MAINS ROAD, BEITH, Ayrshire KA15 2HT

E-Mail: TENNAMAST@btinternet.com

For sales in Benelux countries contact

Doeven Elektronika, Tel: +31 (0) 5282 69679



antennas in action

NEWS & PRODUCTS ■ QUESTIONS & ANSWERS ■ ANTENNA WORKSHOP ■ REVIEWS ■

New From G2DYM

There's a new antenna suitable for reduced-space locations from G2DYM. Called the 'E-Type' the inductively shortened antenna comes in a variety of lengths (from 17.5 to 35m) to suit different bands and available space. For more information on the 'E-Type' antenna contact R. Benham-Holman G2DYM, at 'Cobhamden' Beerdown, Uplowman, Tiveton, Devon EX16 7PH, or Tel: (01298) 361215.

Cushcraft R6000

I've had some news from Waters & Stanton Electronics about the new Cushcraft R6000 vertical antenna they can supply. The R6000 antenna covers bands from 14 to 50MHz with the minimum number of traps for maximum efficiency. At only 5.5m high, the R6000 operates without ground radials allowing it to be pole or roof mounted. For more

details contact Waters & Stanton Electronics at 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835 or FAX: (01702) 205843 for more details

GPS Antenna

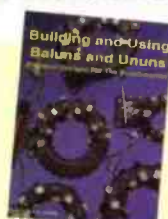
A new compact GPS receiving antenna from Procom of Denmark is



Antenna Impedance Matching £15.50



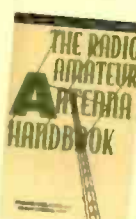
Antennas For VHF & UHF £4.95



Building & Using Baluns & Ununs £18.95



HF Antennas For All Locations £14.65



The Radio Amateur Antenna Handbook £8.50



Vertical Antennas £8.95

available from Communication Technical Services Ltd. With a typical gain of 27dB and 5m of RG174 coaxial cable the antenna can be placed at the optimum point on the roof of the vehicle. The low-profile antenna is securely held in place by a magnetic mount, making it secure under almost all circumstances. For more details of this, or any other Procom antennas contact Communication Technical Services Ltd. at Unit 15, The Gatwick Metro Centre, Balcombe Road, Horley, Surrey RH6 9GA, or tel: (01293) 822602, FAX: (01293) 822612.



Chelcom Webwise!

Chelcom is the latest antenna, manufacturer to put their antenna products up, on the world-wide web, for everyone to see. If you have internet access try pointing your web-browser at their address of: <http://www.chelcom.com> if you're not internet friendly yet write to Chelcom at Riverside House, Homecroft Drive, Cheltenham, Glos GL51 9SN, Tel:/FAX on (01242) 680653.

Like A Comet?

If your looking for an antenna or

antenna accessory from the Comet range of products then you might like to send for the 1998 issue of the Nevada catalogue to browse through. There are three pages of antennas, vehicle mounts, duplexers and low-pass filters in the catalogue.

There are many more items of interest to radio hobbyists within the catalogue so get hold of a copy now from Nevada, 189 London Road, North End, Portsmouth, Hants PO2 9AE, Tel: (01705) 662145, or FAX: (01705) 690626. For those of you with internet access, try <http://www.nevada.co.uk>



Books

Rob Mannion G3XFD has profiled six antenna related books on pages 54 and 55 of this issue so I'll leave it up to him. However, just as a taster, he says that *The Radio Amateur Antenna Handbook*, *(All About) Vertical Antennas* and *HF Antennas For All Locations*, are all 'highly recommended'. And that *Building & Using Baluns & Ununs* and *Antenna Impedance Matching* are both 'useful reference sources'. For the beginners Rob found that *Antennas For VHF & UHF*, is 'an ideal beginner's book'.

contents

News & Intro	23
Antenna Workshop Ray Fautley G3ASG	24
DX-Buster Antenna Ray Ratcliffe GW3KZW	28
Tex Topics	30

welcome to AiA!



Welcome to this month's 'Antennas in Action'. Once again I've reduced the amount that I have taken for 'Tex Topics', this time so that Ray Fautley G3ASG can expand on using a calculator in π -matching problems. However, I've managed to have a look,

on your behalf at the usual mixture of books and antennas! The antennas I've looked at, a commercial three-element folding antenna for 144MHz and a log-periodic for 105-1300MHz, are described in 'Tex Topics'.

I know that as I write this it's supposed to be the middle of summer, and many of you may be reading this on a beach somewhere else but, don't forget that we still need the shorter ideas for publication so, get writing! Each month, any reader's trick, tip or good idea published will win a copy of *More Out Of Thin Air*, or a voucher to spend in our Bookstore.

G17EX

antenna workshop

Pi-matching

Ray Fautley
G3ASG shows
you how to
calculate the
values for π -
section
matching using
your Calculator

A previous article on antenna matching in the October 1997 PW described a procedure for matching whatever impedance appeared at the shack end of the feeder from your antenna to the 50 Ω required by the transmitter. That type of matching network is usually referred to as an 'L' match because the circuit looks like a letter L, although admittedly not the right way up or right way round!

The L match is not the only method used for such matching. Another way is to use a ' π ' section network, so-called because the circuit configuration (Fig. 1) of the three matching reactances X_4 , X_3 and X_2 resembles the shape of the Greek letter ' π '. This time it is the right way up!

Mostly, the π network is remembered as the anode tuning and matching circuit for valve power amplifiers, where it performed both functions. In that case it was to match the output load resistance of 50 Ω to the very much higher value of the optimum anode load resistance for the valve, which could be as high as several thousand ohms.

Study of the design equations below shows the appearance of yet another symbol, ' Q '. You should remember(!) that Q is a measure of the 'goodness' of a tuned circuit, i.e., the higher the Q of a tuned circuit, the greater its 'goodness' or selectivity (or even its 'stiffness' as it used to be called long ago by the Admiralty Handbook of 1938).

So, how does the Q factor get involved with matching problems? From the work done on power amplifiers it was shown (well, sometimes it was!) that if the anode tuned circuit was very heavily damped, due to a resistive load applied to the amplifier's output (giving the tuned circuit a low value of Q), the transfer of power from the valve to the load (where it was needed) was greater than if it was lightly loaded. However, a lightly loaded (higher Q) tuned circuit provided greater selectivity, which in turn reduced the amplitude of valve generated harmonics.

So, we have to strike a compromise between high Q attenuating harmonics and low Q providing high power transfer. The best compromise has been found to occur when Q is in the range of five to 15. For low power and amateur transmitters a Q value of 12 is commonly used.

As with the L network matching circuits, we have two cases to deal with. First for where the parallel equivalent of the resistive part of the measured antenna impedance R_p is greater than the value of the required load resistance R_L . For this case use Design Procedure 1. The second case is for R_p less than R_L , where we use Design Procedure 2.

Before we start the design of the network it's necessary to establish which of the two design procedures is needed. So, to begin by measuring the impedance at the

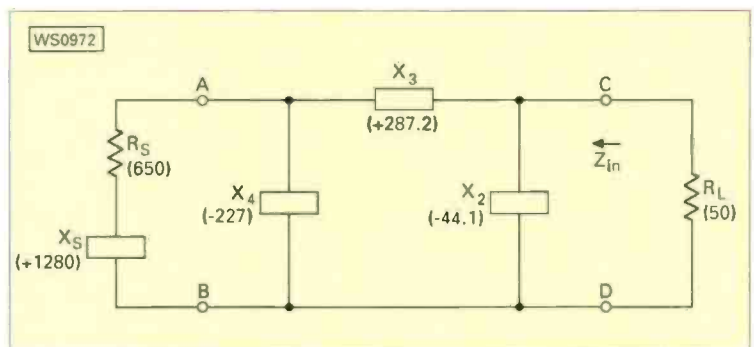


Fig. 1: When the load is a pure 50 Ω the network of X_2 , X_3 and X_4 will be needed to match the source impedance of (650+j1280) Ω for maximum power transformation.

shack end of the antenna feeder at the desired frequency of operation. If the impedance is given as a series combination made up of R_S and X_S , it must first be converted to its parallel equivalent values of R_p and X_p .

When you have calculated the equivalent parallel impedance figure then, if R_p is greater than the load resistance R_L (50 Ω), use Design Procedure One. If, however, R_p is less than R_L , use Design Procedure Two.

Let's first find the parallel equivalent (R_p and X_p) of a series combination (R_S and X_S):

$$R_p = \frac{R_S^2 + X_S^2}{R_S}$$

Determine X_p

$$X_p = \frac{R_S^2 + X_S^2}{X_S}$$

Choose a value for Q (say 12)

Determine X_1

$$X_1 = \frac{R_p}{Q}$$

Determine X_2

$$X_2 = -\frac{R_p \times R_L}{(Q^2 + 1) \cdot \frac{R_p}{R_L}}$$

Determine X_3

$$X_3 = +\frac{(Q \times R_p) + \frac{R_p \times R_L}{(Q^2 + 1)}}$$

Determine X_4

$$X_4 = \frac{(-X_p)(X_1)}{X_1 - X_p}$$

Once again a worked example is the best way to get to know how to do it yourself

Example One

For example one let me assume that on measuring the impedance at the shack end of the feeder connected to an antenna at a frequency of 3.65MHz, that the impedance comprises 650 Ω resistance (R_S) in series with +1280 Ω reactance (X_S). The problem is to design a π matching network to convert this impedance to a pure resistance (R_L) of 50 Ω at 3.65MHz.

Procedure One

The following steps are what I call Design Procedure One. First convert the given series values of R_S and X_S to their equivalent parallel connection values, R_p and X_p .

$$R_p = \frac{650^2 + 1280^2}{650}$$

Determine X_P

$$X_P = \frac{650^2 + 1280^2}{1280}$$

where $R_S = 650\Omega$ and $X_S = +1280\Omega$

First R_P using the electronic calculator.

```
6 5 0 x + 4 2 2 5 0 0
1 2 8 0 x + 2 0 6 0 9 0 0
+ 6 5 0 x + 3 1 7 0 . 6 1 5
```

So $R_P = 3171$ (near enough)

Now for X_P , with the calculator.

```
6 5 0 x + 4 2 2 5 0 0
1 2 8 0 x + 2 0 6 0 9 0 0
- 1 2 8 0 x + 1 6 1 0 . 0 7 8
```

Giving $X_P = +1610$

As R_P (3171 Ω) is greater than R_L (50 Ω) this a problem to be solved using Design Procedure One.

We'll use a value of 12 for Q
Determine X_1

$$X_1 = -\frac{3171}{12}$$

Now use your calculator to work out X_1 , to save space I'll omit this step, but you should have arrived at a value for X_1 of -264.3 In round figures.

Determine X_2

$$X_2 = -\frac{3171 \times 50}{(12^2 + 1) \times 50}$$

On the calculator you would see something like:

```
3 1 7 1 x 5 0 3 1 7 1
3 0 x - 6 3 . 4 2
3 1 7 1 x 3 1 7 1
3 0 x - 1 5 8 5 5 0
+ 1 2 x + 1 2 2 x + 1 1 0
1 4 5
- 6 3 4 2 x 1 2 2 x + 1 1 0
9 4 3 . 4 9 1
= 4 4 . 0 8 5 0
```

Don't forget to negate (make minus) this number you have just calculated. So $X_2 = -44.1$ (again, near enough)

Determine X_3

$$X_3 = +\frac{(12 \times 3171) + \frac{3171 \times 50}{+44.1}}{(12^2 + 1)}$$

Again back to the calculator

```
3 1 7 1 x 3 1 7 1
1 2 x - 3 8 0 5 2
3 0 x 5 0
3 1 7 1 x 1 5 8 5 5 0
4 4 . 1 x - 3 5 9 5 . 2 3 8
+ 3 1 7 1 x 6 3 4 2 x -
4 1 6 4 7 . 2 3 8
1 2 x 1 4 4
+ 1 2 x 1 4 5
+ 1 2 x 1 2 2 x + 1 1 0 x -
1 4 5 =
2 8 7 . 2 2 2
```

Giving $X_3 = +287.2$
Determine X_4

$$X_4 = \frac{(-1610) \times (-264.3)}{(-264.3) - (-1610)}$$

Again as this is quite simple I'll miss out this step with the calculator, and so finally $X_4 = -227$ (again this is accurate enough for our needs).

Now follows the dreaded check on the arithmetic! If we disconnect the load resistance R_L from the network, the impedance looking into the network from terminals C and D (see arrow marked X_{IN} in Fig. 1) should be a pure resistance of 50 Ω .

As another exercise (another time?) you could calculate the impedance looking into the network from terminals A and B with the feeder disconnected. If everything is correct, the answer should be equal to R_P in parallel with minus X_P , which is negative, because it has to tune out the positive reactance of X_P . (That's if you like this kind of work!)

Now let's return to the check looking into the network from terminals C and D (Fig. 1). First evaluate the effective parallel reactance of X_P and X_4 , we'll call it X_5 . This will be:

$$X_5 = \frac{X_P \times X_4}{X_P + X_4} = \frac{(+1610) \times (-227)}{1610 - 227}$$

A little work with the calculator gives us a figure of -264.3 for X_5 .

Next, convert the parallel network of R_P and X_5 to its series equivalent. Start with the effective series resistance, R_S .

$$R_S = \frac{R_P \times X_5^2}{R_P^2 + X_5^2} = \frac{(3171) \times (-264.3)^2}{(3171)^2 + (-264.3)^2}$$

The steps on the calculator are fairly simple so, I'll omit them for space reasons. But you should find that

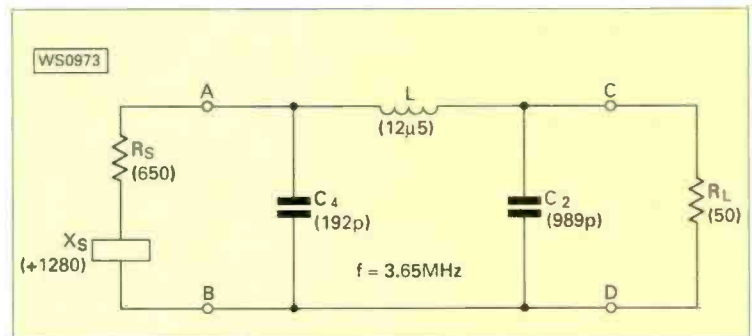


Fig. 2: When the impedances of Fig. 1, are changed to component values (for use in the 3.5MHz band) the circuit looks more familiar.

your figure for R_S comes to about 21.8 Ω .

Now to work out X_S

$$X_S = \frac{R_P^2 \times X_5}{R_P^2 + X_5^2} = \frac{(3171)^2 \times (-264.3)}{(3171)^2 + (-264.3)^2}$$

Calculator

Again the steps on the calculator are fairly simple so, I'll omit them for space reasons. But you should find that your figure for X_S at -262.5 (notice the negative sign).

The next step is to add the series reactances X_S and X_3 , call the result X_6 .

$$X_6 = X_S + X_3 = (-262.5) + (+287.2) = 24.7$$

Which is fairly easy to carry out on the calculator. So, $X_6 = +24.7$ in round figures.

Finally, we have to change the series network of R_S and its parallel equivalent.

$$R_P = \frac{21.8^2 + 24.7^2}{21.8} = 49.97$$

After your work with the calculator, you should find the effective resistance of R_P as 49.8 Ω (near enough to our target of 50 Ω).

The 'nearly last' bit is to evaluate the effective parallel reactance.

$$X_P = \frac{21.8^2 + 24.7^2}{24.7} = 43.94$$

As the previous example, it's fairly simple, giving an effective reactance for X_P of +43.9 Ω .

The really last thing to do is put the just calculated X_P in parallel with X_2 . Well, if you put +43.9 Ω in parallel with -44.1 Ω , which as it's fairly close to nothing (I know it isn't really, but it is close) you won't be far off resonance! QED!

Arithmetic Verified

Having verified all the arithmetic, it remains to give X_2 , X_3 and X_4 actual component values for use at the design frequency of 3.65MHz.

We'll start with X_2 . The reactance value calculated is -44.1 Ω . As the reactance is negative we know that the component will be a capacitor. From the basic formula for capacitive reactance:

$$X_C = \frac{1}{2\pi f C}$$

and a simple bit of transposition:

$$C = \frac{1}{2\pi f X_C}$$

with f in Hertz and C in Farads. We can simplify the calculations necessary by making the equation suitable for f in MHz and C in pF (much more practical units). If, at the same time, all the constants in the equation are combined into a single number we get:

$$C = \frac{159155}{f \times X_C} \text{ pF}$$

Now we put our reactance value and required frequency into the equation.

$$C_2 = \frac{159155}{3.65 \times 44.1} \text{ pF} = 988.76 \text{ pF}$$

On your calculator you should have calculated your first component, the capacitance value for X_2 , as 989pF. This capacitance we'll call C_2 .

Next, use the same method to find the value of the capacitance that is... X_4 .

$$C_4 = \frac{159155}{3.65 \times 227} \text{ pF} = 192.62 \text{ pF}$$

CONTINUED ON PAGE 26.....

antenna workshop

On your calculator you have calculated the value of your second component, C4, which you should have found around a value of 192pF.

Finally we have to find the value of inductance for X3. From the formula for inductive reactance:

$$X_L = 2\pi f L$$

and transposing:

$$L = \frac{X_L}{2\pi f}$$

With another bit of mathematical magic we get:

$$L = 0.159155 \left(\frac{X_L}{f} \right) \mu\text{H}$$

which has f in MHz and L in μH with just one number for the constants.

Putting our values for X_L and f in the above equation:

$$L = 0.159155 \left(\frac{287.2}{3.65} \right) \mu\text{H}$$

```

2 8 7 . 2 ÷ 3 6 5 = 2 8 7 . 2
3 6 5 ÷ 7 8 . 6 8 4 9
x 7 8 . 6 8 4 9
-----
2 1 5 3 9 1 3 3 3
      1 5 9 1 5 5
      1 2 . 5 2 3 1
    
```

finally giving the inductance value required as 12.5 μH .

The really, really final touch is to put the component values onto the network circuit as in Fig. 2. But is it really final?

Another Check?

What another check? I hear you say. Well, after all this work it would give us confidence if we could make one last test. The inductance, which is connected across (i.e. in parallel with) the two capacitances in series-well, look at Fig. 2 again - should resonate fairly close to the operating frequency of 3.65MHz. Does it? To find out, first determine the effective value of C2 and C4 in series.

$$C_S = \frac{C_2 \times C_4}{C_2 + C_4} \text{ pF}$$

If we put in the values for C2 and C4 :

$$C_S = \frac{989 \times 192}{989 + 192} = 160.79 \text{ pF}$$

Calculator

Use your calculator to evaluate the above equation and you should find the effective capacitance as 161pF.

Now we must find the frequency at which 161pF and the inductance 12.5 μH resonates. Using the formula for resonance:

$$f = \frac{1}{2\pi \sqrt{L \times C}}$$

where f is in Hertz, L is in Henries and C is in Farads.

Simplifying the arithmetic again we get:

$$f = \frac{159.155}{\sqrt{L \times C}} \text{ MHz}$$

with f in MHz, L in μH and C in pF.

Putting our numbers into the equation:

$$f = \frac{159.155}{\sqrt{12.5 \times 161}} \text{ MHz} = 3.5478 \text{ MHz}$$

Using the calculator you may start finding the square root of the bottom line of the equation before inverting this figure and multiplying it by the top line. So:

```

1 2 . 5 x 1 6 1 x = 2 0 1 2 . 5
√ 2 0 1 2 . 5 = 4 4 . 8 6 0 8 9
1 ÷ 4 4 . 8 6 0 8 9 = 0 . 0 2 2 2 9 1
x 1 5 9 . 1 5 5 = 3 . 5 4 7 7 4 4 5
    
```

Then we get a frequency of 3.55MHz, close enough to the design frequency of 3.65MHz. That really is the end - at least for that example!

Second Procedure

Now it's time to look at the second procedure and this time we find out how to evaluate the components required to match an antenna system which has a resistive component less than the 50 Ω we want to transform it

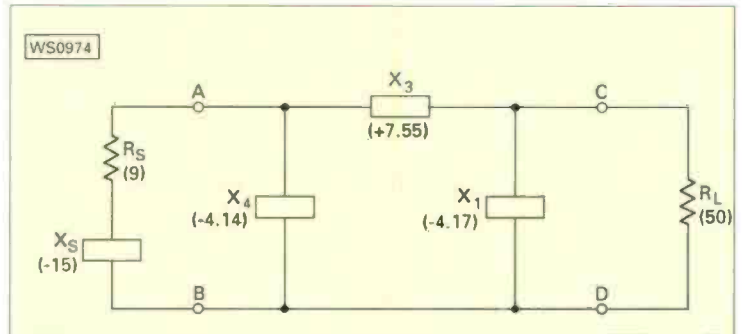


Fig. 3: Looking similar to the network of Fig. 1, this is to match the load (50 Ω) to a much lower value of source impedance of (9-j15) Ω .

into. This time we're moving on to use Design Procedure Two

Having first determined the effective parallel equivalent of the impedance at the shack end of the feeder connected to the antenna and found it to be less than 50 Ω we continue as follows. (Equations for converting a series combination of R_S and X_S to their parallel equivalents R_P and X_P are shown in the first part of the article.) Fig. 3 shows the π -network needed.

Choose a value for Q and, again I will use the figure of 12. Determine X1

$$X_1 = -\frac{R_L}{Q}$$

Determine X2

$$X_2 = -\frac{R_P \times R_L}{\sqrt{(Q^2 + 1)} - \frac{R_L}{R_P}}$$

Determine X3

$$X_3 = +\frac{(Q \times R_L) + \frac{R_P \times R_L}{X_2}}{(Q^2 + 1)}$$

Determine X4

$$X_4 = \frac{-X_P(X_2)}{X_2 - X_P}$$

Now, the inevitable example!

Second Example

Let's now look at a second example. At the shack end of the feeder connected to the antenna, the impedance is measured as 9 Ω resistance in series with -15 Ω reactance (called R_S and X_S) at a

frequency of 28.8MHz. Determine the π network components necessary to convert the antenna system to a 50 Ω resistance.

Convert the given series values of R_S and X_S to their equivalent parallel values of R_P and X_P .

$$R_P = \frac{R_S^2 + X_S^2}{R_S}$$

$$X_P = \frac{R_S^2 + X_S^2}{X_S}$$

where $R_S = 9\Omega$ and $X_S = -15\Omega$

$$R_P = \frac{9^2 + (-15)^2}{9}$$

On the calculator to work out both R_P and

$$X_P = \frac{9^2 + (-15)^2}{-15}$$

First take R_P . Using your calculator. Turning again to the calculator for an evaluation of the formula

```

9 x 9 + 1 5 x 1 5 = 8 1
-----
9 = 2 2 5
-----
3 0 6
-----
3 4
    
```

Which gives $R_P = 34\Omega$ Now for X_P .

```

9 x 9 + 1 5 x 1 5 = 8 1
-----
- 1 5 = - 2 2 5
-----
3 0 6
-----
- 2 0 . 4
    
```

So $X_P = -20.4\Omega$. Let $Q = 12$ Determine X1

$$X_1 = -\frac{50}{12}$$

Let's use the calculator for evaluating

■ DOWN ON THE ANTENNA FARM, HUGE ANTENNAS ARE POSSIBLE, AND ROY GW3KZW SHOWS YOU HOW TO 'GROW-ONE' FOR THE 80M BAND! AND, IT'S SCALABLE IF YOU HAVEN'T GOT THE SPACE.

The DX-Buster

Here's a 'brute' of an antenna for the 3.5MHz band, described by Roy Ratcliffe GW3KZW, and it really is 80m long! So, for once we can say this is an 80m antenna for the 3.5MHz band. Have you got room for one in your garden?

The antenna I'm about to describe is an antenna for 'winkling' out the DX on the 3.5MHz band, but please note that, as presented, this isn't a project for the faint hearted - or those with a postage stamp sized garden!

The antenna was devised after many frustrating hours of experimenting with a variety of antennas, inverted 'V' antennas, verticals, etc., which the books said would work DX. However, from my QTH the antennas worked nothing and, as low band DXing is the main interest, something had to be done to improve matters.

After some thought I decided to try a delta or full-wave loop $(300/f)m$ to determine the wire length. Although this usually produces a wire length slightly too long to

resonate at the 'target' frequency, this would be taken care of later. The wire was erected in the well known 'delta' configuration with the apex at approximately 20m and the feeder (coaxial cable) connected into one of the bottom corners.

Half-Wave Long

The coaxial (inner conductor connected to the sloping wire) was cut to be half-wave long (at 3.75MHz again). But please note, you must not forget the velocity factor of the coaxial cable when calculating lengths. The formula is: $(300/2 \times f) \times V_f$ in metres, where f is the working frequency (in megahertz) and V_f is the velocity factor of the cable used.

From manufacturer's data sheets, the nominal velocity factor for typical solid dielectric coaxial cable seems to be about 0.66. For a typical coaxial cable I mean such as RG58 and RG213 type of coaxial cable. Put more simply, the length of the coaxial feeder I used was $(300/2 \times 3.75) \times 0.66$ or some 26.4m long.

Strength Tested

The wire used to create the loop, had been tested for strength at the outset. I found that in terms of performance there was no observable difference between 'solid' or stranded wire used to form each single loop. The single loop unit was clearly the best antenna I had tried, particularly in its favoured directions of east/west. Then came the inevitable question (as ever), how do I make a good antenna better?

After a few moments head

scratching, I had the idea of a two-element antenna, i.e. driven element and reflector. The idea began to take shape and, the decision was taken to 'go for it'. The tower I was using, had a scaffold pole extension at the top rising to a little under 18m high.

The extension pole was lengthened a little and, was fitted with a crossbar pole approximately five metres long at the top. Both ends of the crossbar were fitted with a pulley and a loop halyard. From past experience, a single length halyard was discounted (when they break you're stuck).

Tuning Operations

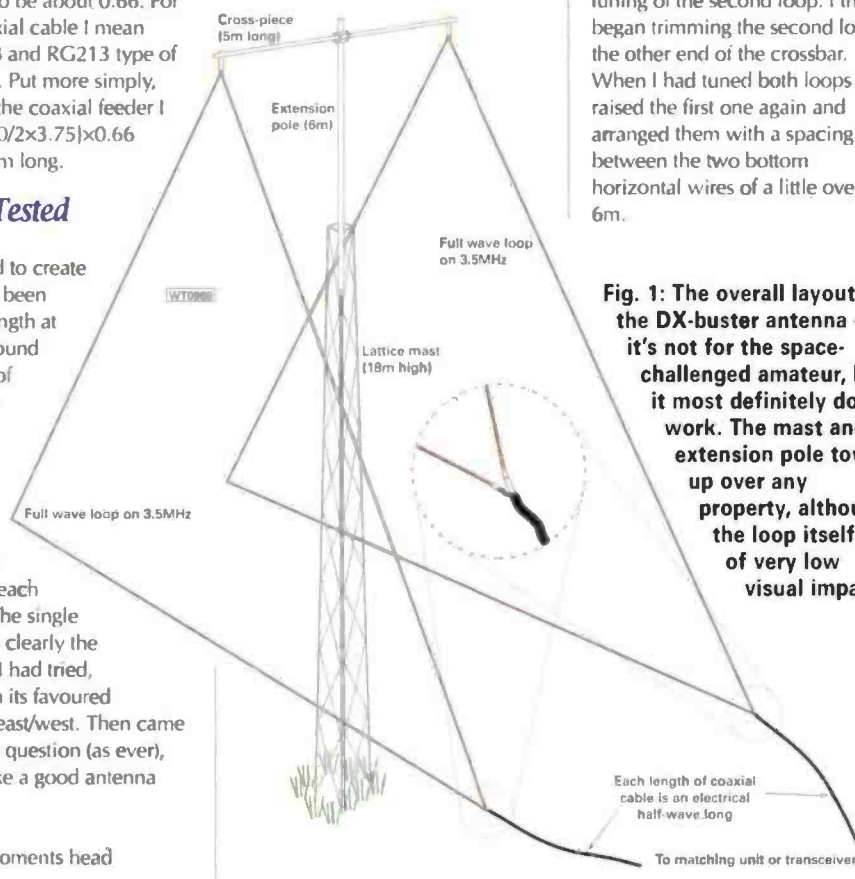
The antenna wire was next passed through an insulator which was then attached to the halyard and raised to begin the tuning

operations. The tuning operation was by checking resonant frequency, then snipping off wire (at the feed-point), in short lengths as needed to give resonance at 3.75MHz. During these tests I ignored the s.w.r. figure, as the feed-point impedance of a single full-wave delta loop is approximately $100-120\Omega$, which gives an s.w.r. of about 2:1 and is quite normal.

It's desirable to have a helper while engaged on these adjustments, as there is likely to be a fair amount of lowering and raising of the wire. As my XYL is licensed, I had the helper and, even better, an interested one at that. So, with the willing helper I completed the tuning procedure on the first loop.

This first loop was lowered to the ground so as not to influence the tuning of the second loop. I then began trimming the second loop at the other end of the crossbar. When I had tuned both loops I raised the first one again and arranged them with a spacing between the two bottom horizontal wires of a little over 6m.

Fig. 1: The overall layout of the DX-buster antenna - it's not for the space-challenged amateur, but it most definitely does work. The mast and extension pole tower up over any property, although the loop itself is of very low visual impact.



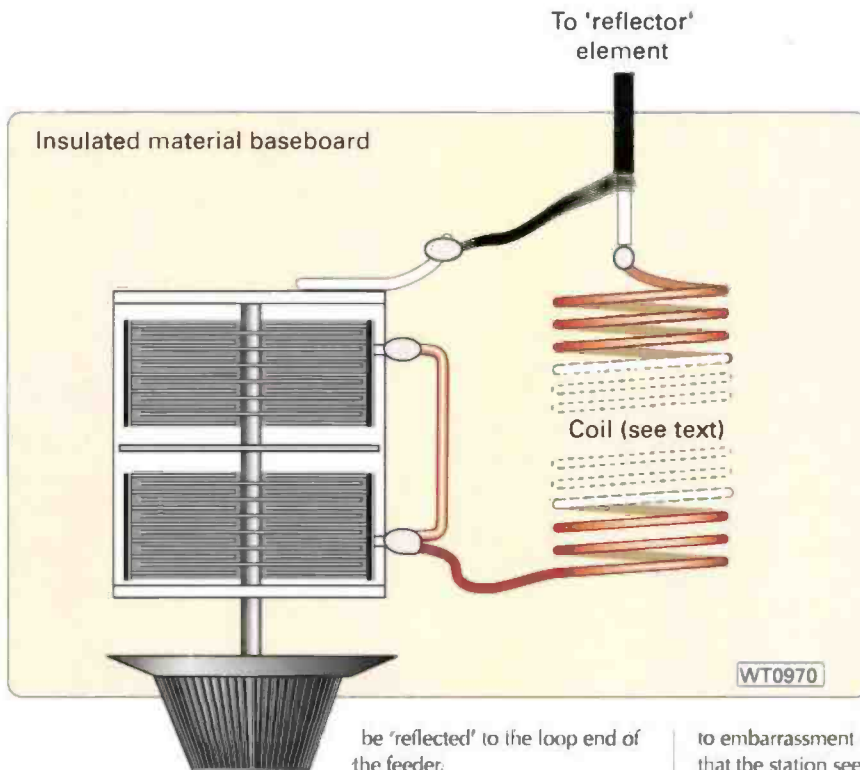


Fig. 2: A tuned circuit to create the phasing unit may be made up of a coil of about 12 μ H and 175pF capacitance. A suitable start point for the coil could be 20 turns of 1.25mm enamelled copper wire on a 38mm diameter former with a winding length of about 30-35mm. (See editorial comment in separate panel).

contacts being commonplace, along with regular contacts with Japan, and in the winter months of December - January, W6 & 7 were regularly worked via a long path and some of the Pacific islands. During the course of numerous contacts with 'G' stations the antenna aroused much interest and descriptions were requested along with the suggestion that a description should be published.

Due to personal circumstances which forced a move of QTH, this antenna is no longer in use and is sorely missed. But, it's my intention to install it, or something similar at the new QTH - as soon as possible.

For anyone that would like to join the 'big guns' on 3.5MHz, this antenna is 'hugely' recommended.



As A Reflector

In order to function as a reflector, one of the loops needs to be approximately 5% longer than the driven element. This is where the half-wave feeders come into play. Whatever is connected to the transmitter end of the feeder will

be 'reflected' to the loop end of the feeder.

The 'reflection' effect is exploited by connecting an inductor across the bottom end of the feeder in order to effectively lengthen the undriven element so, forming a reflector. The inductor was 'adjusted' by using a variable capacitor to adjust the effective inductance. This tuning arrangement could be switched between the two feeders in order to reverse the 'direction of fire'. See the separate box for the circuit to try as a tuning circuit.

to embarrassment at times, was that the station seemed 'deaf' to 'G' stations. Many UK amateurs couldn't be heard when they were trying to break-in when DX was being worked. Quite a number of stations didn't understand that antennas with low radiation angles are poor for 'local' contacts, sometimes leading to accusations of 'standoffishness', although at other times of course, this 'deafness' was a boon.

The antenna gave an excellent account of itself, with VK and ZL

Tuning Circuit

The tuning circuit was adjusted to its optimum point by tuning into a station, putting and varying the capacitor for a maximum 'dip' on the S-meter. Then switching to the other feeder produced a markedly stronger signal. From this test the two directions of the switch were marked. The third position of the switch connects the two loops in parallel, which produces almost all round coverage.

One of the characteristics of the antenna, particularly when in directional mode, and one that led

Editorial Comment:

A suitable start point for the coil could be 20 turns of 1.25mm enamelled copper wire on a 38mm diameter former with a winding length of about 30-35mm. This will produce a coil with an inductance of about 12 μ H and, by using a capacitor with a mean value of about 175pF (400-500pF maximum) capacitance, you can adjust the circuit for the correct setting.

You could try any other combination of coil and capacitance giving the same value of 2100(μ HpF) as this combination of inductance and capacitance is resonant around 3.5MHz. Please remember that any coil you use should be made up from a fairly thick copper wire to reduce losses.

Space-Challenged

For those of us that are a little more space-challenged (most of us) without an area large enough area to try out the DX-Buster antenna for 3.5MHz, why not try scaling it for other bands. I've made a full-wave delta loop for the 50MHz band and it's very manageable in size.

To turn my delta loop antenna for 50MHz into a DX-Buster version for the band, would need a support pole only about three to four metres high to put the horizontal runs above head height. By scaling the various sizes you could create a similarly functioning DX-Buster antenna for other bands.

917EX

"During the course of numerous contacts with 'G' stations the antenna aroused much interest and descriptions were requested along with the suggestion that a description should be published".

tex topics

antennas in action

As space is somewhat limited this month, let me stop rambling and 'get going'. Rob Mannion G3XFD passed over to me an E-mail from Bob Adlington M0BOB asking for some advice about how to improve his system. Bob says his present h.f. antenna is an half-sized G5RV running diagonally (at a height of some 6.5m) from the apex of his roof to the opposite corner of the garden, which is only eight metres wide and 12m long.

Bob goes on to say his contacts are mainly into Europe and he wonders if readers have any ideas how he might improve his setup. For those of you with E-mail access, how about dropping him a line to: M0BOB@mcmail.com but, if you don't have E-mail yourself, you could drop me a line in the office and I'll forward it to him, on your behalf.

A New Book

Now let me describe a new book from Joe Carr K4IPV. Hot off the press from Newnes, comes *Antenna Toolkit*, an A5 sized book of antennas and design information for various antennas. With over 200 pages, the book is copiously illustrated making it easy to read and find a topic on any of the antennas.



There are 11 chapters dealing with topics such as Antenna basics, Wire, Connections, Grounds and all that, Doublets, Marconi and other unbalanced antennas, Limited space antennas, Wire arrays, Impedance matching, and getting a good ground. There's also a chapter on 'Simple antenna instrumentation and measurements'.

Last but not least, although the book seems expensive at £25 (From the PW Bookstore), mounted in an envelope inside the back cover is a CDROM containing a suit of computer programs, suitable for an IBM PC or clone running Windows (3.1 or 95). The suite of programs, *Antlers 2* make many antenna, coil and tuned circuit calculations much easier by taking out the hard work involved.

There are two other programs on the

CDROM, but with minimal support. The two programs are a copy of *MiniNEC* and *VOACAP* which is basically a propagation predictor as used by the *Voice of America* team when trying to decide which frequencies to use through out the day, to reach other areas of the globe. An excellent book for all levels of use.

Moonraker Halo

I've been playing with a Halo Loop antenna from Moonraker for the 50MHz (6m) band recently. The Halo



Fig. 1 The Moonraker Halo Loop antenna seen from below.

type of 'bent' half-wavelength antenna has been around for some time (I first saw a 144MHz version on a car in reading in the late 1960s). But this is the first time I've seen one for the '6m' band.

The antenna is normally mounted in the horizontal plane, Fig. 1, where it is shown at the top of the pole I use.

Although it is horizontally polarised, the antenna is unusual in that it gives almost omnidirectional performance, although not as good all-round as a vertical antenna would be. To match the 50Ω impedance of the coaxial cable feed a Gamma-match bar is used, Fig. 2, although this matching method can give a good match and low s.w.r. when adjusted, it is a little narrow-band in operation, Fig. 3.



Fig. 2: A Gamma-match bar allows a good match to be made over part of the 50MHz band.

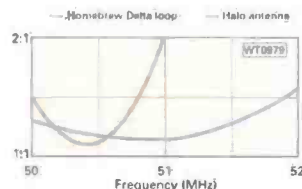


Fig. 3: Comparing the s.w.r. curves for the Halo Loop antenna against a full-wave delta loop antenna with a pi-match unit.

The Halo antenna from Moonraker (priced £24.95) didn't quite have the signal gain of the home-brew delta loop antenna (matching curve also shown in Fig. 3) it gave much better all round performance. A very useful antenna that could be fitted in the roof space of even a small house (or even inside a small flat) to allow 50MHz operation.

Log Periodic

Another antenna I've been trying out recently is the Scanmaster LP1300

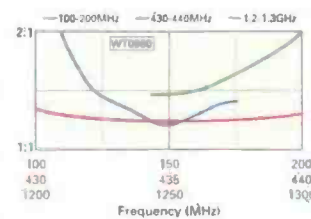


Fig. 4: The Scanmaster LP1300 has an adequately low s.w.r. over the 144, 430 and 1200MHz bands.

(105-1300MHz) Log Periodic antenna from Nevada. Looking like an arrowhead the Scanmaster LP1300 is reputed to cover from 105 to 1300MHz. So I tried it out!

Firstly I checked the antenna, over as much of its claimed bandwidth as I could, for the matching and s.w.r. The results are shown in Fig. 4. I used my MFJ antenna analyser to measure ('guesstimate') the matching between 105 and 175MHz, checking with a transmitter between 144-146MHz.

As you can see in the s.w.r. curves of Fig. 4, the antenna matches quite well in the 144, 430 and 1200MHz bands. There was a pronounced 'dip' in the s.w.r. curves around the 144MHz band, but over the whole of the 430MHz band both low s.w.r. and gain were very good. The front-to-back ratio was very pronounced also in this band. In the 1.2GHz band the s.w.r. and matching were beginning to fall off again, although still adequate for the average user, I doubt it would satisfy the avid '1.2GHz user'.

One advantage of the Scanmaster LP1300 was that the gain/s.w.r. seemed to be reasonably flat over the complete lower portion of the 1240-1300MHz band making the antenna useful for both ATV and 'normal' narrow-band modes higher up in

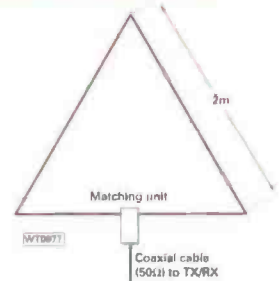


Fig. 5 A simple full-wave delta loop antenna for the 50MHz band.

frequency. At £99, the antenna makes a useful addition to the antenna farm for cross-band work with only one antenna.

Other Antenna

The other antenna s.w.r. curve shown in Fig. 3, is a simple delta-loop antenna that I made for the 50MHz band. The antenna Fig. 5, was created when I needed a 50MHz antenna quickly and cheaply so, the dimensions are not that accurately calculated, the loop itself is almost exactly six metres round, but it works. The matching box shown in the drawing of Fig. 6 was also empirically derived ('guesstimated') and could be improved. But it also works, so why change it!

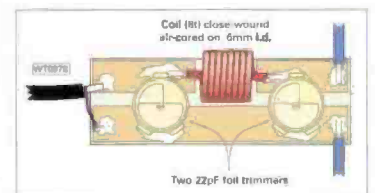


Fig. 6: And an equally simple antenna matching unit for the delta loop.

The matching unit is to match the 50Ω coaxial cable to the 100-120Ω input impedance of the delta-loop and should be adjusted for lowest v.s.w.r. mid-band. As shown in Fig. 3, the lowest s.w.r. isn't quite as low as for the halo loop from Moonraker, but it is much flatter, being acceptably low over the whole of the band. This wide band matching is due mainly to the matching unit being at the antenna feed point and so being a true 'Antenna Matching Unit'.

Well I'm afraid I've run out of space again. I'll see you in the next issue of 'Antennas-in-Action'.

TEX aa

MOONRAKER 70 CMS ANTENNA RANGE

70CMS 5/8
over 5/8
E.9 Gain
Fitting
£29.95
ADD £6.00 P&P

70CMS 12 Element ZL Special **£28.00** ADD £6.00 P&P

MR776
70CMS 5/8
over 5/8
WAVE
ADD £6.00 P&P
£16.95
PL259
Fitting
£18.95
ADD £6.00 P&P

70CMS 7 Element ZL Special **£19.95** ADD £6.00 P&P

MICRO MAG SUPER STRONG
430-440
MHZ 70CMS
£9.95
ADD £6.00 P&P

MR775
70CMS 5/8
WAVE
£12.95
ADD £6.00 P&P
PL259
Fitting
£14.95
ADD £6.00 P&P

70CMS 5/8
WAVE 5.6 DB
GAIN
£23.95
ADD £6.00 P&P

70CMS 70CMS **£15.95**
ADD £6.00 P&P

MICRO MAG SUPER STRONG
144-146 ZH
430-440 70CMS **£13.95** ADD £6.00 P&P

MOONRAKER (UK) LTD. UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR. TEL: (01908) 281705. FAX: (01908) 281706. VISA

MOONRAKER 6 METER ANTENNA RANGE

3 ELE. YAGI (BEAM)
With
Gamma Match
Gain 7DB
£44.95
ADD £6.00 P&P

HB9CV (BEAM)
Gain 3.2DB
£32.95
ADD £6.00 P&P

HALO LOOP
£24.95
ADD £6.00 P&P

DI POLE
with pole & mounting bracket
£12.95
ADD £3.00 P&P

1/2 WAVE VERTICAL (GRP) FIBRE GLASS ANTENNA
£39.95
ADD £6.00 P&P

MR 50/52
With
£18.95
ADD £3.00 P&P

MR 614
£13.95
ADD £3.00 P&P

To: MOONRAKER (UK) LTD. UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR. TEL: (01908) 281705. FAX: (01908) 281706.

Please send me the following item(s):

NAME: _____ ADDRESS: _____ Tel: _____

POST CODE: _____ CHEQUE / P.O. £ _____ p. Plus £6 / £3 P&P PER ORDER

No Yes VALID UNTIL: _____

SRP TRADING



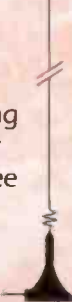
Antenna Rotator AR-300XL
Max load 60kg (with support bearing). 360

deg rotation in approx 65 sec. (cable not supplied). Support bearing optional extra. **£49.95 + free P&P (mainland UK only).**



Synchron SX-144/430
2m/70cm cross needle direct reading SWR/1000W power meter. **£39.95 + free**

P&P (mainland UK only).



SRP Mini-Mag 2/70
2m/70cm dual band mobile antenna featuring super strength mini-magnet (only 30m diameter) c/w miniature coax and plug. **£19.95 + free P&P (mainland UK only).**



SRP-905 Communications Speaker
5 watt 8 ohm filter/mute

extension speaker complete with 3.5mm mono jack. **£13.95 + free P&P (mainland UK only).**



Radio shack DX-394 communications receiver -
150kHz to 30MHz base station AM, CW, USB, LSB communications receiver. Features include clock and timer, signal meter, 100+ memories, RF gain control and direct frequency entry.

A steal at **£149.95 + £7 P&P**



Yupiteru MVT-7100 Scanner
Full spec wideband scanner complete with accessories. **£Ring for this month's special offer**

SRP Trading, 1086 Bristol Road South, Rednal, Birmingham B45 9TZ

Opening times: Mon-Sat 9.30am to 5.30pm. We are Kenwood, Yaesu, Icom, & Alinco dealers.

Call Rod (G8SUP), Richard (G60RA) or Mary (MOBMM) on
TEL: 0121-460 1581, 0121-457 7788 FAX: 0121-457 9009



RADIOWORLD

(WEST MIDLANDS)

37 COPPICE LANE
CHESLYN HAY, WALSALL
WEST MIDLANDS WS6 7HA
WE ARE 5 MINS AWAY FROM J11 M6

TEL SALES/FAX: 01922 414796
SERVICING TEL/FAX: 01922 417829
MOBILE TEL: 0850 099244

Main dealers for Alinco, Icom, Yaesu & Kenwood
Manufacturers warranty on all new equipment

ICOM



IC-706 DSP

HF 6m, 2m.
Smallest DSP radio on the market. **£950**



IC-746

HF, 6m, 2m 100W, 100W,
100W with tuner built in. **£1445**

YAESU



FT-920

HF & 6m built-in tuner
with FM & FREE AM/FM
Filter. **£1274**



FT-1000MP AC

Dual Receiver. Digital
100W Competition radio. **£2124**

KENWOOD



TS-870

Still the only true DSP
radio with TX,EQ N/R. **£1699**



TS-570D

Dedicated HF mobile-
base DSP with built-in
tuner. **£1146**

ALINCO



DX-70TH

HF +6M **£658**



DR-M06

6M MOBILE 20W
£215



DR-140

2M mobile 50W
£220



DR-430

Mobile 70cm
£220



DJ-G5

2M/70CM handie
£237

SPECIAL OFFERS ON ICOM



PCR 1000

Computer driven receiver.
RRP £349. RADIOWORLD
PRICE **£249**



IC-2710H

Top of the range true dual
band mobile. 2-70cm dual
display. RRP £595.
RADIOWORLD PRICE **£495**



IC-T22E

2m handie 5W. RRP £259.
RADIOWORLD PRICE
£185 while stocks last.



FT-VK 1R

VHF/UHF
Handie.
Micro small.



FT-847

The new mobile-
base. DSP HF 2m-
70cm 50MHz.
£1495



FT-100

HF 6m/2m/70cm extra
small mobile.
Information to follow.



TH-G71E

Full 5 Watts
power. Wide
band receive.
£239



TM-G707

The new mobile package
with features: High
visibility display, 5-in-1
programme memory,
memory name function,
multiscan facility & built-
in CTCSS. **£299**

PRICE MATCH

Up to 5% extra discount may be available on
selected items.

WE STOCK ALL ACCESSORIES FOR THE MAIN BRANDS DISCOUNTED BY 10%

Microphones - Icom

SM6 ohm, 8 pin, desk mic.....**£59**
SM8 1.3/600 ohm selectable, 8 pin
desk mic.....**£100**
SM20 600ohm, 8 pin, deluxe
desk mic.....**£108**

Speakers - Icom

SP20 base station loudspeaker with audio
filter.....**£125**
SP21 base station loudspeaker.....**£65**

Microphones - Kenwood

C-60A dual impedance desk mic internal pre-

amp.....**£106**
MC-80 electret desk mic with pre-amp.....**£65**
MC-85 electret desk mic with pre-amp
& compressor.....**£125**
MC-90 desk mic for DSP transceivers.....**£169**

Speakers - Kenwood

SP-23 station loudspeaker for
TS-450/690S/570D.....**£62**
SP-31 station loudspeaker for
TS-850/870S.....**£74.50**
SP-950 station loudspeaker for
TS-950SDX.....**£96**

Yaesu FT-847 options

ATAS-100 active tuning ant system.....**£224**
FC-20 automatic ant tuner.....**£197**
MD-100 ABX desk top mic.....**£99**
VF-115C 455kHz/500Hz Collins Mechanical
filter.....**£89**
VF-1158 02.27kHz SSB filter Collins
Mechanical.....**£89**

**FOR OUR SECOND-HAND
EQUIPMENT SEE TRADERS TABLE
IN THIS ISSUE**

TELEPHONE
SALES ON:

**01
922**

**41
47
96**

Ask for Dave
(G1LBE)

Open 7 days per
week till 9.00pm



There is NO CHARGE for
using credit cards

**WANTED
USED
EQUIPMENT**

PX WELCOME

**BEST PRICES
PAID!**



RADIOWORLD'S SERVICE STATION

37 COPPICE LANE
CHESLYN HAY, WALSALL
WEST MIDLANDS WS6 7HA

TEL SERVICE /FAX: 01922 417829

WE ARE 5 MINS AWAY FROM J11 M6

TELEPHONE SERVICING
ON:

**01922
417829**

Open 7 days per
week till 9.00pm



There is NO CHARGE for
using credit cards

Due to our success, we have now opened a Service Department
to give our customers excellent after-sales service.

- ✓ All types of repairs undertaken and carried out by experienced staff
- ✓ Original manufacturers spares fitted
- ✓ Alignment and calibration using 'state-of-the-art' equipment
- ✓ All repairs guaranteed
- ✓ Modifications undertaken
- ✓ We aim to turn around repairs within 7 working days at very competitive rates

Call now on 01922 417829
phone & fax and ask for Kevin



JOIN THE RSGB - Your National Society and we'll show you how to make a 12-month year grow!

When it comes to amateur radio we have a wealth of experience, plus background advisers to help you enjoy your hobby to the full - but YOU are the most important ingredient in the formula - without you there is no amateur radio. Together we are a winning combination and will ensure that amateur radio continues to thrive and grow into the next millennium.

We put you, the radio amateur and short wave listener first - help us to fight your cause, protect your amateur radio bands, and keep this hobby alive.

Sign up for Direct Debit, and we will give you an extra three months' membership completely **FREE!**

That's how we make a 12-month year grow!



To: Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: 01707 659015,

Fax: 01707 645105. Web: www.rsgb.org. E-mail: Sales@rsgb.org.uk

I would like to join the RSGB. My payment for £36 is enclosed with this form (Over 65 years of age - £27).

Name Callsign (if licensed)

Address

Post/Zip Code:

Credit card number:

Expiry date: Switch Issue No: Start date:

Signed: Date:

Please send Direct Debit form
for my 3 **FREE** months

RSGB

So Thank You Mr Marconi, Grandad

**Peter Norman
GOPKS explains
why he was
'late' getting
on-air, as well
as passing on
thanks to those
who helped
him along the
way.**

Although I've had my licence for a few years now, I didn't make my first appearance on the bands until Easter 1995. Why? Well, there's a number of reasons really. Some of my reasons I think sound feeble and others are to do with promises I made myself, about how I was going to operate (most of which went by the board...).

Anyway, I thought it might be nice to share some of my thanks and tributes with the readers of *PW*.

Making It Possible

So, thank you Mr Marconi, for making it all possible. Yes, I know he wasn't the only one and that great inventions are rarely the work of one man, but evolve from the work of various hands working along the same lines. But for the non-scientists amongst us, it's Marconi's name that is synonymous with radio.

All those stories about the early trials and tests have a romantic air to them, though I don't suppose for one moment they were so easy. I suppose it has, something to do with sepia prints. What's more, talking about Marconi leads me neatly to... My Grandad.

I mention my Grandad, because I have his old Marconi CR100, which used to sit on a desk by his armchair (it was a strong desk!) and with which my brother and I were allowed to fiddle to our hearts' content. Yes, fiddle with it and enjoy the pops and crackles emanating from the elegant, round, black, diecast Eddystone speaker that sat on top, borrowed from the S640 in the hall (I've got that too!).

Proper Sheds

What's more, Grandad was a great one for sheds. No, I don't mean skeds, I mean sheds, those wooden ones at the bottom of the garden. He had two large sheds and one smaller one, not to mention an old, wooden telephone kiosk and some spare telegraph poles (he had worked for the GPO!).

Grandad's sheds were certainly not of the average variety. His were proper sheds of painted corrugated iron and recycled wood, with doors that almost fitted on a good day with a following wind.

Well, his sheds were stacked full of old defunct radios, or rather, I should say that they were stacked with wireless sets from the 1930s and 1940s. On his allotment was another shed devoted to wind-up gramophones and brittle old '78s' of Stanley Holloway, Caruso, Gracie Fields and the like.

If only I had them now I could make a fortune. Which brings me to Clive....

Which Clive?

So, which Clive might that be? Of India? Surely not. Clive Dunn of *Grandad* and *Dad's Army* fame? Not this time, although I do have my Grandad's *Home Guard Training Manual* with instructions for knocking out a tank!

I speak of **Sir Clive Sinclair**, he who has wrought great change. For at the time, (I am referring to the early sixties here), adverts started to appear for the 'Micro-6', the

'Micromatic' and the 'Micro-FM'. I still have my 'Micromatic' - a match box marvel of modernity of its time.

I wonder how many other 1960s teenagers have still got a copy of Sir Clive's book on sub-miniature receivers? I still haven't got any of mine to work!

Along the same lines, *PW* published a design for a solar-powered transistor receiver, also of match box dimensions. Unfortunately, the sun did not shine on my particular example either. This seems to be a recurring theme - my inability to make technology work for me the way I want it to.

Take, for example, the *PW* Clubman. This was a lovely modular design by **J. Thornton-Lawrence GW3JGA** and it was going to be my breakthrough in home-brewing. Although I say it myself, my version, with all the options, was absolutely beautiful, black case and blue front panel with white lettering (to match the CR100 of course). The only snag was....my version didn't work!

I think looking back, it had something to do with the fact that I used 0.15in pitch Veroboard instead of 0.1in (or vice

"If anybody wants a set of parts.....I've got some!"

So thank you



Dad, Clive & The Vicar...

GETTING ON-AIR AFTER YOU'RE FIRST LICENCED IS NOT NECESSARILY A NATURAL PROGRESSION

versa) and so had to re-design the i.f. strip and the i.f.t.s didn't match the holes properly and I didn't have the right test gear and....but what good are excuses? If anybody wants a set of parts....I've got some!

The Vicar

Over the years I've tried to keep up with developments and have continued to buy *PW* and *SWM* and it was in the latter that I came across *The Vicar*. Those in the know will have little trouble in guessing that I refer to none other than the **Rev. George Dobbs G3RJV**.

Over the years, George, if I might make so bold, has taught me that technology does not have to be mind boggling. The title of his original *SWM* series tells you this: 'Plug in your soldering iron and start here', or one in my cuttings book which appeared in another mag, 'Work the States from under £20.....£10....or even £5'.

It's G3RJV's writing above all others that encouraged me to carry on regardless and take the RAE and pass the Morse. So, thank you very much George and the G-QRP Club.



... SET DEVOTED TO CLUB OF GRAMOPHONES...

Shed devoted to wind-up gramophones ...

Hit From Heathkit

At this point I must add another rambling thank you, as I think I was one of the last people to buy a kit from **Heathkit** before they left the Amateur Radio market. I put together an HW-9, expensive it was too, having to send to the States to get the accessory pack for the WARC bands.

And of course, the HW-9 did not work, thanks to those inevitable dry solder joints in which I specialise and which are hard to trace! I had to ask someone to get it going for me. It put me off for quite a while, but then I happened to pass a shop in town trading in old wireless sets and the like.

There, sitting in the shop window, was a KW2000A. This was it and money exchanged hands.

New problems arose however, I had geared myself to low power working only and this was a different order. A flurry of building ensued to produce suitable ancillary gear.

Eventually, I acquired a Shure 444 microphone. And then it was time for the plunge. Sadly, nothing seemed to want to come out of the back and up the open wire feeders to my horizontal wire loop.

I telephoned a local amateur who advertises in the back of the magazines and although he was really helpful, he did not sound all that hopeful about the KW. (He also pointed out that insects have antennae, radios have aerials and 'best 73s' is a nonsense - no need for 'best' as 73 is already plural!).

I was sitting in my cupboard, (yes, really I was!) on Saturday afternoon listening to a contest on 3.5MHz. I heard OT5A calling CQ and I thought, "that's a strange call". It's not on my lists, what the heck, so I called him and *Practical Wireless*, September 1998

to my alarm and astonishment, he answered.

Apparently, I was his 433rd contact, so I thought I'd better give him 001. I was stunned and shocked for an hour afterwards.

Why I had suddenly managed to get out I don't know. So, imagine my surprise when a few days later I managed to work 4U/KC0PA, located in the Western Sahara, also on 3.5MHz, without being on the list, he gave me 33. I was very proud.

Local Net

The following Wednesday, I stumbled across the local Net and lo and behold, it transpired that the wife of one of the chaps used to work with my wife. One thing led to another and I went along to the club, which leads me onto my last specific 'thank you'.

A local amateur wanted to borrow a QRP rig to take to Canada for six months. In return, he would be happy to loan his base station rig. So, I mentioned that I would be happy to let my HW-9 go on holiday abroad for a while.

In the end, the HW-9 stayed at home, but this local chap, who had never met me and knew practically nothing of me, loaned me his rig anyway! The gear was moved to an attic room and an indoor helical antenna pressed into service.

Actually, the antenna was busy holding up the plaster of the ceiling, but by dint of finally getting round to repairing the plaster, the antenna, sorry, the aerial could be removed to the garden and a kind of top-fed half lambda sloping helical created. (I wonder if there is such a thing, if not, I hereby claim proprietorial rights and shall call it the AOG - well, yes I know it is an Act Of God, (but also an Attic Or Garden), pretty neat heh?).

An earth was connected to the rising water main to the cold water tank that shares the shack. It's an interesting design feature I feel, and hopefully if stations I

work hear the sound of running water in the background, they might imagine that I am sitting by a raging torrent in some exotic mountain location!

So, there was a frenzy of activity again and then much puzzling over trying to find a suitable phrase for foreign QSLs. There was also the thrill of working across the Atlantic for the first time to Boston, knowing that the school rugby team was in town at the time on tour!

Then came the astonishment of working VE3SZO/P on Easter Monday after he had driven across a frozen lake to get to his log cabin to use his solar powered rig into a cubical-quad antenna. Isn't it strange how we return to our beginnings, albeit perhaps in a modern format?

For many, such contacts are no doubt commonplace, but for those of us just starting out on the great adventure, it is all very new and exciting. This is why I say thank you to all those who, unwittingly and unknowingly, have helped me over the years.

PW

MULTICOMM 2000

★ FINANCE AVAILABLE ★
LARGE SHOWROOM ★ BEST PRICES

YAESU ★ YAESU ★ YAESU

Choice of the top DXer's

FINANCE AVAILABLE

FOR A FINANCE EXAMPLE, PLEASE SEE OPPOSITE PAGE

FINANCE AVAILABLE



FREE MD-100 MIC & FREE HEADPHONES

YAESU FT-1000MP DC

Yaesu's flagship 1.8 - 30MHz 100W all mode. EDSP filter, auto ATU. Collin's filters. The ultimate HF transceiver.

OUR PRICE £2199.00
or 36 mths @ £71.82

YAESU FT-847

The one we've all been waiting for! We expect our first shipment anytime now. Deposits are now being taken!

CALL US NOW FOR OUR BEST PRICE.
or 36 mths @ £43.60



FREE MD-100 MIC & FREE HEADPHONES

YAESU FT-920

Despite competition from Icom & Kenwood, the 920 clearly remains our most popular transceiver ever sold. Full HF + 6m coverage. Now supplied with AM & FM.

OUR PRICE £1299.00
or 36 mths @ £42.43

YAESU FT-8100

This great value for money dual band mobile transceiver features detachable front panel, 50W on 2m, 35W on 70cms, wide band receive & easy to read display.

OUR PRICE £399.00
or 36 mths @ £13.03



FREE DUALBAND MOBILE ANTENNA



FREE FM

YAESU FT-840

Yaesu's entry model HF transceiver. General coverage receiver. Full 100W output. Great value for money and fabulous performance for its price.

OUR SPECIAL PRICE £649.00 or 36 mths @ £21.20

YAESU VX-1R

What a superb dual band hand-held transceiver and scanner. All in one complete package. Alpha numeric display, CTCSS, dual watch & 16 hours receive compatibility.

OUR PRICE £239.00
or 36 mths @ £7.81



FREE SOFT CASE & SMA ADAPTOR

WE NOW OFFER FINANCING

10% deposit

on most of our selection of

NEW OR USED EQUIPMENT

Take up to 36 months to pay

"ALL MAKES"



KENWOOD TS-570DG

OUR PRICE £999.00

LOMBARD TRICITY

CHARGE CARDS ACCEPTED

ICOM

APR 19.9%



ICOM IC-746

Latest HF + 6 + 2mtr transceiver. Extremely high spec and great value for money at **£1369.00** or 36 mths @ £44.71.



ICOM IC-781

The Rolls-Royce of ALL HF transceivers. We have one previously owned unit. Clean and boxed.

OUR PRICE £1975.00
or 36 mths @ £64.51.



ICOM IC-706 DSP

How much more can they cram into such a small transceiver? DSP now fitted as standard. HF + 6 + 2mtrs.

OUR PRICE £925.00
or 36 mths @ £30.21.



ICOM IC-207H

Dual band transceiver. Detachable front panel. 50W on 2mtrs & 35W on 70cms. Super wide band receiver with AM airband.

OUR PRICE £299.00
or 36 mths @ £9.77.

SALES HOTLINE 01480 406770

★ USED EQUIPMENT ALWAYS WANTED
★ GUARANTEED TOP PRICES PAID

ALINCO



ALINCO DJ-G5 EY
Brilliant value for money. Dual band transceiver. Wide band Rx.
PHONE FOR OUR LOW PRICE
or 36 mths @ £7.35.



ALINCO DX-77
Interesting HF transceiver. Great Alinco value.
Great Alinco quality.
OUR PRICE £589.00 or 36 mths @ £19.24.



ALINCO DX-70T (H)
HF + 6, 100W CTCSS & CW filter.
PHONE FOR SUPER LOW PRICE
or 36 mths @ £21.52.



ALINCO DR-610 Twin band high power. ~~£499.00~~

- DR-M06T 20W, 6mtr ~~£249.00~~
- DR-M06T 6mtr ~~£219.00~~
- DR-150 2mtr, 50W ~~£279.00~~
- DR-605 Dual band ~~£399.00~~

- EDX-1 HF ATU ~~£159.00~~
- EDX-2 Auto HF ATU ~~£289.00~~
- DJ-191 2mtr hand-held ~~£169.00~~
- DR-430 70cms, 35W ~~£359.00~~

ALL PRICES INCLUDE VAT

RECEIVERS

PRICES DO NOT INCLUDE P&P



JRC NRD-545DSP
Orders being taken now!
PHONE FOR OUR SPECIAL PRICE



DRAKE SW-2
Good value, general purpose short wave receiver.
OUR PRICE £429.00
or 36 mths @ £14.01



ICOM IC-R8500
Professional quality, all mode receiver. 0.1 - 2GHz.
OUR PRICE £1269.00
or 36 mths @ £41.45



BEARCAT 9000XLT
Fantastic value for money. AM/FM switchable.
OUR SPECIAL PRICE
£229.00 or 36 mths @ £7.48

AOR

AOR AR7030
CASH PRICE
£679.00
or 36 mths @ £22.18



AOR AR8000
CASH PRICE
£259.00
or 36 mths @ £8.46



AOR AR5000
CASH PRICE
£1159.00
or 36 mths @ £37.85



FINANCE EXAMPLE

All examples do not include PPP.
Payment Protection Plan is available upon request.

Cash price	10% deposit	36 months @	Total credit	APR
£289.00	£29.00	£9.44	£368.84	19.9%

WRITTEN QUOTATIONS AVAILABLE UPON REQUEST

WE HAVE AN EXTENSIVE RANGE OF NEW AND PREVIOUSLY OWNED EQUIPMENT.

FOR THE MOST ACCURATE AND UP-TO-DATE LIST, PLEASE VISIT OUR WEBSITE AT:
<http://www.multicomm2000.com>

MOST OF OUR USED EQUIPMENT CARRIES A FULL 12 MONTH WARRANTY

AOR

AOR AR3000A
CASH PRICE
£689.00
or 36 mths @ £22.50



ALINCO DJX10
CASH PRICE
£259.00
or 36 mths @ £8.46



YAESU FRG-100
CASH PRICE
£429.00
or 36 mths @ £14.01



FREE PSU

UNIT 3, 86 CAMBRIDGE STREET, ST. NEOTS, CAMBS PE19 1PJ

FAX: 01480 356192

E-majl: sales@multicomm2000.com Website: <http://www.multicomm2000.com>

The Alinco DJ-C5E

Good things Do Come In Small Packages!

Following on from his review on the Alinco DJ-C1 and C4 'mini' transceivers last year, we set Dick Pascoe G0BPS the task of looking at the newly introduced dual-band DJ-C5E version. Read on to find out what he thought

"The addition of a speaker changes the C5E rig from a 'complex toy' into a 'real radio' ..."

At this time last year I had just returned from the south of Germany after the annual DARC Rally in Freiderichshafen on the edges of the Bodensee, or as I call it - Lake Constance. This is a particularly nice part of Germany that I love. Not only are the views spectacular but the people are great too.

At that time I took the Alinco DJ-C1 144MHz transceiver and the DJ-C4 430MHz transceivers with me on the trip.

Firstly, all of the good things I said about the C1 and C4 rigs are still good. The better news is that someone must have listened to my comments about the downside of those rigs as these have now been put right on the DJ-C5E.

Where Is It?

The first thing that strikes you about the DJ-C5E upon opening the box is 'where is the rig'? It must qualify as the smallest dual-band rig in the world (unless you know better of course!) it measures just 58 x 95 x 15mm deep (each measurement was taken at the extremity of the rig and excludes the antenna).

If you doubt the size of this rig get a ruler and draw a box from the measurements given, on paper (not just the fascia size but the depth too) that will show you just how small the rig is.

The two earlier Alinco DJ models weighed in at just 75g each, which included the modern Lithium-ion battery. The new DJ-C5E weighs in at just a little more, at 85g including the battery and the antenna meaning that it weighs little more than a standard PP3 battery!

Functions & Features

The front panel of the DJ-C5E is uncluttered, clear making all functions easy to read. The only change from the DJ-C1/C4 is that there is now a **Band selection** button next to the yellow **Function** button. This also provides the 'bell' on/off facility to enable the bleep sound as the keys are pressed.

The switch that provided the **VFO/Memory** change-over became the 'memory write' when used with the Function button. Twenty memories are available which I know is not as many as some rigs but remember its size!

The **Monitor** button switches out the 'squelch'. Another nice feature of the radio is that the squelch control allows settings from 1 to 5.

As is often found with rigs of this type the word 'squelch' is displayed on the screen as '59L 3' for the setting at '3', well if you squint a little it will look almost right!

The use of Function and Monitor button locks/unlocks the frequency control. The step function that controls the frequency stepping is done by the dreaded Function button again with the standard use of the button calling up the predetermined 'call' frequency.

I set the call frequency for my favourite chat frequency where I know

As G0BPS discovered even with the Lithium-ion battery inside the DJ-C5E weighs little more than the standard PP3 battery (see text).



that the locals sit. One call frequency is available for each band.

The frequency is controlled by both the Band selection and the two **Up** and **Down** buttons, which when held down put the rig in scan mode. As mentioned the Band button does the band selection with the Function button enabling the bell facility.

Repeater offsets are easy to set on the DJ-C5E. All you do is just press Function, then **RPT** in the band selected and the offset is shown. This is changeable to any frequency required such as the USA by entering the repeater function, the offset, and pressing the RPT button until the positive or negative offset is shown.

Changing the offset frequency is just as easy. Pressing the Function plus RPT button shows the offset, by pressing the Up/Down buttons this can be changed. Of course any of these can then be entered into a memory for use when abroad.

By holding down the Function button whilst the frequency is displayed the CTCSS tones can be displayed and changed. My local repeater uses 103.5Hz and this was very easy to set up.

Another useful feature is the provision of 'tone decode' as well as 'tone encode' When these are activated, signals with the matching encode will open the squelch.

Others signals only give a busy signal on the display and nothing is heard. I like this, it proved very useful.

The display on the DJ-C5E is still the same at 25 x 7mm, as on the C1/C4 models, but as I said before this is more than adequate. The PTT is still the same large bright yellow button on the side of the rig with a slightly raised edge for protection.

One other feature that I liked was the ability to be able to see the channel numbers instead of the frequency. Switching on the rig whilst holding down the VFO/Memory button enables/disables this useful function. I think this is ideal for friends travelling together using the same simplex/repeater frequencies.

Clear Changes

Now to the changes that have been made on the DJ-C5E from the C1 and C4 models. There are in fact two clear changes that have been made to the earlier models apart from cramming two bands into one tiny case!

The first is obvious, the addition of a speaker changes the C5E rig from a 'complex

toy' into a 'real radio'. I commented in my previous article "But, as with everything there is a down side and on these rigs it is the lack of a speaker, the supplied small earpiece must be used at all times". I also commented that I got used to the earpiece quite quickly. The new speaker gives us a maximum of 60mW into 8Ω, which sounds little but in the average environment is quite enough when held near the ear.

The other change is to the antenna. The DJ-C1 and C4 had a length of wire as the antenna. The new one has a stronger fixed springy wire encapsulated in plastic, which is almost like a real full sized antenna and it appeared to work well too!

At first glance the 'second generation' DJ-C5E appears to be identical to its 'parents'. A closer look tells us quickly that this is not so. The DJ-C5E, C1 and C4 do look like toys but there are in fact complex, well thought out transceivers.

These little transceivers are easy to use, simple to set up and don't need a computer course to get going. In fact everything comes to hand easily.

One other part that often lets down any transceiver from the Far East is the manual, with phrases occasionally being found that make little sense. The DJ-C5E manual has either been written by a fluent English speaker or a native 'Brit'.

It's excellent, with clear, easy to follow instructions albeit in a very small package of just 21 pages which measures just 130 x 85mm.

The audio output of the DJ-C5E when used in a quiet environment is ample, however, if used in busy rally situation the additional speaker microphone may be needed.

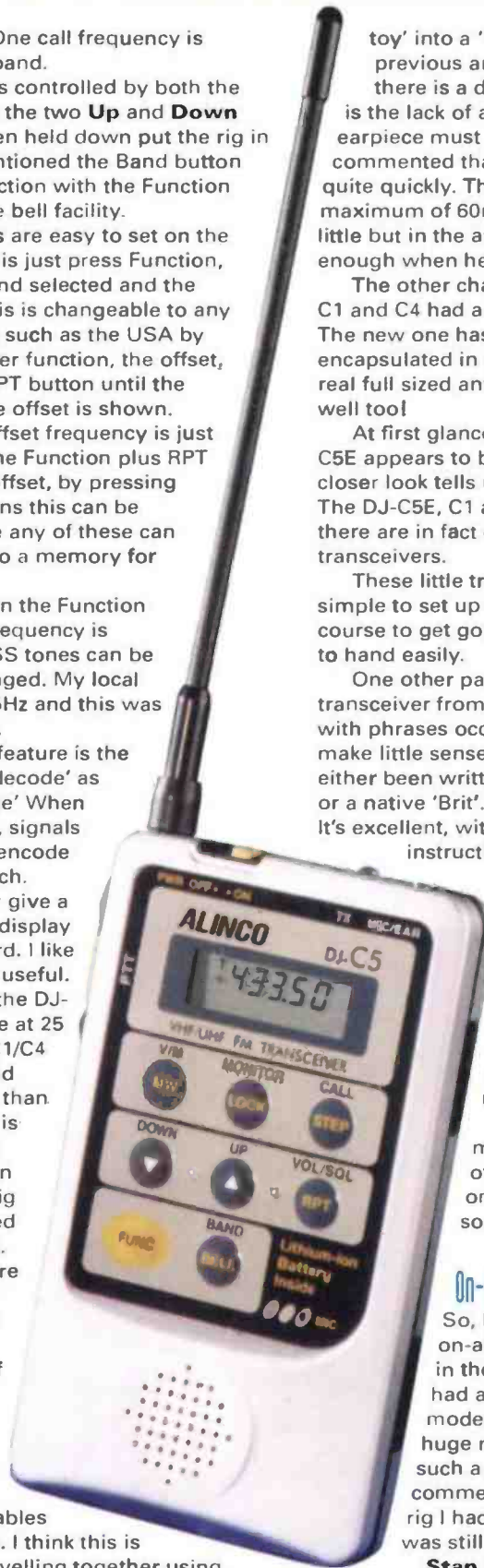
The additional speaker microphone is fitted to the top of the rig next to the 'transmitter on' i.e.d. A small 2.5mm stereo socket is provided here.

On-Air Performance

So, how did the Alinco DJ-C5E fare on-air? The first to see the DJ-C5E in the shack was **Alan G4YFP** who had also played with the previous models. He was entranced with the huge number of facilities found in such a small package. After his comments and obvious liking of the rig I had to do a double check that it was still in the shack when he left!

Stan G6ZNW had also seen the previous versions and liked them. I gave him the 'C5 to play with and asked him what he thought. He told me he had liked the earlier version and now that a speaker had been added it was much more usable, but he asked "where was the other one?"

When I told him there wasn't another one, and this was a dual-bander his reply was "That is truly amazing, that is so small yet the buttons are big enough to work, the smaller they get, **more** often the more awkward they



"It weighs little more than a standard PP3 battery"!



are to work".

Tony G4WIF asked me what happened when they went wrong, "Hopefully they don't" I replied. We agreed that if there was a problem it would be very difficult to fault find and repair.

Norman DL6NEE told me "It's impossible to believe that such a small package contains such a complex rig". **Sheldon GW8ELR** said "where is the s.s.b. switch? it seems to have everything else"!

Manuela DF7QK said "It's so small, really interesting for ladies, with good sized buttons for big or tiny fingers. It's so much easier to handle than those big ones"

Edwin P80AOL said with a chuckle "It's too big to fit the credit card machine but still very nice, very small for a dual-band rig"

Chris G3TUX commented "Intuitive little rig, seems quite remarkable". While **Marcia, 2E1DAY** said "Neat, fits into top pocket or handbag. Discrete and less chance of being stolen". **Sylvia 2E1CYL** comments were "Lovely, handbag/pocket sized rig. Also fits jeans or skirt pocket too. The audio is really excellent"

Vincenz EA3AD offered the following comment on the DJ-C5E: "Incredible! Very portable, audio is good and what a nice compact rig" and **Toni EA3EAT** said "not only looks like a credit card but feels like one too, Very nice" **Roger G4TNT** said it was,



Given that **Dick GOBPS** and **Tony G4WIF** agreed that if there was a problem with the DJ-C5E it would be very difficult to fault find and repair owing to its small size... maybe these appropriate sized helpers could be called upon!

"Marvellous, I would have bought one of these if I had seen them before buying my little Yaesu. These are much better"

So, the bottom line is that, I spent a week in Prague at the home of **Petr OK1CZ** whilst on holiday with **George G3RJV & JoAnna Dobbs** and my wife **Daphne**. We all used the DJ-C5E and loved it.

Petr was disappointed he had already bought his tiny Yaesu and immediately asked about importing these into the Czech Republic. **George** and **JoAnna's** comments were "Adequate receiver and at that size you don't need any more do you" and "it fits in my skirt pocket" I respectively.

Later on in our visit we drove from Prague to southern Germany for the huge Freiderichshafen Amateur radio rally. Almost everyone I showed the Alinco DJ-C5E rig to loved it. I spent the weekend with the rig passing from hand-to-hand as I manned the **G-QRP** club stand.

There is however, one point that disappointed me on with the Alinco DJ-C5E. Other versions including the US version also have Air Band (a.m.) and Marine band receive.

Why is Air Band and Marine not available on the British version? This may be a dealer option available here later. **(Editorial comment: Airband receive of 118-136MHz a.m. is possible on the 'E' model with a simple modification. Also possible is extended f.m. coverage of 136-173.995MHz and 420-460MHz or within the lock-up range of the p.i.l. For details on these modifications contact Nevada direct).** If this does happen it will make this tiny rig hugely popular. And why, with such a tiny transmit power output is a licence required for it?

Would I Buy One?

So, would I buy one of the tiny DJ-C5E rigs for my own use? Well, I was so impressed with the specification, the size and the improvements from the DJ-C1 and C4, made by fitting a speaker, an almost 'proper' antenna and making it dual-band in such a small package that I did buy one! I am delighted with my purchase and hopefully it will give me good service for many years.

PW

Manufacturer's Specifications

General

Frequency coverage:	144MHz	430MHz
European:	144.00 - 145.995	430.00 - 439.995
USA:	118.00 - 173.995	420.00 - 449.995
	(118.00 - 136.00 MHz a.m. RX on USA model)	
Current drain: RX	- 30mA	- 40mA (Squelch on)
TX	- 240mA	- 300mA
Rated voltage	3.8V	
Dimensions:	56 x 94 x 10.6mm (without projections)	
Weight:	85g (including battery)	

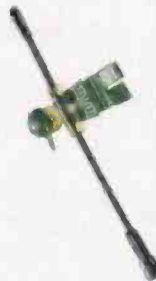
Transmitter

Modulation:	F3E (FM Reactance Modulation)
Output power:	300mW
Spurious	-60dB

Receiver

Receiver system:	Double conversion superheterodyne	
Intermediate frequency: (European)	1st - 20.8 MHz	
	2nd - 450 kHz	
Sensitivity:	Max -16dBu	-15dBu
Audio output power:	Max 60mW into 8Ω	
Microphone Impedance:	2KΩ	

Optional extras include: Speaker microphone, Earphone microphone, wall charger, car charger.



My thanks go to **Nevada of 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626** for the loan of the Alinco DJ-C5E which is available from them for £189.95.



Win a Hora C-408 UHF Hand-Held Transceiver!

Yes... this Hora C-408 QRP hand-held (kindly donated by *Waters & Stanton plc*) could be yours because every completed survey form stands an equal chance of winning the prize!

So, in return for your information and comments on the survey form which will be used to help us bring you an ever-improving read each month - you could be the lucky winner. Good luck and thank you for your time!

Rob Mannion
Editor, Practical Wireless

This survey has been compiled and produced with the help of ICD Marketing Services Limited, a company specialising in this field. It is designed to provide us with a complete picture of the people who read our magazine and to help us focus our efforts on meeting the needs of all our readers.

It is important that we involve as many of our readers as possible, so please spare us a few minutes of your time to complete this survey. The questions are straightforward and you are under no obligation to answer them; some questions are about you and, if appropriate, your partner.

Any information you provide will be treated with great care. It will be processed and held by ICD and will always be safeguarded under the terms and conditions of the Data Protection Act.

Your answers will be used, both by ICD and ourselves, for analytical and marketing purposes and may be passed on to other organisations. They may wish to send you details of products and services that are likely to be of interest to you, based on your answers. If you would prefer not to receive these offers, please tick the space at the end of this survey.



1998 Readership Survey

Section 1. Name & address. In order to enter the prize draw, you are required only to complete sections 1 & 2.

1. Please give your name in the way you should be addressed.

Mr Mrs Miss Ms Other

Surname _____

Forename _____

Address _____

Town _____

County _____

Postcode _____

Telephone 0 1 _____

2. Marital Status

Single Married Divorced

Widowed Living with partner

Partner's surname _____

Partner's forename _____

3. Your date of birth _____

4. Partner's date of birth _____

5. Are you: Male Female

Section 2. About You & Practical Wireless Magazine

1. How many issues of PW do you usually buy in a year?

1 2-4 3 5-7

8+ Every issue 5

2. When did you first buy PW?

Within the last 12 months 2 years ago

3 years ago More than 3 years ago

3. How do you obtain your copy of PW?

By subscription Home delivery

Casual purchase Newsagent

From an amateur radio dealer On firm order

From a friend

4. How many other people usually read your copy of PW?

None Three 4 Six

One Four 5 Seven +

Two Five 6

5. How many copies of the following magazines do you usually read or buy per year?

	None	1-3	4-6	7-9	10-12
Electronics & Wireless World	01 <input type="checkbox"/>	08 <input type="checkbox"/>	15 <input type="checkbox"/>	22 <input type="checkbox"/>	29 <input type="checkbox"/>
Ham Radio Today	02 <input type="checkbox"/>	09 <input type="checkbox"/>	16 <input type="checkbox"/>	23 <input type="checkbox"/>	30 <input type="checkbox"/>
Monitoring Times	03 <input type="checkbox"/>	10 <input type="checkbox"/>	17 <input type="checkbox"/>	24 <input type="checkbox"/>	31 <input type="checkbox"/>
Radio Active	04 <input type="checkbox"/>	11 <input type="checkbox"/>	18 <input type="checkbox"/>	25 <input type="checkbox"/>	32 <input type="checkbox"/>
Radio Communications	05 <input type="checkbox"/>	12 <input type="checkbox"/>	19 <input type="checkbox"/>	26 <input type="checkbox"/>	33 <input type="checkbox"/>
Short Wave Magazine	06 <input type="checkbox"/>	13 <input type="checkbox"/>	20 <input type="checkbox"/>	27 <input type="checkbox"/>	34 <input type="checkbox"/>
Others	07 <input type="checkbox"/>	14 <input type="checkbox"/>	21 <input type="checkbox"/>	28 <input type="checkbox"/>	35 <input type="checkbox"/>

6. Do you own a home computer?

Yes No

7. If yes, which type (e.g. IBM PC compatible, Macintosh, etc.)?

386 486 Pentium

Pentium II Mac Other

8. Do you have an e-mail address?

Yes No

If yes, what is it? _____

9. Do you hold an Amateur Radio transmitting license?

Yes (Class A) Yes (Class B) Yes (Novice A)

Yes (Novice B) No

10. How much do you spend on your radio hobby in an average year? (Including QSL expenses, books, equipment, rally visits, etc.)

Under £50 £50-£100 £101-£250

£251-£500 £501-£1,000 Over £1,000

11. Have you ever bought anything from an advertisement in PW?

Yes, accessories Yes, antennas Yes, books

Yes, components Yes, major equipment No

12. How many Rallies/Amateur Radio shows do you visit each year?

None 1-2 3-4 5+

13. How do you rate your expertise in radio and electronics?

Beginner Average Experienced

14. What radio related societies, clubs or specialised groups do you belong to?

AMSAT G-ORP RIG

BARTG RAYNET Local club

BATC RSGB

15. Are your other hobbies and interests technical or non-technical?

Technical Non-Technical

16. Do you read magazines about these hobbies?

Yes No

17. How interested are you in the following regular features in PW? (1 = not interested, 10 = very interested)

Advertisements	01 <input type="checkbox"/>	Keylines Editorials	13 <input type="checkbox"/>
Antennas in Action	02 <input type="checkbox"/>	Military Radio	14 <input type="checkbox"/>
ATV & SSTV	03 <input type="checkbox"/>	News (general)	15 <input type="checkbox"/>
Aussie Oracle (Australian report)	04 <input type="checkbox"/>	Radio Diary	16 <input type="checkbox"/>
Beginner's Series (radio basics)	05 <input type="checkbox"/>	Radio holiday features	17 <input type="checkbox"/>

Computing related features	06 <input type="checkbox"/>	Reader's letters	18 <input type="checkbox"/>
Competitions	07 <input type="checkbox"/>	Reviews - accessories	19 <input type="checkbox"/>
Constructional-major equipment	08 <input type="checkbox"/>	Reviews - major equipment	20 <input type="checkbox"/>
Constructional-minor equipment	09 <input type="checkbox"/>	Scene USA (American report)	21 <input type="checkbox"/>
Electronics In Action	10 <input type="checkbox"/>	Valved equipment	22 <input type="checkbox"/>
HF Operating	11 <input type="checkbox"/>	VHF Operating	23 <input type="checkbox"/>
Historical Radio	12 <input type="checkbox"/>		

18. On a scale of 1-10, how do you rate the technical content of PW? (1= not technical enough, 10= too technical)

19. In recent years, PW has provided a free pull-out 'year planner' in the January issue. Do you find it useful?

Yes No

20. If you would like to see more 'Data Cards' provided free with PW, what would you prefer?

Callsign Prefix (International) Data HF Bands plans

Component identifier information, etc Repeater data cards

General data cards

21. How do you rate the overall design and lay-out of PW?

Poor Fair Good Excellent

22. What subjects covered in PW interest you the most?

Adverts News items

Antennas Reviews

Broadcast Scanning

Constructional Utility

Feature articles

23. What amateur radio related subjects not covered by PW would you like to see covered in PW?

Advanced articles Historical

Beginners articles Less technical matter

Current radio developments Listeners logs

Frequency details More technical matter

General interest

24. How important do you consider constructional projects to be in PW?

Very Important Not so important

Fairly important not interested in construction

Not important

25. If you are interested in the constructional projects in PW, how often do you build anything from a design published in PW?

Never Seldom Sometimes

Often Always

26. Do you think £2.20 is a fair amount to pay for PW?

Yes No

27. How much more would you pay for:

	Nothing	20p	50p	£1
Cover gifts	01 <input type="checkbox"/>	04 <input type="checkbox"/>	07 <input type="checkbox"/>	10 <input type="checkbox"/>
More features on your interests	02 <input type="checkbox"/>	05 <input type="checkbox"/>	08 <input type="checkbox"/>	11 <input type="checkbox"/>
More pages	03 <input type="checkbox"/>	06 <input type="checkbox"/>	09 <input type="checkbox"/>	12 <input type="checkbox"/>

28. Can you say briefly, how you would like us to improve PW?

More competitions More special offers

More pages Other

LEISURE / MOTORING

1. Please write below the three magazines which you buy most regularly in order of preference and indicate whether bought at a newsagent, or on subscription (and whether you would consider taking out a subscription).

	Newsagent	Have Subs.	Cons Subs.
_____	1 <input type="checkbox"/>	4 <input type="checkbox"/>	7 <input type="checkbox"/>
_____	2 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
_____	3 <input type="checkbox"/>	6 <input type="checkbox"/>	9 <input type="checkbox"/>

2. From the interest areas detailed below please indicate whether you currently subscribe or would consider subscribing to an appropriate quality publication magazine (Please tick all that apply):

	Have Subs.	Cons Subs.		Have Subs.	Cons Subs.
Angling	01 <input type="checkbox"/>	49 <input type="checkbox"/>	Golf	25 <input type="checkbox"/>	74 <input type="checkbox"/>
Antiques	02 <input type="checkbox"/>	50 <input type="checkbox"/>	Hair & Beauty	26 <input type="checkbox"/>	74 <input type="checkbox"/>
Bicycles & Cycling	03 <input type="checkbox"/>	51 <input type="checkbox"/>	Home Interests	27 <input type="checkbox"/>	75 <input type="checkbox"/>
Birdwatching	04 <input type="checkbox"/>	52 <input type="checkbox"/>	Humorous	28 <input type="checkbox"/>	76 <input type="checkbox"/>
Boats & Yachting	05 <input type="checkbox"/>	53 <input type="checkbox"/>	Men's Interests	29 <input type="checkbox"/>	77 <input type="checkbox"/>
Business	06 <input type="checkbox"/>	54 <input type="checkbox"/>	Mother & Baby	30 <input type="checkbox"/>	78 <input type="checkbox"/>
Camping/Caravanning	07 <input type="checkbox"/>	55 <input type="checkbox"/>	Motorcycling	31 <input type="checkbox"/>	79 <input type="checkbox"/>
Car/Motoring	08 <input type="checkbox"/>	56 <input type="checkbox"/>	Personal Computing	32 <input type="checkbox"/>	80 <input type="checkbox"/>
Classical Music	09 <input type="checkbox"/>	57 <input type="checkbox"/>	Personal Finance	33 <input type="checkbox"/>	81 <input type="checkbox"/>
Computer Games	10 <input type="checkbox"/>	58 <input type="checkbox"/>	Pets	34 <input type="checkbox"/>	82 <input type="checkbox"/>
Consumer (Which?)	11 <input type="checkbox"/>	59 <input type="checkbox"/>	Photography	35 <input type="checkbox"/>	83 <input type="checkbox"/>
Cookery	12 <input type="checkbox"/>	60 <input type="checkbox"/>	Politics	36 <input type="checkbox"/>	84 <input type="checkbox"/>
Country Pursuits	13 <input type="checkbox"/>	61 <input type="checkbox"/>	Regional Interests	37 <input type="checkbox"/>	85 <input type="checkbox"/>
Crafts	14 <input type="checkbox"/>	62 <input type="checkbox"/>	Religious	38 <input type="checkbox"/>	86 <input type="checkbox"/>
Crosswords & Puzzles	15 <input type="checkbox"/>	63 <input type="checkbox"/>	Retirement	39 <input type="checkbox"/>	87 <input type="checkbox"/>
Current Affairs	16 <input type="checkbox"/>	64 <input type="checkbox"/>	Rock Music	40 <input type="checkbox"/>	88 <input type="checkbox"/>
Do It Yourself	17 <input type="checkbox"/>	65 <input type="checkbox"/>	Rugby	41 <input type="checkbox"/>	89 <input type="checkbox"/>
Family Issues	18 <input type="checkbox"/>	66 <input type="checkbox"/>	Science & Technology	42 <input type="checkbox"/>	90 <input type="checkbox"/>
Films & Entertainment	19 <input type="checkbox"/>	67 <input type="checkbox"/>	Style & Fashion	43 <input type="checkbox"/>	91 <input type="checkbox"/>
Fitness/Health	20 <input type="checkbox"/>	68 <input type="checkbox"/>	Teenage Pop	44 <input type="checkbox"/>	92 <input type="checkbox"/>
Food/Drink	21 <input type="checkbox"/>	69 <input type="checkbox"/>	TV Video & Radio	45 <input type="checkbox"/>	93 <input type="checkbox"/>
Football	22 <input type="checkbox"/>	70 <input type="checkbox"/>	Water Sports	46 <input type="checkbox"/>	94 <input type="checkbox"/>
Gardening	23 <input type="checkbox"/>	71 <input type="checkbox"/>	Weddings	47 <input type="checkbox"/>	95 <input type="checkbox"/>
Geography	24 <input type="checkbox"/>	72 <input type="checkbox"/>	Women's Interests	48 <input type="checkbox"/>	96 <input type="checkbox"/>

3. Which of the following newspapers do you read?

	You	Partner		You	Partner
Daily Mail	01 <input type="checkbox"/>	11 <input type="checkbox"/>	Guardian	06 <input type="checkbox"/>	16 <input type="checkbox"/>
Daily Star	02 <input type="checkbox"/>	12 <input type="checkbox"/>	Independent	07 <input type="checkbox"/>	17 <input type="checkbox"/>
Daily Telegraph	03 <input type="checkbox"/>	13 <input type="checkbox"/>	Mirror	08 <input type="checkbox"/>	18 <input type="checkbox"/>
Express	04 <input type="checkbox"/>	14 <input type="checkbox"/>	Sun	09 <input type="checkbox"/>	19 <input type="checkbox"/>
Financial Times	05 <input type="checkbox"/>	15 <input type="checkbox"/>	Times	10 <input type="checkbox"/>	20 <input type="checkbox"/>

4. Which of the following do you enjoy on a regular basis?

	You	Partner		You	Partner
Antiques/Fine Art	01 <input type="checkbox"/>	21 <input type="checkbox"/>	Football Pools	11 <input type="checkbox"/>	31 <input type="checkbox"/>
Betting	02 <input type="checkbox"/>	22 <input type="checkbox"/>	Further Education	12 <input type="checkbox"/>	32 <input type="checkbox"/>
Bingo	03 <input type="checkbox"/>	23 <input type="checkbox"/>	Gardening	13 <input type="checkbox"/>	33 <input type="checkbox"/>
Books	04 <input type="checkbox"/>	24 <input type="checkbox"/>	Going to the Pub	14 <input type="checkbox"/>	34 <input type="checkbox"/>
Competitions	05 <input type="checkbox"/>	25 <input type="checkbox"/>	Photography	15 <input type="checkbox"/>	35 <input type="checkbox"/>
Cookery	06 <input type="checkbox"/>	26 <input type="checkbox"/>	Religious Activities	16 <input type="checkbox"/>	36 <input type="checkbox"/>
Crosswords/Puzzles	07 <input type="checkbox"/>	27 <input type="checkbox"/>	Sewing/Needlecraft	17 <input type="checkbox"/>	37 <input type="checkbox"/>
Current Affairs	08 <input type="checkbox"/>	28 <input type="checkbox"/>	Theatre/Arts	18 <input type="checkbox"/>	38 <input type="checkbox"/>
Do It Yourself	09 <input type="checkbox"/>	29 <input type="checkbox"/>	Voluntary Work	19 <input type="checkbox"/>	39 <input type="checkbox"/>
Fashion	10 <input type="checkbox"/>	30 <input type="checkbox"/>	Wines	20 <input type="checkbox"/>	40 <input type="checkbox"/>

5. Do you enjoy reading romantic fiction? (e.g. Mills & Boon)

You	1	Partner	2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. How many cars are there in your household?

One	Two	Three +
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

7. For your private car(s), in which month did your car insurance cover begin? (Please write in month e.g. S E P T)

Your:	Month:	Partner:	Month:
<u>YOUR HOME</u>	_____	_____	_____

8. What type of home do you live in?

Detached House	1	Semi-detached	2	Terraced House	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flat/Maisonette	4	Bungalow	5		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

9. Is your home:

Owned	1	Privately Rented	2	Council/Housing Ass.	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Are you planning to move home in the next 12 months?

Yes	1	No	2	Possibly	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. If yes, will you be arranging a mortgage?

Yes	1	No	2	Please tick if first time buyer	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Are you considering any of the following home improvements?

Double glazing	1	Fitted kitchen	2	Loft conversion	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. If you have household insurance, in which month do you renew your cover? (Please write in month e.g. S E P T.)

Home Contents Insurance	Month:
_____	_____

Buildings Insurance	Month:
_____	_____

14. Do you make international telephone calls from home?

Frequently	1	Occasionally	2	Never	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Do you have or are you considering a mobile phone on any of the following networks?

	Have	Cons		Have	Cons
Cellnet	1 <input type="checkbox"/>	5 <input type="checkbox"/>	Orange	3 <input type="checkbox"/>	7 <input type="checkbox"/>
Mercury One-2-One	2 <input type="checkbox"/>	6 <input type="checkbox"/>	Vodafone	4 <input type="checkbox"/>	8 <input type="checkbox"/>

16. Do you have, or are you considering any of the following computer purchases?

	Have	Cons		Have	Cons
PC with Windows	1 <input type="checkbox"/>	5 <input type="checkbox"/>	Modem	3 <input type="checkbox"/>	7 <input type="checkbox"/>
Internet/E-mail	2 <input type="checkbox"/>	6 <input type="checkbox"/>	CD-ROM	4 <input type="checkbox"/>	8 <input type="checkbox"/>

MONEY & INVESTMENTS

17. Are you considering changing your Bank or Building Society current account?

Yes	1	Possibly	2	No	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Do you currently, or would you consider telephone / direct banking?

Already do	1	Would consider	2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Do you / your partner have any of the following credit cards? (Please tick all that apply)

Credit Card	1	Charge Card	2	Store Card	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gold Card	4	Considering a credit card	5		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. Do you pay your monthly credit card balance in full?

	You	Partner		You	Partner
Always	1 <input type="checkbox"/>	5 <input type="checkbox"/>	Rarely	3 <input type="checkbox"/>	7 <input type="checkbox"/>
Usually	2 <input type="checkbox"/>	6 <input type="checkbox"/>	Never	4 <input type="checkbox"/>	8 <input type="checkbox"/>

21. Do you have or are you considering any of the following investments or financial provisions? (Please tick all that apply)

	Have	Cons		Have	Cons
Deposit Account	1 <input type="checkbox"/>	6 <input type="checkbox"/>	Stocks/Shares	4 <input type="checkbox"/>	9 <input type="checkbox"/>
Life Insurance	2 <input type="checkbox"/>	7 <input type="checkbox"/>	Will	5 <input type="checkbox"/>	0 <input type="checkbox"/>
Pension Plan	3 <input type="checkbox"/>	8 <input type="checkbox"/>			

22. Would you consider professional help in arranging your personal finances?

Yes	1	No	2	Unsure	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. Do you foresee the need for a personal loan?

Yes	1	Possibly	2	No	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. If you have a mortgage or loan, would you be interested in ways of reducing your monthly repayments?

Yes	1	Possibly	2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SHOPPING

25. Have you in the past or would you consider buying goods by mail / over the telephone?

	1		4
Fashion	<input type="checkbox"/>	Music	<input type="checkbox"/>
Books	2	Vitamins/Health Supplements	5
Garden Products	3	Other	6

26. Do you buy American whiskey?

You	1	Partner	2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. If you smoke please write in the name of the cigarette brand you and / or your partner smoke most often.

You	_____
_____	_____

Partner

Partner	_____
_____	_____

Important: Please sign below that you are a smoker aged 18 or over.

Your signature _____

Partner's signature _____

GENERAL INFORMATION

28. What is your occupation?

	You	Partner		You	Partner
Director	01 <input type="checkbox"/>	15 <input type="checkbox"/>	Public Sector	08 <input type="checkbox"/>	22 <input type="checkbox"/>
Manager	02 <input type="checkbox"/>	16 <input type="checkbox"/>	Professional	09 <input type="checkbox"/>	23 <input type="checkbox"/>
Self-Employed	03 <input type="checkbox"/>	17 <input type="checkbox"/>	Armed Forces	10 <input type="checkbox"/>	24 <input type="checkbox"/>
Skilled Worker/Trade	04 <input type="checkbox"/>	18 <input type="checkbox"/>	Student	11 <input type="checkbox"/>	25 <input type="checkbox"/>
Manual Worker	05 <input type="checkbox"/>	19 <input type="checkbox"/>	Housewife/Homemaker	12 <input type="checkbox"/>	26 <input type="checkbox"/>
Office Worker	06 <input type="checkbox"/>	20 <input type="checkbox"/>	Retired	13 <input type="checkbox"/>	27 <input type="checkbox"/>
Shop Worker	07 <input type="checkbox"/>	21 <input type="checkbox"/>	Unemployed	14 <input type="checkbox"/>	28 <input type="checkbox"/>

29. What is your approximate family income each year?

Under £5,000	1	£25,000-£29,999	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
£5,000-£9,999	2	£30,000-£39,999	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
£10,000-£14,999	3	£40,000-£49,999	8
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
£15,000-£19,999	4	£50,000-£59,999	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
£20,000-£24,999	5	Over £60,000	0
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. Please write in your children's date(s) of birth, starting with the oldest, and indicate whether male or female.

	Male	Female
Child 1	1 <input type="checkbox"/>	2 <input type="checkbox"/>
Child 2	3 <input type="checkbox"/>	4 <input type="checkbox"/>
Child 3	5 <input type="checkbox"/>	6 <input type="checkbox"/>
Child 4	7 <input type="checkbox"/>	8 <input type="checkbox"/>

31. Is anyone in your household affected by any of the following?

	You	Partner	Other
Asthma	01 <input type="checkbox"/>	06 <input type="checkbox"/>	11 <input type="checkbox"/>
Diabetes	02 <input type="checkbox"/>	07 <input type="checkbox"/>	12 <input type="checkbox"/>
Hayfever	03 <input type="checkbox"/>	08 <input type="checkbox"/>	13 <input type="checkbox"/>
Hearing Loss	04 <input type="checkbox"/>	09 <input type="checkbox"/>	14 <input type="checkbox"/>
Mobility problems	05 <input type="checkbox"/>	10 <input type="checkbox"/>	15 <input type="checkbox"/>

32. If you have private medical insurance, when do you renew your cover?

(Please write in month e.g. S E P T.)	Month:
_____	_____



Thank you for completing this questionnaire. All information will be treated under the terms of the Data Protection Act. As already mentioned Practical Wireless Magazine & ICD may make your information available to other respected organisations who may wish to send you offers of products and services. Please tick here if you would prefer not to participate in this offer (). If you have any comments or queries about the products and services of Practical Wireless Magazine or the services of ICD Marketing Services Limited, please write to Practical Wireless Magazine, Arrow Smith Court, Station Approach, Broadstone, Dorset BH18 8PW or ICD Marketing Services Limited, Garden Floor, Bain House, 16 Connaught Place, London W2 2EP. V264

**HOW TO RETURN
YOUR SURVEY:**
FOLD SURVEY IN
THREE, AFFIX ADHESIVE
TAPE AND STAMP
WHERE MARKED
AND POST.

Please Affix Tape Here

PLEASE
AFFIX
STAMP
HERE

(Please do not send correspondence to this address)

Practical Wireless Magazine
Readership Survey
P O Box 903
Bristol
BS99 5ND



Please Affix Tape Here

▼ Fold Here First

▲ Fold Here Second

Sources, 'Sinks' and Electromotive Forces

Geoff Billington G3EAE looks at the theory behind those puzzling sources 'sinks' and electromotive forces (e.m.f.s) that can confuse many enthusiasts.

Whilst teaching electrical and introductory alternating current theory, I became rather worried about the concept of an electromotive force and some of its implications. For instance, I was often confused by the fact that the voltage across an inductor is often, but not always, treated as an e.m.f.

Eventually, I sorted things out to my own satisfaction. The readers may think that this is a quibble - it isn't - and no more will be said about it until the end of the article.

A Simple Question

So, I'll begin then with a simple question: When is a potential difference due to an e.m.f.?

To answer...I'll start off with an obvious case. Everyone will agree that some sort of 'electromotive force' must exist inside a cell (battery). However, things are not quite so obvious when we come to 'back' or 'negative' e.m.f.s. So, to clear things up we need to think about energy sources and energy 'sinks' in electric circuits.

Sources & Sinks

A cell is an **energy source**, and it supplies energy to a circuit. A resistor is an **energy sink**, it removes electrical energy from the circuit which it converts into heat.

In **Figs. 1** and **2**, the 'box' contains either an energy source or an energy sink. And you can find which one by using a voltmeter and an ammeter as shown.

In **Fig. 1**, the ammeter shows current flowing out of the terminal which the voltmeter identifies as positive. The box therefore contains an energy source, perhaps a battery.

In **Fig. 2**, the ammeter shows current flowing into the terminal identified as positive. This box contains an energy sink, perhaps a resistor.

However, the box in **Fig. 2** could equally well contain a 'reversed' cell which is being charged by the current and is exerting a reversed, or back, e.m.f.

Unfortunately we're unable to use these two meter readings to tell us which of these two possibilities is actually the case. A nega-

tive source is equivalent to a sink and however different in other respects their behaviour may be, a negative source and a sink are identical in so far as they both extract electrical energy from the circuit.

Note that the word 'negative' is used here in its mathematical sense: a negative source removes circuit energy.

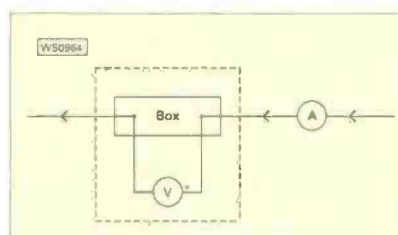
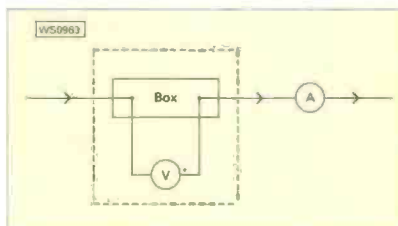


Fig. 1: The ammeter shows current flowing out of the terminal which the voltmeter identifies as positive. The box therefore contains an energy source, perhaps a battery (see text).

Fig. 2: The ammeter now shows current flowing into the terminal identified as positive. This box contains an energy 'sink', perhaps a resistor (see text).

Electromotive Force

Let's now look at the electromotive force (e.m.f.) due to a conductor. To help the explanation, the diagram, **Fig. 3**,

shows an inductor, switch and resistor connected in series to a battery of e.m.f. 'E' volts. The switch has recently been closed and the current at the present instant is 'i' and is increasing towards its final value. (see **Fig. 3**).

Suppose that the voltage across the inductance at this instant is 'V' volts, where the sign of 'V' is as yet undetermined.

According to the textbooks, 'V_L' is a 'back e.m.f.', i.e. an e.m.f. which opposes the current.

The voltage equation is therefore written: (1).

$$E - V_L = V_R$$

(or $E - L (\delta i / \delta t) = iR$. If you want it in its full glory).

Exactly the same result is obtained if the inductor is regarded as an energy sink. The

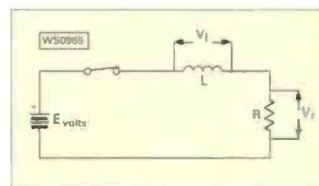


Fig. 3: An inductor, switch and resistor connected in series to a battery of e.m.f. 'E' volts. The switch has recently been closed and the current at the present instant is 'i' and is increasing towards its final value (see text).

GEOFF G3EAE SAYS 'MAY THE FORCE BE ALWAYS WITH YOU!'

voltage (V) then drops its negative sign and transfers to the right hand side:

$$(2). \\ E = V_L * V_R \\ \text{(or } E = L (\delta i / \delta t) * iR \text{).}$$

Of course, equations (1) and (2) are identical and are both correct. If you decide to call the inductive voltage an e.m.f., you must

give it a negative sign and put it on the left hand side of the equation along with other e.m.f.s. Alternatively you can forget about the negative sign and put the inductive voltage on the right with the energy sinks. It makes no difference.

You may classify any circuit element as either a source or a sink providing you put the correct sign in front of the voltage. For instance, it would be rather ridiculous if we decided to designate a resistor as an energy

source, but it would not matter so long as we went on to say that it produced an e.m.f. of $- (iR)$ volts.

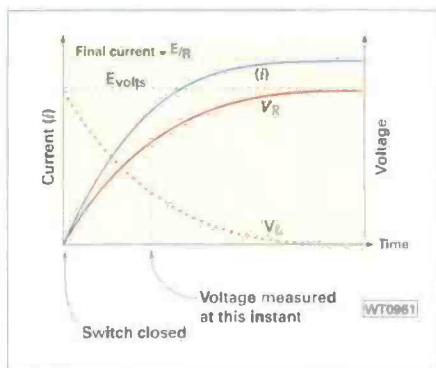


Fig. 4: The instantaneous voltages across the resistor and Inductor sum to the applied e.m.f. The inductive e.m.f. follows a reducing curve, while the resistive e.m.f. follows a rising curve finally becoming E_{Volts} after a time period.

Inductors & Alternating Currents

Now it's time to look at inductors, which depending on circumstances, can behave either as a sink or as a source. An inductor absorbs energy whilst the current through it is increasing. This energy is stored in the form of a magnetic field.

When the current is steady the field strength is unchanging, no energy is absorbed or given out so the induced voltage disappears. If the current starts to decrease, the magnetic field starts to collapse and returns energy to the circuit. A voltage or appropriate sign appears across the coil during the change.

With an alternating current an inductor behaves alternately as a source and as a sink. Energy is taken from the circuit during one quarter cycle and returned in the next.

In an a.c. circuit an inductor could equally well be taken as a source or a sink. Providing the voltage across the inductor is given the appropriate sign and is placed on the correct side of the equation - the mathematics will take care of everything, whichever choice is made.

In fact, as I'll explain later...inductors in a.c. circuits are always treated as sinks. The same is true of capacitors, which can also absorb and return energy. In this case, it is stored in the form of an electric field.

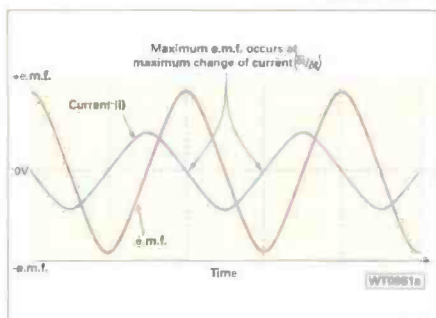


Fig. 5: The voltage waveform is shown leading the current waveform and this means that the voltage is positive when the gradient of the current waveform (di/dt) is positive (see text).

Alternating Current Conventions

If a smoothly varying (sinusoidal) current is passed through an Inductor, the inductor produces a voltage of similar waveform, but one quarter of a cycle out of phase with the current waveform. The textbooks tell us that this voltage **LEADS** the current. * See Editorial note below.

However, what the textbooks should also say is that the 'leading' voltage is not classed as an e.m.f. **but as a source of e.m.f.** Readers who have a mathematical background may see that this is borne out in Fig. 5. The voltage waveform is shown leading the current waveform and this means that the voltage is positive when the gradient of the current waveform (di/dt) is positive.

It would be inconvenient in a.c. circuit analysis if the same convention was not applied to resistors, inductors, and capacitors. They are all treated as sinks.

***Editorial note:** Some textbooks and other sources state it's logical to consider that the **current LAGS** behind the voltage as the rising voltage is - usually - considered to be a reference.

Capacitors

Now it's time to turn to capacitors (which unlike the inductors, and are in some cases treated as sources and sometimes treated as sinks) are rarely treated as sources. In fact, the voltage across a capacitor is hardly ever referred to as an e.m.f., although there are some cases when this might seem sensible, e.g. when a resistor is connected between the terminals of a charged capacitor.

The reason for the ambivalent attitude to inductors becomes understandable if you consider mutual inductance, e.g. transformers. Things are much more complicated here!

The magnetic field produced by the primary current in a transformer may give up some, or almost all, of its energy to the secondary. The simple treatment used for self inductance is no longer applicable, and it's obvious common sense to say that an induced e.m.f. drives the current in the secondary circuit of a transformer.

Volts & EMF

Although it is common practice to refer to 'an e.m.f. of so many volts', it's not 'hair splitting' to point out **that volts do not measure force, and it can prove extremely confusing to imply that they do.** In reality the reference should be to 'an energy source which give rise to a potential difference of so many volts', but this is much too cumbersome of course!

As e.m.f.s are universally expressed in volts, it should be possible to substitute some word like 'function' or 'factor' or some other unobjectionable 'F' word for the maverick word 'force', see Figs. 4 and 5.

So, let's hope that I've been unable to sort out some of the confusion referring to those sources, sinks and e.m.f.s - and may 'the force be always with you' when you switch on in future!

“... I became rather worried about the concept of an electromotive force ...”

PW



August 14: The Cockenzie & Port Seton Amateur Radio Club are holding their 5th Annual Radio Junk Night at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian. Open from 1830 to 2130. Bring along your 'junk' and sell it yourself. Tables will be provided on a first come first served basis (no charge for the table). A raffle will be held at approx. 2100. Refreshments will also be available, and there is access for any disabled visitors. Entry fee is £1 for all persons. All money will be donated to the British Heart Foundation. Further details from **Bob Glasgow GM4UYZ @ GB7EDN** or telephone on **(01875) 811723**.

August 16: The 9th Great Eastern Radio & Computer Rally is to be held at Wallington Hall, Nr Kings Lynn. Doors open at 1000 (0945 for disabled visitors). The event will feature Amateur Radio, computer and electronic component exhibitors, a Bring & Buy, and lots more. Food and drink is served all day. Talk-in on S22. There is also ample free parking. For further details or trader information, contact **Ian G0BMS** on **(01553) 765614**.

August 16: The 3rd Cardiff Amateur Radio & Computer Fair will be held at The Star Sports & Recreation Centre, Splott, Cardiff. Doors open 1030 till 1500. **Stuart Robinson GW0WMT** on **(01222) 613070**.

August 16: The Stroud Radio Society Rally will be held at Archway School, Stroud, Glos. Doors open 1030 (1000 for disabled visitors). There will be a talk-in on S22 and admission is £1.50. There will also be a Bring & Buy. **Stuart G0GNN** on **(01453) 752411** or **Steve G7EUW** on **(01453) 758032**.

August 23: The Telford Rally will be held this year at the Telford International Centre. There will be major dealers, a flea market, Bring & Buy, all in purpose built exhibition halls with good disabled access and plenty of space to move around. There will be catering, Morse testing and good local attractions including the

famous Ironbridge Gorge Museum. **Jim G8UGL** on **(01952) 684173** or **Tony MOAMP** on **(01743) 235619**, E-mail: **zeroamp@hotmail.com**

August 30: The Galashiels and DARS are holding their Open Day and Rally in the Volunteer Hall, St Johns Street, Galashiels, Scottish Borders from 1100 to 1600. There will be traders, refreshments, Bring & Buy, etc. **Jim GM7LUN** on **(01896) 850245** or packet @ GB7JED.

August 31: The Huntingdonshire Amateur Radio Rally Annual Bank Holiday Monday Rally is to be held at Emulf Community School, St Neots, Cambridgeshire (near Tesco Superstore on A428). Doors open 1000 to 1400 and admission is £1. There will be hot and cold refreshments available and a hall and car boot sale on hardstanding. Talk-in on S22. **David Leech G7DIU** on **(01480) 431333** (between 0900 and 2100).

September 6: The Bristol Computer & Radio Rally will be held at the Brunel Centre, Temple Meads Station, Bristol. Doors open 1030 until 1600 (from 1015 for disabled visitors). Admission is £1, accompanied children under 12 go in for free. There will be a large Bring & Buy, under £30 bring & Buy, refreshments, 150+ tables, table hire at £15 each and parking opposite in the NCP for £1. **Muriel**

Baker, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG, or telephone on **(01275) 834282** (24 hour answerphone).

September 6: The Coleraine & District Amateur Radio Society will be holding their annual Radio Rally at the new venue of the Bohill Hotel & Country Club, located a short distance outside Coleraine on the main road to Bushmills and the Glants Causeway. Doors open at 1200 and admission is £1.50. Further information from **John M10AAZ** on **(01265) 54930** or by E-mail **John@mi0aaz.force9.co.uk**

September 6: The Annual Wight Wireless & Computer Rally will be held at the National Wireless Museum, Arretton Manor, Newport, Isle of Wight. Admission is free and so is the parking. **Douglas G3KPO** on **(01983) 567665**.

September 6: The Bury Radio Society's 14th Annual Rally will be held at the Castle Armoury (TA Centre), Castle St., Bury. Doors open 1030 (1000 for disabled visitors). Talk-in on S22, Morse tests, Bring & Buy and all the usual traders. Further information and booking forms from **Alan G0RFE** on **(01706) 621263** or via E-mail: **g0rfe@zen.co.uk**

September 12: Reddish Rally is to be held at St Mary's Parish Hall, Reddish,

Stockport. More information from **John G4ILA** on **0161-477 6702**.

September 12: The 4th Northampton Radio & Computer Rally is to be held at the heart of the Shires Shopping Village Showground on the A5, just two miles north of Weedon, with easy access. Rally opens at 0900. There will be a Bring & Buy, organised by the Northampton Radio Club. Bring the family as they can spend the day in the 'ole worlde' village. Refreshments and toilets are on site. Admission is only £1. Contact **Steve MOARZ** or **Paul G0HWC** on **(01604) 632478**.

September 13: The 1998 BARTG Rally will be held at Sandown Exhibition Centre, Esher, Surrey. Doors open 1030. Attractions include free parking, Bring & Buy, many trade stands, a licensed bar and catering. *DataStream 98* forms an integral part of this Rally. *DataStream 98* will consist of a series of lectures looking at various aspects of amateur radio data comms. More info. from **Alan Hobbs G8GOJ, 83 St Peters Street, South Croydon, Surrey CR2 7DG, 0181-688 2564** (evenings) or <http://www.bartg.demon.co.uk/rally.htm> or E-mail: **rally@bartg.demon.co.uk**

September 13: The Milton Keynes & District Amateur Radio Society are holding their Annual Rally and Boot Sale In Bletchley Park. More information from **Dave White G3ZPA** on **(01908) 501390**.

***September 13:** The 13th Lincoln Hamfest will be held on the Lincolnshire Showground. This is on the A15 just five miles North of the City. Talk-in on 70cm. There is extensive parking available on the day and overnight on the 11/12th for caravans and tents. There will be many trade stands, a Bring & Buy, Flea Market and Car Boot Sales. Morse tests will be available by arrangement, there is also catering and a licensed bar. Admission is £2. (free for those 14 and under). **John & Sue** on **(01522) 525760** or John (mobile) on **(0385) 738976**.

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off. The Editorial Staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. Editor

Great Value ATUs! – improve your reception!

If you want to get the best results from your antenna, it needs to be impedance matched to the receiver. If there is a mismatch, then not all of the signal energy will be transferred to the receiver, and signals will be weaker than they could be. An ATU (antenna tuning unit) should be used to correct the antenna mismatch and so improve reception. A well designed receiving ATU will also reduce signal levels away from the desired frequency, and so help reduce noise and interference too. Both these benefits are proved by the Howes CTU8 and CTU9 tuners. Fully guaranteed and backed by our expert technical advice service, these ATUs are an excellent way to improve your reception.

HOWES CTU8

- Receiving ATU
 - 500kHz to 30MHz
 - "T" Match
 - SO239 sockets
 - 12 month warranty
- £49.90**



HOWES CTU9

- Receiving ATU
 - 500kHz to 30MHz
 - "T" Match
 - 4:1 Balun
 - Bypass switch
 - SO239 sockets
 - Terminal Posts
 - 12 month warranty
- £69.90**



HOWES ASU8

- Antenna Selector / Attenuator
 - DC to 30MHz
 - Three SO239 inputs
 - SO239 output
 - 0/5/10/15/20/25dB Attenuator
 - 12 month warranty
- £49.50**



Please add £4.00 PGP to your order. Delivery normally within 7 days. These are factory built items, please see separate advert for the Howes Kits range.

Mail Order to: **Eydon, Daventry, Northants. NN11 3PT**

☎ **01327 260178**

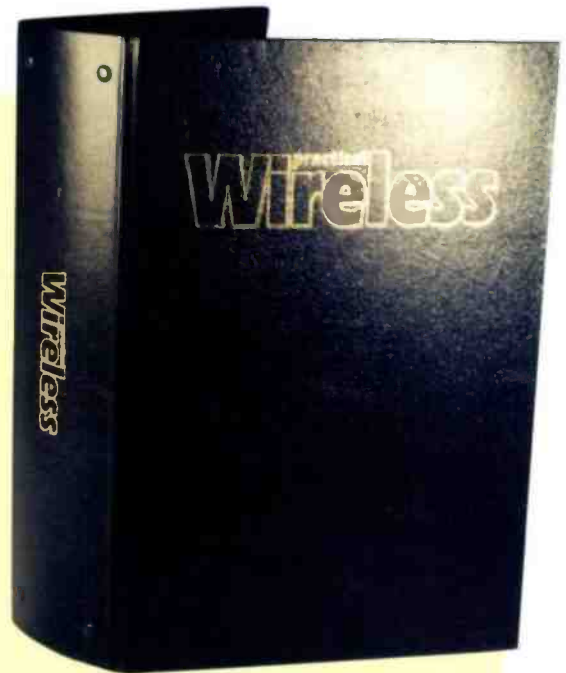
www.howes-comms.demon.co.uk



C.M.HOWES COMMUNICATIONS

DON'T MISS OUT
SUBSCRIBE TO PRACTICAL WIRELESS TODAY!

FREE
PRACTICAL
WIRELESS
BINDER WITH
EVERY
SUBSCRIPTION ORDERED!



If you place an order for a subscription to the UK's only independent and un-subsidised Amateur Radio magazine this month we'll give you a **FREE** binder to keep your precious copies safe.

The PW binders are produced from a heavy duty card coloured in a smart navy blue with the PW logo printed in gold lettering on both the front and the spine. Each binder comes complete with a set of your labels and binding bars and will comfortably hold a year's worth of magazines. They're also ideal for helping you to get organised and in making sure you can easily 'lay your hands' on that all important issue.



So, what are you waiting for, Subscribe to **Practical Wireless** today!

To order your subscription please use the Order form on page 82 of this issue or call the Credit Card Hotline on (01202) 659930 and quote Subs 9.

Subs Rates:	
1 Year	
£25	UK
£30	Europe
£32	Rest of World Airlsaver
£37	Rest of World Airmail



HAYDON COMMUNICATIONS

MAIL ORDER: 0181-951 5781/2

London showroom & Mail Order

132 High St. Edgware, Middx HA8 7EL.

Tel: 0181-951 5781/2. Fax: 0181-951 5782

Open Mon-Fri 9.30-5.30pm. Sat 9.30-2pm

(or easy to remember number:- "07000 HAYDON")

(NEXT DAY DELIVERY £10 TO MOST AREAS)

W. Midlands showroom

Unit 1, Canal View Ind. Est., Brierley Hill, W. Mids.

Showroom now quadrupled in size.

Open Mon-Fri 9.30-5pm. Sat 9.30-2pm



RECOMMENDATION AND PRICE ARE TWO GOOD REASONS WHY YOU SHOULD BUY FROM US!



YAESU FT-847

Yaesu was the first manufacturer to produce a self-contained amateur HF transceiver; the first to produce an FM transceiver with memory; the first to produce a full-duplex satellite transceiver; and now Yaesu is the first to produce an HF/VHF/UHF all mode transceiver, ideal for home or field use, with the versatility to cover every modern operation mode! (4m Tx included).



ICOM IC-756

For amateur radio enthusiasts, chasing rare Dx is a lifelong pursuit. For amateur radio manufacturers, designing the best transceiver to catch rare Dx is a constant challenge. Enter the Ic-756. This HF/50MHz, all mode transceiver is perfect for hams who want to step up to the next level. Full of functions designed to give you an advantage and backed by performance that'll keep your competition on their toes.



ICOM IC-746

Looking for one rig to satisfy all your base station needs? Look no further! The IC-746 offers IF DSP, new and exciting features, superior performance over a wide frequency range and all mode operation at 100W (40W in AM mode). The 746 offers all mode operation (SSB, CW, RTTY, AM and FM) on the amateur HF (1.8-28MHz), 50MHz and 144MHz bands.

ALINCO DX-70TH

The worlds most compact HF + 50MHz transceiver with 100W output. Operation modes include SSB, CW, AM and FM. All this plus a superb receiver with narrow filters fitted as standard.



ALINCO DJ-G5

A superb dual band (144/430MHz) hand-held that does everything including spectrum display of adjacent channels. The Rx has a superb front end with optional extended receive including airband. It has CTCSS/DTM built-in as standard. One of the only true dual-band hand-helds on the market today. The only thing that's not amazing is it's incredibly low price. A serious dual-band hand-held for th serious enthusiast!



KENWOOD TM-G707E

From the extra large control panel with the welcoming glow if its amber-coloured LCD, to Kenwood's new easy operation mode, the TM-G707E is extraordinary user friendly. That, after all, is a design imperative for mobile communications equipment. But this FM dual-band (144MHz.430MHz) transceiver goes well beyond the call of duty, offering a "five-in-one" programmable memory, a memory name function and numerous other features that make operation more natural than ever. (Ext. Rx available).



KENWOOD TH-G71

It only takes one glance to see that Kenwood's new dual-band hand-held (144/430MHz) is something special. The brightly illuminated keypad and LCD, high performance antenna and typically stylish yet ergonomic design set it apart. But this compact hand-held transceiver is distinguished internally too, offering a rich selection of features that would normally be found on much more expensive hand-helds. (Ext. Rx available).



AUTHORISED DEALERS FOR ICOM, KENWOOD, YAESU AND ALINCO. SHOP IN CONFIDENCE.

HAYDON COMMUNICATIONS

MAIL ORDER: 0181-951 5781/2

London showroom & Mail Order

132 High St. Edgware, Middx HA8 7EL.

Tel: 0181-951 5781/2. Fax: 0181-951 5782

Open Mon-Fri 9.30-5.30pm. Sat 9.30-2pm



(or easy to remember number:- "07000 HAYDON")

(NEXT DAY DELIVERY £10 TO MOST AREAS)

W. Midlands showroom

Unit 1, Canal View Ind. Est., Brierley Hill, W. Mids.

Showroom now quadrupled in size.

Open Mon-Fri 9.30-5pm. Sat 9.30-2pm



BASE COLINEARS P&P £8.50

★ ★ NEW LOW PRICES ★ ★

QT-S2 GF 144MHz 4.5dB (86")	£54.95
QT-S70 GF 70cm 5dB (60")	£54.95
TSB-3608 GF 50/144/70, 2.15/6.2/8.4dBi gain	£59.95
TSB-3315 GF 144/70, 8.5/11dB (5.4m)	£99.95
TSB-3301 GF 144/70.6.5/9dB (3m)	£54.95
TSB-3302 GF 144/70, 4.5/7.2dB (1.7m)	£39.95
TSB-3303 GF 144/70, 3/6dB (1.1m)	£29.95

ACCESSORIES P&P £2.00 on the following

TSA-6001N Duplexer (+Coax) 2/70 (N/N259)	£24.95
TSA-6003 Duplexer (Coax) 2/70 (PL/259's)	£19.95
CFX-514 Triplexer (6/2/70) (Coax)	£56.95

MOBILE ANTENNAS £6.50 delivery

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

ACCESSORIES P&P £2.50 on the following

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

Q-TEK ANTENNAS P&P £8.50

Q-TEK ZL SPECIALS

2m 5ele (boom 45"/9dBd)	£36.95
2m 7ele (boom 60"/11dBd)	£45.95
2m 12ele (boom 126"/13.8dBd)	£69.95
70cm 7ele (boom 28"/11dBd)	£24.95
70cm 12ele (boom 48"/13.8dBd)	£44.95

Q-TEK YAGIS FOR 2/4/6m + 70cm

2m 5ele (boom 63"/9dBd)	£36.95
2m 8ele (boom 125"/11dBd)	£46.95
2m 11ele (boom 186"/12.7dBd)	£65.95
2m 5ele crossed (boom 64"/9dBd)	£69.95
2m 8ele crossed (boom 126"/11dBd)	£85.95
4m 3ele (boom 45"/7dBd)	£39.95
4m 5ele (boom 128"/9dBd)	£59.95
6m 3ele (boom 72"/7dBd)	£49.95
6m 5ele (boom 142"/9dBd)	£69.95
70cm 13ele (boom 76"/12dBd)	£36.95
70cm 13ele crossed (boom 83"/12dBd)	£55.95

Q-TEK HB9-CV

70cm HB9CV (boom 12")	£16.95
2mtr HB9CV (boom 20")	£19.95
4mtr HB9CV (boom 22.5")	£29.95
6mtr HB9CV (boom 32.5")	£36.95
10mtr HB9CV (boom 52")	£65.95

NEW HF MOBILE WHIPS (PL-259)

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

PL-80 80m whip (approx 1.5m long)	£21.95
PL-40 40m whip (approx 1.5m long)	£19.95
PL-20 20m whip (approx 1.5m long)	£19.95
PL-6m 6m whip (approx 1.2m long)	£16.95

END FED HALF WAVES

Ground plane free

4m Length 92" (SO239)	£39.95
6m Length 126" (SO239)	£49.95
2m Length 52" (SO239)	£25.95
70cm Length 26" (N-type)	£20.95

Q-TEK ACCESSORIES

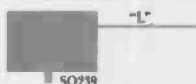
Q-TEK PENETRATOR

- ★ 1.8 - 60MHz HF vertical
- ★ 15 foot high
- ★ No ATU or ground radials required

SEND SAE FOR LEAFLET

ONLY **£150.00** delivery £10

Q-TEK INTREPID - Half waves



HF single band end fed wire antenna - "requires no ATU". (1kW).

ITP-80 80m version (40.7m)	£69.95 P&P £6
ITP-40 40m version (20.3m)	£59.95 P&P £6
ITP-20 20m version (10.1m)	£49.95 P&P £6

ALSO AVAILABLE IN OTHER BANDS. PLEASE PHONE.

DELUXE G5RV Multi-stranded plastic coated heavy duty antenna wire.

All parts reusable. Stainless steel and galvanised fittings. Full size - 102ft.

Only **£39.95**

Half size 51ft. Only **£34.95** Carriage £6.00.

STANDARD G5RV

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

NEW Q-TEK INDUCTORS

80mtr inductors. Add them to your 1/2 size G5RV and convert it to a full size.

£22.95 P&P £2

COPPER ANTENNA WIRE (All 50mtr rolls)

Enamelled	£11.00 P&P £5
Hard drawn	£12.00 P&P £5
Multi-Stranded (Grey PVC)	£8.95 P&P £5
Extra H/duty (Clear coated)	£22.00 P&P £5
Flexweave (H/duty)	£30.00 P&P £5
Flexweave H/duty (20 mtrs)	£13.00 P&P £5
Flexweave (PVC coated 20 mtrs)	£16.00 P&P £5

Q-TEK BALUNS

Wound on ferrite rod and encapsulated into a dipole centre with an SO239 socket. Brass terminals form the balun output and stainless steel screw eyes offer an anchor point for the ends of the antenna. Ratio power rating is 1000 watts.

1:1 Balun	£22.95 P&P £2
4:1 Balun	£22.95 P&P £2
6:1 Balun	£22.95 P&P £2

Q-TEK TRAPS

40 mtrs Traps	£25.00 P&P £4
80 mtrs Traps	£25.00 P&P £4
10 mtrs Traps	£25.00 P&P £4
15 mtrs Traps	£25.00 P&P £4
20 mtrs Traps	£25.00 P&P £4

Q-TEK WINCHES

SEND SAE FOR SPEC SHEET

DESK MICS & HEADSETS

D-308B BLACK DELUXE

DESK MIC (with up/down). Super quality. (Supplied with 8 pin pre-wired Yaesu lead) **£49.95** P&P £5.00

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

U-120 headset

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

£24.95 P&P £3.50

Supplied with two pin molded plug - will fit Alinco/Yaesu/Standard/ADI/Icom hand holds).



Optional leads (P&P £1.50).

F-3035 8 pin "Standard" round	£16.95
F-303Y 8 pin "Yaesu" round	£16.95
F-303K 8 pin "Kenwood" round	£16.95
F-303I 8 pin "Icom" round	£16.95
F-303YP Modular "Yaesu" phone	£16.95
F-303KP Modular "Kenwood" phone	£16.95
F-303IP Modular "Icom" phone	£16.95

TELESCOPIC MASTS

5 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 **£69.95** 12 mtrs **£99.95**

Carriage £10.00.

Free standing tripod for the above telescopic masts **£84.95** P&P £10

GUY WIRE KITS P&P £6

Standard kits (complete with wire)	£22.95
Heavy duty kits (complete with wire)	£25.95
MAST HEAD PULLEY Easy to fit pulley with mast clamp (up to 2")	£7.50 P&P £1.50

SECTIONAL MASTS Carriage £8.50

4 x 5 foot aluminium sections each swaged at one end.

1 1/4" dia	£19.95
1 1/2" dia	£29.95
1 3/4" dia	£36.95
2" dia	£45.95

WALL BRACKETS + MAST BASE PLATES

2" Mast base plate	£12.00 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



EP-320
Hanging type earphone with boom mic & PTT.
Fits Kenwood, Alinco, Yaesu or Icom.

£24.95 P&P1




NEW X-17K
Throat activated microphone with earphone unit + PTT. fits Kenwood, Alinco, Yaesu or Icom.

£39.95 P&P1

NE-300
Miniature dual band high gain telescopic antenna with BNC fitting. Only 8" long fully extended.

£9.99 P&P1



RA-5
Super gain dual band telescopic antenna with BNC. Length 0.48m.

£14.99 P&P1

NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS
NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS

NISSEI METERS



NISSEI METERS

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-502	1.8-525MHz (200W)	£99.95 p&p £5
RS-40	144/430MHz Pocket PWR/SWR Meter (200W) (SO239)	£34.95 p&p £1
RS-40N	As above with N-type	£39.95 p&p £1



GARMIN GPS-III

Latest UK version complete with moving map of UK & Europe. £449.00.

OUR PRICE £319.95

GPS-12	Navigator	£129.95
GPS-12XL	Includes Europe CPD	£209.95
GPS-11	New version	£245.00
Cigar power lead		£20.00
Active magnet antenna		£39.95

HF ACCESSORIES



P-2512 'M'

25-30 amp power supply with variable volts (3-15). Dual meters (Volts + amps). The UK's best selling power supply. RRP £90.95.

OUR PRICE £89.95

P-1012	12 amp PSU	£49.95
PS-200	Portable PSU	£46.95

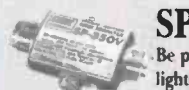


VECTRONICS VC-300DLP

UK's most popular 300W ATU with built-in dummy load. SPECIAL OFFER **£119.95**
MFJ-949 Special offer.....£139.95

CUSHCRAFT PRODUCTS

R-6000	6-20 meters	£275.00
R-7000	10-40 meters	£329.00
X-7	10, 15, 20 meters 7 ele yagi	£449.00
X-9	10, 15, 20 meters 9 ele yagi	£649.00
A-35	10, 15, 20 meters 3 ele yagi	£329.00



SP-350V

Be protected this summer! In-line lightning surge protector.

INTRO PRICE £19.99 P&P £1

COAX SWITCHES (P&P £3.00)

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

RECEIVERS

HAND-HELD SCANNERS

MVT-7100	OUR PRICE £219.95
MVT-9000	OUR PRICE £319.95
AR8000	OUR PRICE £269.95
AR8200	OUR PRICE £369.95

BASE RECEIVERS

UBC-9000XLT	OUR PRICE £249.00
AR3000A	OUR PRICE £649.95
AR5000	OUR PRICE £1189.95
IC-8500	OUR PRICE £PHONE
PCR-1000 Computer receiver	OUR PRICE £249.00

SHORT WAVE PORTABLES

SW-100E	OUR PRICE £149.95
SW-55E	OUR PRICE £235.00
ATS-818	OUR PRICE £119.95
R-861	OUR PRICE £169.00
RC-828 with cassette	OUR PRICE £199.95

SGC PRODUCTS



SGC-230

Superb ATU will work with any HF transceiver. £249.

SALE £289.00

SGC-2020 HF QRP TCVR	£559.00
SGC power clear (DSP speaker)	£259.00
SGC-500 powercube	£949.00
SGC-231 HF + 6m Smartuner	£449.00



OPTOELECTRONICS PRODUCTS

Tectoyz micro counter	£89.95
TNC-100 Optional antenna	£6.99
Opto Cub	our price £89.95
Opto Scout	our price £349.95
R-11 Interceptor	our price £299.95
Opto Xplorer	our price £795.00
Opto Lynx computer interface	£129.95
Micro DTMF decoder	£89.95



SCOOP PURCHASE Q-TEK HF-M5

5 band HF mobile antenna system (with interchanging cable whips). RRP £39.95. Antenna length: 130cm. Longest whip: 100cm. Fitting: 8 UNF base. Freq cov: 20-10m (incl WARC). Max power: 200W PEP. (can be used for base by adding 1/4 wave radials).

SPECIAL PRICE £29.95 Del £4.50

MFJ PRODUCTS



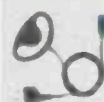
MFJ-259 MkII

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

ONLY £169.00 P&P £5

MFJ-949	300W ATU + dummy load	£149.95
MFJ-969	HF + 6m ATU	£179.95
MFJ-9620	1.5kW versa tuna	£279.95
MFJ-784B	DSP filter	£239.95
MFJ-418	CW tutor	£79.95

HANDHELD ACCESSORIES



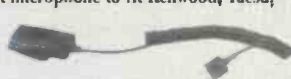
Nissei EP-300T

Over the ear earpiece with lapel mic & PTT. Fits Kenwood, Alinco, Yaesu or Icom. New low price **£19.95** P & P £1

(Please specify brand of radio when ordering)
This Ear/Mic comes with an "over the ear" earpiece as EP-300

MS-107

Fist-microphone to fit Kenwood, Yaesu, Icom & Alinco. **£16.95** + £1 P&P



NB-30W 2M FM handheld amplifier 2.5W input. 30W output (for 5W ip). Turn your handheld into a mobile for under £50

RRP £49.95 P&P £2

T-2602

2m/70cm/23cm (2/3/5.5dB) flexible antenna with wideband receive (14" long BNC). **OUR PRICE £22.95** P&P £1

DB-770H

High gain 2m + 70cm telescopic antenna with wideband receive. **OUR PRICE £24.95** P&P £1



POLICE STYLE HOLSTER HHC-2

Matches all hand helds. Can be worn on the belt or attached to the quick release body holster. **£19.95** + P&P £1

Waterproof case for handheld£10.00 P&P £1



QS-200

Mounts on the air vent grille on a car dashboard to allow easy and safe operation of most handhelds. **£9.95** P&P £2



MA-339

Mobile holder for handhelds **£9.99** + P&P £2

QS-200 Air vent holder.....£9.99 P&P £2



QS-300

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

OUR PRICE £19.95 P&P £2



EP-300

Deluxe over the ear earpiece. **£9.95** + P&P £1

This month the Rev. George Dobbs G3RJV describes a little receiver based on the TA7310 integrated circuit which he says is "The chip that came too late".

**"Where I reap thou shouldst but glean"
The Song of the Shirt**

Thomas Hood 1799 - 1845

Centre photograph: A 7MHz receiver - built with the "Chip that came too late"!

Carrying on the Practical Way

In my early days enjoying Amateur Radio, the hobby was one of 'gleaning'. Looking through the rich harvest of government surplus and gleaning out items which may be of use, or made of use, to the hobby. Practically everything in my first station was surplus or recycled.

"Oh dear" younger readers are saying, "here he goes on a 'those were the days approach' again!" However, in fact, the very reverse is true, because I think that Amateur Radio could still be a hobby based upon gleaning from a richer commercial world!

Admittedly there are no longer vast stocks of government surplus waiting for our use, but it's an electronic age. The world is full of low-priced electronic equipment. Complex, multi-function chips are designed for cheap production of tens of thousands of consumer electronics items. In amongst all of this we need to sort out those items which can be pressed into Amateur Radio service.

Excellent Example

An excellent example of something which can be found with the 'search and glean' approach is the NE602 (and NE612) chip. Designed for cellular phone usage and produced in huge numbers, this little chip has formed the backbone of many Amateur Radio projects for the home constructor.

Sometimes when looking at designs for QRP receivers and transceivers in recent years, I have hoped to see one that does not use an NE602!

The block diagram of the NE602, Fig. 1, shows what a useful chip it is for simple amateur radio construction. A small 8-pin DIL device contains a balanced mixer, and oscillator capable of oscillation to around 200MHz and a built-in voltage regulator.

As it stands the i.c. has all the hard work of a direct conversion receiver and a couple of them make a simple superhet receiver. The mixer is not the best performer in the world...but it's adequate for many applications.

The bad news is that the NE602 is now being phased out and shortly will not be a current device. They will soon become difficult to obtain although the NE612 may survive a little longer.

The phasing out of the NE602 has prompted many constructors and designers of equipment for amateur construction to look around for suitable replacements. Not least me - the NE602 has often been featured in this column!

Hidden away on a Japanese QRP Web page, I found reference to the TA7310P, a device that appears to be very similar. It contains a balanced mixer, an r.f. oscillator and an audio preamplifier in a 9-pin, in-line package.

I did a little investigating but failed to produce much information about the device. Then I rang Peter Thomas G7JAB at JAB Electronic Components and received bad news and good news!

The bad news is that the TA7310 is no longer a currently produced device, the good news is that there still appears to be plenty of them around. Peter has quite an adequate stock, as do some of the component stockists for the service industry. The device was used in several common CB transceivers and is stocked as a replacement.

So, although it's not worth offering a full-blown project, it is a chip that may appeal to the experimenters who read this column. The lack of real information on the device is not helpful but I am able to offer readers a simple receiver circuit which they might like to try or use as the basis for their own designs.

Receiver Project

The diagram, Fig. 2, shows the circuit of the little 7MHz receiver project I built with one of the TA7310s I obtained. This is a low component count direct conversion receiver. Let us begin with the audio end of the TA7310.

The coupling in and out of the audio pre-amplifier requires the use of two matching transformers. One between the mixer output at pin 6 and the pre-amplifier input at pin 7 and the other on the audio output at pin 9.

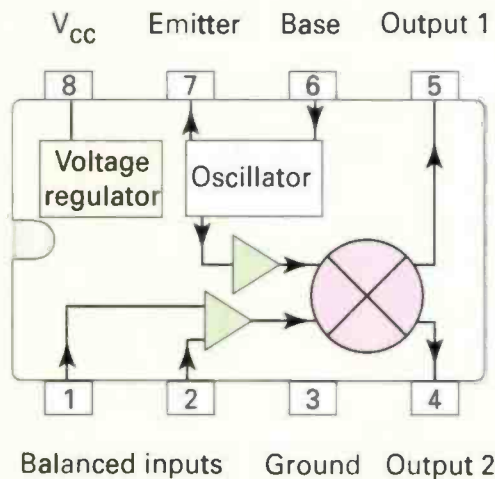


Fig. 1: Block diagram of the NE602/NE612 i.c. (see text).

WT0950



The coupling is not the problem it might appear to be as these are gleaned items. On my prototype they are the two audio transformers commonly found in cheap Japanese 'a.m.' radios.

The driver transformer for the typical push-pull transistor amplifier in the cheap receivers and the output transformer do exactly what we want here. However, commercial transformers are available. The LT44 can serve as T1 and the LT700 as T2, both are available from Maplin.

The oscillator portion of the TA7310, located around pins 1 and 2, uses an inductively coupled feedback circuit. It's the 'tickler coil' idea from the old Armstrong type oscillators.

In practice I found that the ratio of turns on the TOKO KXNK4173AO provided enough feedback to maintain stable oscillation on the 7MHz band. By keeping this part of the circuit as close to the pins as possible,

and using a polystyrene capacitor for the 47pF in the tuned circuit (and perhaps for the 560pF coupling capacitor) it should be stable enough for a useful receiver. The core of the inductor will pull it on to the band.

The receive input goes to pin 4.

The circuit here uses minimal input tuning with one tuned

circuit. Another TOKO inductor, the KANK3334, is used with its coupling coil providing an input to match a 50Ω antenna.

Naturally, a better band-pass filter could be used and this would give better input filtering. It would also be useful to add a simple attenuator on the input. (This could be a 1kΩ linear potentiometer).

Although the circuit in Fig. 2 does provide a very simple receiver, the overall gain is under 40dB, which is hardly enough for a successful direct conversion receiver. However, using a pair of 'Walkman' type cassette player headphones, 7MHz signals can be heard with a reasonable antenna. But ideally some extra gain is required so I added an audio amplifier.

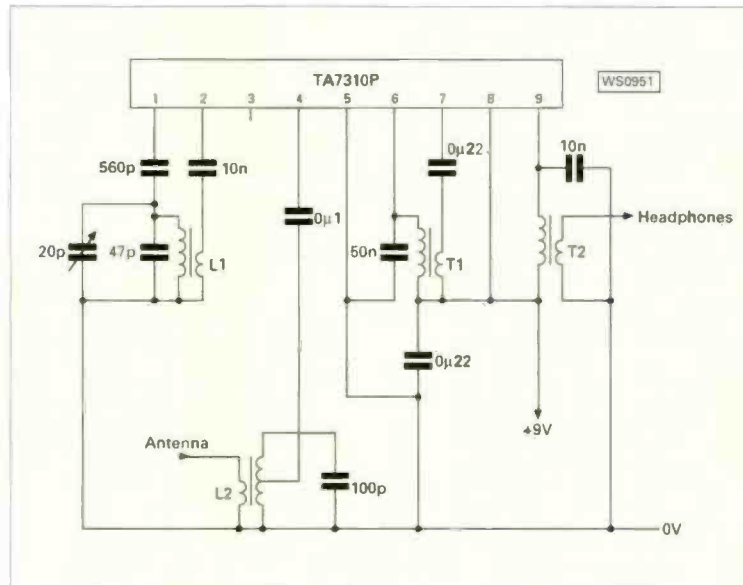


Fig. 2: Circuit of the basic 7MHz receiver project using the TA7310P i.c. (see text).

Cheap & Cheerful

The diagram, Fig. 3, shows a 'cheap and cheerful' audio amplifier based on the LM386. The output from the TA7310 is modified to provide an input to the audio amplifier.

A 1kΩ resistor replaces the output transformer with capacitive coupling to the amplifier circuit. This additional audio amplification raises the overall gain enough to make a useful receiver for amateur band use.

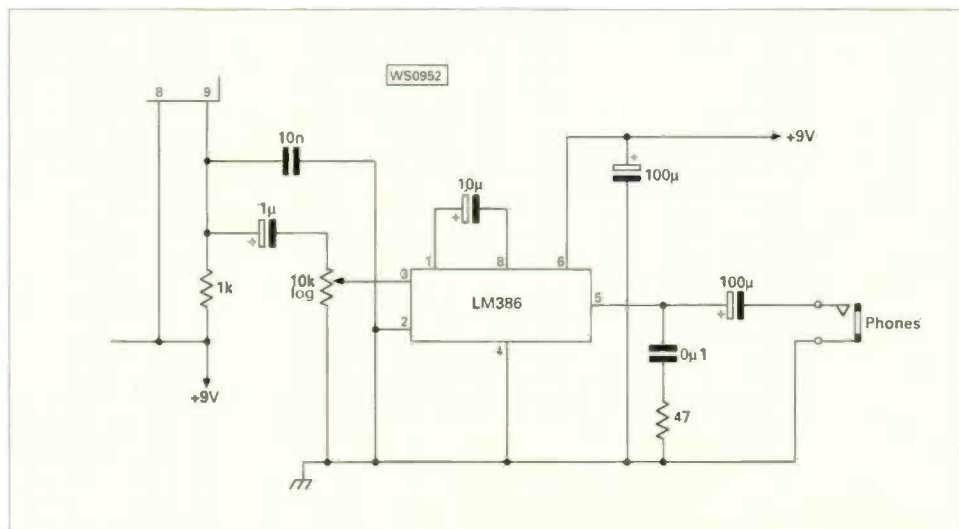
The TA7310 has 'arrived' really too late to become a device for future designs but readers may enjoy experimenting with yet another little device gleaned from that vast electronic world. So...keep looking out for those useful items!

PW

The TA7310 i.c. is available from:

JAB Electronic Components,
PO Box 5774, Great Barr, Birmingham B44 8PJ.
Tel: 0121 - 682 - 7045.

Fig. 3: Suitable add-on audio amplifier for the (low a.f. output) 7MHz receiver.



There's still time to work on your antenna, try out new ideas and designs. How about building that vertical antenna you've been thinking of this year? To help, the PW team have selected a choice of books on the antenna - in all its forms - to provide you with practical and theoretical help.

Book PROFILES

It's Still Antenna Time!

The Radio Amateur Antenna Handbook

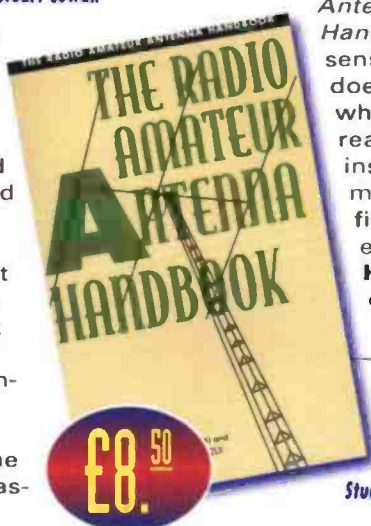
William Orr and Stuart Cowan

The 'Orr & Cowan' books are justly well-known and appreciated by Radio Amateurs throughout the world. Their book on cubical quad antennas for instance - has become a minor classic and is itself to be recommended.

But before reading up on the more specialised antenna project, design or idea - Orr and Cowan have provided much information - *The Amateur Radio Antenna Handbook* - in a conveniently-sized booklet. Thoroughly practical, although of course the 'Tower and lots of real estate' approach reflects its American origins, the authors in their usual 'no nonsense and let's get on with it' style take the reader step-by-step through DX antennas, antenna location, performance and the 'famous' s.w.r. meter, towers and rotators, all about baluns, popular vertical antennas, cubical quads, delta quads and other loop anten-

nas, horizontal and sloping wire antennas, h.f. beams, v.h.f. beams.

The Radio Amateur Antenna Handbook is a sensible book, it does not overwhelm the reader but instead it's more likely to fire you with enthusiasm. **Highly recommended.**



Vertical Antennas

William Orr & Stuart Cowan

Following on from their general coverage *The Amateur Radio Antenna Handbook*, Orr and Cowan have produced another 'companion' book taking an in-depth look at the vertical antenna. Bearing in mind that many Radio Amateurs have very limited space for antennas - the authors have produced many ideas which will prove suitable for use in British gardens.

In their usual style the authors first discuss the 'real life vertical antenna' before

going onto the 'radio ground' and how it effects antenna operations. Other chapters include Practical Marconi Antennas, antenna matching devices, ground-plane antennas, phased vertical arrays, multi-band vertical antennas and finally there's a chapter entitled 'Antenna Round-up' ...ideas on how to make your antennas work better.

If you're tempted to have a go at vertical antennas - there's plenty of information, ideas, projects and guidance in this book just for you. **Highly recommended.**

Antennas For VHF & UHF

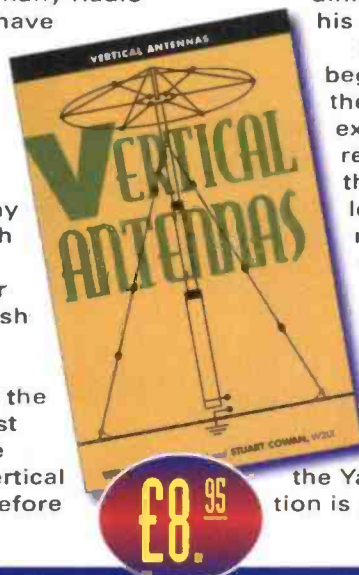
Ian Poole G3YWX

Well known to *PW* readers, **Ian Poole G3YWX** is a talented teacher and instructor who has unveiled the mysteries of our complex technical hobby in an easy-to-read and informative style for many years. In this slim book, produced to the usual Babani style and standard, the reader will find a very great deal to interest them. Ian has tackled the fascinating subject of v.h.f. and

u.h.f. antennas in his usual way.

Suitable for beginner and the not-so-experienced reader alike the author leads the reader through basic concepts (theory, how it works, etc.), feeding the antenna, the dipole,

the Yagi (this section is particularly



helpful), the cubical quad, vertical antennas, wide band antennas, antenna measurements, aspects, frequencies and channels. Very readable and informative and - in particular - the section (in antenna measurements) on using the 'dip' meter will prove very helpful to readers following the 'Radio Basics' series.

Antennas For VHF & UHF is an **ideal beginner's book. Highly recommended.**

HF Antennas For All Locations *Les Moxon G6XN*

This RSGB-published book has been available for some years now and can really be considered as a combined practical manual and textbook. In this, the second edition, the author goes into great technical detail how antennas work, on waves and fields, feeders, propagation, practical considerations, designs, ideas.

Now completely revised and extended the book also car-

ries comprehensive chapters dealing with 'Making The Antenna Work' (An excellently produced chapter), antenna construction and erection, plus a section dealing with the - sometimes vexed - question of choice for the individual: 'What Kind of Antenna'?

An in-depth technical read with much practical advice and many projects and ideas. **Highly recommended.**

Antenna Impedance Matching

Wilfred Caton

This ARRL published book is most certainly aimed at those in the hobby who enjoy delving deeply into the highly complex technicalities of antenna matching and who also enjoy mathematics. Written by a former professional antenna engineer and produced in a softback format and in the usual ARRL style but using an unfamiliar typeface, this book is profusely illustrated with diagrams and charts.

Chapters include: Impedance matching techniques, Matching over a band of frequencies, Matching solutions (including five narrow band examples followed by six broadband examples), making an overlay tracing box. There are also four pages of 'Errata' (corrections, up-dates

and further explanations) and a repeated 'contents' page. **A useful reference Source**

Building & Using Baluns & Ununs

Jerry Sevick W2FM

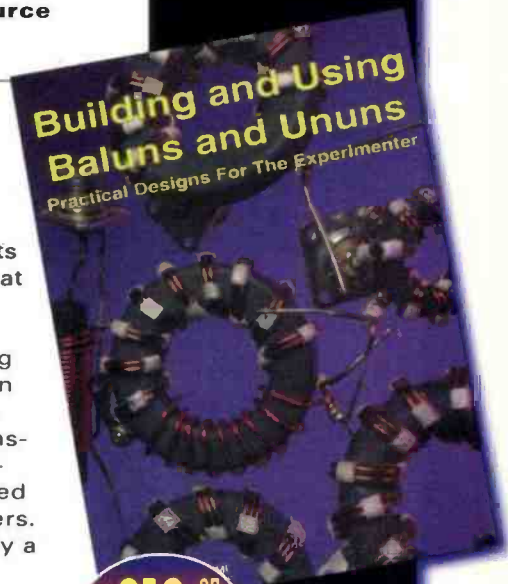
As the title suggests this book is aimed at providing an eminently practical approach to making and using your own balanced-to-unbalanced (baluns) transformers and unbalanced-to-unbalanced (ununs) transformers. This is not primarily a 'theoretical' book although of course theory is covered) but can be considered as a well illustrated (primarily by photographs) guide to

making successful baluns and ununs.

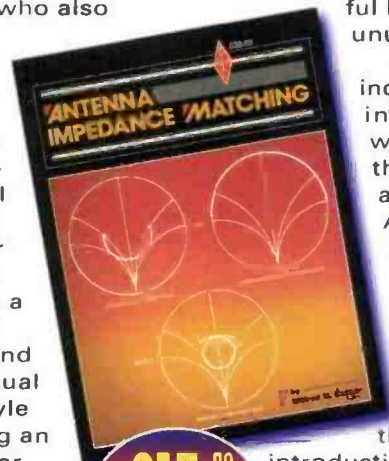
Chapters include: an introduction, when to use them, history and design, Amateur Radio use, baluns for antenna tuners, using with the G5RV antenna,

the unun, introduction, use, dual ratio types, multimatch and ununs for Beverage antennas, short ground-mounted verticals and loading coils. An interesting read which also conveys the complex nature of the devices in an effective way.

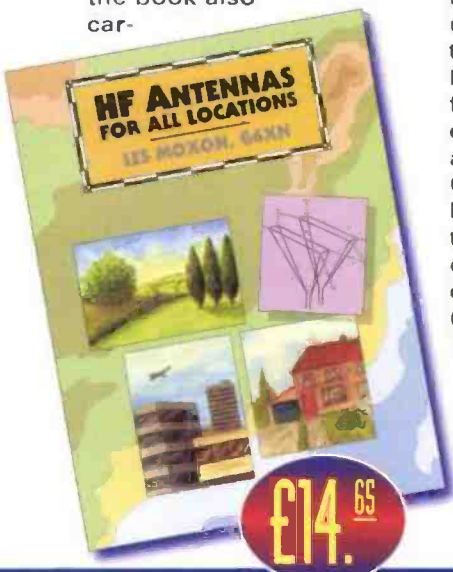
Packed with ideas and practical projects. ***Building & Using Baluns & Ununs* is an excellent Reference and practical projects source.**



£18.⁹⁵



£15.⁵⁰



£14.⁶⁵

Telephone
(01202) 659930

OR USE THE ORDER FORM ON PAGE 82

Please note: Cash not accepted with mail orders.

Attacking That N

The MFJ-1026 Noise Cancelling Signal Enhancer

Jack King G4EMC - despite his appropriate callsign - suffers from very high noise levels at his home in Kent. So...the editorial team thought he was 'Just the chap to try out a unit, that would offer a possible cure for the problem'!

"I found that I could get signal enhancement"

Some while ago, at the Picketts Lock Show in London I was chatting to the Editor, asking if *PW* was considering reviewing the new MFJ-1026 QRN eliminator. His reply was that he had not planned to at that time - but somehow I got the job!

The reason I asked the question in the first place was due to the increasingly high QRN and QRM levels experienced at my home. The problems come not only from 'atmospheric noise' but also industrial developments and increased computer activity from local banks and building societies. Other problems are generated by neighbouring switch mode power supplies on all the latest home entertainment devices, etc. And added to these are the effects from high voltage power lines not too far away.

Medway Valley

My location in the Medway Valley is almost on

the highest point locally, overlooking Maidstone to the South East. But the site is well below the hills surrounding the Medway Valley itself.

By comparing my problems with those of my friends on the other side of town and others further away, I seem to be receiving a lot more noise on all bands. The problems are present from 1.8 to 14MHz.

For example, on 1.8MHz the noise level is - S9+8. On 3.5MHz it's at S8, on 7MHz it's between S7/8 and on 214MHz it's up to S6. Tests (switching to a dummy load) have proved that the majority of the noise comes in via the antenna socket. So, that's why I really wanted to know if the MFJ device would help before shoving my hand deeper into my limited resources!



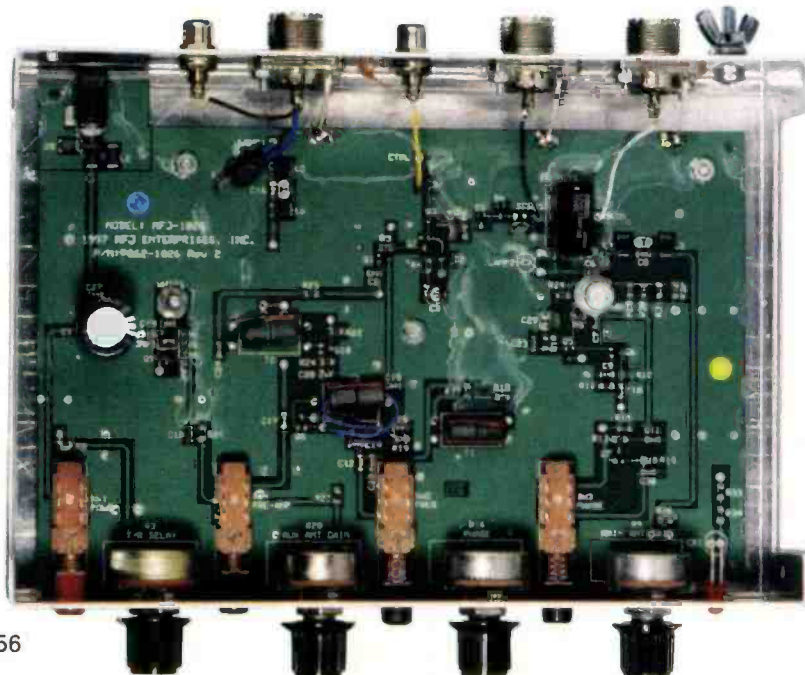
The MFJ-1026 Arrives

The MFJ-1026 Noise Cancelling Device duly arrived, and following the advice offered by all other reviewers - I read the accompanying manual over and over again. It's good advice!

The next stage, running out a random length antenna, was achieved by stringing a wire from the upstairs shack down to and round the garden fence, and plugged into the back of the MFJ unit. Power was applied and some practice attempts to null out background noise, etc., (as recommended in the notes) were made.

At the first few attempts, I was somewhat disappointed to find that the results were not quite what I had expected to get after having read the advertising, as little or no difference to the aural noise level was achieved. Then I began to think that perhaps it was a case of 'hyped publicity', or 'Medicine Show' exuberance or over-exaggeration. However, not having experienced

Internal view of the main p.c.b. The stains (centre right) on the main board were present when the unit was received and are probably caused by the post production p.c.b. 'washing' process.



noise Problem

IF QRN POSES YOU A PROBLEM THEN THE MFJ-1026 MIGHT JUST BE THE ANSWER!

For more details on the full MFJ product range check out the Waters & Stanton Web site at: <http://www.waters-and-stanton.co.uk>

such a device before, I was not sure what to expect.

I mainly wanted to see how the MFJ-1026 worked in improving signals on the h.f. bands, particularly 3.5 and 7MHz. But despite a lot of knob twiddling, it did not seem to be doing very much with the background noise, using the supplied telescopic whip antenna and its pre-amplifier. Neither did it seem to be effective in decreasing any perceived computer noise in the shack generated by my old 386 power supply unit running the GB7MAI TCP/IP hub or my other computers.

Reading the instruction manual again, I then opened the case to find the shorting jumper to activate the external wire antenna. This then isolates the whip, but amplifies the signal from the auxiliary

This was achieved with the auxiliary antenna gain set to maximum, pre-amplifier turned on, the phase knob fully anti-clockwise, and the phase button set to normal, and with the main antenna gain set to equal the auxiliary antenna setting.

By watching the S-meter drop, and by listening to the loudspeaker, I found it was possible to virtually 'remove' the incoming signal's audio from the speaker, and then by pressing the phase button to invert the signal, it then became much clearer and stood out over the remaining background noise.

Trying to repeat the process on the 3.5MHz band with higher noise levels was not so simple, but with practice it was possible! However, as an experiment, I repositioned my trap dipole as an inverted Vee antenna, which seems to have improved the situation to some extent...although more testing with the antenna in this configuration will be necessary!

Some Help

Having had the unit on test over a number of weeks, I unfortunately found that the 1026 was not the answer to all my interfering noise problems but it did provide some help. Perhaps, it's that my QTH is not now in a suitable position regarding amateur operation on h.f. bands! If that's the case...asking the MFJ-1026 to eliminate such powerful interference is probably asking too much from it, as it stands.

However, I did find on occasions that the little device could, with some careful adjustment, enhance signals out of the background noise, and improve readability by a considerable extent. Perhaps after all it's a case of 'practice makes perfect'?

My thanks for the loan of the review unit go to **Waters & Stanton PLC of 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, FAX: (01702) 205843** who can supply the MFJ-1026 for £139.95. *PW*

Rear panel view of the MFJ-1026. (see text for comments on telescopic antenna).



antenna. (I was a little surprised that this adjustment was not provided with an external switch).

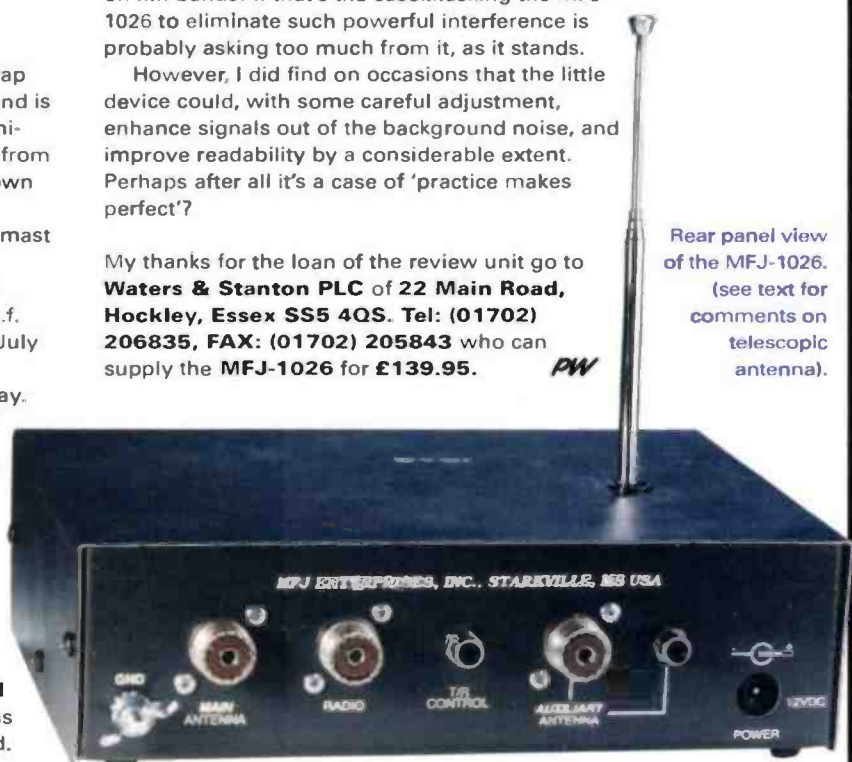
The G4EMC Antenna

The main h.f. antenna here at G4EMC is a trap dipole, which runs more or less East/West and is supported only at roof top height of my semi-detached house at about 8m above ground from a mast of approximately 14m high lower down the garden.

The antenna then slopes down to a stub mast of around 5m in height in the front garden. Greater height over the roof is not possible, without causing problems in lowering my h.f. beam. (See 'Old Antennas Never Die' - *PW* July 1997, page 24)

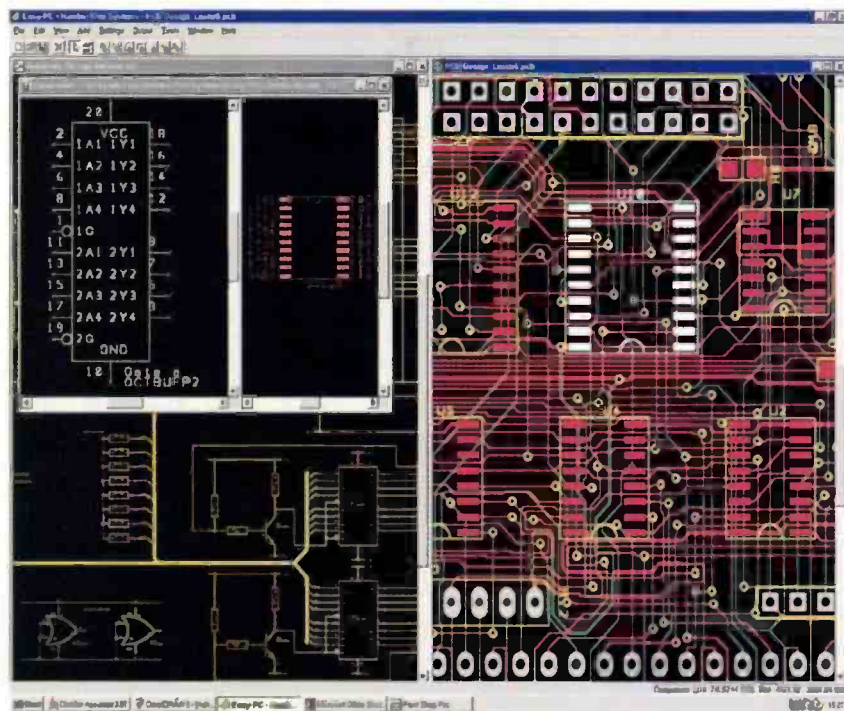
The reference antenna was some 6m away. (Probably too far, but there are no hard and fast rules laid out for its best position). Actually, in practice a good deal of trial and error may be required to attain the best results. And because my report is of course based only on how I found things, the finding may not coincide with results that other users may achieve - especially if they've got more 'real estate' to play with!

After a little practice, I found that I could get signal enhancement on some stations that were not very strong on the 7MHz band.



Easy-PC

Electronics CAD for Windows 95 and NT



- True Windows graphical user interface
- Multi-sheet Schematics - Projects.
- Full links to our Analogue, Digital and Electromagnetic Simulators.
- Impressive, high speed, gridless, shape-based autorouter options.
- Design rule and connectivity checks.
- Full Windows outputs.
- Gerber, Excellon and DXF outputs.
- Free technical support! No dongles or maintenance contracts.
- Trade up allowance from other products.
- New entry level version available.
- New demo' available - please call!

Number One Systems

Ref: PW, Harding Way, St. Ives,
Cambridgeshire, PE17 4WR,
United Kingdom

Tel: 01480 461778 Fax: 01480 494042
International: +44 1480 461778/494042
email: sales@numberone.com
http://www.numberone.com

THE VINTAGE WIRELESS LISTING

Published regularly, containing 100s of out of print, old and collectable wireless books, magazines, vintage and valve communications receivers, valves, components, etc. Send six 1st class stamps for the next listing or £4 for the next four catalogues, or £10 for the next four catalogues and eight issues of "The Vintage Wireless Trader", containing our latest acquisitions and subscribers' "Wants and Sales", published at approximately six-weekly intervals.

NEW BOOKS

Vintage Radio Valve Line-up Guide, 1930s-1950s. This invaluable book contains the valve line-up and replacement guide for hundreds of radios, pre-war and post-war. 118 pages. £12.50 including P&P.

R.1155 Receiver Data. Contains circuits and technical notes. 47 large format pages. £11.75 including P&P.
Radar. P. S. Hall (et al.) An absorbing and informative study by authors from The Royal Military College of Science. Covers the origin, development and operation of military radar from Chain Home to Patriot, etc. Numerous photos and illustrations of equipment and its principles of operation. 170pp. Published by Brassey's Weapon Technology series at £25. Our price £7.50. P&P £2.50.

Radio, Radio by Johnathan Hill. At long last the 3rd edition of this indispensable book for the collector. A hefty volume of 320 pages. £35. P&P £2.50.

The Ultra-Magic Deals by B. F. Smith. A well researched book on Ultra codebreaking operations providing a fascinating study of the technologies, personalities and politics of Britain and America's most mysterious secret - the pooling of their cryptological intelligence against Germany and Japan. Includes recently released details of Bletchley Park operations and is one of the few books published on cryptanalytic operations. 276 pages. Published at £17.95. Our price £11.50. P&P £2.50.

VALVE AND VINTAGE COMPONENTS

32x32µF at 350V Hunts electrolytics. Can type £4 each. 2 for £7 post free.

50x50µF 300V TCC electrolytics. Can type £3.25 each. 2 for £6 post free.

2-gang 0.0005µF Tuning Caps. Standard size, as fitted to old valve sets. Slightly solid but electrically sound and unused. List price over £15. Our price £5.50 each. P&P £1.50.

Octal valve holders:

60p each. 5 for £2.50 post free.
B9A valve holders. 5 for £2 post free.
B7G valve holders skirted. 4 for £2 post free.
MES dual bulbs 6.3V .3A. Box of 10. £2.95 + 60p P&P.

High Voltage Caps:

0.1µF 1000V wkg. Mixed dielectric. 1 1/2" x 3/4" axial wire ended. 80p each. 5 for £3.50 incl. post.

0.068µF 800V wkg. Mylar dipped. 1 1/2" x 3/4" axial wire ended. 70p each. 5 for £3 incl. post.

0.5µF "Metalpack" paper/foil. Wire ended. 350V 2 1/2" x 1/2". 70p each. 5 for £3 incl. post.

0.22µF 1000V wkg. Mixed dielectric. 1 1/2" x 3/4" 70p each. 5 for £3 incl. post.

0.01µF 1500V wkg. Mixed dielectric. 1 1/2" x 3/4" wire ended. 80p each. 5 for £3.50 incl. post.

1µF 400V wkg. Mixed dielectric. 1 1/2" x 3/4" wire ended. 80p each. 5 for £3.50 incl. post.

CALLERS WELCOME AT OUR VINTAGE WIRELESS SHOP BY PRIOR ARRANGEMENT.
LOTS OF INTERESTING ITEMS BUT PLEASE TELEPHONE BEFORE VISITING.

(Dept PW) CHEVET SUPPLIES LTD.

157 Dickson Road, BLACKPOOL FY1 2EU

Tel: (01253) 751858. Fax: (01253) 302979.

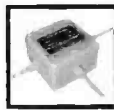
Telephone orders accepted.



COMPETITIVE AMATEUR RADIO PRODUCTS

The Complete Collection

- AD270 Indoor Active Antenna (includes MPU) £70.44
- AD370 Outdoor Active Antenna (includes MPU) £93.94



Ultra-compact receiving antenna systems giving wideband coverage from 200kHz to 100MHz at high sensitivity. Both systems come complete with a mains power unit.

- V.L.F Converter (10kHz - 500kHz) £46.94



Converts incoming VLF signals to frequencies 28MHz higher, for easy tuning on normal communications receivers. Simply connects in series with the antenna.

- D70 Morse Tutor £76.32



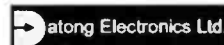
The revolutionary new way to practise Morse Code reception. An unlimited supply of precision Morse at the turn of a switch, plus built-in oscillator for sending practice.

- FL3 Audio Filter £152.69



The FL3 offers the complete solution to receiver audio processing. It has powerful filtering capabilities and enables shortwave listeners to separate unwanted signals from wanted signals.

All prices include V.A.T. and postage and packing is free within mainland U.K. Payment can be made by Visa, Mastercard, Switch, cheque or postal order.



Clayton Wood Close, West Park, Leeds, LS16 6QE
Tel: +44 (0)113 274 4822 Fax: +44 (0)113 274 2872

LEICESTER AMATEUR RADIO SHOW COMMITTEE PRESENT THE

27th LEICESTER AMATEUR RADIO SHOW

at a new venue

CASTLE DONINGTON INTERNATIONAL EXHIBITION CENTRE

near junction 23A M1 motorway & East Midlands International Airport

on

**Friday 25th & Saturday 26th
SEPTEMBER, 1998**

Direct bus services from Barnsley, Bradford, Leeds, Leicester, Sheffield, Loughborough, Milton Keynes, Nottingham and Wakefield to East Midlands Airport. Free shuttle bus from airport to exhibition hall.

Nearest railway stations: Derby and Loughborough on Midland Mainline from Leeds, Sheffield, Wakefield, Kettering, Wellingborough, Luton, Bedford, London (St. Pancras) and the continent. Central trains from Birmingham and the South-West serve Derby also. Central trains from Cambridge and the East serve Leicester. Air flights from the UK and the World via the British Midland Airways link from Schiphol Airport, Amsterdam, Holland.

ALL THE USUAL FEATURES BUT EVEN BIGGER THAN EVER. 150 STANDS, A CONVENTION AND FLEA MARKET.

For stand and table bookings contact John Theodorson, G4MTP.
Tel/Fax: **(01604) 790966** E-mail: G4MTP@lars.org.uk

For further details contact Geoff Dover, G4AFJ.

Tel: **(01455) 823344** or Fax: **(01455) 828273**

or see our internet site <http://www.lars.org.uk> with maps and all sorts of information on how to reach the show and all its features.

New Radio Books



Shortwave Receivers Past & Present

This new comprehensive edition covers over 770 receivers including European ones manufactured from 1942-1997. Tabletop (non-portable) general coverage, amateur, shortwave and speciality receivers are featured. Whether you are a shortwave listener or amateur radio operator, here is the information you need in an easy-to-use format. Organised for quick reference, entries include receiver type, photograph, features, specifications, accessories, variants, availability, date sold, size and weight, reviews, cost when new, used value, value rating and status.

Price: £19.50 → £3.50 UK post. European post £5.50 or £12 elsewhere.



North Atlantic Flight Communications

Plot trans-Atlantic flights with your HF radio and computer. Enter the flight details and watch in real time as the program plots the flight's progress across the North Atlantic on high resolution charts. The accompanying large book clearly explains all the procedures from filing the flight plan right through to landing at the destination, and describes the radio communications system in depth. Software requires IBM/PC. Please state if you require to run it on Windows 95 or 3.1.

Price: £15 + £1.25 UK post. Postage for Europe add £2.25 or £5 airmail to other destinations.



The UK Scanning Directory

This new 6th edition covering 26MHz to 1.8GHz, continues to amaze everybody. The tens of thousands of frequencies include Civil and Military Aviation, Army, Navy, the largest Police list ever published, DSS Snoopers, GCHQ, Eye-in-the-Sky Links, Bailiffs, Prisons, Motor Racing, Universities, Railways, Couriers and many more we dare not mention. Separate parts cover the Civil Aviation Band and European frequencies for Dxers. This book remains Britain's largest and best selling scanning directory, the undisputed leader in the field. No other book dares to list so many frequencies and in such great detail.

Price: £18.50 + £1 UK post. For Europe add £3.25, elsewhere £7.50.



Ask for free catalogue. Allow 14 days delivery



INTERPRODUCTS (P98)
8 Abbot Street, Perth PH2 0EB, Scotland
Tel & Fax: 01738 441199

E-mail: interproducts@netmatters.co.uk

Essex Amateur Radio Services

The little dealer with the big heart

BUYERS ARE WAITING NOW FOR YOUR PRE-ENJOYED EQUIPMENT!

- ★ VHF/UHF ★
- ★ HF Transceivers ★
- ★ Station Accessories ★

AVOID Part Exchange WE PAY TOP PRICES

We pay cash same day or 24 hours by post. Always large stock available. Phone today for the best deals. Silent Key sales handled efficiently and personally.

**4 Northern Avenue, Benfleet
Essex SS7 5SN**

01268 752522

7 days a week 8am to 8pm

Bristol Radio

&

Computer Rally 1998

Sunday 6th September 1998

Brunel Centre

Temple Meads Station, Bristol

10.30am to 4pm

(Disabled from 10.15am)

Admission: £1.00

(Accompanied children under 12 - FREE)

Parking: £1.00

(Large NCP opposite entrance)

- ★ Over 150 tables ★ Table hire at £15.00 each
- ★ Large Bring & Buy ★ Under £30.00 Bring & Buy
- ★ ATV demonstration ★ Raffle ★ Refreshments

For more information or to book tables
contact Muriel Baker G4YZR (QTHR)

Tel: 01275 834282

(24 hour answerphone)

MULTICOMM 2000

★ FINANCE AVAILABLE ★
LARGE SHOWROOM ★ BEST PRICES

AMERITRON



AMERITRON 811CEX
600W linear, 1.8 - 30MHz.
OUR PRICE £699.00
or 36 mths @ £22.83



AMERITRON 1200CEX
1500W output, 3CX1200A7
ceramic valves.
OUR PRICE £1799.00
or 36 mths @ £58.77



AMERITRON 800CEX
1200W output, 3CX800A7 valves.
OUR PRICE £1395.00
or 36 mths @ £45.56



AMERITRON 82CEX
1500W output, 2 x 3-500Z valves.
OUR PRICE £1699.00
or 36 mths @ £55.50

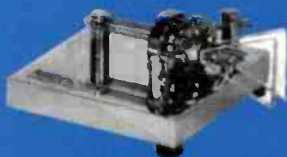
- B-5016 2mtr, 160W.....£299.00
- A-0105 6mtr, 150W.....£325.00
- B-1016 2mtr, 160W.....£349.00
- B-1030 2mtr, 300W.....£715.00
- B-108 2mtr, 80W.....£225.00
- B-215 2mtr, 150W.....£349.00
- B-2516 2mtr, 160W.....£299.00

MIRAGE



- D-3010 70cms, 100W.....£359.00
- D-26n 70/60.....£269.00
- BD-35 2/70.....£119.00
- D-100ATVN 70/100.....£405.00
- B-34 2mtr, 35W.....£99.00
- B-34 2mtr, 35W.....£75.00
- B-1060 2mtr, 600W.....£1095.00

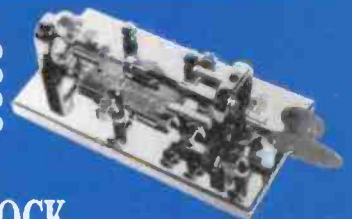
BENCHER, INC.



BENCHER LAMBIC KEYS

- BY-1.....£69.00
- BY-2.....£78.00
- BY-3 Gold.....£175.00

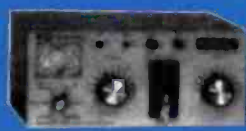
- Original de-luxe.....£149.00
- Vibro keyer de-luxe.....£139.00
- Vibroplex straight key.....£129.00
- Vibroplex Racer.....£120.00



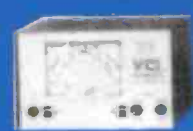
ANTENNAS NOW IN STOCK



VECTRONICS VC-300DLP
1.8 to 30MHz 300W ATU
OUR PRICE £108.00



VECTRONICS HFT-1500 ATU
1.8 to 30MHz 1KW power
OUR PRICE £295.00



VECTRONICS PM-30HF
1.8 to 60MHz, 300 to 3KW
OUR PRICE £59.95



SGC POWER CLEAR
DSP speaker.
OUR PRICE £269.00

TIMEWAVE
DSP-599ZX
OUR PRICE £299.00



"LINEAR AMP UK" . . . Linears are now available. Phone for best price.



PALSTAR
30 amp fan cooled PSU
PRICE £89.00

SGC-230
Auto ATU.
OUR PRICE £279.00



SGC-2020
HF QRP transceiver.
OUR PRICE £569.00



SALES HOTLINE 01480 406770

- ★ USED EQUIPMENT ALWAYS WANTED
- ★ GUARANTEED TOP PRICES PAID
- ★ 12 MONTH GUARANTEE

IMPORTED DIRECT FROM THE USA



BEST UK PRICES



MFJ 259 MkII
HF/VHF antenna analyser.
£169.00

MFJ 862
VHF/UHF SWR power meter £44.00

MFJ 941 E
300W HF ATU including 4:1 Balun £79.00

MFJ 901 B
Brilliant BUDGET HF ATU £55.00



MFJ 931
Artificial RF ground £65.00



MFJ 934
Antenna tuner & artificial ground £145.00



MFJ 945 E
HF + 6mtr 300W ATU £69.00



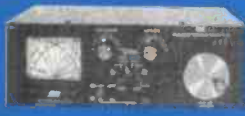
MFJ 264
1.5kW dummy load £45.00



MFJ 784 B
Fully featured DSP filter £179.00



MFJ 959 B
Receiver antenna pre-amp £69.00



MFJ 969 C
300W HF + 6 ATU £139.00



MFJ 418
NEW CW tutor £55.00



MFJ 989 C
3kW HF ATU £275.00



MFJ 948 B
300W HF ATU £85.00



MFJ 949 E
300W HF ATU + dummy load £99.00



MFJ 921/924
VHF or UHF ATU's £65.00



MFJ 493
Super menu driven memory keyer £119.95



MFJ 817
Dual band SWR watt meter £59.00



MFJ 812
VHF/SWR watt meter + field strength £29.00



MFJ 912
4:1 deluxe balun £32.00



MFJ 986
2kW roller coaster ATU £225.00



MFJ 962D
1.5kW roller coaster ATU £199.00



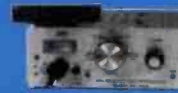
MFJ 906
6 mtr ATU SWR/PWR 200W £68.00



MFJ 914
Auto tuner extender £52.00



MFJ 910
Mobile antenna matcher £18.00



MFJ 9420X
20 mtr SSB transceiver £189.00

OPENING HOURS

Monday - Friday 9.30-5.00pm.
Saturday 9.30-2.00pm.
Closed Sundays.

WORLD-WIDE DELIVERY

Our efficient couriers ensure a guaranteed next day delivery in the UK and a 48-hour worldwide service if required.

PART EXCHANGE

We urgently require your treasured set. We buy outright for cash. Alternatively, use your old equipment as a deposit on finance for a new or used set.

FINANCE

We now can offer you a competitive finance package with only 10% deposit. Multicomm 2000 is a licensed credit broker. Written quotations are available upon request.

ACCESSORIES

Here at Multicomm 2000 we also have a large selection of books, antennas, linears, etc. If we don't have it in stock we can order it!

USED EQUIPMENT

We probably have the largest range of used equipment in the country. Most of our used equipment carries a full 12-month warranty and can be purchased on finance (if required).

LARGE SHOWROOM

We have a large, modern, showroom crammed full of new and used equipment. All are available for demonstration. Callers are welcome anytime!

PRICING POLICY

We source many products direct and usually offer an unmatched price on all of our products.

UNIT 3, 86 CAMBRIDGE STREET, ST. NEOTS, CAMBS PE19 1PJ

FAX: 01480 356192

SALES HOTLINE 01480 406770

EMAIL: Sales@multicomm2000.com

WEBSITE: www.multicomm2000.com

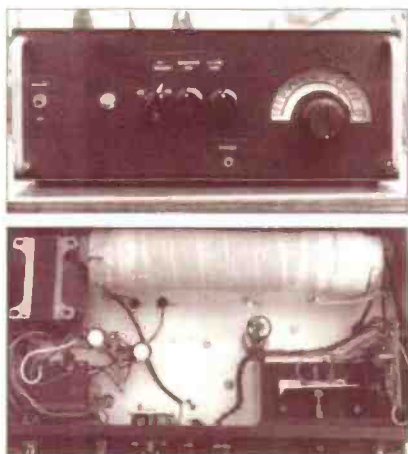
Valve & Vintage

The voice with the soft 'Black Country' accent and the fact there's a still warm soldering iron on the counter of PW's vintage 'wireless shop' tells us that it's Phil Cadman G4JCP's turn to look after the 'customers' this time.

Fig. 1: The 'mystery' receiver rescued by reader Mr Leach (see text).



Fig. 2: Keith Waters' Band II converter unit (lower Photograph) which is used in conjunction with an R1155 (see text).



Greetings and hello from September's friendly neighbourhood 'Valve and Vintage' proprietor! This time I thought I'd let your soldering irons cool down a little and show you what some valve enthusiasts have been doing these past few months.

But first, a leftover from the transmitter and receiver revamps I covered in my two previous columns. There's also an interesting new query...so let's get busy!

Like a 'good boy' I always, as a rule, install appropriate fuses in all the equipment I construct and use. But did you know that manufacturers used to fit

miniature lamps instead of h.t. fuses in low-power valve equipment?

Typically, a low-voltage lamp rated at about 150 to 200% of the expected h.t. current would be wired in series with the h.t. centre tap (or the earthy end of the h.t. secondary winding) and the equipment chassis.

The lamp served a dual purpose. Most importantly, it would behave as fuse and blow if a short circuit occurred on the h.t. line. Under normal conditions the lamp would simply produce a dim glow. Any change in h.t. current, due to a fault or other problem, would cause a corresponding and (hopefully) noticeable change in the lamp's brightness.

These days I'd never recommend using lamps as fuses. Modern miniature lamps - and lampholders - may not take kindly to the

presence of several hundred volts across them.

Fitting a lamp instead of a fuse isn't such a good idea when using silicon - as opposed to valve - rectifiers. The high switch-on surge currents will weaken the lamp filament causing it to blow prematurely, maybe even on the first switch-on.

If you come across such a lamp whilst repairing or restoring a piece of valved equipment it would be a good idea to replace it with a proper fuse. Unless, of course, you are simply doing a cosmetic restoration or the accuracy of the restoration is paramount.

Can You Help?

The request on my World Wide Web page asking for information about **D. G. Long's** 'Savoy' radio ('Valve and Vintage', June 1996) has finally borne fruit. **Jed** (via the Internet) e-mailed to say that he recalled repairing a Savoy radio in the 1960s.

So, it seems that Savoy did indeed manufacture radio sets. Regrettably, I have no other information about the Savoy company or their products, so if anyone knows more please write to me.

Just as one mystery radio was being identified along came another. This time it was **Mr. K. E. Leach** who wrote enclosing photographs of a set, **Fig. 1**, he'd rescued from being dumped.

The style is reminiscent of an early Cosor Melody Maker but Jed (who I E-mailed copies of the photographs to) made the observation that it might be a home constructed set, possibly a John Scott-Taggart design. The only name on the set is 'Castle' and Jed supposes that to be the name of the cabinet maker rather than the set's manufacturer.

Having checked what little literature I possess on Scott-Taggart's designs (**Charles Miller** profiled him in 'Valve and Vintage' in the January and April 1997 issues of *PW*) I tend to agree. The style places it firmly in the late 1920s to very early 1930s. Does anyone recognise the set or can anyone shed light on its origin?

Transmitter Project

Twelve months ago I featured an a.m. transmitter project. The main purpose of the transmitter was to 'rebroadcast' Band II v.h.f. stations on the long or medium waveband. Thus allowing older radios to receive, for example, BBC Radio 2, 3 and 4.

Recently I received a letter and several photographs from **Keith Waters** of Oxford. Keith has built a medium-wave version of the transmitter which he feeds into a restored and modified R1155 receiver. But rather than use a separate v.h.f. set to drive the transmitter, Keith installed a Maplin v.h.f. tuner (kit) within the transmitter enclosure. This has produced a useful stand-alone unit, see photographs **Fig. 2**, that can provide Band II f.m. reception on any medium wave radio.

Also in the September 1997 issue I asked if anyone had used modern miniature r.f. chokes in valve radio equipment. In his letter, Keith told me that he had used the Maplin 1mH type (WH47B) and found it to be quite okay. It would seem that modern miniature r.f. chokes **are satisfactory** but only for low power applications. (the 1mH choke mentioned is physically very small and only rated at 300mW).

Keith tells me he did initially have a

problem with the transmitter 'motor-boating'. This he traced to the 100 μ F electrolytic across the h.t. supply - removing it cured the problem!

It seems that under certain circumstances the triode amplifier section and heptode mixer section can form a low-frequency oscillator - causing the typical 'motor boat' like sounds). Reducing the value of the h.t. decoupling capacitor seems to help in these situations. Reducing the value of the coupling capacitor between the two sections (C7 in the original circuit) might also help.

Valve Audio Rules!

Two books about valve audio amplifiers were profiled in the July issue of *PW* (pages 30 and 31). They were *Valve Amplifiers* by Morgan Jones and *Valve and Transistor Audio Amplifiers* by John Linsley Hood.

Valve and Transistor Audio Amplifiers features many well-known valve amplifiers dating from the 1940s through to the 1960s. The author also covers some valve preamplifiers and a few power supplies...useful for anyone who wants to experiment with valve or transistor designs and likes to 'borrow' ideas from the present and past.

In contrast, *Valve Amplifiers* keeps well away from solid-state devices except for their use in power supplies and bias circuits. Morgan Jones also features famous valve amplifiers from the past but concentrates on just three examples. The author then describes, in detail, a contemporary ten-watt amplifier of his own design.

But the main purpose of the book is to introduce the mechanics of valve amplifier design to anyone who wants to design (and build) their own amplifier. Sensibly, the author has kept any mathematics to a minimum and provided plenty of worked examples and the emphasis is on the practical aspects of the design process.

However, our readers' should be warned about the addictive nature of valve audio! A friend of mine, **Paul Webb** of Wombourne in Staffordshire, was until a few years ago quite unacquainted with valve amplifiers. Having spoken with me about the virtues of valve amplifiers and having read *Valve Amplifiers* from cover to cover, he's now totally convinced of the supremacy of valve audio amplification. This conviction has recently resulted in him designing and building the amplifier shown in **Fig. 3**.

The amplifier is an all-triode single-ended design with type 845 output valves. These produce some 15 to 20W of audio per channel. The 845 is a 100W dissipation directly-heated triode, which is slightly under-run in this amplifier; each has a mere 900V on its anode and is biased to draw around 80mA of h.t. current.

The amplifier's associated power supply, which is situated out of shot below the amplifier, is of a similar size but considerably heavier. Realising the absurdity of using such an amplifier to drive headphones, Paul had previously constructed an entirely separate, self-contained headphone amplifier, see **Fig. 4**.

The second amplifier is also an all-triode design, albeit the output valves are 6L6G beam tetrodes connected as triodes. The power output is a shade under 1W per channel. Interestingly, the 6L6Gs can be switched to operate as tetrodes whereupon the audio power output increases to 4W per



channel, sufficient to drive a pair of sensitive loudspeakers.

If you contemplate building any piece of valve equipment which is to run a significant amount of power then do take into consideration the sheer physical size and weight of the equipment. Also, carefully consider the insulation and safety aspects of high voltages - over 900V in this case.

And make sure you provide adequate ventilation! Paul's amplifier dissipates over 300W (**Continuously**). In particular, the two output valves dissipate over 100W apiece - 72W at the anode and 32.5W at the filament (10V at 3.25A).

Fig. 3: Paul Webb's valved hi-fi amplifier (see text).

Build A Prototype

You should also always be prepared to build a working prototype. Paul's headphone amplifier suffers from one problem which we did not anticipate. Because it's a headphone amplifier it has to be very quiet. The h.t. supply is very well smoothed and the valve heaters are fed with d.c. rather than the usual a.c. Yet there is a noticeable 'hum' when listening with headphones!

We quickly traced the hum to magnetic induction between the mains transformer and the output transformers. Such small magnetically-induced voltages are not normally a problem but they certainly are in the case of headphone operation.

So, if you're contemplating using headphones extensively with a home constructed valve receiver pay extra attention to h.t. smoothing. Even more importantly, check the position of the mains transformer (and smoothing choke, if there is one) and output transformer **before** you start drilling holes.

Oops! Nearly crashed into the bottom of the page. I'd better say cheerio until it's my turn 'in the shop' again. Please send your comments, letters and stories of hopeless valve addicts to me either via the *PW* offices, via E-mail to phil@oldpark.demon.co.uk or direct to: **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX.** *PW*



Fig. 4: A low power headphone (yes headphone!) amplifier. See text for further details.

PHIL G4JCP HAS SOMETHING TO DELIGHT ALL YOU VALVE ENTHUSIASTS THIS MONTH

Due to the fast turn around of popular secondhand items, readers should check on availability of advertised stock. In other words...if you spot something you fancy...don't delay or you could miss it!

Trader

YOUR GUIDE TO SECOND-HAND EQUIPMENT

WATERS & STANTON

01702 206835

WATERS AND STANTON PLC SECONDHAND STOCK LIST AS AT 23rd May 1998. PLEASE NOTE SECONDHAND ITEMS COME WITH FULL 3 MONTH PARTS & LABOUR GUARANTEE FOR MORE INFORMATION PHONE STEVE DAVIES ON 01702-206835 OR FAX 01702-205843

HF TRANSCEIVERS
Icom IC-725 Base Transceiver 12V..... £475
Icom IC-751A Base Transceiver 12V..... £575
Icom IC-761 Base Transceiver with Gen. Con. Mains..... £795
Kenwood TS-1405 Base Trans with Gen. Con. 100W 12V..... £340
MFJ MFJ-9020 x2 20m CW QRP Transceiver..... £125
Trio TS-5305 Base Trans Mains with MC-50PWR meter..... £325
Trio TS-8305 Base Transceiver Mains..... £375

VHF/UHF BASE/MOBILE TRANSCEIVERS
AKD 2001 x2 2m FM Mobile 25W..... £125
AKD 7003 70cm FM Mobile 3W..... £125
Icom IC-260E 2m All Mode Mobile 10W..... £145
Kenwood TM-211E 2m FM Mobile 50W..... £199
Kenwood TM-255E 2m All Mode Mobile 40W..... £485
Yaesu FT-212RH 2m FM Mobile 45W..... £345
Yaesu FT-212RH 70cm FM Mobile 35W..... £165
Yaesu FT-200R 2m All Mode Portable..... £199
Yaesu FT-200R II 2m All Mode Portable..... £299
Yaesu FT-5100 2m/70cm FM Mobile 50W/35W..... £399

VHF/UHF HAND-HELD TRANSCEIVERS
Alinco DJ-560 2m/70cm FM H/Hand..... £169
Alinco DJ-511 2m FM Micro Transceiver 340mW..... £75
Alinco DJ-F1 2m FM H/Hand..... £99
Icom IC-25B7 2m FM H/Hand..... £149
Icom IC-24ET 2m/70cm FM H/Hand..... £179
Icom IC-P4E 70cm FM H/Hand..... £169
Icom IC-M11 VHF Marine H/Hand..... £199
Icom IC-W2E 2m/70cm FM H/Hand (with up mic)..... £199
Kenwood TH-20E 70cm FM H/Hand..... £99
Kenwood TH-20E 70cm FM H/Hand..... £225
Kenwood TH-70E 70cm FM H/Hand..... £285
Standard C-508 2m/70cm FM Micro H/Hand..... £179
Standard C-528 2m/70cm FM H/Hand with Rapid DesCharger..... £225
Standard C-558 2m/70cm FM Handheld..... £299
Yaesu FT-41R 70cm FM H/Hand..... £175
Yaesu FT-410R 2m/70cm FM H/Hand..... £189

SHORTWAVE RECEIVERS
AKD HF-3 Target 42V Base/Mobile RX..... £135
AOR AR-3030 12V Base/Mobile RX with Collins Filter..... £299
AOR AR-7030 12V Base/Mobile Receiver with NB-7030..... £699
Grundig YB-206 Portable Receiver with FM..... £69
Grundig YB-500 x2 Portable Receiver with SSB..... £145
Icom IC-R72 x3 Base Station Receiver..... £549
JRC NRD-345 100kHz-30MHz AM/SSB/CW/FAX 100Ch 12V..... £549
Lowe HF-150 x3 12V Base/Mobile Receiver..... £250
Lowe HF-250 x2 12V Base/Mobile Receiver..... £399
Realistic DX-394 150kHz-30MHz AM/SSB Mains/12V..... £115
Sangean ATS-801A x3 Portable Receiver with SSB..... £89
Sony ICF-SW70 Portable Receiver with FM..... £55
Sony ICF-SW55 x2 Portable Receiver with SSB..... £189
Sony ICF-SW77 Portable Stereo Receiver with SSB..... £285
Sony ICF-SW100E Pocket Stereo Receiver with SSB..... £149
Sony ICF-2001D Portable Receiver with SSB..... £199
Yaesu FRG-7 0.5-30MHz AM/SSB/CW Mains/12V..... £149
Yaesu FRG-100 50kHz-30MHz 12V Base/Mobile..... £399

SCANNERS MOBILE/BASE
Icom IC-R7100 25MHz-2GHz All Mode 12V Base..... £395

SCANNERS HAND HELD
Alinco DJ-X1 100kHz-130MHz AM/FM/WFM 100Ch..... £139
AOR AR-1000 0.5-130MHz (with exp) AM/FM/WFM..... £115
AOR AR-2000 0.5-130MHz AM/FM/WFM 100Ch..... £125
Furman HP-2000 0.5-130MHz AM/FM/WFM 100Ch..... £145
Icom IC-R1 0.1-130MHz AM/FM/WFM..... £199
Icom IC-R10 0.5-130MHz All Mode 100Ch..... £195
Wels WS-300 100kHz-130MHz AM/FM/WFM 100Ch..... £159
Yupiter MVT-7300 100kHz-1650MHz All Mode 100Ch..... £249
Yupiter VT-225 x2 100-142-150-160-220-391MHz AM FM 100Ch..... £189

SOUTH EAST COMMUNICATIONS

(REP OF IRELAND)
00353 51 871278

H.F. TRANSCEIVERS
Kenwood TS505..... £549.00
Icom IC706 mk1..... £599.00
Icom IC728..... £499.00
Yaesu FT1000mp/ac..... £1699.00
Kenwood TS440 sat..... £649.00
Kenwood TS680..... £549.00
Yaesu FT920 demo..... £1199.00
Yaesu FT840..... £499.00

VHF/UHF TRANSCEIVERS
Yaesu FT8100 2m/70cm..... £299.00
Alinco DJ191 hand held..... £109.00
Alinco DJ191+ctcss..... £129.00
Kenwood TM255E..... £499.00
Yaesu FT3000m demo..... £275.00
Alinco DR130..... £169.00

SHORTWAVE RECEIVERS
Kenwood R5000..... £599.00
JRC NRD535 deluxe base..... £899.00
Lowe HF 150 with keypad..... £275.00
Lowe HF225 with keypad..... £299.00
Sony ICF SW55..... £175.00
Sony ICF SW7600 boxed..... £99.00
AKD HF3..... £99.00
Trio R-600..... £199.00
AOR 3030..... £329.00
Yaesu FT7000..... £149.00

BASE/MOBILE SCANNERS
Icom IC7000 5-2000MHz..... £699.00
Icom ICR7100..... £799.00
Realistic PRO 2037..... £129.00
Yupiter MVT8000..... £199.00
AOR 8000 boxed..... £209.00
Beareat 3000XLT..... £129.00
Realistic PRO 2006..... £149.00
Icom PCR1000..... £239.00
Icom ICR-10+case..... £219.00
Alinco DX10..... £209.00
AOR 5000..... £899.00
Yupiter MVT9000..... £249.00

STATION ACCESSORIES
MFJ 259 antenna analyzer..... £169.00
Diamond SX200 swr/pwr meter..... £55.00
Diamond GSU-3000 30amp PSU..... £99.00
Watson 20 amp PSU..... £69.00
Opto scout..... £259.00
Watson frequency counter..... £49.00
Watson multimode decoder..... £49.00
Datong CW tutor D70..... £39.00
NB30 30watt 2m amp..... £45.00
GP45XL GPS unit..... £189.00
Mirage B-34-G amp..... £89.00
GPS 3000 GPS unit..... £79.00
GPS 2..... £189.00
Global AT2000..... £69.00
Smartuner SG230..... £219.00
MFJ 259 tuner..... £199.00
MFJ 949E..... £119.00

All prices are in Sterling.

NEVADA

01705 662145

TRANSCEIVERS HF
DRAKE TR-7 COMP LINE UP - REALLY NICE..... £599
TEN TEC CORSAIR II..... £450
ATLAS 350XL HF 100W TX..... £245
ICOM IC725 HF 100W TX..... £499
ICOM IC-728 HF 100W TX..... £599
KENWOOD TS-4405 HF 100W TX..... £499
KENWOOD TS-520 HF 100W TX..... £299
KENWOOD TS-850 SAT HF 100W TX...choice..... £1199
KENWOOD TS-9305 HF 100W TX..... £699
KENWOOD TS-6805 100W HF + 10W 6M..... £599
YAesu FT-107M HF 100W TX..... £399
YAesu FT-207 CW MATCHING PSU, 100W HF..... £425
YAesu FT-77 + PSU HF 100W TX..... £499
YAesu FT-767GX HF + 6M BASE..... £775

TRANSCEIVERS VHF/UHF
DENPA M-22 2MTR MOBILE TV..... £129
ICOM IC-228H 2M 45W MOBILE..... £185
ICOM IC-2400 DUAL BAND MOBILE..... £279
ICOM M56 MARINE MOBILE..... £225
KENWOOD TM-201 2MTR MOBILE..... £189
KENWOOD TM-451E 70CMS MOBILE TX..... £265
SHAKESPEAR SE2500S 25W MARINE TX..... £249
STANDARD C-78 70CMS MOB TX+AMP..... £199
STANDARD C-78 + 10W 70CMS PORT..... £199
STANDARD C-800 2MTR MOBILE TX..... £175
STANDARD C-8900 2M MOBILE..... £185
TRIO TR-2300 2MTR MOBILE TX..... £95
TRIO TR-2300 GX 2MTR MOBILE TX..... £95
YAesu FT-200R 2MTR M/MODE TX..... £225
YAesu FT-290 MK II 2MTR M/MODE + AMP..... £399
YAesu FT-480R 2MTR 10W M/MODE..... £225
YAesu FT-726R HF/2M/70CMS BASE TX..... £799
YAesu FT-2500M + CTCSS 50W 2M..... £249
YAesu FT-270RH 2MTR/70CM MOBILE..... £199
YAesu FT-5100 DUAL BAND MOBILE..... £349
YAesu FT-5100 DUAL BAND MOBILE..... £329

HAND-HELDS
ADI AT-18 2MTR H/HELD TX..... £69
ALAN CT-145 2MTR H/HELD TX..... £69
ALAN ALM-203E 2M H/HELD TX..... £149
ALINCO DJ-180 2MTR H/HELD TX..... £99
ALINCO DJ-500E DUAL BAND..... £199
ALINCO DJ-F1 2Mtr H/H + AIRBAND..... £149
ICOM IC-W2E 2M/70CMS H/HELD TX..... £175
ICOM T-41 70CMS H/HELD TX..... £185
ICOM IC-41E 70CMS - EX DEMO..... £155
KENPRO 202 2MTR H/HELD TX..... £65
KENPRO KT-22 2MTR H/HELD TX..... £75
KENPRO KT-44 70CMS H/HELD TX..... £85
KENWOOD TH-215E 2MTR H/HELD TX..... £99
KENWOOD TH-26 2MTR H/HELD TX..... £95
KENWOOD TH-28E 2MTR H/H TX+70CM RX..... £169
KENWOOD TH-45E 70CMS H/HELD TX..... £145
KENWOOD TH-75E DUAL BAND HANDIE..... £159
REXON RL-102 2MTR H/HELD TX..... £79
STANDARD C-500 2M/70CMS H/HELD TX..... £159
YAesu FT-202 2MTR H/HELD TX..... £55
YAesu FT-208R + BASE UNIT/ACCS..... £179
YAesu FT-470 2M/70CMS H/HELD TX..... £179
YAesu FT-510 2M/70CMS H/H TX..... £199

MISCELLANEOUS EQUIPMENT
HFT 1500 COASTER ATU..... £275
ICOM PS-55 30 AMP PSU - BOXED..... £159
KENWOOD AT200 ANTENNA TUNER..... £175
KENWOOD AT230 ATU..... £189
KENWOOD AT250 ANTENNA TUNER..... £225
KENWOOD DFC-230 FREQ CONTROLLER..... £65
KENWOOD PS-20 12A POWER SUPPLY..... £69
KENWOOD TL-120 100W HF AMP..... £185
KPC 9612 TNC 1200/9K6..... £175
MFJ 986 3K PEP TUNER..... £249
M/M MODULES 432/50 70CMS AMP..... £195
PACCOMM TINY 2 1200 BAUD TNC..... £70
TOKYO HL130U 70CMS 120W AMP..... £275
TOKYO HL-700B HF AMP 600W S/S..... £499
TOKYO HX60 6MTR TO HF TVTR..... £175
YAesu FL2000B HF AMP..... £345
YAesu FTS12 CTCSS UNIT FT23 ETC..... £39
YAesu FTS17 CTCSS + FT 41/811 ETC..... £39
YAesu FW107R 2M/70CMS TVTR..... £249
YAesu MMB11 290R MOBILE MOUNT..... £20

RADIOWORLD

01922 414796
Servicing 01922 417829

MAKE	MODEL	PRICE
A.D.I.	AR 146 2 METRE FM (AS NEW)	£185
AEA	PIC 232	£100
AEA	PIC 900 DUAL PORT	£295
HI-GAIN	TH3 JNR 3 ELEMENT	
	TRI-BAND NEW	£300
ICOM	ANTENNA TUNER 160 ATU	£160
ICOM	IC 725	£395
ICOM	IC 726 HF/6M	£525
ICOM	IC 737 HF BUILT IN ATU	£650
ICOM	IC 307H DUAL BAND	£280
ICOM	IC 765 BOXED	£995
ICOM	IC 78 3 BAND HANDIE	£275
ICOM	IC 706 MK1 I	£750
ICOM	IC 726 HF/6M	£550
ICOM	IC R7100 25-3000 RECEIVER	£650
ICOM	IC R72 0-30 RECEIVER	£400
KENWOOD	DRU 2 DIGITAL RECORDER	£90
KENWOOD	PS33 POWER SUPPLY	£120
KENWOOD	PS52 HEAVY DUTY SUPPLY	£165
KENWOOD	S02 STABILISING CRYSTAL	£85
KENWOOD	SM 230 SCOPE	£500
KENWOOD	TH 22E 2 METRE HANDIE	£100
KENWOOD	TH 78E DUAL BAND HANDIE	£175
KENWOOD	TM 251E 2M	£225
KENWOOD	TM 451E 70 cm NEW	£250
KENWOOD	TM 255E MULTIMODE 2M	£495
KENWOOD	TS 530SP	£275
KENWOOD	TS 830S	£375
KENWOOD	TS 850	£800
KENWOOD	TS 850SAT	£875
KENWOOD	TS 870SAT DSP	£1,400
KENWOOD	TS 940SAT BUILT-IN TUNER	£850
KENWOOD	TS 950SDX	£2,100
KENWOOD	TS 950 SD DIGITAL	£1,550
KENWOOD	YG455C1 500Hz CW FILTER	£75
KENWOOD	YK88C1 CW FILTER	£40
KENWOOD	YK88SN1 1.8K FILTER	£40
MFJ	1276 PACKET CONTROLLER	£100
MFJ	2 OFF 1272 TNC MIC INT SW	£30
MFJ	4628 MULTI-READER	£140
MFJ	969 HF 6M TUNER	£135
MICROWAVE MODULES	2M 100 watt AMP	£120
YAesu	MULTI-CAT INTERFACE	£50
YAesu	FT 51R HANDIE (AS NEW)	£240
YAesu	FL 210KZ WARC	£475
YAesu	FP 757A HEAVY DUTY	£100
YAesu	FT 23R 2M HANDIE	£100
YAesu	FT 726 2/6/70 SAT	£650
YAesu	FT 8500 2/70	£350
YAesu	FT290 MKII + ACCESSORIES	£275
YAesu	FT 757GX GENERAL COV	£400

PLEASE MENTION TRADERS' TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!

's Table

YOUR GUIDE TO SECOND-HAND EQUIPMENT

ARC EARLESTOWN 01925 229881

- HF TRANSCEIVERS**
- 2 x Yaesu FT-757GX1 + boxed **£TEL**
 - Yaesu FT-980 **£799**
 - Yaesu FT-101ZD MLIII + FC-902/FCV-901R incl 2m/6m **£799**
 - Yaesu FT-102 **£375**
 - Yaesu FT-101Z **£299**
 - 2 x Icom IC-765 VGC from **£1300**
 - Kenwood TS-520 **£200**
 - Kenwood TS-930 vgc **£750**
 - Kenwood TS-120S **£TEL**
 - JST-125 **£575**
 - FL-21002 HF linear **£495**
 - Kenwood TS-830M **£TEL**

- MOBILE/BASE VHF/UHF TRANSCEIVERS**
- Kenwood TS-711E + SP430 boxed **£TEL**
 - Alinco DR-112 + book/microphone **£115**
 - Navico AMR-1000 2m mobile **£160**
 - Yaesu FT-480R boxed **£250**
 - Icom IC-239 - boxed **£199**
 - Icom IC-2900 **£300**
 - Yaesu FT-230 **£175**
 - Yaesu FT-290R11 boxed **£325**
 - Yaesu FL-2025 **£99**
 - Kenwood TR-9130 **£275**
 - Trio TS-770E **£TEL**
 - TR-9000 + mic/book/lead **£275**
 - TM-401A boxed (10 watt output) **£175**
 - IC-821H immaculate condition **£TEL**
 - AKD-6001 boxed **£100**

- RECEIVERS/SCANNERS**
- Yupiter MVT-9000 - mint condition **£TEL**
 - Yaesu FRG-8800 + FRT-7700 **£499**
 - Drake R-8E - vgc **£650**
 - Icom IC-R71E boxed **£599**
 - Regency MX-7000 **£TEL**
 - Lowe HF-225 **£299**
 - Icom IC-R100 - mint condition **£275**
 - Yaesu FRG-7700M + ATU **£325**
 - Realistic DX-394 **£TEL**
 - Icom IC-R7000 + book **£TEL**
 - Roberts R-600 **£TEL**
 - Roberts R-876 **£85**
 - Kenwood R-5000 **£TEL**
 - AOR AR8000 **£210**
 - Icom IC-R7100 + book **£800**
 - Realistic PRO-59 **£75**
 - Sony CRF-V21 top of the range cvr £3000 new **£1000**

- MISCELLANEOUS**
- Codemaster CWR418E data decode terminal **£75**
 - Diamond SX400 VHF/UHF 200W power/SWR meter **£59**
 - Diawa AP606K active audio filter **£75**
 - Diawa DK210 keyer compact external keyer **£75**
 - Diawa LA-2035 2m 2.5-30W compact PA with SSE **£39**
 - Icom AG25 2m masthead preamp **£89**
 - MFI-127B packet (TNC-2) terminal **£55**
 - Microset R432-90 90W 70cm amplifier **£199**
 - Microwave modules 30W 70cm amplifier **£95**
 - Opto 3300 Hand-held frequency counter with case **£95**
 - Scopex 456 6MHz oscilloscope as new **£65**
 - QRM eliminator filter unit **£50**
 - Spectrum TRC8-10 10m to 6m transverter **£155**
 - Tokyo HX240 2m to HF transverter 2/10W in 50W out **£145**
 - Wels SP400 130-500MHz 150W power/SWR meter **£85**
 - Yaesu FT700 Heavy duty 20A matching PSU **£95**
 - Yaesu GS00A Elevation unit **£165**

- HANDHELDS**
- Alinco DJ-G5 Dualband Handheld - boxed **£180**
 - Icom IC-4E **£115**
 - Kenwood TH-27 - boxed **£125**
 - IC-V2E + extras **£150**
 - IC-X21E7 + CTCSS fitted **£225**
 - Yaesu FT-23R boxed **£110**

- MISC.**
- AT-230 - box **£175**
 - MFI-784 boxed **£175**
 - VC-3000DLP boxed **£99**
 - MML 144-1000s linear **£95**
 - Datong D-70 **£TEL**
 - CAP Co SPC-300 ATU boxed **£150**
 - Yaesu SP-901 speaker **£30**

SHORTWAVE SHOP 01202 490099

- HF TRANSCEIVERS**
- Icom IC706 HF/6M & 2M Mobile M/Mode **£395**
 - Indes QRP PLUS Compact SW all band HF **£300**
 - Trio TS830M HF with Valved PA **£275**
 - Yaesu FT747GX Basic Spec HF 100W all band **£395**
 - Yaesu FT747GX HF 100W all band with FM **£375**
 - Yaesu FT77 Compact HF with FM board **£325**

- ATUs**
- Diawa CNA1001 external auto ATU with fine tune **£145**
 - MFI-956 SW/MW/LW Receive ATU **£30**

- VHF/UHF**
- Icom IC229E Compact 2m mobile 25W **£179**
 - Icom IC-PAET 7Compact fully featured 70cms v/h **£125**
 - Icom IC02E 2m hand-held display & keypad **£95**
 - Iret PRC-638 30-80MHz FM 4W 25KHz Spacing **£175**
 - Kenwood TM751E 2M Multimode Mobile 25W **£395**
 - Trio TR9130 2M Mobile Multimode 25W **£295**
 - Yaesu FT480R 2M Multimode Base 10W **£225**
 - Yaesu FT290R - 2m multimode mobile 2.5W good cond **£175**
 - Yaesu FT290R11 - 2M M/Mode mobile bracket & amp **£395**

- RECEIVERS**
- Drake SW8 HF Gen Cov Rt with VHF airband **£399**
 - Grundig Satellit 650 Large gen cov Rts with FM broadcast **£195**
 - Healthtr SB301 HF ham band receiver (valved) **£75**
 - Icom IC-R70 HF gen cov Rts with PBT & notch **£495**
 - Lowe HF125 HF Gen Cov RX Adjustable Filters **£195**
 - Lowe HF225 HF Gen Cov RX Adjustable Filters **£325**
 - Realistic DX200 HF gen cov Rts with BFO **£75**
 - Trio JR500S Ham Band HF receiver VGC **£85**
 - Yaesu FR8800 HF pec cov Rts with VHF module **£85**
 - Yaesu FR7700 HF gen cov Rts with memory unit **£275**
 - Yaesu FR101 HF ham band only Rts **£100**

- SCANNERS**
- Icom IC-R7000 quality wideband multimode Rts **£575**
 - Lowe PS10 10 ch h-held marine scanner **£75**
 - Realistic PRO38 10 ch VHF/UHF FM scanner **£65**
 - Yaesu FRG-9600 base station/mobile wideband scanner **£295**
 - Yupiter MVT-125M compact VHF airband only scanner **£125**

- MISCELLANEOUS**
- Codemaster CWR418E data decode terminal **£75**
 - Diamond SX400 VHF/UHF 200W power/SWR meter **£59**
 - Diawa AP606K active audio filter **£75**
 - Diawa DK210 keyer compact external keyer **£75**
 - Diawa LA-2035 2m 2.5-30W compact PA with SSE **£39**
 - Icom AG25 2m masthead preamp **£89**
 - MFI-127B packet (TNC-2) terminal **£55**
 - Microset R432-90 90W 70cm amplifier **£199**
 - Microwave modules 30W 70cm amplifier **£95**
 - Opto 3300 Hand-held frequency counter with case **£95**
 - Scopex 456 6MHz oscilloscope as new **£65**
 - QRM eliminator filter unit **£50**
 - Spectrum TRC8-10 10m to 6m transverter **£155**
 - Tokyo HX240 2m to HF transverter 2/10W in 50W out **£145**
 - Wels SP400 130-500MHz 150W power/SWR meter **£85**
 - Yaesu FT700 Heavy duty 20A matching PSU **£95**
 - Yaesu GS00A Elevation unit **£165**

Visit our WEBSITE!
<http://www.shortwave.co.uk> For latest updates...

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.

PHOTO ACOUSTICS 01908 610625

- HF TRANSCEIVERS**
- Icom IC-761 100W General Coverage transceiver with built-in auto ATU and PSU **£999.00**
 - Icom IC-756 (SUPERB) 100W HF General coverage + 6M + VDU + DSP All Mode Still has 18 months warranty **£1250.00**
 - JRC JST-135 100W HF General Coverage transceiver ALL MODE fitted with BWC (Variable Bandwidth Control) and PSU (MINT) **£899.00**
 - Trio TS-770E 2m/70cm multimode base station 10W on both bands. Mains powered **£399.00**
 - Yaesu FT-736R Fitted with 2m/70cm & 6m (excl cond) **£899.00**
 - Kenwood TH-75E 2m/70cm hand-held CW carper, nicad & aerial **£199.00**

- SHORTWAVE & SCANNING RECEIVERS**
- HF-150 general coverage receiver **£249.00**
 - Icom IC-R7100 Wideband HF/VHF/UHF Receiver ALL MODE (SUPERB) **£629.00**
 - AOR-7030 General Coverage receiver ALL MODE (SUPERB RECEIVER) **£549.00**
 - Icom IC-R7000 Wideband HF/VHF/UHF receiver ALL MODE, built-in PSU **£499.00**
 - Yaesu FRG-100 General coverage receiver (MINT COND) with PSU **£349.00**
 - Trio R600 General coverage receiver. (Ideal starter rig) **£199.00**
 - NRD-535 General coverage receiver. (AS NEW). Top of the range receiver **£699.00**
 - Icom IC-R71E General coverage receiver, built-in PSU. (SUPERB UNIT) **£479.00**
 - Kenwood R5000 General coverage receiver fitted with VHF unit (ALL MODE). C/W box & manuals **£649.00**
 - AOR-3000 Wideband receiver, ALL MODE, computer controllable **£429.00**
 - Realistic DX-394 General coverage receiver, ALL MODE **£99.00**
 - Yupiter VT-125M Airband handheld receiver (EXCELLENT RECEIVER) **£109.00**
 - Nevada MS-1000 Wideband receiver AM/FM/WFM (Mobile/Desk) **£179.00**

- VHF/UHF TRANSCEIVERS**
- Yaesu FT-290R11 2M Multimode c/w matching 25W linear, carry case box & manual **£439.00**
 - Yaesu FT-290R12 2M Multimode **£375.00**
 - Yaesu FT-290R1 2M Multimode **£239.00**
 - Yaesu FT-4700 2M/70cms mobile **£279.00**
 - Kenwood TM-431E 70cms mobile **£239.00**
 - Kenwood TM-701E 2M/70cms mobile **£299.00**
 - Kenwood TM-411E 70cms mobile **£189.00**
 - Alinco DJ-580E 2m/70cms handheld, wideband receive **£199.00**
 - Alinco DJ-F1E 2M handheld **£149.00**
 - Alinco DJ-180E 2M handheld (AS NEW) **£139.00**
 - Kenwood TH-215E 2M Handheld c/w speaker mic **£129.00**
 - Kenwood TH-28E 2M handheld c/w speaker mic, case **£129.00**
 - Trio TR-9000 2M Multimode 10W **£199.00**

- ACCESSORIES**
- 200W Dummy Load **£69.00**
 - LAR VHF ATU **£39.00**
 - Datong FL-3 Filter **£95.00**

MULTICOMM 2000 01480 406770

- HF TRANSCEIVERS**
- CORSAIR GREAT CONDITION **£399**
 - ICOM IC-725 AS NEW **£479**
 - ICOM IC-735 (BOXED) **£499**
 - ICOM IC-737A (BOXED) AS NEW **£469**
 - ICOM IC-737A (BOXED) AS NEW **£699**
 - ICOM IC-737A (BOXED) AS NEW **£725**
 - ICOM IC-738 AS NEW **£799**
 - KENWOOD TS-680S HF + 6-MTRS **£499**
 - KENWOOD TS-180S GOOD CONDITION **£325**
 - KENWOOD TS-680S HF + 6-MTRS **£525**
 - KENWOOD TS-850SAT AVERAGE CONDITION **£699**
 - KENWOOD TS-850SAT (BOXED) **£769**
 - KENWOOD TS-850SAT USED ON RX ONLY **£799**
 - KENWOOD TS-940S AS NEW **£725**
 - KENWOOD TS-950D (BOXED) AS NEW **£1,399**
 - TENTEC CORSAIR II AS NEW **£499**
 - YAESU FT-101ZD MK-III **£799**
 - YAESU FT-1676X AS NEW 3-MODULES **£999**
 - YAESU FT-980 HF TRANSCEIVER GREAT COND **£999**
 - YAESU FT-980 HF TRANSCEIVER GREAT COND **£625**
 - YAESU FT-990 (BOXED) AS NEW **£395**

- VHF/UHF TRANSCEIVERS**
- ADI AD-200 NEW UNUSED **£125**
 - ICOM IC-211E 2-MTR. MULTIMODE BASE **£269**
 - ICOM ICU-16T 70CMS HANDHELD AS NEW **£110**
 - ICOM ICW-21-ET DUAL BAND HANDIE **£199**
 - KENPRO KT-22 3-METER HAND HELD **£70**
 - KENPRO KT-22 3-METER HAND HELD **£70**
 - KENWOOD TH-25E 2-MTR. HANDHELD **£99**
 - KENWOOD TH-28E HAND HELD **£115**
 - KENWOOD TH-48E AS NEW **£119**
 - KENWOOD TM-2550A MOBILE 70-WATTS STANDARD C-508 (EX-DEMO) **£199**
 - TRIO TS-700G GREAT 2-MTR. MULTIMODE **£395**
 - YAESU FT-290 MK-1 (BOXED) **£189**
 - YAESU FT-290 MK-1 (BOXED) **£180**
 - YAESU FT-50R (6-WEEKS OLD) **£185**
 - YAESU FT-690 MK II 6-MTRS + 10W LINEAR **£330**
 - YAESU FT-726 2-MTR. TRIBAND MULTIMODE **£335**
 - YAESU FT-726 270VHF/SAT **£550**
 - YAESU FT-7676X 3-MODULES AS NEW **£999**

- ACCESSORIES**
- 12-AMP PSU **£40**
 - ALINCO 2-MTR LINEAR 3W IN 50W OUT UNUSED **£29**
 - BINOS LP144 / 3 / 50 LINEAR **£90**
 - B-NOS LPA 144/25/180 LINEAR **£149**
 - DAIWA CNW-419 50WATT ATU **£169**
 - DATONG FL-3 AUDIO FILTER **£65**
 - DAVIS PERCEPTION II (WEATHER STATION) **£110**
 - HOKA CODE 3 V3 + OPTIONS **£299**
 - HOKA CODE 3 V3 + ALL OPTIONS **£499**
 - ICOM AT-100 AUTO ATU MINT **£145**
 - ICOM HEADPHONES **£39**
 - ICOM HS-51 HEADSET/MIC **£79**
 - ICOM PS-15 20-AMP PSU **£70**
 - ICOM RC-12 REMOTE **£35**
 - ICOM RM-3 REMOTE **£69**
 - ICOM SP-3 SPEAKER **£60**
 - JPS NTR-1 DSP FILTER (EX-DEMO) **£110**
 - KENWOOD HMC-2 SPEAKER MIC **£12**
 - KENWOOD MC-80 MICROPHONE **£50**
 - KENWOOD SMC-31 SPEAKER MIC **£15**
 - KENWOOD SMC-34 SPEAKER MIC **£15**
 - MFI-247 HF ANTENNA ANALYSER **£99**
 - MFI-948 300W ATU (EX-DISPLAY) **£59**
 - MIZUHO AX-1 6-WAY ANTENNA SWITCH **£25**
 - OPTO SCOUT (BOXED) **£229**
 - OPTO SCOUT (BOXED) **£229**
 - OSCAR HF SWR/PWR METER **£25**
 - SEM QRM ELIMINATOR **£39**
 - TELEREADER RTTY CW DECODER **£39**
 - TOKYO HX-240 144-HF TRANSVERTER **£95**
 - TV-1000 RTTY DECODER **£35**
 - VARIOUS FILTERS from **£20**
 - WATSON WAT-2 RX ATU **£35**
 - WATSON 10-AMP PSU **£40**
 - WATSON MORSE KEY (BASIC) **£10**
 - YAESU FRT-7700 ATU **£50**
 - YAESU FRV-7700 VHF CONVERTER **£55**
 - YAESU SP-901 SPEAKER **£39**
 - YAESU YH-2 HEAD-SET **£15**

PLEASE MENTION TRADERS' TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!

UK's Premier Service Centre

12.5kHz CONVERSIONS

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

SERVICE

Rig problems? You'll want to know that when things go wrong, they're put right - back to the way the manufacturer specifies, and back to the way the rig worked when new. Castle Electronics has been servicing rigs for years; is trusted by some of the largest names in the industry to put their equipment into good shape, and can be trusted by you to make your station operational in the best and most efficient way. Make Castle your first stop for service!

KENWOOD YAESU ICOM 

Castle Electronics

Unit 20, Halfpenny Green Airport
Bobbington, Nr Stourbridge
West Midlands DY7 5DY

Tel: (01384) 221036

Fax: (01384) 221037

Geoff G4AQU - John G6VJC



service
showroom
finance terms
mail order
part exchange

PHONE 0181 684 1166 **LANGREX SUPPLIES LTD** FAX 0181 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 6.00	KT66 China 10.00	524GT 3.00	6V6G 8.00
CL33 10.00	KT88 China 12.00	6A05 2.00	6V6GT 4.00
688CC 2.50	N78 8.00	6AR5 20.00	6X4 3.00
E180F 3.50	OA2 3.00	6A57G 7.50	6X5GT 3.00
E810F 20.00	OB2 3.00	6AUSGT 4.00	12A7T 3.00
EABC60 2.00	OC3 3.00	6AU6 2.00	12AU7 3.50
EB91 1.50	OD3 -3.00	6AW8A 4.00	12AX7 5.00
EBF80 1.50	PCF80 2.00	6B4G 22.00	12AX7A 7.50
EBF89 1.50	PCL82 2.00	6BA6 1.50	12AX7WA 6.00
EBL31 15.00	PCLB5/805 2.50	6BE6 1.50	12BA6 2.00
ECC33 12.00	PCL86 2.50	6BM6 2.00	12BE6 2.00
ECC35 12.00	PD500 6.00	6BQ7A 2.00	12BH7/A 10.00
ECC81 3.00	PL36 3.00	6BR7 4.00	12BY7A 7.00
ECC82 3.50	PL81 2.00	6BR6 4.00	12DW7 15.00
ECC83 5.00	PL50A 3.00	6BW6 4.00	12E1 10.00
ECC85 3.50	PL50B 3.00	6BW7 3.00	13E1 85.00
ECC88 6.00	PL509/519 10.00	6BZ6 3.00	57ZB 95.00
ECC808 15.00	PL802 4.00	6C4 2.00	805 45.00
ECF80 1.50	PY500A 3.00	6CB6A 3.00	807 7.50
ECM35 3.50	PY800/801 1.50	6CD6G 5.00	811A 25.00
ECM42 3.50	QQV02-6 12.00	6CL6 3.00	812A 55.00
ECM81 3.00	QQV03-10 5.00	6CG7 7.50	813 27.50
ECL82 3.50	QQV03-20A 10.00	6CH6 3.00	833A 85.00
ECL86 3.50	QQV06-40A 12.00	6CWA 6.00	856A 20.00
ECL800 25.00	U19 6.00	6D05 17.50	872A 30.00
EF37A 3.50	UABC80 1.50	6D06B 10.00	921A 25.00
EF39 2.75	UCH42 5.90	6F6G 6.00	2050A 12.50
EF40 4.00	UCL82 2.00	6F07 7.50	5751 6.00
EF86 10.00	UCL83 2.00	6GK6 4.00	5763 6.00
EF91 2.00	UF89 4.00	6J5G 6.00	5814A 5.00
EF183/4 2.00	UL41 12.00	6J5M 4.00	5842 12.00
EL33 15.00	UL84 3.00	6J7 3.00	6072A 6.00
EL34 8.00	UY41 4.00	6JB6A 27.50	6080 6.00
EL34G 6.00	UY85 2.00	6J6C 27.50	6146B 15.00
EL35 5.00	VR105/30 3.00	6J5SC 27.50	6201 8.50
EL41 3.50	VR150/30 3.00	6K6GT 4.00	6336A 35.00
EL84 2.25	Z759 10.00	6L6G 15.00	6550A 25.00
EL95 2.00	Z803U 15.00	6L6CC 15.00	6883B 15.00
EL360 15.00	2D21 3.50	6L6WGB 10.00	7025 7.50
EL509/519 12.00	3B28 12.00	607 3.00	7027A 25.00
EM34 15.00	4CX250B 45.00	6SA7 3.00	7199 15.00
EM611/4/7 4.00	5R4GY 7.50	6SC7 3.00	7360 25.00
EN91 7.50	5J4G 10.00	6S07 3.00	7581A 15.00
E280/81 3.50	5U4GB 10.00	6S37 3.00	7586 15.00
G232 8.50	5V4G 4.00	6SK7 3.00	7587 20.00
G233/37 6.00	5Y3GT 2.50	6SL7GT 5.00	
KT61 15.00	5Z3 5.00	6SN7GT 5.00	
	5Z4G 6.00	6UBA 1.50	

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 CWD/ 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

ESSEX SHORTWAVE SERVICES

8AM TELEPHONE NUMBER: 01268 475614 8PM
VISITS BY APPOINTMENT ONLY

AOR AR2000 £125.00	ICOM IC-R10 £195.00	LOWE HF-125 £250.00	TARGET HF-3 £99.00
AOR AR3000A (New) £685.00	ICOM IC-R72 £495.00	LOWE HF-150 £250.00	WELZ WS1000E £150.00
AOR AR5000 (New) £1155.00	ICOM IC-R72 (New) £595.00	LOWE PR-150 £125.00	YAESU FRG-7 £150.00
AOR AR5000+3 (New) £1375.00	ICOM IC-R8500 £1450.00	NRD 535 £899.00	YAESU FRG-100 £350.00
AOR AR7030 (New) £675.00	ICOM PC-R1000 £299.00	NRD 545 £1599.00	YAESU FRG-8800 £265.00
AOR AR8000 £225.00	ICOM PC-R1000 with DSP £360.00	REALISTIC PRO-2006 £150.00	YUPI TERU MVT-7100 £165.00
AOR AR8200 (New) £365.00	KENWOOD R-5000 £550.00	REALISTIC PRO-2035 £140.00	YUPI TERU MVT-7200 £195.00
FAIRMATE HP-2000 £125.00		SONY ICF-SWE1 £65.00	YUPI TERU MVT-9000 £265.00

RING 01268 475614 FOR YOUR SPECIAL DEAL
RECEIVERS AND SCANNERS WANTED. TOP PRICES PAID.

Best prices.
Personal service.

Sales
Repairs
Accessories

TROUBLE FINDING PW EACH MONTH

We need to know if any of you are having problems obtaining *Practical Wireless*. If you can't find a regular outlet, then let us know. Please contact Donna Vincent, Distribution Complaints by telephone (01202) 659910, FAX: (01202) 659950, E-mail: dist-com@pwpublishing.ltd.uk or by letter to: Distribution Complaints, PW Publishing Ltd., Arrowsmith Court Station Approach, Broadstone, Dorset BH18 8PW.

WE CAN HELP YOU IF YOU KEEP US INFORMED.

You can always place a regular order with your local newsagent. To help make this easier, please fill in and cut out the coupon on this page.

Dear Newsagent, Distributed by Seymour
please reserve/deliver my monthly copy of *Practical Wireless*

Name.....

Address.....

Postcode.....

Signed.....



RadioScene

VHF REPORT

REPORTS & INFORMATION BY
THE LAST SATURDAY OF EACH
MONTH.

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

TEL: (01873) 860679

E-MAIL: butlerd2@boat.bt.com

Packet Radio @ GB7MAD

UK DX Cluster @ GB7DXC

THIS MONTH DAVID BUTLER
G4ASR TAKES A LOOK AT YOUR
LETTERS AND HAS REPORTS OF
TREMENDOUS SPORADIC-E
OPENINGS ON THE VHF
BANDS.

There was DX galore on the 50, 70 and 144MHz bands during June. I've reports of Sporadic-E (Sp-E) openings to the Middle East, Asia and Africa and surprisingly these were on the 144MHz band! On the 70MHz band the first two-way contacts have been made with Slovenia (S5) and on the 50MHz band there were brief transatlantic openings to South America, North America and the Caribbean area.

Those of you who have been reading this column for a number of years will recall that

Some antennas at the QTH of David Butler G4ASR. Can you can spot the 6-element 70MHz Yagi!



I always reckon that the Tuesday after the first weekend in June is invariably good for Sp-E propagation on the 144MHz band. To put some faith to my assertion the first reported 144MHz Sp-E opening of the season occurred on Tuesday June 3 and what an opening it was.

This was no single-hop event to middle Europe but the 'full monty' to Greece (SV), Crete (SV9) and Israel (4X)! Yes, I am talking about the band where the casual operator thinks all 'traffic' is made via an f.m. repeater and anything over 100km is DX. This was on the 144MHz band and many of the contacts were up to 3600km away!

The first of a series of openings started around 1110UTC with PA0PVW first hearing a 4X station operating with c.w. on 144.298MHz. Stations in DL, ON and PA then had brief openings for the next two and a half hours to Malta (9H) and to the expedition station SV9/DC9KZ on the island of Crete. Around 1215UTC the Sp-E opening extended into south-east England with stations (mainly in IO91 and JO01) working SV1OH (KM18), SV7ADJ (KN20) and SV9/DC9KZ (KM35).

The real DX though was provided by the stations of 4X4MO (KM72), 4Z5B5 (KM71) and other Israelis who were worked on s.s.b. between 1241-1244UTC. Later on, around 1330UTC, another event saw stations in northern England (IO93/94) working into Bulgaria (LZ) and Romania (YO).

According to David Dibley G4RKG (IO91) the station of G4FUF (JO01) contacted three 4X stations, although nothing was heard of them at his QTH. David did manage to work SV9/DC9KZ at 2800km and heard SV7ADJ (KN20). He mentions that the SV9 station was heard calling CQ for some time without getting many replies, suggesting that the footprint in the UK was very localised.

Neil Whiting G4BRK (IO91), located near Swindon, didn't hear anyone to the north or west of his QTH calling the DX, so

he thinks he was around the limit of the propagation. Neil reports that SV9/DC9KZ was audible for 10 minutes and peaked to 59 for about 30 seconds.

Neil was very pleased to contact the SV9/DC9KZ expedition station as the 2866km contact was his furthest ever on the 144MHz band. He also heard an SV1 station earlier but signals were too weak to identify the full call sign.

Geoff Grayer G3NAQ (IO91) made two contacts with the SV9 station as he heard the expedition group calling for some time without getting a reply. Geoff was only running 60W output and received an S9+ report showing that the path loss can be very low during Sp-E openings.

Geoff reckons that the propagation from SV9 was a double E-layer refraction with a chordal-hop between the two reflection points. He supports this theory as the distance involved is too short for conventional two-hop Sp-E.

Chordal hops are shorter than those involving a ground reflection and they allow propagation above the normal maximum usable frequency (m.u.f.). He didn't hear any single-hop contacts being made to highly populated areas in northern Italy where one would expect the intermediate ground reflection point to be. Finally Geoff states that the 4X4 stations (around 3500km away) were definitely well above the single-hop distance associated with Sp-E propagation.

Other Sp-E openings on the 144MHz band occurred on June 5, 6, 11, 12 and 18, although most of these were of very short duration existing for only a few minutes. The exception to this though was the event on June 11 which lasted for well over two hours and was quite widespread throughout much of England and Wales.

Turning first to the opening on June 5. This occurred between 1440-1450UTC with only the stations of I8MPO (JN70) and IT9IPQ/9 (JM78) being reported in southern England. A short opening on the following day, June 6, occurred around 1600UTC and saw contacts being made by stations on the south coast and the Channel Islands into Malta (9H) and Sicily (IT9).

The Sp-E opening on June

11 was however considerably better. It was first reported in western Europe around 1800UTC with stations in DL, HB9, ON and PA working DX such as EA7GTF in southern Spain, EA9CW in Ceuta, north Africa and 7X2DS in Algeria, also in north Africa.

A few minutes later the opening spread into the Channel Islands, southern England and south Wales with the s.s.b. stations of CN81HB (Morocco), EA9MH (IM85) and EA7/G4XEN (IM87) being much in demand. This opening lasted for nearly one hour, fading out just before 1900UTC. At this point during a Sp-E opening it's very easy to fall into the trap of thinking that the opening has finished.

Quite often, as was the case with the Sp-E opening event, the m.u.f. rises and falls during the period of E-layer enhancement and the band will open up on a number of discrete occasions. The next such event commenced at 1915UTC and lasted for approximately 25 minutes.

The station of EA9MH and stations from southern Spain (IM66, IM67, IM77) were heard working into central England (IO82, IO92) at this time. One station, EB9DZP (IM66) was even heard using f.m. on 144.320MHz! A number of stations located to the east of the country (JO01, JO02) found that they had propagation into Portugal, contacts on s.s.b. being made with CT1GCO (IM57), CT2GF and CT4QP (IM59).

Further openings on the 144MHz band also took place between 1955-2005UTC and 2020-2040UTC. The Sp-E 'cloud' was relatively static and contacts were again made into CT and EA. In the latter opening, stations situated as far north as IO93 were able to make contacts into these countries.

On the following day, between 2025-2032UTC, there was an opening from southern England to EA9IB (IM85). On June 18 around 1310UTC a few stations in south-east England managed to contact IW9ERJ/H9 (JM56) operating from the island of Partellera, mid-way between Sicily and Tunisia.

SLOVENIAN FIRSTS

Excellent news has been reported following the release of the 70MHz band on June 13 to Slovenian Radio Amateurs. Last month I posed the question "Who will be the first UK operator to work S5 on the 70MHz band?". Well the answer to that is David Wickens G6WZA (IO80) who made the first G-S5 contact at 1329UTC on June 18.

David reports that he was

RadioScene

In the shack 'fiddling about' when he decided to listen to the 70MHz band having heard good activity on lower frequencies. Almost immediately he heard an s.s.b. station on 70.200MHz. The callsign sounded odd but after a few seconds he identified the station as S57A (JN65).

So, David called S57A and was rewarded with the first two-way contact between both countries. David mentions that he uses a Yaesu FT-290R driving a Spectrum Communications transverter and a 25W Spectrum amplifier into a home-made 4-element Yagi.

A few minutes later, at 1335UTC, **Bill McDowell GW6ZMN** (IO81) achieved the second contact with Slovenia. Bill had actually tried to make contact on the previous day having heard S57A calling on the 50MHz band for tests on 70MHz. At that time S57A could hear UK beacons on the 70MHz band but no other activity. (Maybe one of the penalties of locating beacons away from the centre of amateur activity.)

Around 1230UTC on June 18 GW6ZMN heard S57A calling on the 50MHz band and attempted a test on 70.200MHz. Nothing was heard at this time but approximately one hour later the station of S57A was heard on the s.s.b. calling frequency and the first GW-S5 contact was established.

Bill mentions that he uses a Yaesu FT-706 transceiver (at 144MHz) driving a 25W **R.N. Electronics** transverter into an 80W Pye A200 solid-state amplifier. The antenna he uses is a Sandpiper dual-band Yagi, 3-elements on 50MHz and 4-elements on the 70MHz band.

Interestingly both G6WZA or GW6ZMN were totally oblivious to the fact that they had made the first contacts with S5 until I telephoned them for these reports. Congratulations to both stations for making these excellent contacts.

Further s.s.b. contacts by S57A included G0IUE (IO91) at 1338UTC, E17GL (the first EI-S5 contact) at 1340UTC, G3NAQ (IO91) at 1342UTC and G4YTL (IO91) at 1343UTC. **Derek Thom G3NKS** (IO81) was alerted by telephone to the opening at 1400UTC but although hearing nothing from S57A he did hear the new Slovenian beacon S56A.

The new personal Slovenian beacon, nominally on 70.030MHz, (70.0293MHz

at G3NKS) was peaking 559 at 1415UTC and faded out at 1500UTC. The beacon owner, Mario S56A, reports that it runs 1W output into a 2-element Yagi beaming towards the UK.

Boris Celik S57A reports in an E-mail that he is only running 5W output from a home-made 28/70MHz transverter and a 4-element Yagi made from a modified TV antenna. At his QTH there is a cable television system and there are plenty of surplus antennas that can be used as 70MHz beams. For those that want to QSL direct his address is **Grcna 81, 5000 Nova Gorica, Slovenia**.

On the following day, from 0850UTC on June 19, John GW3MHW was hearing signals via Sp-E propagation right up to the low frequency end (88MHz) of the f.m. broadcast band. He then set up his c.w. transmitter for automatic CQ calls with spaces for receiving. At 1105UTC John was answered by S57A with 559 signals being exchanged.

After the contact was completed further c.w. QSOs by S57A were made with the stations of G3NKS (IO81), G3VWH (IO82), G3LVP (IO81) and G3IKR (IO82). The stations of S58J (alenka.jezersek@siol.net) and S59F (ivan.nanut@siol.net) are both looking for a second hand 70MHz transverter to enable them to be active on the band. If you can help then send them an e-mail. (N.B. It's usual for a contingent of S5-amateurs to attend the Weinheim v.h.f. convention in September so transportation/payment may not be much of a problem.)

THE 50MHZ BAND

With the risk of sounding repetitively boring I can again report that conditions on the 50MHz band have been excellent. During June (well I could say any month during the summer!) the band was open for long periods via Sp-E propagation to most European countries. Many European operators were unfortunately causing mutual interference on 50.110MHz, so for all of you without v.f.o.s I'll now report on the real DX that you may have missed elsewhere on the band!

Looking first to the West I can report that the transatlantic path between the UK and North America was open on at least six days during June. Although most openings were to the USA and Canada it was very

pleasing to note contacts being made with stations in Puerto Rico on two occasions.

The first of the 50MHz openings occurred on June 4 with the stations of KP4EIT (FK6B) and WP4O working CT1DNF at 1130UTC. A little over two hours later KP4EIT was heard by G3KOX (IO91), G4UPS (IO80) and other stations in southern England, GJ, GU and GW.

Jamie Ashford GW7SMV (IO81) contacted him at 1407UTC and reckons he may have been the first GW to do so during this new solar cycle. This opening was fairly brief but conditions were also quite good to South America later in the evening.

Several stations located in southern UK heard the Brazilian station PY5CC (GG54) calling CQ around 2045UTC. Although his signals were peaking S6 no contacts were made. Another chance to contact Puerto Rico came on June 24.

Jim Smith G0OFE (IO90) reports that KP4EIT was heard at his QTH between 1430-1515UTC although signals were weak for most of the time. Jim worked him at 1444UTC and thinks KP4EIT only contacted stations located in the south and south-east part of the UK. **Peter Taylor G8BCG** (ex-H44PT) heard the Puerto Rican station whilst he was mobile in Cornwall (IO70) but regretfully couldn't work him.

Transatlantic openings to North America via multi-hop Sp-E occurred on June 6, 10, 19 and 27. There may well have been more but these were the more significant events although most were fairly brief and geographically selective. Despite the opening on June 6 being of short duration the signals were very strong.

Darren Moody G0HVQ (IO81) for example heard VE1PZ (FN85) peaking 599 around 1330UTC over the 4300km path. Although I didn't receive any reports for an opening on June 10 the station of **Arnie Arnott VE1IW** (FN84) did hear the GB3MCB beacon located in Cornwall (IO70). It was copied quite strongly between 1800-1810UTC but despite many calls on 50.110MHz no contacts were made. (An interesting debating point is that if someone can hear a low power beacon elsewhere on the band why move to 50.110MHz which more often than not is occupied by local European stations. Why don't you call anywhere and operators will find you?)

On June 19 the band opened up late in the evening (as normally would be the case for the UK-USA path via Sp-E). At 2210UTC the station of VE1YX was heard in Jersey and

a few minutes later propagation moved into southern England.

Although the 50MHz band wasn't open to North America from the UK on June 23 a number of USA stations did work into central Europe. The station of WT8R reported c.w. contacts with DJ3TF, OK1DDO and SP6GZZ between 1530-1600UTC. Probably the best transatlantic event of the month occurred on June 27.

Bob Mobile WA1OUB (FN43) worked 9 European countries, CT, DL, EA, EI, G (11 stations), GD, GM (3 stations), GW (2 stations) and PA between 2110-2320UTC. His best DX was DL7AV (JN58) at 6185 kilometres.

Now I'll take a look at openings in a southerly direction into deepest Africa. Again, I may not have captured all of the events but the following should give you a good idea of what passed you by!

The station of 9G1BJ (IJ99) in Ghana had excellent propagation into the UK on June 5 between 1800-1845UTC. His list included G3FPQ G3KOX, G3WOS and G4CCZ (all in IO91), G4FUF (JO01) and many more throughout much of England. Conditions on June 7 were particularly good with the stations of TR8CA and TR8XX (Gabon) putting very strong signals into the southern part of England from 0720UTC.

Neil Carr G0JHC reports that by 0800UTC the propagation had extended further north to his QTH (IO83) and he was able to work the station of TR8XX. A few hours later, just before 1100UTC, 9G1BJ was heard working stations in IO91/JO01 and in the afternoon at 1644UTC the station of 3C5I (Equatorial Guinea) gave **Geoff Brown GJ4ICD** (IN89) country no.163 on the 50MHz band.

Alan Isaachsen 3C5I also had two openings into the UK on June 14, the first at 0830UTC and another later in the day between 1820-1850UTC. Some of the stations known to have contacted 3C5I included G3NVO (first G station), G0JHC, G3FPQ, G3OIL, G3WOS, G4CCZ, G4HBA, G4IGO, GW4EA1 and GW4LXO.

At the end of the month, on June 28, Ron 7Q7RM (Malawi) had a good opening throughout much of southern, central and northern England. He was heard between 1700-1730UTC as was the low power beacon 7Q7SIX (KH75) on 50.003MHz.

Finally, I'll point the beams towards the Middle-East (and beyond) and report on what's been heard from that direction. First up is news that A45ZN (Oman) had an opening into the UK on June 2 at 1130UTC and

contacted G3HBR (IO93) for his first G-station.

Later in the day, at 1600UTC, the station of UN3G (MN83), located by the Chinese border in Kazakhstan, worked G4HBA (IO80) and other stations. At the beginning of the month Erol TA7V (KN90) in Turkey reported that he had obtained a 50MHz permit and would be active between June 1 to September 31. He is using the 5-element Yagi left behind by the YM7PA expedition last year. By June 2 Erol had made 143 QSOs in 25 countries (but not the UK). However, **Geoff Crowley GM7SJC** did report working TA7V on June 27. Other DX stations worked from the UK during June included EK6AD (LN20), OD5RAK and OD5SB (Lebanon), IY4MB (Jordan), Omani 4L5O (LN21) host of the 4L6PA expedition to Georgia in 1996 and 4X4FR, 4X4IF/4X (KL79), 4X6ON and 4Z5JA (Israel).

ITALIAN PREFIXES

I get the distinct impression from your reports that some of you think that the different Italian prefixes count as separate DXCC countries. Let me make it quite clear that the like of IBO, IX1, IN3, IV3, IAS, IZ5, IL7 and IC8 although interesting as prefixes (and some are valid for the Islands On The Air award, IOTA) all count as Italy.

The island of Sicily (IT9) is NOT a separate DXCC country and neither are its associated islands, ID9, IE9, IF9, IG9 and IH9. What does count as a separate DXCC country is Sardinia (IS0) and its islands, IM0.

However, there is some justification to the confusion as Italian v.h.f. licensees (IW) in mainland Italy (JN61/JN63) and on the island of Sardinia (JM49/JN40) appear to use the same prefix. As evidence of this are the stations of IWOGDC (JN63, Italy) and IW0UIQ (JM49, Sardinia). Confused? I'm not surprised!

After I made some enquiries about the confusing Italian prefixes (on the UK Six Metre Group Web Page) Sergio IKOFTA came up with an explanation. He reports that all v.h.f. licensees on Sardinia use the series IW0UAA-IW0UZZ and that other series are used for the mainland (IW0) area. So, pay very careful attention to the callsign when working an IW0 station as you may actually be working a new DXCC country.

DEADLINES

Sorry I haven't mentioned everyone who sent in a report this time but I've run out of space again! Don't forget that in the next few months the 50MHz

band will be open to Southern Africa and South America via trans-equatorial propagation. Guaranteed!

Please let me know what you've been working. Forward any news, views, comments or photographs (especially) to the address and by the date given at the top of the column. A simple telephone call is all it takes.

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

73 David GAASR

HF FAR & WIDE

**LEIGHTON SMART GW0LBI,
33 NANT GWYN,
TRELEWIS,
MID-GLAMORGAN,
CF46 6DB,
WALES**

TEL: (01443) 411459 (9AM - 6PM)

LEIGHTON SAYS THAT YOUR REPORTS SHOW THAT 28MHZ IS STARTING TO LIVEN UP AT LAST!

Quite a few of our reporters have mentioned that the 28MHz band has been active this month, with a couple of new reporters sending in logs and comments. It seems that there is a general lack of occupancy on this very effective band; **Angie Sitton G0HGA** mentions that she has noticed that while the 27MHz CB frequencies are full of foreign signals, the 28MHz band appears to be dead flat, with no signals apparent at all!

I think your observations means just one thing Angie...the band is open, but there simply isn't anyone transmitting there! Incidentally, 28MHz has always been one of my favourite bands, because it's a band full of surprises when it opens and you never know what's going to be thrown up there.

Even now, when Sporadic-E (Sp-E) is the major form of propagation on 28MHz, bringing in stations from around a maximum of 3200km distant, now and then a real rarity will pop-up out of the blue.

I remember listening to the usual European stations via SP-E one summer, when suddenly up came a station from Zimbabwe at S7 signal strength! Whether this was due to 'F' layer

propagation or perhaps double-hop sporadic 'E' I don't know, but needless to say he must have worked every single European country in about 30 minutes!

The old adage 'If the band looks flat, put out a CQ' must surely apply here eh?

DX NEWS

Some DX snippets from the pages of the RSGB's *DX Newsheet* now. There's news that Dave K8MN will be on the air from Tanzania on 1.8 - 50MHz in late August for three years as he takes up a new post there. His callsign is not known as yet, but QSL via WA8JOC.

Keen slow scan TV (SSTV) enthusiasts should look out for Mac 6Y5MC in Jamaica who is regularly active with this mode (QSLs should be sent to WA4WTG). Also look out for Murtada 9K2MU in Kuwait who is also active with SSTV on 21 and 28MHz (QSLs for Murtada should go to WA4JTK).

In the Central African Republic Alex TL5A is now active on all bands, including 1.8MHz (QSLs should go via PA3DMH). In Antarctica, VK0TA has been transmitting from Davis Base, often on s.s.b. at 2315 on 14.122MHz.

Francesco IK0FVC says that the 1A0KM (Sovereign Military Order Of Malta) was indeed a 'pirate', and that he will announce any legitimate 1A0KM operations in advance in future.

Finally, Ted NH6YK will be active again in August as KH4/NH6YK while visiting his XYL who is stationed there. He'll be active on h.f. and 50MHz (QSLs to go to his home call address).

The *DX Newsheet* is a weekly up-to-date publication for h.f. enthusiasts edited by

Fig. 1: Jean-Michel Simonet 5N9NJM operates a mobile station in Nigeria, using a Hustler vertical antenna and 100W of s.s.b. and has been making many contacts all over Europe and beyond on the 14MHz band (see text).



Chris Page G4BUE, and is packed with information on up-and-coming DX operations. Details of subscriptions to *DX Newsheet* can be obtained from **RSGB Headquarters Lambda House, Cranbourne Road, Potters Bar, Hertfordshire EN6 3JE**.

PROPAGATION REPORT

On to the monthly Propagation Report from **Don McLean G3NOF** now. Don says: "The h.f. bands have been patchy over the past month, although strong Sp-E has been noted on all bands. As usual, 14MHz has been the most consistent, with north Americans heard from 1100 until the early hours with best conditions from 1700 onwards. South America came in at around 2000 onwards, with some Asian signals noted between 1500 and 1800UTC.

"On 18MHz, a few long-path signals from Australia and New Zealand were heard between 2200 and 2300, with Asian stations coming in from 0800 to 1700, although this varied on some days. North America came through from 1100 to the early hours, with some south Americans at their best from 2000 onwards. This band seemed to be at its best from 2200, and usually closed around 0100UTC.

"The short-path to Asia on 21MHz was sometimes open between 1500 and 1700, with a few African stations coming through between 1600 and 1800. North Americans were patchy between 1200 and 1800. The band closed at around 2200. On 28MHz, I have only heard a few signals from Africa and south America, mostly between 1400 and 1700, otherwise the band was poor for DX".

RadioScene

YOUR REPORTS

From your reports, most of our contributors seem to have been active on the higher bands of late. However, **Sean Gilbert G4UCJ** in Milton Keynes did a little operating on 7MHz and managed to work NP4Z (Puerto Rico) at 0122, T11C (Costa Rica) at 0144, and AZ4F (Argentina) at 0153, using 30W of c.w. from an Allinco DX-70 and a simple half-sized G5RV dipole.

THE 14MHZ BAND

A 'Letter from Africa' now! And on behalf of everyone involved with the column I give a warm 'HF Far & Wide' welcome to **Jean-Michel Simonet 5N9NJM**. Jean-Michel tells me that he operates a mobile station in Nigeria, using a Hustler vertical antenna (see Fig. 1) and 100W of s.s.b. has been making many contacts all over Europe and beyond on the 14MHz band.

Jean-Michel's report shows his contacts with IT9RZR (Italy), C21NJ (Nauru), HS1GUV

(Thailand), G0MPR, A71BY (Qatar), 4S7DA (Sri Lanka), LZ2PG (Bulgaria), 9H1AL (Malta), and ZD7IP (St. Helena Island). Jean-Michel says he'd like to ask PW readers to turn their beams towards Africa, as he'd be more than pleased to work a few of you, so get those antennas swung around!

Next we go the report from QRP enthusiast **Carl Mason GW0VSW** in Skewen, West Glamorgan, who has been bashing away with a mean 4W. Carl says he managed a total of 168 QRP contacts during the CQWW Contest in just 12 hours of operating.

Using the 4W of c.w. into a half-sized G5RV dipole, Carl's log shows contacts with DL/EA8CN (Canary Islands) at 0930, NP4FW (Puerto Rico) at 2146, CX9DX (Uruguay) at 2344, and OH8KTW (Finland) at 1110UTC. A switch to 4W of s.s.b. however, gave him contacts with ZB2AZ (Gibraltar), at 1014, CU2DX (Azores Islands) at 1905, and TF/DL6DQW/P (Iceland) at

2231UTC.

Still with QRP operation **Eric Masters G0KRT** in Worcester Park, Surrey offers a single 14MHz QRP contact in the form of DL1AXB, for a two-way low power contact, both using c.w.

Next on the 'active list' comes **Charlie Blake M0AIJ** of Milton Keynes, who as usual has been transmitting from both mobile and fixed stations this month. His mobile log shows 14MHz s.s.b. 5A1A (Libya) at 1000, TK/PA3GIO/P (Corsica Island) at 1103, GM0PNS on the Isle of Pabay at 1007, and XK3NJ commemorating the 125th anniversary of the Canadian Mounted Police.

Charlie's fixed station contacts on 14MHz include GM3VLB/M on the Isle of Skye, and EA6AEI (Balearic Islands) at 1417. Charlie says that he's lost a couple of rare contacts due to the bad behaviour of some amateurs, especially in 'pile-ups'.

What would have been a nice contact for Charlie, with JT1X in Mongolia, was made impossible by stations continuously calling the DX station even when there was a contact taking place. "This sort of thing has made me give the h.f. bands a bit of a rest"! he says.

Well, in reply Charlie, I'm sorry to say that every hobby includes some who refuse to show courtesy to others. The pity is that they spoil it for others in their 'quest' to get what they want. We can only hope that these people 'grow up' and use their equipment properly and show a bit of common courtesy to others on the bands. If we all did that, Amateur Radio would be an even better hobby than it is now wouldn't it?

Gripe over...and now back to the reports where I read that Don McLean G3NOF in Yeovil dug out some interesting stuff on 14MHz this month. His log shows s.s.b. contacts with FM5BH (Martinique Island) at 2309 QSL via F6HEQ, FG5FC (Guadeloupe) at 2226 QSL to F6DZU, YB0JWA (Indonesia) at 1501, Z21CS (Zimbabwe) at 1644, and 4S7SW (Sri Lanka) at 1741UTC (QSL via ON6TZ).

THE 18 & 21MHZ BANDS

A welcome to new reporter **Bev West GW0OSQ** in Pontypool in Gwent. In his first comments Bev tells me that 18 and 28MHz are his favourite bands at the moment.

Bev is a keen QRPer, and using a G5RV dipole and just 10W of s.s.b. on 18MHz, Bev hooked up with ES1QD/0 on the island of Muhu, JA9HDH (Japan), VO1XC (Newfoundland), BV5BG (Taiwan), and 5X1T (Uganda) during the daytime, while 2000

hours brought in BY5QE (China), as well as AP2AGJ (Pakistan) and JA1JRK for a second Japanese contact.

On the 21MHz band, we welcome another new reporter, **Andy Hosking 2E0APD** who has also been rather busy! Using just 3W of c.w. and a mobile whip antenna mounted on a balcony, Andy lists his contacts with K9FHJ (USA) at 2114, OK1DPB (Czech Republic) at 1003, PY2EXF (Brazil) at 1928, 4Z9AHI (Israel) at 2040, ZS1AAQ (South Africa) at 1604, KP4TNT (Puerto Rico) at 2108, and finally N4DR (USA) at 2126. "I hope this proves what can be done with low power when conditions are good" he says. Well, you said it Andy, well done!

Editorial comment:

Congratulations Andy...what an achievement. It just shows what can be done. And on behalf of the PW editorial team I congratulate you - we're all very pleased for you. G3XFD.

Back to Nigeria now, where Jean-Michel 5N9NJM reports mobile contacts on the 21MHz band with PA6V (Netherlands), VU2AVG (India), VQ9RU (Chagos Island), G4WXJ, G3EDM, and KH2RU (Guam).

Staying with 21MHz, s.s.b. 'mobileer' Charlie M0AIJ hooked-up with YCBVIP/QRP and YCOLBK (Indonesia) at around 1300, as well as YF7XND (East Malaysia) at 1440UTC.

Don G3NOF lists (amongst others), s.s.b. contacts with TUSDRI (Ivory Coast) at 1824 (QSL via PO Box 796, Daloa, Ivory Coast), VK8AN (Australia) at 1602, and 5N1ISC (Nigeria) at 1642UTC.

THE 28MHZ BAND

Up to 28MHz now, and over to Sean G4UCJ again, who reports 28MHz as being open quite a few times this past month. His log shows 30W c.w. contacts with OH0BCI (Aaland Island) at 1013, 5B4/RW3TJ (Cyprus) at 1103, PS7ZZ (Brazil) at 1937, and EA9AZ (Ceuta, north Africa) at 1103UTC.

Now over to a letter from **Joseph Tabone** in the island of Gozo, Malta GC (George Cross) who has been operating **9H4GRS**, the station of the Gozo Amateur radio Society. Joseph says that he's been working QRP side-band on 28MHz for quite some time, as he's very interested in QRP 'phone operation. Using around 5W, Joseph's log for May/June includes contacts with WP4DL (Puerto Rico), V515G (Namibia), WD4HXN (USA), ZD8T (Ascension Island), 9Q5TR (Zaire - now the Republic of Congo) all around 1700 - 1800, EX8MDA (Kyrgyzstan) at 1347, and 4S7BRG (Sri Lanka) at 1400UTC. Joseph is right when

LEIGHTON GW0LBI SAYS THAT THE 28MHZ BAND IS AT LAST LOOKING LIVELY!

PW LISTENING & OPERATING WATCH LIST

All Times in UTC

Charlie Blake M0AIJ listens and operates: 0500 - 0700 on 7.061MHz s.s.b. with an NRD 525 receiver & sloping wire antenna.

Steve Locke GW0SGL operates: 1100 - 1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940.

George Woods G3LPT (Suffolk) operates: an open net on 29.570MHz n.b.f.m. every weekday morning except Monday at 0930.

Don McLean G3NOF operates: 1030 Saturdays on 3.685MHz on the ISWL Net, or 1030 Sundays on the Yeovil Club Net 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

John Wheeler G0IUE monitors: 28.5MHz s.s.b. every evening between 1700 and 2200 regardless of conditions using an Icom IC-706 and a 2-element TET triband beam antenna.

Leighton Smart GW0LBI operates: Some weekday evenings at around 2100 - 2330 on 1.949MHz s.s.b. using a Yaesu FT-747 transceiver at 5/30W and a long wire Marconi antenna.

Rob Mannion G3XFD listens and operates: (weekdays & weekends) 1800 - 1830 on 3.7MHz 100W s.s.b., & 3.530MHz QRP c.w. using an Alinco DX-70 transceiver, home-brewed 'OXO' 500mW transmitters and other QRP equipment and a long wire antenna. Also at 2300 on either 3.530, 3.560 or 7.025MHz (c.w.) or 3.7MHz s.s.b. (All operation dependent on PW workload and travel commitments!).

Sean Gilbert G4UCJ operates: around 0700 to 1100 and 2100 to 0000 seven days a week on 7 and 14MHz using FT-307 and Alinco DX-70 transceivers at 5/25W output and a G5RV dipole antenna in the loft space.

T. Ibbitson G0VTI operates: each evening between 1900 - 2000 on or around 7.020MHz c.w., or 14.035MHz c.w. using a Ten-Tec Scout.

he says "Not bad for a 'dead' band eh?"

Back to Bev GW00SQ now, who says he uses a home-built cubical-quad antenna on 28MHz which cost him just £10 to make! Bev offers a single s.s.b. contact on 28MHz in the form of 5X1T (Uganda) with just 8W.

For his 28MHz log Carl GW0VSW also offers a single s.s.b. contact with 9K2ZZ (Kuwait) at 1755UTC.

Don G3NOF has been having a look at 28MHz this month, and with his 3-element beam antenna he hooked up with CP6EB (Bolivia) at 1605, ZD7VC (St. Helena Island) at 1800, 7Q7DX (Malawi) at 1801UTC, and 9Q5TR (Congo) (QSL via 4Z5DP).

Looks like 28MHz is starting to come alive, albeit rather quietly! Let's hope that the coming months provide more spectacular DX as we slowly head towards the next sunspot peak. I also hope that more people actually start using the band before the powers-that-be cast their

covetous eyes over the band!

SIGNING-OFF

That's it for this time around. Keep a watch out on the higher bands over the next few months, not forgetting the under-used 24 and 28MHz bands, as signs are that they may be producing some good long-distance traffic if the trend continues. The best thing about these bands is that it's possible to work some rare DX with the simplest of antennas, as our reporters show.

THANKS TO ALL REPORTERS FOR YOUR TIME AND EFFORT FOR THE COLUMN, KEEP UP THE GOOD WORK, AND GOOD OPERATING! AS USUAL, KEEP THOSE REPORTS AND INFORMATION WITH FULL DETAILS OF TIMES, FREQUENCIES, POWER INPUT, MODE AND ANTENNAS USED (AND PHOTOS!) COMING IN. CHEERIO FOR NOW.

73 Leighton GWOLBI

RADIO 'SCAPE

REPORTS & INFORMATION TO ME PLEASE.

MIKE RICHARDS G4WNC,
PO BOX 1863,
RINGWOOD,
HANTS
BH24 2ZD

E-MAIL:
mike.elaine@btinternet.com

WEB SITE:
<http://www.btinternet.com/~mikespages>

MIKE RICHARDS G4WNC LOOKS AHEAD TO THE THOSE AUTUMN EVENINGS IN THE SHACK AND OFFERS SOME GOOD ADVICE ON UP-GRADING YOUR COMPUTER.

With the summer holidays coming to an end now's a great time to starting gearing-up for a interesting winter in the shack. It's also a very good time to get yourself a PC if you don't already have one.

It's also an ideal time to upgrade if you've been struggling with an outdated PC. You'll usually find that the PC suppliers offer lots of special deals at this time of year to try and keep their businesses ticking over during the post-holiday slump.

When choosing your PC make sure you get the fastest you can afford and also go for a large hard disk (6.4Gb plus). You need a PII Pentium (unless something else has arrived since I wrote this!).

If you can, try and get a 300MHz or faster processor. You'll also no doubt want to get on the Internet to get your hands on all that wonderful radio related software. For this you either need to go for a 56k modem or maybe go for the real speed of ISDN2 - there should be some tempting offers around in the autumn. So, have a good look around before you buy - remember that an ISDN2 based service will always be better than a fast modem.

If you already have Internet access then you might like to try designing your own PC on-line. Yes you really can do this.

Most of the major mail order computer suppliers run their own Web sites where you can see all the available models. However, some companies take this a step further and provide a range of basic combinations to suit various budgets. They then give you the option to customise these combinations so that you can build your ideal machine.

Once you've chosen your ideal PC you just hit a key to submit your selection and you'll be presented with a new screen showing the new price. Having used the system myself I can say this really is an excellent way to build your ideal PC, but still hit your budget.

If you want to try a few sites here's a couple with good reputations that I've tried recently, <http://www.dan.co.uk> or <http://www.mesh.co.uk> If you want to find more sites, take a look at one of the

major PC magazines or use one of the Internet search engines to find UK computer manufacturers.

ANALYSIS SOFTWARE

One or two readers have written to say that the excellent *Spectrogram v4.12* has disappeared from the [ftp.funet](http://ftp.funet.fi) site. If you're having troubles you should be able to find it on the excellent US winsite archive.

The location is: [ftp://ftp.winsite.com/pub/pc/windows95/sounds/gram412.zip](http://ftp.winsite.com/pub/pc/windows95/sounds/gram412.zip) If you come across any other good audio analysis software please drop me a E-mail so I can pass on the good news.

SSTV THE EASY WAY!

At the beginning of this column I mentioned that a lot of good radio software can be found on the Web. One package that caught my attention recently is the excellent *W95SSTV* by Jim Barber N7CXI and Bill Montgomery VE3EC. As you can probably guess from the name this is a slow scan TV program designed to run on *Windows '95*! In fact it will run on *Windows '95* and *Windows NT*.

Before you get too excited let's take a look at the systems' requirements. As far as the processor is concerned the minimum required is a 486DX66 with at least 8Mb of RAM and a 16-bit sound card. You can apparently use some 8-bit cards but not all work properly (e.g. SoundBlaster Pro).

On the video front you will need at least 640 x 480 pixel resolution with high or TruColor. The recommendation is that the card should use VESA local bus or PCI. That's about it for the system but like all modern *Windows* based applications fast processors, lots of memory and big hard disks make everything work so much better.

To get a copy of the shareware version of *W95SSTV*

try the home site at <http://www.siliconpixels.com> or maybe [ftp.funet.fi/pub/ham/fax_sstv/w95sstv/](ftp://ftp.funet.fi/pub/ham/fax_sstv/w95sstv/) You can either download the program as a single 3.8Mb file or as three smaller files if you want to load the program onto a different PC.

Installation is well structured using the standard *Windows '95* set-up systems to ensure that the program can be completely removed should you decide you no longer want it. One of the interesting features of the *W95SSTV* program is that it uses your computer sound card both for reception and transmission of SSTV signals. This really simplifies the connections down to just simple screened cables for the audio input and output.

You can even avoid having to make a connection to the pit line by using the VOX facility on your transmitter. This all makes *W95SSTV* great for those that want to try SSTV without making any major changes to their station - so, there's really no excuse for not giving this fascinating mode a try.

Once the software is up and running and you've made the necessary connections you just need to go through a simple set-up procedure. This is well described in the Release notes file and centres mainly around adjusting the *Windows '95* volume control settings. Whilst doing this its as well to turn-off your rig's VOX facility or you'll find you're transmitting test signals all over the place!

To complete the set-up process you will need to find a SSTV signal and by far the best time and place for this is on the 14MHz band at around 14.230 or 14.233MHz on a Sunday morning. The final stage is to set the volume settings to match the program's requirements.

With all the settings complete you can now tune around and find some

The image editor from the *W95SSTV* program.



RadioScene

interesting signals to receive. The easiest way to do this is to set W95SSTV to Auto-RX, as it will then automatically synchronise and start decoding the picture. An alternative is to use the Quick Restart. This immediately stops all other tasks and switches the program to receive mode - great if you want to quickly sample a picture that's already underway.

Whenever you try a new mode like SSTV it's very important to spend some time listening before you attempt to transmit. By following this principle you will make sure you understand the mode and the way its used. If you just barge in you will probably end-up annoying other users and making yourself generally unpopular!

Once you've picked-up the operating standards you can get ready for your first transmission. Because SSTV is all about sending images you first need to find yourself a suitable picture.

The W95SSTV program provides a lot of help in finding a suitable picture through its built-in image processor. This is a simple but very useful extra that contains all the basics for getting going.

To start you will need to get a basic graphic for the background to your CQ image. If you know anyone with a digital camera or maybe a scanner you could put together a photo of your shack, home, local town, etc. This can then be imported into the image processor in W95SSTV.

Next you need to use the image processor to add the words 'CQ CQ' and your callsign. It really is dead easy. With this complete you just save the final image and use it

over and over as your main CQ screen.

You can, of course, use the same process to make all sorts of different messages. If you want to convert to the registered version of the program all you have to do is send \$50US to one of the international agents. For those in the UK Roger Wilkins G3XFA is the man to contact and he's available via E-mail at RTWilkins@compuserve.com

SPECIAL OFFERS

If you'd like a copy of Hamcomm/JVFX, etc. I've arranged a very special offer with the **Public Domain and Shareware Library** (PDSL). They have put together a library set of all five disks for just £12, all inclusive.

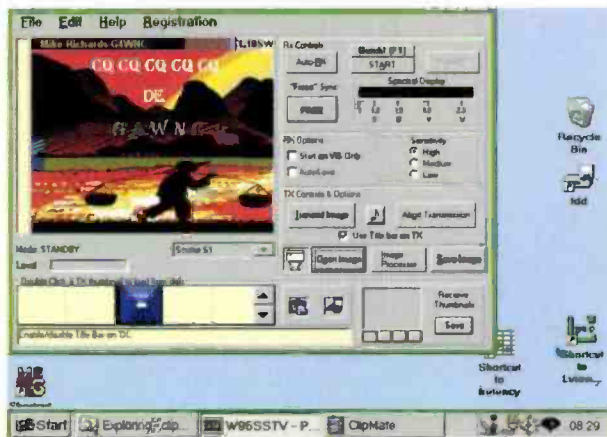
Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by 'phone - you don't even have to write a letter! Please direct all orders and enquiries about this disk set to PDSL, **Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel. (01892) 663298** and request library volume: **H008739abcde**.

The software is only available as a set of five disks as follows: IBM PC Software (1.44Mb disks): **Disk A** - JVFX 7.1, HAMCOMM 3.1 and WXFAX 3.2; **Disk B** - DSP Starter plus Texas device selection software; **Disk C** - NuMorse 1.3; **Disk D** - UltraPak 4.0 and **Disk E** - Mscan 1.3 and 2.0.

THAT'S ALL I'VE GOT ROOM FOR THIS TIME, SO CHEERIO FOR NOW AND PLEASE KEEP YOUR NEWS, VIEWS AND REPORTS COMING TO ME.

73 Mike G4WNC

The W95SSTV main screen.



AUSSIE ORACLE

LETTERS AND REQUESTS FOR TOPICS YOU'D LIKE COVERED TO ME PLEASE.

CHRIS EDMONDSON VK3CE, BOX 1 YARRA ROAD, WONGA PARK, VICTORIA 3115, AUSTRALIA

E-MAIL: vk3ce@tbsa.com.au

THIS TIME CHRIS EDMONDSON VK3CE SETS OUT TO EXPLAIN WHY HF COMMUNICATIONS ARE SO WIDELY USED IN HIS PART OF THE WORLD.

G'Day and greetings once again from 'Down Under'. Before I utter another word, I must warmly thank all of those who took the time to send E-mail messages or to write after my first column appeared in the July issue. Your comments were very much appreciated and the quantity of mail came as a very pleasant surprise indeed.

It's the end of July as I write this and we're stuck in the grips of our ghastly Winter weather, so yesterday the XYL and I loaded the kids in the car and headed for a picnic luncheon in the sunny Dandenong Ranges. Chilly indeed at only 21°C, but not a cloud to be seen in the sky, so all was well with the world...!

We lunched, looking out over a magnificent view of the beautiful Yarra Valley and the distant mountains of the Great Dividing Range, not far from an English couple who had come to Australia 20 years ago for a one-month holiday. Two years later they moved here permanently. I doubt they've stopped smiling since...!

Isn't it good to see the h.f. bands coming back a bit to what they should be? I've worked quite a few Europeans over the past few weeks, but none of them anywhere near where one of the 'harmonics' is holidaying at present, just outside Munich. (But beware, she's on her way to the UK about the time you read this!) Sadly, absolutely no interest has been shown in Amateur Radio by this one, so we talk daily via the Internet.

INTERNET OR AMATEUR RADIO?

Ah, the Internet is no doubt the key to Amateur Radio's eventual demise, right? No, I don't think it has to be that way.

I feel there's absolutely no skill required to use the Internet, no thrill of accomplishment when you stretch the bounds just that little bit further, no tingling sense of

anticipation or the satisfaction of excitement of having finally achieved a goal. But I'll let you in on a little secret ... here it is a very useful tool for the DXer. In most ways, though, it's pretty sterile. I think we'll leave it to the computer 'nerds', eh?

Thousands of amateurs around the globe do use the Internet for all manner of things though. There are lively discussion groups, news groups aimed at specific interests like satellites, DX openings, equipment modifications and so on.

In fact, almost everything you could wish to use as an adjunct to operating your radio station. But as I said, as an entity in its own right, it has absolutely none of the 'magic' of wireless. What a dreary thing it really is!

Perhaps those people who so fear the Internet should embrace it too, for that is probably the best way to deal with its very real menace to our hobby. Know your 'enemy'!

OUR WORLD OF RADIO

So, what's happening in our world of radio? Well, lots, as always. But before I look at that, I really should continue what I started last time around - a snapshot of the Amateur Radio scene here in Australia.

This time I'll deal with h.f., firstly by talking about h.f. outside the amateur service. I told you last time about the large h.f. antennas which generally flap around behind my car, a four wheel drive Subaru WRX.

In the interests of science and for yet another equipment review, I've just swapped the eight-footer, which usually sits on the back of my WRX for a magnificent 12-footer, almost 4m long, this thing is wonderful for wiping out fluorescent tubes at filling stations. What a shame most Aussie 'servos' use shrouded lamp fittings these days!

I'm afraid the main reason for antennas like these rarely attracting a second glance in this Sunburnt Country may have gone through to the keeper in the sub-editing department at PW last time around. You see, in the July issue, the caption accompanying the photograph incorrectly explained that it was Australian law which meant that antennas like these are a common sight. (Editorial comment: A slip of the editorial keyboard caused this, sorry Chris. Donna G7TZB).

Not so! It's the vastness of the land which makes large h.f. antennas relatively commonplace, although in fairness, they're more often seen on large lorries (when I say large, I mean it, in some places they're up to 80m long, with a big prime mover hauling up to

CHRIS VK3CE TELLS THE FASCINATING STORY OF AUSTRALIAN HF



Chris VK3CE is the Editor of Radio and Communications and if you've seen this copy you will have noticed that Rob G3XFD is writing a return column giving Aussralians the 'low-down' on Amateur Radio from 'up-here'.

three long trailers, we call them road trains for obvious reasons), plus interstate passenger buses or four wheel drive vehicles. We live in a place where nothing but h.f. will regularly get through.

It's very hard to explain the extraordinary vastness of the Australian land to people who have everything literally at their fingertips. So, let me try again...

Let's say you decide to install a 144MHz repeater to serve your local community. You live in a rural area on the western seaboard with a major population centre of 2000 residents only 300km away.

Fortunately, you have a nice high mountain range close by and the highest point of the tallest peak soon sports a large solar array, a couple of 'deep cycle' batteries, a small mast for the antennas, and an old refrigerator to house the equipment, which includes a 100W amplifier to extend the repeater's range. The area gets plenty of sunshine, so power really isn't much of a problem.

You fire up your repeater for the first time and discover to your delight that its coverage extends more than 160km (100 miles) in all directions other than down. Clearly, it's going to be a very busy repeater, right? Well, not necessarily - not if it's in the north-western VK6 area, anyway, where I understand one of the local repeaters has only one licensed amateur living within its normal 160km range!

If I were to load my family into the car and set off for that far-off point I suppose I could

cover 1000km per day if I really tried hard. I would be driving for four full days and still face half a day in the driver's seat to get within spitting distance the place. In the process, I would have driven almost a third of the way to the UK. Yes, Australia really is big...

Only two means of wireless communication are in any way practical in the outback these being h.f. or satellite. Telephone lines reach only the towns and follow the highways of this nation.

Isolated communities have relied for decades on h.f. communications. Some farms are so large that it's even used to communicate from the boundaries back to the homestead.

Entertainment is something that we all take for granted. I live in Melbourne, a major city of more than three million people. My children watch the cable TV, crisp digital satellite TV or our six free-to-air channels.

I listen to broadcast radio a lot. It's always 'chugging' quietly away in the background as I work.

But large areas of Australia cannot even receive a single medium wave (m.w.) or f.m. broadcast station during the day and can only get crackling reception from the nearest m.w. broadcast station several hundred or even a 1000km away at night.

Equally, personal communications in a place like Australia can be something of a challenge. In all honesty, I don't think I'd choose to live somewhere that was far out in the outback (what if the children were to get sick, and what about effective schooling?) but a surprising number of people do and most of the vehicles plying the red roads out there have h.f. whips on them. Satellite telephony has been an option for quite a few years, but it remains relatively expensive, which renders it a choice selected by few.

Many older people head for the 'bush' when they retire, with either no communications gear in the car or a simple CB radio. But, this is not really the ideal gadget to rely on out in the wilderness.

We know that 27MHz a.m. or s.s.b will only really be of much use at night, unless the band is wide open in which case you could wind-up talking to anywhere. And their

alternative, u.h.f. CB on 477MHz, is pretty much worthless once outside towns. You need to go down much lower in frequency to ensure reliable cross-country communications during the day.

Yet we regularly hear of people whose cars experience mechanical breakdown when they're way out in the bush and only by their carrying a large quantity of water in the car have they been saved from almost certain death by dehydration, as some roads may only see one or two vehicles a day ... if that.

There is no way on Earth that I'd head for the Aussie bush without a formidable armoury of radio gear, a couple of 20 litre fuel churns, spare fan belts for the car (make sure it's a reliable one at that), a good amount of water and food, ropes and a spade to dig my way out of sand, some very good maps, a compass and a GPS receiver. In fact, half that stuff lives in my car all the time!

FLYING DOCTORS

Exactly 75 years ago this year, Australia saw the introduction of the **Royal Flying Doctor Service (RFDS)**, which today has a fleet of 38 aircraft regularly plying the land. The flying ambulances are used to evacuate people too ill to be treated at their homes and take regular medical teams to small communities in all states of the country.

As h.f. communication, initially via pedal-powered radios, was used from the earliest days to communicate with the RFDS it seemed natural that radio would play an important role in overall communications in Australia. There is a large number of duplex h.f. frequency pairs used for telephony in Australia, plus many so-called 'outback chat channel' allocations from just over 2MHz, and these frequencies are in heavy demand indeed right around the country.

The RFDS runs one of the two major public-access h.f. networks and our national telecommunications carrier, Telstra, runs the other. I have held an Outpost Station Licence for almost ten years.

My callsign in this service is VJV33 and with it I can use an approved 100W h.f. radio to call for emergency assistance, place telephone calls, or just talk to other vehicles or homesteads around the country. I have even heard aircraft in flight using these channels. The 2.02MHz frequency is frantically busy any night of the week and during the day you'll find school classes being conducted all the way from frequencies in the 3MHz range up to 10 or 11MHz.

Can you even begin to imagine a school classroom so huge that the only way the teacher can talk to the students is via an h.f. radio? Tune-up around 5MHz any weekday and you'll hear the treble voices of children warbling to their teachers on a busy upper side band (u.s.b.) channel.

FULL CIRCLE

So, we've now come full circle and get back to the big black h.f. antenna on my car. I've operated mobile h.f. for quite a long while now. It was 25 years ago this year that I first tried attaching a tank whip to roof racks on my car (and managed to shorten it by about 6in when I drove under a 1500V power line used by Melbourne's trams, but that's another story...).

I was not ever really all that happy with the strength or durability of commercially-made h.f. whips but, try as I might, I couldn't home-brew an antenna which offered the sort of frequency coverage that I wanted. Of course, to add insult to injury, you'd need five separate antennas just to cover 3.5 (80), 7 (40), 14 (20), 21 (15) and 28MHz (10m). Then, about 10 years ago, I was driving through town and saw a very large truck with a really huge h.f. whip mounted up-front on the 'roo bar' (which I suspect you may know better as a bull bar) parked at the side of the road. It was the first time I'd seen one of these things close up, so I pulled over and wrote down the manufacturer's name.

A search of Australian telephone directories finally turned up the name I was looking for, **Terlin Aerials**. The company was based several thousand kilometres away, in Perth, Western Australia.

Not only did I have a personal interest in the Terlin Aerials antenna, but I figured it could be of interest to the readers of my magazine *Radio and Communications* (then called *Amateur Radio Action*). What I had seen had all sorts of weird frequencies marked on it such as 2020, 5515, 5820 and so on. What were these for? I remember wondering.

When I introduced myself over the 'phone, I asked if the company made antennas for Amateur Radio use. "Amateur what?", came the reply. It turned out the company was making 10 antennas a week for the RFDS and similar channels and they'd never even heard of the amateur service!

So, I FAXed a long list of frequencies to Terlin, starting from 1.825MHz and working up from there. The Terlin antenna worked a treat, and I was able to work any part of any h.f. band from the car, simply by moving a 'wander

RadioScene

lead' from one tap to another.

The equipment review appeared a couple of months later, and this was duly followed by a 'phone call from one of our subscribers in the USA asking: "Is this thing really that good"? I answered that it was the best mobile h.f. antenna I'd ever used, so the caller said he'd order a dozen or so to see what amateurs over there thought of them.

Well, I still own antenna Number One all these years later and **Outbacker**, as the company's now called, took another 5000 amateur h.f. antennas to Dayton this year. None of them came home... not one.

So, I guess the bottom line is that h.f. communication in Australia is a bit different to what you'd find in Europe. The bands are clear and quiet, and working mobile is a lot of fun.

THAT'S ALL FOR THIS MONTH, NEXT TIME (DECEMBER PW) I'LL TALK ABOUT WHAT YOU CAN FIND ON THE HIGHER BANDS AND LOOK AT HOW MUCH COMMERCIAL GEAR COSTS OUT HERE (YOU MAY BE SURPRISED!). ALL THE VERY BEST TO YOU AND YOURS, PLEASE FEEL FREE TO WRITE TO ME AT ADDRESS GIVEN AT THE HEAD OF THE COLUMN.

73 Chris VK3CE

BROADCAST

REPORTS & INFORMATION TO ME PLEASE.

PETER SHORE,
C/O PW EDITORIAL OFFICES,
ARROWSMITH COURT,
STATION APPROACH,
BROADSTONE, DORSET
BH18 8PW

E-MAIL:
petershore@pwpublishing.ltd.uk

PETER SHORE BRINGS YOU THE LATEST NEWS AND VIEWS FROM THE WORLD OF INTERNATIONAL BROADCASTING INCLUDING THE NEW SCHEDULES OF WHEN AND WHERE TO LISTEN FOR YOUR FAVOURITE PROGRAMMES.

The political landscape of West Africa may well change dramatically in the coming months. The death of **General Abacha**, (and the more recent death of **Mashood Abiola**) who led the military government that has held power in Nigeria for the last four or so years, and the release of political detainees, means that democracy could soon be restored to the former Commonwealth country.

If this happens, the plethora of clandestine radio stations beaming pro-democracy programmes to Nigeria may cease operation. So, if you want a chance to hear them before they leave the airwaves, here is a summary of what's on when.

Radio Nadeco, which represents the National Democratic Coalition of Nigeria, beams from WWCR in Nashville, USA. It has a weekly English-language programme on Wednesday at 1930 until 1945UTC on 15.685MHz. You can contact the station at **514 10th Street NW, Suite 600, Washington DC 20004, USA** or check out their Internet site at www.nadeco.org/radionadeco.htm

Radio SNBS (Save Nigeria Broadcasting Service) also beams from a commercial US station, this time WGTG in Georgia. It's on the air each Sunday at 1930-2000UTC on 9.40MHz in English and Nigerian languages. You can write to Radio SNBS at **PO Box 202, Boston, MA 02131, USA** or check out their web site at www.nagdhr.com

Voice of Oduduwa comes from WHRA in Maine, USA each Monday at 2100-2200UTC in Yoruba, one of the Nigerian vernacular languages. Tune in on 15.46MHz, or write to **Yoruba House, 7600 Georgia Avenue NW, Suite 405, Washington DC 20012**; web site address: www.yorubanation.org

Radio Kudirat is operated by London-based National Liberation Council of Nigeria. It beams from South Africa on transmitters hired from Sentech (which also transmits **Channel Africa, BBC World Service** and other international broadcasters) with a daily service at 1900-2000 in English and a variety of other languages on 11.54 and 6.205MHz. Both can be heard with reasonable reception in the UK. Radio Kudirat can be reached at **PO Box 9663, London SE1 3LZ**

The **Voice of Free Nigeria (VoFN)**, another US-based station, operates on Sundays at 1900-2000UTC on 11.715MHz. It's

thought that the transmitter is in a North African country. The VoFN station can be found at **PO Box 441395, Indianapolis, IN 46244, USA** or by pointing your web browser at <http://pw2.netcom.com/~fnn>

Finally, in this line-up of clandestine stations is **Radio New Nigeria** which originates from a US-based pressure group on human rights. It has broadcasts in English and local languages on Saturday at 0100-0130 on 5.91MHz and 1500-1530 on 6.175MHz and on Sunday at 0600-0630 on 11.995MHz.

Meanwhile, we should not forget that the **Voice of Nigeria** is the state broadcaster and can be heard in English and other languages during the day. The current schedule for English - all beamed towards Africa - is believed to be: 0500-0700, 1000-1100, 1500-1700 and 1900-2100 all on 7.255 and 15.12MHz.

If democracy returns to Nigeria, listen out for a change in the tone of broadcasts from the Voice of Nigeria. I would like to hear from any reader who catches one or more of the stations which I've highlighted here, and if anyone comes across a station that I have not mentioned, let me know!

OTHER CUTS

Elsewhere in the world cuts are still the order of the day with a number of broadcasters. The **Canadian Broadcasting Corporation (CBC)** has announced that it will close its news bureau in Delhi and Moscow as part of cost-saving measures. Presumably CBC will rely on material filed by BBC correspondents with which it has an exchange agreement for news stories.

Further afield, **Radio New Zealand** is being targeted by the country's government and asked to find savings across the board. There is a serious threat to some output, which may be replaced by programmes sourced from outside New Zealand, including - potentially - some from a number of the world's major international broadcasters via **World Radio Network** in London. More news as I get it!

PROGRAMME INFORMATION

On now to some general frequency and programme information from around the world. **Radio Korea International** broadcasts in English not just from South Korea, but also via Skelton in



the UK and Sackville in Canada.

The Korean station has English at: 0200-0300 on 7.275, 11.725, 11.81 and 15.575; 0800-0900 on 9.57 and 13.67; 1030-1100 on 11.715; 1100-1200 on 7.275; 1200-1300 on 7.285; 1230-1300 on 6.055, 9.57, 9.64 and 13.67; 1600-1700 on 5.975, 9.515 and 9.87; 1900-2000 on 5.975 and 7.275; 2100-2130 on 3.97 and 6.48 and 2100-2200 on 15.575MHz.

Radio Netherlands' (RN) English-language service has some interesting programmes (as is always the case!) on the air during September. In the regular documentary slot-in broadcasts on Wednesday and Friday, depending on the particular transmission, you can hear *A Curse and a Blessing*, examining the water in Bangladesh. It's the stuff of life and death in the country and there's even a proverb which sums up the curious place water holds in the Bengali heart: "The river destroys this way and that way: it's the game the rivers play."

Bangladeshis have a true love-hate relationship with water, for they celebrate its beauty in song and poetry yet spend much of their time and money in attempts to control it. **Francis Rolt** explores the positive and negative sides of water as creator and destroyer.

Also during September there's a special feature on RN's English Language service about the touchy subject of *Ageing*. According to **Pete Myers** getting older is an unavoidable drag.

As Dutch society gets greyer, the middle-aged have become a political force in Holland. There are dozens of organisations helping people adjust to a new lifestyle and to play a useful role in society.

English from Hilversum can be heard in Europe each evening between 2030 and 2230UTC on 1512kHz medium wave (from the Belgian transmitter) with the documentary slot on Wednesday at around 2051 and on Friday at about 2151. There is also a day-time placing on short wave at 1030-1230UTC on 6.045 and 9.86MHz.

THAT JUST ABOUT WRAPS THINGS UP FOR THIS MONTH. WRITE TO ME, OR E-MAIL ME (ADDRESS AT THE HEAD OF THE COLUMN) IF YOU HAVE ANY NEWS FOR THE NEXT COLUMN. UNTIL THEN, GOOD LISTENING!

Peter

FREE ADVERTS

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

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

Bargain Basement

Advertisements from traders or for equipment that is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. No responsibility will be taken for errors.

You should state clearly in your advert whether the 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

1.5m prime focus dish with stand, aluminium, £180. Mr Mitchell, Yorkshire. Tel: (01377) 253999.

2 Pye Cambridge v.h.f. f.m. portable radiotelephones, 88-108MHz, type FM10P, bare sets with one battery holder only, no crystals or ancillaries but including Pye service manual, offers please. Noel on (01743) 356430.

19-element Cushcraft boomer 2m (144MHz) never used, £100. 19-element Cue Dee 70cm (430MHz), £40. 4-element Cue Dee 2m, 325. 4CX250 valves and bases, £15. 400W 2m (144MHz) amp, hardware with 2 off 4CX250s, £50. Mike on (01304) 211609.

27MHz 27/81 Fidelity CB2000, f.m., £28. Maxcom 30E, £20. Midland mobile port-a-pak, model 77-805, £55, boxed and unused. Sony SW77, £230 and Radio Shack DX-394, £80, both boxed and unused. Bandit home-base antenna, with new TK brackets, 27-30MHz, £30. All offers considered. Ron on (01608) 659487.

40' pneumatic masts for sale, Clark Scam 12, one in immaculate condition, absolutely brand new not a recon, only used for 6 weeks in still weather, £200 no offers. The other is the older version with a minor seal leak, £80 o.n.o.. Both 7'10" tall when collapsed with plenty of spares, seals, e.t.c. The military pay £2k for these. Maybe swap for an SGC remote a.t.u. Contact Jon MOBQQ (QTHR as M1CCK) Portland, Dorset. Tel: (01305) 823232, or E-mail: jon@zetnet.co.uk

70cm (430MHz) hand-held transceiver, Kenpro KT-44, boxed with original accessories plus extra dry cell pack, thumb wheel tuning, little used, £60 including postage. Brian GOMJL, Liverpool. Tel: 0151-228 3080, evenings.

A number of assorted magazines: 96 assorted Practical Wireless magazines from between the years 1948 and 1966, 38 assorted Radio Constructor magazines from between the years 1948 and 1966, and 82 assorted Television Construction magazines from between the years 1962 and 1974, offers welcome. Tel: Fareham (01329) 286826.

Alinco DR-590 twin band f.m. mobile, CTCSS, 12.5 band fitted, detachable front panel plus remote control cable mounting bracket and mic., boxed with manual, £250. Tom G6DEI, Derby. Tel: (01332) 767960.

Alinco DR-M06TH, 6m (50MHz), 20W model, used twice, £150. Alinco DR-430, 70cm (430MHz), 35W model, two months old, £150. Both as new. RN electronics 4m (144/70MHz) transverter, as new, £95. Contact Alan GWIMCD in Cwmbran, Gwent on (01633) 870791 after 6pm or weekends.

Altron AQ6-20 Minibeam for sale, 3 element beam for 20, 15, & 6m, v.g.c. with rotator, can be seen working, £100 o.n.o. Contact Jon MOBQQ (QTHR as M1CCK) Portland, Dorset. Tel: (01305) 823232, or E-mail: jon@zetnet.co.uk

AOR 3000A, boxed, £475. Realistic 2042, boxed, £175. Datong FL3, £70. New Yupiteru 9000, bargain at £275. Sirio 827, buyer takes down, £45. Vic, Stoke-on-Trent. Tel: (0973) 538502.

AOR A8000 scanner, plus OPTO Scout plus leads, £350. The pair will split. Also AR1000, £40. RA17L, needs t.l.c., £50. MM 30W, 2m (144MHz) linear, £25. Sharp PC1000, mini PC, £60 (packet) Tel: (01509) 214336, or E-mail: beano@globalnet.co.uk

AR88LF communications receiver, 1943, good working order, buyer collects. Any reasonable offer accepted. Tel: South Wales (01633) 861771 after 6pm.

B40C, mint, and one for spares, plus Admiralty manual, £100. No. 52 Remote RX and p.s.u., and spare set valves (new), £75. Tel: 0181-384 9199, after 6pm please.

Communications receivers: Collins R390, £200. Marconi Apollo, £250. Marconi Atlanta, £100. Marconi Electra, £60. Marconi HR22 s.s.b., £60. Eddystone EC 880/2, £250. Eddystone EC 958/7, £250. Eddystone EA12, £125. Eddystone 680X, £125. Philips BX925, £100. Lots of other equipment, transmitters, components, e.t.c. Paul, Poole. Tel: (01202) 690019.

Complete set-up including Icom IC-736 transceiver, IC-2KL linear amplifier, IC-AT500 tuner, 255E 2m (144MHz) transceiver, Weston ultra most, rotator, 12/17m beam. Plus lots more, will only sell complete. For details Tel: Warwick (01926) 400423

Complete station going QRT - Kenwood TR9130, Icom IC-4GE, Yaesu FRG-7700, Baycom BP2, c.w., s/ware, aerials, books, accessories, all for £600 o.n.o. - or will split. Buyer collects. Tel: Barry (01797) 270651, after 6pm, or G1VZT @ GB7RMS.

Compressed air mast for 50kg

payload, 12ft closed, 72ft extended complete with fixing frame, control valves and compressor, little used and in excellent condition, can possibly deliver, £495 o.n.o. Tel: Bob on (01305) 832387, or 0374 424272 (mobile).

Cushcraft R7000 vertical, £235. Diamond V2000 2-70-6 (144, 430, 50MHz) vertical, unused, £70. FT-2901I mobile mount, £12. FT-707 m.mount, £12. Pole mount rotator cage, £25. FC-707 a.t.u., £90. FT-7 h.f. mobile, £185. PS31, £100. Tel: East Anglia (0468) 756782.

CX201 2-way coaxial switch, as new, £9. Magnetic balun for long wire antenna, as new, £15 (Waters & Stanton catalogue price £30). Please write to Dave, 5 Alton Close, Bushbury, Wolverhampton WV10 8ES.

Datong FL3 audio filter, £60. Kenwood LF30A low-pass filter, £20. Heath HW9 with matching a.t.u. and s.w.r. meter, all manuals, no mods, £275. Capco mag loop, £50 (AMA-3). Tel: (01452) 741036.

Decoder MCL1100 easy read with auto baud rate, auto align lock, normal and auto mode, auto speed, RTTY, c.w., NAVTEX, FEC, ARQ, SITOR, with Reuters 10in monitor, only £90, easy use. Tel: Frank (01295) 670108.

Drake R4245 professional h.f. receiver, absolute mint condition, £1000. Drake R8A receiver, mint condition, £650. Tel: (01772) 704009 after 6pm. Wanted - MFJ-1026 eliminator or ANCA. May exchange R4245 for mint condition NRD-2350.

Drake R8A receiver, £600. Vectronic VC300M a.t.u., new, £80. PR-150 pre-selector, £75. Yaesu FRG-9600 100kHz to 905MHz receiver, £100. All o.n.o. Colyn on (01624) 801592.

Eddystone 358X RX, only £85. WS19 with p.s.u., £180. BE-201 plus p.s.u., £80. Class D Mk1, £15. TCS a.t.u., £15. Pac-Bell pre-amp, model K, new valves, £12. PC desk top case, £10. Ben on (01562) 743253 or E-mail: 106312.1035@compuserve.com

Eddystone 770R receiver, good condition, £70 o.n.o. Also various coil packs for HRO receiver, offers please. Andy Chepstow on (01291) 627585 (daytime), and (01453) 546556 (evenings).

Eddystone 880, immaculate, £250. KW202/204 and a.t.u., £175. Codar CR70A, MII, £45. AR88, £25. Labgear L300, TX, £55. TU5B TX tuning unit, mint, £28. Test set type 46, Ref 105/111, £20. Wavemeter, type W1191, Ref 10T31, £20. Tel: Yorks (01274) 824816.

Eddystone 1837/2, digital, five filters, v.g.c., £350. Lowe HF-150, like new, excellent receiver, £200. Trio 9R-59 valved radio, s.s.b., v.g.c., £70. Grundig Satellite 6000, s.s.b., £150. Satellite 5000, multi-bands, s.s.b., £150. Drake 8E, excellent, £600. FRG-7, like new, £130. Normende world radio, excellent, £115. Tel: London 0181-813 9193.

Eddystone EC958/5 (a.k.a. Marconi Nebula) 10kHz to 30MHz s.s.b. receiver, g.w.o., table cabinet, original manual, £175 o.n.o. Tel: Southampton (01703) 454586 evenings.

Eddystone radios, approx. 30 sets, prices from £20-£150. Contact Dave on (01582) 840988 after 3pm or leave message before.

Explorer h.f. amp, £725. Yaesu FT-736R 2-70 (144-430MHz) base, mint, £795. FT-726R 2-70-6 + Sat board, mint, £695. Standard C7800 70cm mobile, mint, £120. AOR 2002 scanner, 1300MHz, mint, £155. Transmatch a.t.u., £45. Tel: East Anglia (0468) 756762.

F&L Hamtower with head unit, three section, 30ft by 15in triangular stepped mast, part of uni-mast system, free standing, dismantled, good condition, £65, ready for collection, moving QTH, must sell. Call John on (01242) 524217.

Ferguson Stereogram, model 3367, a.m./f.m. with Garrard 6200C turntable, 1974, with operating instructions book, v.g.c., £100 o.n.o. Contact Mr Goodson, 27 Clearsprings, Lightwater, Surrey. Tel: (01276) 472995.

For sale - radio spares, transformers, condensers, plugs, resistors, books, valves, e.t.c. Tel: 0113-240 3496.

FREE, about 1.5Kg of 10Hz microwave bits and pieces, including CV 6108 Magnetron (good door-stop), quick before the skip gets the lot. Tel: Roy GW4KGD, QTHR (01758) 712108.

FRG-8800, comm receiver, a.m., l.s.b., u.s.b., c.w., f.m., with manual, v.g.c., £295, or swap for 2m (144MHz) multi-mode, same value. Tel: (01487) 823879.

FT-101B with c.w. filter, £130. FT-23R, speaker/mic, mobile mount, NiCads, charger, drycell case, £110. Datong Morse tutor, £25. v.h.f./u.h.f. s.w.r./p.w.r. meter, £15. Faulty MM14430, 1-3V in 30Wout amp, £15. All o.n.o. plus P+P. Tel: Steve on 0171-635 8386 evenings, or E-mail: s.bunting@ums.ac.uk

FT-767GX MkII, complete 6/2/70 (50/144/430MHz) modules, from a non-smoker, copy workshop manual, boxed, £775 o.n.o. Tel: Jim GOMSL on (01458) 834917.

FT-980, £500 o.n.o., FT-230R, £180 o.n.o., FT-208, £95 o.n.o., VC-300DLP, £110 o.n.o., MFJ-LPF, £15 o.n.o., USA & International Callbook CD-ROM, £30, all boxed, manuals, e.t.c. plus P+P. Also Eddystone 770R II RX - offers - buyer collects. Contact Steve GOMMN on (01482) 795646 (Hull) QTHR.

FT-990 a.c., all filters, excellent condition, £1000. Also FT-480R multi-mode, £200. Going QRT. Tel: (01902) 497408.

Give the old stagers a surprise with your perfect Morse, buy my new, boxed, unused, keyboard, complete, £99 o.n.o. Tel: Medway (01634) 379140.

Goldstar OS9020A, 20MHz, two channel, Maplin's catalogue never used, boxed, new, operating and repair manuals, full accessories, £349 o.n.o. Tel: Medway (01634) 379140.

Good home wanted for Marconi, h.f./d.f. tuner amplifier, B21B in v.g.c. and working order. Swap for good RA17L/RA117E or sell for £125. Neil G8L1U on Uxbridge (01895) 230006.

Gould oscilloscope, OS4200, dual-trace, 10-bit digital storage, with analogue/digital option 4202, sample rate 800kHz, £60. Tel: Hitchin (01462) 459713

Ham Major 588 10m multi-mode 28, 29.700 with approved RA documents, excellent condition with box, bracket, g.w.o., £60 no offers. Christopher Brown G0UNJ, 5 Ounsley Ave, New Moston, Manchester. Or Tel: (01616) 810529.

Hand-held Oatman S4, c.w. mains charger and manual, s.w. and MCS51 ROM, as new, £175 o.n.o. Tel: Mike, Somerset (01749) 670016.

Helix, a 45ft length of Andrew EW-77 Helix elliptical wave guide, A10Vin very good condition. Sale or exchange for ham gear, e.t.c. Tel: Peter on (01771) 623654.

Newlett Packard Spectrum Analyser 8551B (heavy) with 851B display, 10MHz-10GHz, working, including full maintenance, handbook, can demonstrate, £300. Tel: G8B1H, Gloucester (01452) 830018 (anytime).

IC-551, 10W, multi-mode, 6m (50MHz), with mic and handbook. TS-430S, 100W, h.f., g.c., RX, both v.g.c., TS-430S, £450 v.o.n.o. IC-551, £325 o.n.o., collect or pay carriage. Tel: Ken G3KIP QTHR in Tunbridge Wells on (01892) 547643.

IC-706 MkII, d.s.p., complete with AT-180 (h.f. + 6 a.t.u.), FL-223 (s.s.b. narrow filter), MB-63 (front mount plate), MB-62 (mounting bracket), OPC-581 (separation cable), SP-7 (base speaker), SM-8 (base mic.), OPC-589 (mic. adapter cable), Manson EP-925 (25A p.s.u.), Daiwa CN-101 (h.f. +6+2 s.w.r.), Daiwa CN-103 (2+70 s.w.r.), all in mint condition with original packaging, £1250. Garry on (01325) 255067 after 6pm.

IC-706, MuTek front-end professionally fitted, HM103 mike, OPC639 mains, r.f. filter, FL223, narrow s.s.b./1.9MHz, filter fitted, modular to 8-pin adapter lead, in v.g.c., £650 o.n.o. Free delivery, also complete station for sale. Paul GW6VZW, Cwmbran. Tel: (01633) 860921.

Icom 701, six band h.f. with p.s.u., excellent, £250. IC-32E 2m/70cm (144/430MHz), handy, £150. Tel: Kent (01303) 813213. (Ashford, Kent).

Icom 706HDSP, new, £869. MB63, MB65, OPC589, OPC599, OPC581 free Yaesu VXIR, new, £209. FT-51, MH29, FB14, CSC37, CSC66, EDC12, £350. Kenwood TS690's v.g.c., £799. Sony ICFSW 7600, new, £109. Bob on (01245) 495230.

Icom 736, fitted 9MHz-455kHz, filters for c.w., plus high stability Xtal. SM20 mike, SP21 extension speaker, manual, boxed, mint, buyer inspect and collect or carriage extra, £875 o.n.o. Contact Mike GOUGE in Glos. on (01452) 539106.

Icom 737, TX/RX with d.c. power supply, matching speaker, hand-mic, s.w.r. power meter if required, with manual and circuit diagram, original packing, £850. Tel: (01206) 395968, any time.

Icom IC-720A h.f. trans., 100W, IC-P515 power supply, IC-SP3 speaker, boxes, manuals, £600. Trio AT230 antenna tuner, £230, excellent condition. John GOFIK, Potters Bar. Tel: (01707) 872772 after 6pm.

Icom IC-781, top of the range, 150W all-mode h.f. transceiver, built-in power supply and a.t.u., CRT with real time bandscope, very good condition, £1850. GONBB, Whitstable. Tel: (01227) 266460.

Icom IC-821H v.h.f./u.h.f. multi-mode base transceiver, manual, boxed, £900 o.n.o. Cushcraft 13B2 13-element 2m (144MHz) Yagi, boxed, manual, £70. Tonna 70cm (430MHz) 19-element cross Yagi satellite antenna, unused, boxed with manual, £35. Steve, Woodbridge. Tel: (01986) 798524 anytime.

Icom R-7000 scanner, £500. Icom R-71 receiver, £500. Icom R-70 receiver, £300. Yaesu FRG-100 receiver, £300. All complete with manuals and boxed, seen very little use and in mint condition. Tel: Wirral area on 0151-625 5501.

Icom R70, £300. Icom R71E, £500. Icom R7000, Yaesu FRG-100, ERA Microareder MKII, £70. Synoptic decoder, £60. All in excellent condition with manuals and boxed. Tel: 0151-625 5501.

Icom-737, v.g.c., boxed auto a.t.u. fist mic (user is non-smoker), £600. Contact GOMKA at 17 Trevor road, Swinton, Manchester M27 0YH, no 'phone.

Jones paddle key, brass, solid red base, £45. Bencher key chrome, £45. Katsumi bug key, auto/semi, £20. Vibroplex keying lever, £65. OX edge, £5. Trio TS-5208, new, PB driver, £185. Tel: (01494) 530018.

JRC NRD-525, high frequency general coverage receiver, includes phase locked system and four narrow band filters. Also magnetic balun, insulators and long wire antenna, detailed manuals, buyer collects, condition - as new, £600 complete. Tel: Canterbury (01227) 765831.

JRC NRD535 with bandwidth control and ECSS, excellent condition, £850. Rascal RA117, h.f. RX, v.g.c. with handbook, £150 o.n.o. Wanted, AR88 S-meter and plastic AR88 logo to right of vernier. Tel: (01245) 381961. Keithley digital multi-meters (2), model 177 micro volt with IEEE, £25. Model 176A TRMS, £20. Tel: (01462) 459713 (Hitchin).

Kenwood 850SAT with record unit and filters, excellent condition, £920. Tel: (01704) 506008.

Kenwood R-5000, v.h.f., all extra

filters, late model, absolute mint condition, £875. Consider exchange for g.c. transceiver, must have RS232, cash adjustment if necessary. Realistic Pro 26 1.3GHz, hand-held, new, £160. Tel: (01903) 859712.

Kenwood R-820 receiver, very classic, mint condition, £350. Drake 8E receiver, excellent performance, £550. FRG-9600, v.h.f., u.h.f. and h.f., board fitted, works excellently, £250. FRG-7, like new, £130. Nordmende world-band portable radio, £120. Grundig Satellite 3000 digital, like new, show condition, £250. Tel: Middlesex 0181-813 9193.

Kenwood R2000 communications receiver, all-mode, plus two clocks, memories, VC10 v.h.f. converter fitted, like new, boxed purchased Love of Matlock, excellent, only £290. Frank, on (01295) 670108.

Kenwood R2000 with VC10, v.h.f. converter fitted, clean, boxed, little used, £290. MCL1100 decoder with Reuters, 10in monitor decodes RTTY, c.w., ARQ, NAVTEX, FEC, SITOR, auto baud, auto speed, £90. Frank on (01295) 670108.

Kenwood R5000, fully loaded, late model, mint, £675 or exchange quality transceiver. Hand-held scanner PRD-26, 1.3GHz, mint, £160. Tel: Sussex area (01903) 859712 anytime.

Kenwood TM-241E, 2m (144MHz), mobile, 50W transceiver, mint condition. Steve, North Wales (01678) 521280, daytime.

Kenwood TM-733E dual-band, 2m/70cm (144/430MHz), 50W output, data port, mobile bracket, manual, as new, boxed, bargain at £250. Tel: Harold GOEZN, QTHR, on (01773) 781290.

Kenwood TR-751E multi-mode, 25W on 2m (144MHz), £300. SOTA 100W linear, £100. Eagle 9-element Yagi for 2m (144MHz), £35, or the lot, £400. Buyer collects on all items, cash preferred. G4IUT on (01952) 550235.

Kenwood TS-450S, mint condition, limited use, boxed with manuals, £650, carriage extra. Tel: (01594) 833234.

Kenwood TS-570D, 10 months old, in mint condition. Boxed, manuals, d.s.p., full coverage, a superb chance to own a modern set at a reasonable price, genuine sale, £885. Tel: (01283) 702212.

Kenwood TS-680S, with manual, a.t.u. type AT230, speaker type SP230, global frequency counter MM550, with manual, Microwave advanced Morse trainer MMS2, Lustraphone headphones with mic, model VC52. Douglas G3KPO, Ryde, IOW. Tel: (01983) 567665.

Kenwood TS-870SAT, good condition, £1150. Ernie G3OHT. Tel: (01964) 630252.

KW2000B with handbook, RX is deaf, transmitted signal has 100Hz ripple, make good restoration project, offers around £150. Buyer inspects and collects. G3XAP, evenings on (01449) 723122.

Linear amp, 2m (144MHz), 800W, plus built and tested, p.s.u. needs work. Tel: Martyn on (01422) 251520.

Low-band, v.h.f., TX/RX, 20W, Pye Pegasus and accessories, also 5 Storno CQP833 and accessories, £150. Tel: Paul, Leeds (01977) 684139, after 6pm.

Lowe 225, a.m., f.m. syncro, keypad, whip, amplifier, £225. AOR 3000A,

mint, £500. Yupiteru 9000, as new, boxed with case, £275. Realistic 2042, fitted with voice operated record for cassette, boxed, £200. Vic, Stoke-on-Trent. Tel: (0973) 538502.

Lowe HF-225, excellent condition with manuals, no p.s.u., £250. Buyer collects. Tel: (01332) 758636, after 6pm.

Lowe, g.d.o., FX-1, ok, no box, £35. Capco, v.h.f., a.t.u., SPC100, £40. SSR ultra tuner, 0/30MHz, 3 op's, bridge 100W 9" by 5 1/2", £50. Not boxed, all s/k sale plus postage or collect. Contact GW4XKE QTHR on (01222) 512959.

Metrix AX series, dual bench, p.s.u., mint condition, 0-30V, 0-2.5m, £100 o.n.o. Tel: Mike, Somerset (01749) 670016.

MFJ QRP mono band, 20m (144MHz) transceiver, good condition, plus MFJ-971 a.t.u., £200 for both. Tel: Matthew on 0121-785 2671 or write to G4POK, 375 Station Road, Stechford B33 8PL.

MFJ-247 antenna analyser, £95. MFJ-207 antenna analyser, £50. SEM QRM eliminator, £45. 706 c.w. filter, £35. 1012D filter, £25. Discone can TX, 6, 2, 70, 23/50, 144, 430, 1296MHz) unused, £30. VHF/30 amplifier, £40. UHF/20 amplifier, £40. Tel: East Anglia (0468) 756762.

MMT-432/144 all-mode transverter, Novice output power, £70. Lowe HF-225 receiver, excellent condition, £240. Yaesu FRG-9600 v.h.f./u.h.f. all-mode scanning style receiver with built-in h.f. converter, £265. Collect or P+P extra, messages with luck via pensioner's ansaphone on 0161-477 5303. I'll phone back, evenings only!

Optoelectronics Scout pocket-size, frequency finder, boxed with manual, includes charger and aerial, v.g.c., £265 o.n.o. Tel: Romford (01708) 721558.

PA valves, new, for sale, GEC 6146B, £24 pair. Sylvania 6JE6C/6L06, £25 pair. Valve list s.a.e. P+P, £2. Tel: (01241) 828559, GM05HD, QTHR.

Packrat PK232 MBX, Packet TNC all mode Packet, RTTY, w.g., etc. as new, £150. Tel: (01294) 607232.

PRD 2039, wide band, base scanner, 68-960MHz, with gaps, as new, boxed, £80. AOR 1500EX, hand scanner, 500kHz, 1300MHz, all accessories, as new, boxed, £120. Both items post paid. John G30AZ. Tel: Basingstoke (01256) 465126.

Rascal RA-17L receiver, v.g.c., £395, or part exchange for faulty one. Also, two other Rascals for spares only. 50MHz T-beam, modern scope, £280. Please ring (01872) 862291.

Rascal RA1784 MA1072, £450. Eddystone 1650, £525. h.f. Rascal RA1771, £325. Rascal Kaynard h.f. TX/RX, £150. HRD500, £130. 2m PA, £25. Collins 6185, £50. 618T, £60. Martyn PA h.f., £40. Telford (01952) 419666.

Rascal RA17L receiver, desk top, case with manual, v.g.c., Navy colours, £125. Brian G4UJL, 8.30am to 5.30pm on (01249) 444270 or after six on (01249) 817757 (QTHR).

Realistic DX200 g.c., s.s.b. rec. band, set/spread dials, v.g.c., boxed with instruction book, £50 o.n.o. Tel: Ray, Glasgow on 0141-569 2155.

Realistic DX302 short wave comms RX, digital read-out and pre-selector, mains power and battery, £100. Weircliffe bulk tape eraser, heavy to lift, new £150, want £150. G3WVK, QTHR. Tel: (01647) 281631.

Realistic short wave radio recorder, DX392, £100 o.n.o., boxed, or will exchange for any Eddystone models, 730 888A or 940, must be in good condition. Contact E. Foster at 72 Vimy Road, Billesley, Birmingham B13.

Redifon R55 1940s marine RX, 350kHz to 8MHz + p.s.u., £60. Codar AT5 transmitter, 160 & 80m (1.8 & 3.5MHz), £40. Rascal RA17L receiver, 500kHz to 30MHz, superb, absolute bargain, £115 (2 available). Very scarce, collectors' grade Hallicrafters S.36 wartime u.h.f. communications receiver, mint, £195. Tel: (01482) 887938.

Roberts 861 short wave radio, in mint condition, boxed, e.t.c., still in guarantee, bargain at £115. Bev GW00SQ, Pontypool. Tel: (01495) 757221.

Royal Navy B40 receiver, complete with s.s.b. converter, g.w.o. Also German tank radio, v.h.f. Empfänger, type E, No. 1094, working order, both very heavy, to collect, £120 both. Tel: (01203) 449637.

Scanner antennas, wide band, log periodical, 100-1300MHz, £75 o.n.o. Butternut 30-512MHz, £50 o.n.o. Maplin rotator, £30 o.n.o. All unused. Two 20ft aluminium poles, £15 each. Tel: Brian, Abingdon (01235) 525295.

Several s/h Quad valued tuners for sale, also various teletypes, all believed working, but are sold as seen. Stan Green, W. Midlands. Tel: 0121-422 3654.

Sony ICF-SW55 receiver, 150MHz, a.m., u.s.b., l.s.b., very small, v.g.c., all documentation, £195. Lucien on 0181-537 1651 and leave message or E-mail: spax@orange.co.uk

SX200, 1.8MHz, 200MHz, s.w.r. power meter, mint, £40. NFJ 6m (50MHz) antenna tuner, 50MHz, 60MHz, new, £45. Wanted PR-150 pre-selector, FRG-8800 v.h.f. converter, FL3 Datong filter. Vince on (01487) 823879.

Tektronix 7403N 50MHz oscilloscope with 7A18 dual-trace amplifier and 7B50 timebase, 9.76 by 12.2cm display, g.w.o., original manuals, also full set of spares, including spare tube, £250 o.n.o. Tel: Southampton (01703) 454586 evenings.

Ten-Tec Delta 2, full featured h.f. transceiver, £450. Diawa 30A P.U., £75. JPS NIR 10 d.s.p. filter, £140. Millen (USA) g.d.o., 1.7-300MHz, £40. Datong FL3 a.f. filter, £75. Palomar narrow band bridle, £35. Tel: (01935) 813097.

Timewave DSP599ZX, mint, £340, with full manual, £175. Tel: London 0181-931 5495.

Trio 9R59D, tidy and serviced, bargain, £60. w.h.y. AOR 3000A, mint, £450. Yupiteru 9000 + case, boxed, £225. PRO 2042 with VOX record, £175. 80m heavy duty coaxial, £20. Image 350BT, £200. Vic, Stoke-on-Trent. Tel: (0973) 538502.

Trio 9500, 70cm (430MHz), multi-mode, £250 o.n.o. MFJ-924 s.w.r. meter, £60. Eddystone bug key, offers. Tel: Mike on (01792) 416768.

TS-530S h.f. transceiver, immaculate condition, s.s.b. and c.w. narrow filters fitted, £325. MC50 desk mic, £35. Brand new spare set of valves, driver and 2 x p.a.s., £50. AT230 matching a.t.u., one owner from new. Best offer over £500 secures the lot. Buyer collects on all items, cash preferred. G4IUT on (01952) 550235.

TS-850 SAT, £850. Mobile mount for Yaesu FT-77, £20. Remote mount for

Yaesu FT-4700, £25. Yupiteru MVT-7000 with NiCads and charger, £140. Kenwood TS-790E, £1000. 2+813 valves, £35 pair. Tony GOCZV, South Cave, East Yorks. Tel: (01430) 422657.

Two 1155 receivers, one working, one with no p.p. also short wave Eagle RX-60N, g.w.o., military RX107, g.w.o., buyer collect, £125 the lot. Tel: (01203) 440634.

VGA monitors for PCs, screen size 640/480, with 256 colours, already tested, £40 each, six to sell. Contact Mr Lewis at 115 Toberdonny road, Derwick, Ballymoney, Co-Antrim, N. Ireland BT5 83S, Tel: (01265) 742167 or E-mail: miope@compuser.com

Viceroy MkIII power pack (offers?), Unused valves, boxed, no silly prices, all at £1 or less. Two Radford transformers, one 6.3, 6.3V 250-250, one 6.3V 250-250 plus 5V. G3HWD, 1 Alan Road, Padstow, Cornwall PL28 8DS, Tel: (01841) 532723.

Vintage EKCO car radio, model CR32 1946 (yes, forty-six!), with handbook, offers. Also, mic. from WWII transceiver, 19Set (I think). Tel: Dave on 0141-632 5408.

Yaesu FC-757AT auto a.t.u., £150. RA17L, £100. Scanner PRO-2035, £175. Yaesu FR.FL 400 h.f. separates, £150. All g.w.o., manuals with all except RACAL. Tel: Rod G3ZEH, Lowestoft (01502) 560869.

Yaesu FRG-100 h.f. receiver, 130k-30MHz, u.s.b./l.s.b. a.m./c.w. scan and memory, mint condition, must sell as newly licensed and need to buy transceiver, hence £295. Tel: Southampton (01703) 491229.

Yaesu FRG-7, v.g.c., seen working, £160. Cable wall bracket, e.t.c., £40, buyer collects. Tel: Somerset (01278) 789361.

Yaesu FT-101Z h.f. transceiver, nine bands, s.s.b., f.m., e.w., cooling fan fitted, comes with YD148 base station microphone, Welz AC-38M a.t.u. and manual, immaculate condition, boxed, £270. Tel: Wisbech (01945) 589707.

Yaesu FT-101Z in excellent condition, WARC bands, no mods, original packing and manual plus mic., used only on receive at this station, £250. Brian G4UJL, 8.30am to 5.30pm on (01249) 444270 or after six on (01249) 817757 (QTHR).

Yaesu FT-101ZD MkIII h.f. transceiver, with f.m. board, fan, narrow c.w. filter, WARC bands plus matching SP901 speaker and FC-902 a.t.u., mint condition with manuals, £485. Tel: Wirral 0151-645 2385.

Yaesu FT-102 transceiver and FC-102 a.t.u., 5 outputs, all mods, new valves, £295. Tel: Cornwall (01579) 362590.

Yaesu FT-102, all filters a.m./f.m., fitted, boxed with mic, £300. Tel: Martin, Essex (01245) 266728.

Yaesu FT-470 dual-band hand-held, 2m/70cm (144/430MHz) plus desk charger and load of accessories, £165 o.n.o. Trio TS-120V h.f. QRP transceiver, MC35S microphone, excellent electronic condition, 500Hz c.w. filter fitted, includes manual and box, £250. Yaesu FL-110 h.f. linear, 10W in, 100W out, manual, £120. VFO 120, £40. DFC-230, £35. Best offer over £350 secures the lot. Original box, mobile mount and owners manual for the TR-751E, £20. Buyer collects on all items, cash preferred. G4IUT on (01952) 550235.

Yaesu FT-650, £400. FTI S-meter, not working, £350. FT-77, £200. FT-726, 144MHz/h.f., £350. FT-201, old, £150.

Classified Ads

To advertise on this page see booking form.

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.

VALVES WANTED for cash: KT88, PX4, PX25, DA100, EL34, EL37, CV4004, ECC83. Valves must be Mullard/GEC, West European to achieve this price. Ask for free wanted list. Prompt and courteous service. Visitors please phone for an appointment (we are a very busy Export Warehouse). Billington Export Ltd. Billingshurst, West Sussex RH14 9EZ. Tel: (01403) 784961. Fax: (01403) 783519. E-mail: BillingtonExportLtd@btinternet.com

VALVES:- OVER 50000 STOCKED Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, (Jim Fish G4MH), 28 Banks Ave., Golcar, Huddersfield, West Yorks HD7 4LZ. Tel: 01484 654650. Fax: 01484 655699. E-mail: wilsonvalves@surflink.co.uk Visa etc. Fast & personal service.

CASH FOR VALVES. ECC32 £10. ECC33/35 £6. ECC83/EF86 £3.50. KT66 £40. KT88 £65. EL34 £20. EL37 £18. PX4 £70. PX25 £130. GZ34 £8. GZ32 £8. DA100 £150. 4212E £150. PT15 £10. Ask for free wanted list. Colomor (Electronics) Ltd, Unit 5, Huffwood Trading Estate, Bookers Road, Billingshurst, W. Sussex RH14 9RZ. Tel: 01403 786559. Fax: 01403 786560. E-mail: giacomelli@colomor.demon.co.uk

VALVE EQUIPMENT REPAIRS. Specialist in RACAL, K.W., receivers and transmitters. Fast reliable service. Alignment and testing facilities available. Tel: Roy G4CDR (01254) 55939.

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.

For Sale

QUARTZ CRYSTALS 4kH-300MHz FM £1.50. Ceramic, SAW filters. TTL oscillators FM £2.50. New 16 page list.

Q Electronic Design. Tel: 0181-391 0545. Fax: 0181-391 5258.

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.

THE UK'S LARGEST SOURCE for Vintage Service data, circuits and manuals from 1900 to the 1970s. Free brochure from Tudor Gwilliam-Rees, Savoy Hill Publications, 50 Meddon St, Bideford, The Little White Town, North Devon, EX39 2EQ. Tel: 01237 424280.

E-mail: tudor.gwilliam-rees@virgin.net
Visa & Mastercard accepted.

INTERESTED in vintage wireless? Send 2 x 1st class stamps for latest list of books, bits & pieces etc. Old Time Supplies, PO Box 209, Banbury, Oxon OX16 7GR.

JAPANESE TRANSMITTING TUBES and microwave semi-conductors for broadcasting, communication and industrial use. T. Yoshihara, Osaka, Japan. Fax: 816-338-3381.

WE BUY & SELL HAM GEAR New and used amateur equipment bought and sold, PX welcome. Ring Dave G3RCQ the gentleman dealer on: showroom (01708) 374043 or office 0956 854947. Open 7 days 9am-10pm. 9 Troopers Drive, Harold Hill, Romford, Essex RM3 9DE.

VINTAGE RADIO VALVES circuits parts etc. SAE for details. PO Box 42, Sleaford, Lincs NG34 0TX.

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.

DISCLAIMER

Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. *Practical Wireless* advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of *Practical Wireless* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

Wanted

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.

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.

QSL Cards

HIGH QUALITY BUT LOW PRICES personal and specialist designs from 'standard' to B&W and full colour photographs including SWL, fast service. SAE for samples: Adur Village Press (G4BUE), Highcroft Farmhouse, Gay Street, Pulborough, W Sussex RH20 2HJ. Tel 01798 815711.

Miscellaneous

VALVE ENTHUSIASTS: Capacitors and other parts at attractive prices! Ring for free list. Geoff Davies (Radio), Tel: (01788) 574774.

VIDEO TAPE CONVERSIONS NTSC PAL SECAM digital processing. Includes cine conversions. Fast service. G3LQP QTHR. Tel 0181-642 4956.

Holidays

NORTH WALES HOLIDAYS - Caravan - bunkhouse - camping. Elevated rural site, two miles from beach, use of shack and antennas, open all year, Tynrhos, Mynytho, Pwllheli. Tel: 01758 740712. Packet address: GW4VAG@GB7BAY#55.GBR.EU

Computer Software & Hardware

PC SSTV-DATA Tx/Rx pack £35.95. Other PC/AMIGA SSTV/Packet Interfaces. SAE leaflets, Super Demo-Utils disk £1. Peter Lockwood G8SLB, 36 Davington Road, Dagenham RM8 2LR. Tel/Fax: 0181-595 0823. E-mail: g8slb@zbee.com

HAM/SCANNER SHAREWARE External range. Free disk list. Tel: 01732 852146. Pentium systems also sold.

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 <input type="checkbox"/>				
Category heading:				

G6XBH G1RAS G8UUS

VISIT YOUR LOCAL EMPORIUM
Large selection of New/Used Equipment on Show

AGENTS FOR: YAESU • ICOM • KENWOOD • ALINCO
Accessories, ReVex/Diamond range of SWR/PWR, Adonis Mics, Mutek products, Barenco equipment, MFJ products.

WE SPECIALIZE IN ALL TYPES OF PLUGS, ADP, ETC
★ ERA Microreader & BPS4 Filter, SEM Products ★
★ Full range of Scanning Receivers ★

AERIALS, Tonna, Maspro, plus full range of base/mobile antennas.
BRING YOUR S/H EQUIPMENT IN FOR SALE
JUST GIVE US A RING

Radio Amateur Supplies

3 Farndon Green, Wollaton Park, Nottingham NG8 1DU
Off Ring Rd., between A52 (Derby Road) & A609 (Ilkeston Road)
Monday: CLOSED. Tuesday-Friday 9.00am to 5.00pm. Saturday 9am to 4pm
INTERNET: <http://www.geocities.com/Eureka/1448> E-MAIL: ras-nottm@geocities.com

G6XBH G1RAS G8UUS Tel: 0115-928 0267

R.A.S. (Nottingham)

BARTG '98 RALLY

Sunday 13th September, 1998
at 10.30am

Sandown Park, Esher, Surrey
(M25/J10 - A3 - A307)

Radio, datacomms and computer stands.

- Ample free parking ● G84ATG talk-in
- Licensed bar & café ● Bring & Buy

Again this year, commencing at 11.30am, we present
Datastream '98, a series of data-related lectures.

Details: Alan G8GOJ 0181-688 2564
www.bartg.demon.co.uk

Organised by the British Amateur Radio Teledata Group

DEMODULATORS FOR JVFAX HAMCOMM SKYSPY RADIORAF V2.13 & POCASG

THE ORIGINAL RECEIVE ONLY with 25 way 'D' type £16.99
POCASG RECEIVE version (as above, with variable hysteresis) £19.99
TRANSMIT version (Pocsag Rx + Fax/SSTV/HamComm Tx) £24.99
25 to 9 way Adaptor £3.00. Shareware on 3.5" HD disks

JVFAX7 + HamComm 3.1 + Pktmon12 + Pocsag (PD2.04) + Wxgraph £2.50
RADIORAF Version 2.13 £2.50 DL4SAW SSTV (V1.2) £2.50

REGISTERED VERSIONS OF SOFTWARE INCLUDING SKYSPY for ACARS™ (Win95)

NEW DL4SAW/GSHPC SSTV (V2.3) £34.99 HamComm3.1 £19.99
SkySpy V1.1 £24.99 Pocsag (PD2.04) £19.99 RadioRaft V2.13 £19.99
All prices UK/Eire inc VAT + P&P. For non-EU deduct 17.5% VAT
All products (except software) carry a full money back guarantee.
Minimum credit card order £15.00. Outside British Isles add £2.00

Pervisell Ltd, 8 Temple End, High Wycombe Bucks HP13 5DR
Tel: (01494) 443033 Fax: (01494) 448236
www.pervisell.com e-mail: ham@pervisell.com

WANTED, TOP PRICES PAID

All makes, types, models of any vintage, domestic, military, professional radio equipment including any accessories, adaptors, etc. Also test gear, valves, components, literature in any condition or quantity.

Please telephone or write to:-
Centre Electronics
345 Stockfield Road, Yardley, Birmingham B25 8JP.
Telephone 0121-706 0261

SHOP OPENING HOURS: Monday, Tuesday evening 7-9pm. Thursday, Friday & Saturday 10-4pm.

NATIONWIDE COLLECTION SERVICE

AERIAL ROTATOR FOR ONLY £49.95!

AR300XL Light Duty Rotator
Rotor unit type AR300XL and control console.
Continuous indication of beam heading.
Clamps to 2" (52mm) max. mast and takes 1 1/2" (38mm) max. stub. mast.
"Offset" type mounting. Vertical load carrying 45kg. Special offer £49.95.

AR1201 Alignment Bearing
Allows greater/higher head loads. Fitted above rotor. £18.95.

New Channel Master Medium Duty Rotator
2" main mast
1 1/2" stub mast.
Vertical load carrying 113kg.
Colorator £89.95.
Bearing £18.95.

Carrriage on either rotator £5.50.

GLOSSY 34 PAGE CATALOGUE AVAILABLE BY RETURN @ £1

AERIAL TECHNIQUES
Tel: 01202 738232 Fax: 01202 716951
11 Kent Road, Parkstone, Poole, Dorset BH12 2EH E-mail: atech@dircon.co.uk

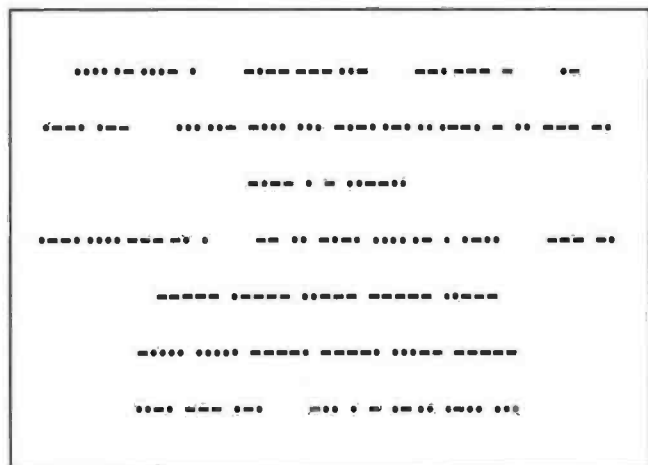
J. BIRKETT

SUPPLIERS OF ELECTRONIC COMPONENTS

TELESCOPIC AERIALS Length closed 19mm, open 71mm, 4 sections with Knuckle Base and Screw @ £2.
CLANSMAN BATTERIES 6135-99-840-0100 @ £10. Type 6135-99-749-7054 @ £5.
FERRITE RINGS approx size ext dia 12.5mm, int dia 7.5mm @ 8 for £1.
RADIAL CAPACITORS 400v.w. 0.01µF, 0.022µF, 0.1µF, 250v.w. 0.047µF all at 20p each.
SMALL EX-MOD SQUARE AIRCRAFT CLOCKS with second speed hand, Smiths @ £130, NERO LEMANIA @ £145.
ELECTROLYTIC CAPACITORS 32+32µF 450v.w. @ £3. 50µF 300v.w. @ £1.60, 10+10+10µF 450v.w. @ £3.
TRANSFORMERS input 240 V.A.C., output 12 volt 4.17 amp @ £5 (P&P £1.50).
MULLARD TUNER MODULE 88 to 108MHz, 10.7MHz out @ 10 for £5.
MOD KIT WITH 60-0-60AM METER with Shunt Plus Toggle Switch, Lampholder, Lucar Plugs and Sockets etc. @ £5.95.
RACAL PORTABLE AERIAL KIT in folder ex. Clansman @ £16.50 (P&P £5).
FERRITE RODS 5" x 1/2" @ £1.50, 8" x 1/2" @ £2, 4" x 1/2" @ 50p, 8" x 1/2" @ £3.
FETS 2N3819 @ 35p, MPF102 @ 45p, J304 @ 25p, J230 @ 20p, dual gate 3N201 @ 80p, BF981 @ 35p.
VHF RECEIVER TYPE 100 spares for 1985 with 5 valves @ £3 (P&P £2).
EX HARRIER BAROMETRIC ALTIMETER @ £75 (P&P £5).
R.F. POWER TRANSISTORS 175MHz 24 volt 2N5641 @ £7, 2N5643 @ £10, BFR64 @ £2.50.
SEVEN SEGMENT HD1017R @ 5 for £1, FET IRF 9523 @ 50p, BVF4101 @ 50p.
240 VAC POWER SUPPLY for testing ARCS2 etc., 27 volt 15-17-20 amp @ £35 (P&P £10).
ACCESS, SWITCH, BARCLAYCARD & AMERICAN EXPRESS cards accepted.
P&P £2 under £10. Over Free, unless otherwise stated.

25 The Strait
Lincoln LN2 1JF
Tel: 01522 520767
Partners J.H. Birkett
J.L. Birkett

C.M. HOWES KITS. Available by post and for callers.



LAR COMMUNICATION CENTRE
Bradford Road, East Ardsley, Nr Wakefield WF3 2DN
Tel: 0113-252 4586 Fax: 0113-253 6621

Approved dealers for Kenwood, AOR, Icom, Yaesu and many others. We sell amateur radio equipment, scanners, shortwave receivers, antennas and over 800 accessories. Books, PW and SWM. Our after sales service is second to none.

We are open Mon to Sat 9.30am to 5.30pm

Please mention
Practical Wireless
when replying to
advertisements.

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

Book Store



FREE POST & PACKING ON BOOKS MARKED *

**BUY
of the
MONTH**

RADIO AMATEUR CALL BOOK CD-ROM - INTERNATIONAL & NORTH AMERICAN LISTINGS 1998

If you're a keen DXer and own a PC then the *Radio Amateur Call Book CD-ROM - International & North American Listings 1998* could be just what you've been looking for! Containing over 1 470 000 Radio Amateurs' details together with new and updated prefix maps this packed CD allows you to search by first and surnames as well as city and postcode.

The *Radio Amateur Call Book CD-ROM* contains a Windows and DOS version of the programme with full instructions on how to install the program. So, if you're fed-up with trawling through pages of paper to check out the QSL details of that all important DX contact you've just made, why not place an order today for the latest in up-to-date information?

Order your copy today at a cost of just **£40 plus £1 P&P (UK), £2 P&P (overseas).**

To order please use the form on page 82 or call the Credit Card Hotline on (01202) 659930 and quote PW9.

LISTENING GUIDES

Airband

ABC CIVIL AIRCRAFT MARKINGS 1998. Alan J. Wright	336 pages	£6.99
ABC MILITARY AIRCRAFT MARKINGS 1998. Alan J. Wright	192 pages	£6.99
AIR BAND RADIO HANDBOOK 6th Edition. David J. Smith	192 pages	£9.99
AIRBAND RADIO GUIDE 3rd Edition. Graham Duke	98 pages	£6.99
AIRCRAFT RADIO FREQUENCIES & GUIDE BOOK 2nd Edition	96 pages	£5.99
AIR TRAFFIC CONTROL 7th Edition. Graham Duke	112 pages	£8.99
AIRWAVES 98	134 pages	£8.95
CALLSIGN 98	156 pages	£8.95
FLIGHT ROUTINGS 1998. Williams		£6.95
INTERNATIONAL AIR BAND RADIO HANDBOOK. David J. Smith	192 pages	£9.99
UNDERSTANDING ACARS		
3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn	80 pages	£9.95
VHF/UHF AIRBAND FREQUENCY GUIDE & CALLSIGN GUIDE	280 pages	£12.50
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY		
2nd Edition. Robert E. Evans	260 pages	£19.95

Datamodes

FAX & RTTY WEATHER REPORTS. Philip Mitchell	88 pages	£11.50
GUIDE TO UTILITY STATIONS. 16th Edition. Joerg Klingenfuss	989 pages	£30.00
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 17th Edition		
Joerg Klingenfuss	436 pages	£25.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell	32 pages	£7.50
RADIO DATA CODE MANUAL. 15th Edition. Joerg Klingenfuss	604 pages	£23.00

DXTV

DXTV FOR BEGINNERS. Simon Hamer	31 pages	£3.95
GUIDE TO DX-TV. Keith Hamer & Garry Smith	36 pages	£3.95
GUIDE TO WORLDWIDE TV TEST CARDS	80 pages	£4.95
THIS IS BBC TV - FIRST 30 YEARS OF TV GRAPHICS. Keith Hamer & Garry Smith	36 pages	£4.95
THE FIRST 30 YEARS OF BBC-2. Keith Hamer & Garry Smith	60 pages	£4.95
THE STORY OF BBC COLOUR TELEVISION	36 pages	£5.95

Frequency Guides

1998 SHORTWAVE FREQUENCY GUIDE. Joerg Klingenfuss	584 pages	£23.00
1998 SUPER FREQUENCY LIST CD-ROM. Joerg Klingenfuss		£25.00
* FERRELL'S CONFIDENTIAL FREQUENCY LIST 10th Edition	450 pages	£19.95
PASSPORT TO WORLD BAND RADIO 1998	528 pages	£15.50
RADIO LISTENERS GUIDE 1998	112 pages	£4.50
RSGB IOTA DIRECTORY & YEARBOOK 1998/9 (A4 size)	112 pages	£8.95
SHORTWAVE INTERNATIONAL FREQUENCY GUIDE	176 pages	£12.95
VHF-UHF SCANNING FREQUENCY GUIDE. Bill Laver	192 pages	£12.95
WORLD RADIO TV HANDBOOK 1998	808 pages	£18.95

General

BUYING A USED SHORT WAVE RECEIVER 3rd Edition (Booklet). F. Osterman	23 pages	£2.95
FROM INTERNATIONAL WATERS. Mike Leonard	570 pages	£20.95
GETTING ON TRACK WITH APRS. Stan Horzempa W1LOU	165 pages	£11.50
POP WENT THE PIRATES. Keith Skues	568 pages	£15.95
* SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD	187 pages	£4.50
SHORT WAVE DIRECTORY (LOOSE LEAF). Bob Grove		£8.00
SHORT WAVE DIRECTORY BINDER		£4.00
SHORT WAVE RADIO LISTENING FOR BEGINNERS	174 pages	£13.95
SHORTWAVE RECEIVERS PAST & PRESENT (NEW 3RD EDITION)	450 pages	£25.95
SHORTWAVE LISTENER'S GUIDE. Ian Poole	192 pages	£14.99
THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK New 5th Edition		
Andrew Yoder	410 pages	£19.95

Marine

DIARY OF A MARITIME RADIO OFFICER. Ross Bradshaw		£12.95
GMDS5 EDITIONS MARINE SSB OPERATION. Michael Gale	96 pages	£11.95
GMDS5 EDITIONS MARINE VHF OPERATION. Michael Gale	48 pages	£7.95
GMDS5 FOR SMALL CRAFT. Alan Clemmensen	94 pages	£11.95
SCANNING THE MARINE BANDS. F.F. O'Brian	152 pages	£ 9.50
SHORTWAVE MARITIME COMMUNICATIONS. B. E. Richardson	195 pages	£16.50
SHIP TO SHORE RADIO FREQUENCIES. Ken Davies	95 pages	£5.99
SIMPLE GPS NAVIGATION. Milk Chinery	96 pages	£10.95

Satellite

AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326.F. A. Wilson	230 pages	£5.95
ARRL SATELLITE ANTHOLOGY 4th Edition	150 pages	£9.50
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson	371 pages	£18.95

NEWNES SATELLITE COMMUNICATIONS POCKET BOOK. James Wood	220 pages	£12.99
SATELLITE HANDBOOK (ARRL) New Edition		
Martin Davidoff K2UBC	370 pages	£15.50
SATELLITE PROJECTS HANDBOOK. Lawrence Harris	174 pages	£14.99
* SATELLITE TELEVISION. A layman's guide. Peter Pearson	73 pages	£1.00
SATELLITE TELEVISION INSTALLATION GUIDE. 5th Edition. John Breeds	76 pages	£15.00
WEATHER SATELLITE HANDBOOK. 5th Edition. Dr Ralph E. Taggart WB8DQT	192 pages	£15.50

Scanning

AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I. D. Poole	152 pages	£4.99
SCANNER BUSTERS 2. D.C. Poole	100 pages	£6.00
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD	261 pages	£10.95
SCANNERS 3 PUTTING SCANNERS INTO PRACTICE		
4th Revision. Peter Rouse	271 pages	£10.95
SCANNING SECRETS. Mark Francis	280 pages	£18.95
UK SCANNING DIRECTORY. NEW 6th Edition	540 pages	£18.50

AMATEUR RADIO

Amateur Television

AN INTRODUCTION TO AMATEUR TELEVISION		
Mike Wooding G6IOM & Trevor Brown G8CJS	156 pages	£5.00
SLOW SCAN TELEVISION EXPLAINED. Mike Wooding G6IOM	156 pages	£5.00
THE AMATEUR TV COMPENDIUM. Mike Wooding G6IOM	104 pages	£3.50

Antennas & Transmission Lines

25 SIMPLE AMATEUR BAND AERIALS BP126. E.M. Noll	63 pages	£1.95
25 SIMPLE INDOOR AND WINDOW AERIALS BP136. E.M. Noll	50 pages	£1.75
25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS BP132. E.M. Noll	63 pages	£1.95
25 SIMPLE TROPICAL AND MW BAND AERIALS BP145. E.M. Noll	64 pages	£1.75
ALL ABOUT VERTICAL ANTENNAS. W.I. Orr W6SAI & S.D. Cowan W2LX	192 pages	£8.95
ANTENNA EXPERIMENTERS GUIDE (RSGB). Peter Dodd G3LDO	160 pages	£15.00
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Carron	195 pages	£15.50
ANTENNAS FOR VHF AND UHF BP301. I.D. Poole	104 pages	£4.95
ANTENNAS & TECHNIQUES FOR LOW BAND DXING (ARRL)	394 pages	£15.50
ARRL ANTENNA BOOK 18th Edition	732 pages	£24.00
ARRL ANTENNA COMPENDIUM Volume One	175 pages	£7.50
ARRL ANTENNA COMPENDIUM Volume Two	208 pages	£10.50
ARRL ANTENNA COMPENDIUM Volume Three. Edited by Jerry Hall KT7D	236 pages	£10.50
ARRL ANTENNA COMPENDIUM Volume Four	204 pages	£15.50
ARRL ANTENNA COMPENDIUM Volume Five	200 pages	£15.50
BEAM ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX	268 pages	£8.95
BUILDING & USING BALUNS. Jerry Sevick	128 pages	£18.95
CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX	110 pages	£8.95
EXPERIMENTAL ANTENNA TOPICS BP278. H.C. Wright	70 pages	£3.50
G ORP CLUB ANTENNA HANDBOOK		
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GW0LNO	155 pages	£7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LOI	233 pages	£10.99
HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN	322 pages	£14.65
* MORE OUT OF THIN AIR (PW1)	112 pages	£8.95
PRACTICAL ANTENNAS FOR NOVICES. John Heys G3BDD	52 pages	£6.30
PRACTICAL ANTENNA HANDBOOK 2nd Edition. Joseph J. Carr	437 pages	£29.95
PRACTICAL WIRE ANTENNAS RSGB. John Heys G3BDD	100 pages	£8.95
RADIO AMATEUR ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX	188 pages	£8.50
RECEIVING ANTENNA HANDBOOK. Joe Carr	189 pages	£17.50
SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS		
W.I. Orr W6SAI & S.D. Cowan W2LX	188 pages	£8.95
W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB	123 pages	£7.80

Beginners (inc RAE)

AMATEUR RADIO FOR BEGINNERS (RSGB). Victor Brand G3JNB	86 pages	£3.50
AN INTRODUCTION TO AMATEUR RADIO - NEW EDITION. Ian Poole G3YWX	150 pages	£4.99
BASIC RADIO PRINCIPLES & TECHNOLOGY. Ian Poole G3YWX	262 pages	£14.99
BASIC RADIO & ELECTRONIC CALCULATIONS. Ray Petri G0OAT	160 pages	£13.95
AN RAE STUDENTS NOTEBOOK. Bob Griffiths G7NHB	76 pages	£8.95
HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB)		
Clive Smith G4FZH and George Banbow G3HB	88 pages	£8.75
NOW WE'RE TALKING (ARRL)	144 pages	£15.50
PRACTICAL RECEIVERS FOR BEGINNERS (RSGB). John Case GW4HWR	165 pages	£12.50
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK (BP378)		
Ian Poole G3YWX	150 pages	£4.95
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL		
Fifth Edition. Ray Petri G0OAT	208 pages	£13.95
RADIO AMATEURS EXAMINATION/END OF COURSE TEST PAPERS. Ray Petri G0OAT	104 pages	£13.95

RAE MANUAL (RSGB). G.L.Benbow G3HB.....	127 pages	£8.75
RAE REVISION NOTES (RSGB) G.L.Benbow G3HB.....	92 pages	£5.25
THE NOVICE LICENCE STUDENT'S NOTEBOOK. John Case GW4HWR.....	124 pages	£5.00
SHORTWAVE RADIO LISTENING FOR BEGINNERS. Anita Louise McCormick KA8KGI.....	176 pages	£13.95
TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB) John Case GW4HWR.....	101 pages	£6.75
W1FB'S HELP FOR NEW HAMS (ARRL). Doug DeMaw W1FB.....	155 pages	£8.95
YOUR FIRST AMATEUR STATION. (RSGB) Colin Redwood G6MXL.....	120 pages	£5.75

Callbooks

RSGB YEARBOOK 1998. EDITION. Edited by Brett Rider G4FLO.....	512 pages	£13.50
---	-----------	--------

Computing

ELECTRONIC PROJECTS FOR YOUR PC BP320. R.A. Penfold.....	102 pages	£3.99
E-MAIL ON THE INTERNET BP420.....	156 pages	£6.99
GETTING THE MOST FROM YOUR PC HARD DISK BP280.....	90 pages	£3.95
HOW TO EXPAND, MODERNISE AND REPAIR PCs AND COMPATIBLES BP271 R. A. Penfold.....	166 pages	£ 5.99
INTERFACING PCs AND COMPATIBLES BP272. R. A. Penfold.....	26 pages	£4.99
MS-OFFICE ONE STEP AT A TIME (BP402).....	77 pages	£5.95
MS WORKS FOR WINDOWS 95 EXPLAINED BP405.....	175 pages	£5.95
NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition. Michael Tooley.....	256 pages	£12.95
PERSONAL COMPUTERS IN THE HAM SHACK (ARRL).....	284 pages	£11.50
THE INTERNET AND WORLD WIDE WEB EXPLAINED. J. Shelley.....	130 pages	£5.95
WINDOWS 95 EXPLAINED (BP400).....	175 pages	£5.95

EMC

INTERFERENCE HANDBOOK. William R. Nelson WA6FOG.....	260 pages	£9.50
THE RADIO AMATEUR'S GUIDE TO EMC (RSGB). Robin Page-Jones G3JWJ.....	117 pages	£8.95

Historical

1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback.....	260 pages	£11.85
OLD TIME RADIOS - RESTORATION & REPAIR. J. Carr.....	256 pages	£19.95
COMMUNICATIONS RECEIVERS - THE VACUUM TUBE ERA. R.S. Moore.....	141 pages	£17.95
CRYSTAL SET BUILDING & MORE (Inc Newsletters Vol 6 & 7 of Xtal Set Society).....		£10.50
CRYSTAL SET PROJECTS. Phil Anderson.....	160 pages	£9.50
EXPERIMENTAL TELEVISION (1932).....	312 pages	£11.75
HEATHKIT - A GUIDE TO AMATEUR RADIO PROJECTS. C. Penson.....	248 pages	£21.95
HENLEYS 222 RADIO CIRCUIT DIAGRAMS (1924).....	771 pages	£9.45
HOW TO BUILD YOUR RADIO RECEIVER (A4) (Popular Radio Handbook No. 1).....	100 pages	£6.95
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey).....	127 pages	£7.95
* SEEING BY WIRELESS - THE STORY OF BAIRD TELEVISION. Ray Herbert.....	27 pages	£4.95
THE XTAL SET SOCIETY NEWSLETTER. Volume 1 & 2 Combined. Phil Anderson W0XI.....	96 pages	£13.00
THE CRYSTAL SET HANDBOOK & VOL. 3 XTAL NEWSLETTER. Phil Anderson W0XI.....	130 pages	£7.00
THE XTAL SET SOCIETY NEWSLETTER. Volume 4. Phil Anderson W0XI.....	88 pages	£8.50
THE CRYSTAL SET HANDBOOK & VOL. 5 XTAL NEWSLETTER. Phil Anderson W0XI.....	88 pages	£8.50
CRYSTAL RADIO HISTORY, FUNDAMENTALS AND DESIGN. P.A. Kinzie.....	122 pages	£7.50
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 + 1934).....	94 pages	£6.95
VISION BY RADIO (1925) (Jenkins).....	140 pages	£7.85
WIRELESS FOR THE WARRIOR VOL. 1 (Wireless Sets 1-88).....	204 pages	£27.50
WIRELESS FOR THE WARRIOR VOL. 2 (Hardback - Standard Sets of World War II).....	430 pages	£36.00

Maps & Log Books

AMATEUR RADIO LOGBOOK (RSGB).....	50 pages	£3.75
AMATEUR RADIO WORLD ATLAS (A4 SIZE).....	20 pages	£8.00
NORTH ATLANTIC ROUTE CHART.....	740 x 520mm	£8.50
QTH LOCATOR MAP OF EUROPE. NEW EDITION.....	1080 x 680mm	£7.00
RADIO AMATEURS MAP OF THE WORLD. NEW EDITION.....	980 x 680mm	£7.00
RECEIVING STATION LOG BOOK (RSGB).....	60 pages	£3.75
RSGB PREFIX GUIDE.....	32 pages	£5.75

Morse

MORSE CODE FOR RADIO AMATEURS (RSGB).....	28 pages	£4.25
SECRETS OF LEARNING MORSE CODE Mark Francis.....	84 pages	£6.95

Microwaves

AN INTRODUCTION TO MICROWAVES (BP312). F.A. Wilson.....	134 pages	£3.95
ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL. Various Authors.....	446 pages	£15.50
ARRL UHF/MICROWAVES PROJECT MANUAL (ARRL).....	400 pages	£15.50
MICROWAVE HANDBOOK - COMPONENTS & OPERATING VOL 1 (RSGB).....	110 pages	£10.50
MICROWAVE HANDBOOK - CONSTRUCTION & TESTING VOL 2 (RSGB).....	120 pages	£15.75
MICROWAVE HANDBOOK - BANDS & EQUIPMENT VOL 3 (RSGB).....	140 pages	£15.75
OR BUY ALL 3 FOR.....		£34.00

Operating & Handbooks

ALL ABOUT HAM RADIO. Harry Helms.....	290 pages	£16.50
AMATEUR RADIO OPERATING MANUAL (RSGB). Ray Eckersley G4FTJ.....	249 pages	£12.23
ARRL HANDBOOK 1998 75th Edition.....	360 pages	£24.00
ARRL HANDBOOK 1998 ON CD-ROM.....		£30.00
ARRL OPERATING MANUAL NEW EDITION.....	420 pages	£18.50
COMPLETE OX'ER. Bob Locher.....	204 pages	£9.50
HAM RADIO MADE EASY (ARRL). Steve Ford.....	204 pages	£11.50
HINTS AND KINKS FOR THE RADIO AMATEUR. Edited by Charles L. Hutchinson and David Newkirk.....	129 pages	£9.50
LOW PROFILE AMATEUR RADIO (ARRL). Jim Kearman KR1S.....	124 pages	£8.00
SETTING UP AN AMATEUR RADIO STATION BP300. I.D. Poole.....	81 pages	£3.95
TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED. Joseph D. Moell & Thomas N. Curlee.....	325 pages	£23.95

Packet

NOS INTRO: TCP/IP OVER PACKET RADIO. Ian Wade G3NRV.....	356 pages	£11.50
PACKET RADIO PRIMER (RSGB). Dave Comber G8UYZ & Martyn Corft G8NZU.....	266 pages	£8.95
PACKET, SPEED & MORE SPEED APPLICATIONS (ARRL).....	148 pages	£10.50
YOUR PACKET COMPANION. Steve Ford WB8IMY.....	170 pages	£7.50

Propagation

AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293. J.G. Lee.....	116 pages	£3.95
--	-----------	-------

QRP

G-QRP CLUB CIRCUIT HANDBOOK. Edited by Rev. G. Dobbs G3RJV.....	96 pages	£9.00
INTRODUCING QRP. Dick Pascoe G0BPS.....	48 pages	£6.95
W1FB'S QRP NOTEBOOK (ARRL). 2nd Edition. Doug DeMaw W1FB.....	175 pages	£7.50

Test Equipment

GETTING THE MOST FROM YOUR MULTIMETER BP239. R.A. Penfold.....	102 pages	£2.95
HANDS-ON GUIDE TO OSCILLOSCOPES. Barry Ross.....	228 pages	£19.95
HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267. R.A. Penfold.....	104 pages	£3.50
MORE ADVANCED TEST EQUIPMENT CONSTRUCTION BP249. R.A. Penfold.....	102 pages	£3.50
MORE ADVANCED USES OF THE MULTIMETER BP265. R.A. Penfold.....	96 pages	£2.95
AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315. F.A. Wilson.....	122 pages	£4.95
PRACTICAL TRANSMITTERS FOR NOVICES. John Case GW4HWR.....	126 pages	£10.00
TEST EQUIPMENT FOR THE RADIO AMATEUR. Clive Smith G4FZH.....	170 pages	£10.95

VHF

ALL ABOUT VHF AMATEUR RADIO. W. L. Orr W6SAL.....	163 pages	£8.85
VHF/UHF HANDBOOK (RSGB). Dick Biddulph G8PDS.....	180 pages	£18.75

ELECTRONICS

A REFERENCE GUIDE TO PRACTICAL ELECTRONICS TERMS BP287. F.A. Wilson.....	431 pages	£5.95
BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285.....	166 pages	£4.99
CIRCUIT SOURCE BOOK 1 - BP321. R.A. Penfold.....	182 pages	£4.95
CIRCUIT SOURCE BOOK 2 - BP322. R.A. Penfold.....	214 pages	£4.95
FAULT FINDING ELECTRONIC PROJECTS BP391.....	133 pages	£4.99
GETTING STARTED IN PRACTICAL ELECTRONICS BP345. Owen Bishop.....	198 pages	£4.95
HOW TO TEST ALMOST EVERYTHING ELECTRONIC.....	326 pages	£15.95
NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK Third Edition. Vivian Capel.....	210 pages	£12.95
NEWNES ELECTRONICS ENGINEER'S POCKET BOOK. Keith Brindley.....	306 pages	£12.95
POWER SUPPLY PROJECTS BP76. R.A. Penfold.....	89 pages	£3.99
PREAMPLIFIER & FILTER CIRCUITS BP309. R.A. Penfold.....	92 pages	£3.95
PRACTICAL ELECTRONIC FILTERS BP299. Owen Bishop.....	89 pages	£4.95
PRACTICAL ELECTRONICS HANDBOOK. Ian Sinclair.....	439 pages	£13.95
PRACTICAL OSCILLATOR CIRCUITS BP393. A. Flind.....	136 pages	£4.99
RADIO ENGINEERS FACTFINDER FOR WINDOWS (Floppy Disk) John Davies.....		£18.00
TEST EQUIPMENT CONSTRUCTION BP248. R.A. Penfold.....	104 pages	£3.99
*THE ART OF SOLDERING BP324. R. Brewster.....	84 pages	£3.99
UNDERSTANDING BASIC ELECTRONICS (ARRL).....	314 pages	£15.50
VALVE AMPLIFIERS. Morgan Jones.....	374 pages	£25.00
VALVE & TRANSISTOR AUDIO AMPLIFIERS. John Lindsay Hood.....	310 pages	19.95
W1FB'S DESIGN NOTEBOOK (ARRL). Doug DeMaw W1FB.....	195 pages	£7.50

Data

ARRL ELECTRONICS DATA BOOK. Doug DeMaw W1FB.....	260 pages	£8.95
ELECTRONIC HOBBYIST DATA BOOK BP396. R.A. Penfold.....	242 pages	£5.95
PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53. F.A. Wilson.....	249 pages	£3.95
PRACTICAL ELECTRONIC DESIGN DATA BP316. Owen Bishop.....	327 pages	£5.99
PRACTICAL RF HANDBOOK 2ND EDITION. Ian Hickman.....	302 pages	£18.95
SECRETS OF RF CIRCUIT DESIGN. Joseph Carr.....	405 pages	£23.95
SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL) Les Hayward W7Z0I & Doug DeMaw W1FB.....	256 pages	£11.50
SPREAD SPECTRUM SOURCE BOOK.....	320 pages	£15.50
TOWERS INTERNATIONAL MOSPOWER & OTHER FET SELECTOR.....	140 pages	£19.95
TOWERS INTERNATIONAL TRANSISTOR SELECTOR - UPDATE 5.....	476 pages	£24.95
TRANSISTOR DATA TABLES (BP401).....	178 pages	£5.95

Projects

BUILD YOUR OWN INTELLIGENT AMATEUR RADIO TRANSCIVER. Randy L. Henderson.....	350 pages	£24.95
COIL DESIGN & CONSTRUCTION MANUAL BP160. B.B. Babani.....	106 pages	£3.95
HOW TO DESIGN & MAKE YOUR OWN PCBs BP121. R.A. Penfold.....	66 pages	£2.50
MORE ADVANCED POWER SUPPLY PROJECTS BP192. R.A. Penfold.....	92 pages	£2.95
PRACTICAL RF HANDBOOK (2nd Edition). Ian Hickman.....	300 pages	£19.95
PROJECTS FOR RADIO AMATEURS & SWLs BP304. R.A. Penfold.....	92 pages	£3.95
RADIO RECEIVER PROJECTS YOU CAN BUILD.....	312 pages	£19.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275. R.A. Penfold.....	88 pages	£3.95

Valves/Tubes

ELECTRON TUBE LOCATOR. George H. Farhauer.....	350 pages	£21.95
ESSENTIAL CHARACTERISTICS (TUBES & TRANSISTORS) (Original publishers General Electric) Re-published by Antique Electronic Supply (Arizona).....	475 pages	£10.50
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS.....	60 pages	£2.95
RADIO VALVE GUIDE BOOK VOL 1.....	54 pages	£2.95
RADIO VALVE GUIDE BOOK VOL 2.....	42 pages	£2.95
RADIO VALVE GUIDE BOOK VOL 3.....	40 pages	£2.95
RADIO VALVE GUIDE BOOK VOL 4.....	48 pages	£2.95
RADIO VALVE GUIDE BOOK VOL 5.....	44 pages	£2.95
RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America). Re-published by Antique Electronic Supply (Arizona).....	384 pages	£10.50
RCA TRANSMITTING TUBES (Original Publisher Radio Corporation of America) Re-published by Antique Electronic Supply (Arizona).....	318 pages	£10.50
TUBE SUBSTITUTION HANDBOOK.....	150 pages	£15.50

Telephone
(01202) 659930

E-MAIL: bookstore@pwpublishing.ltd.uk

FAX: (01202) 659950

OR USE THE ORDER FORM ON PAGE 82



Please note:
Cash not accepted with mail orders.

Photocopies of this page are acceptable

Order Form



SUBSCRIPTION RATES

Practical Wireless – 1 year.

- £25 (UK)
- £30 (Europe 1st class)
- £32 (Rest of World Airmail)
- £37 (Rest of World Airmail)

Special joint subscription with Short Wave Magazine – 1 year.

- £50 (UK)
- £59 (Europe Airmail)
- £63 (Rest of World Airmail)
- £74 (Rest of World Airmail)

PLEASE START MY SUBSCRIPTION WITH THE.....ISSUE.

Monitoring Times – 1 year (12 issues).

- £38 (UK)
- £43 (Europe Airmail)
- £49 (Rest of World Airmail)

Satellite Times – 1 year (12 issues).

- £38 (UK)
- £43 (Europe Airmail)
- £49 (Rest of World Airmail)

BINDERS/BOOKS

Binders

Please send me Practical Wireless binder(s) @ £6.50 each.

£1 P&P UK, £2 P&P overseas £

Books Please send me the following books

- £
- £
- £
- £

Postal charges:

- £1** for one, **£2** for two or more (UK)
- £2** per book or **£10** for five books or more items (overseas surface)
- £2** per binder (overseas surface)
- NEW FASTER NEXT DAY SERVICE (UK MAINLAND ONLY)**
- £4.50** per parcel (orders must be placed by 12 noon)

GRAND TOTAL £

FOR ALL MAIL ORDER PURCHASES IN PRACTICAL WIRELESS

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., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

Name

Card number

Address

Valid from to

.....

Signature

.....

Telephone number

Telephone number

Orders are normally despatched by return of post but please allow 28 days for delivery.

I enclose cheque/PO

Prices correct at time of going to press.

Payable to PW Publishing Ltd.) £

Please note:

Charge to my Access/Visa card the sum of £

ALL PAYMENTS MUST BE MADE IN STERLING, CASH NOT ACCEPTED WITH MAIL ORDER.

CREDIT CARD ORDERS TAKEN ON (01202) 659930

FAX ORDERS TAKEN ON (01202) 659950

FREE! Scan '98

48-page
Booklet

BROADCAST SPECIAL

- ◆ A Unique Event - Roy Clayton G4SSH
- ◆ Off & Clear - QRT - Rosina Brown
- ◆ Amateur Bands Round-Up - Paul Essery GW3KFE
- ◆ How Low Can You Go? Kelvin Law G4WMZ

NEW BROADCAST SECTION

- ◆ Bandscan America
- ◆ LM&S

PLUS

- ◆ JW Reviews The Enhanced Fairhaven RD500
- ◆ Toroids, Binoculars, Rods & Beads Part 1 - by Joe Carr K4IPV
- ◆ The NRD-545 Revisited After The ROM Change

and all your regular
favourites too!

August On Sale Now -
£2.75 - Miss It Miss Out!



short wave magazine

Next Month in Practical Wireless, the magazine that brings you Amateur Radio & So Much More

Coming Next Month in PRACTICAL WIRELESS

THE UK'S BEST SELLING INDEPENDENT
AMATEUR RADIO MAGAZINE

Next Month in *Practical Wireless*, the
magazine that brings you Amateur
Radio & So Much More

LEICESTER SHOW SPECIAL!

The 27th Leicester Show takes place not only a month earlier
but also at a new venue -
we bring you details of all you need to know.

REVIEWED!

PW's very own antenna enthusiast Tex Swann G1TEX puts
the MFJ-259B Antenna Analyser to the test.

Rob Mannion G3XFD has been out and about with the
Pro-Am MM3401 triple mag-mount antenna in his quest to
find himself a suitable portable/mobile system.

ELECTRONICS IN ACTION!

More electronics related hints, tips, news and mini reviews.

BUILD!

David McBright shares his idea for a Morse practice
oscillator.

Plus all your regular favourites including

Bargain Basement
Carrying on the Practical Way
Keylines
News
Radio Scene
Valve & Vintage

and much, much more!

* Contents subject to change

PW

CAN YOU AFFORD TO MISS IT? -
OCTOBER ISSUE ON SALE 10 SEPTEMBER 1998
PLACE YOUR ORDER TODAY!

YOUR LOCAL DEALERS

<p>W. SUSSEX</p> <p>Adur Communications</p> <p>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.</p>	<p>SURREY</p> <p>Chris Rees G3TUX</p> <p>The QRP Component Company PO Box 88 Haslemere Surrey GU27 2RF Tel: (01428) 661501 Fax: (01428) 661794</p> <p>KITS, KEYS & QRP</p> <p>MAIL ORDER - 9AM TO 6PM (NOT SUNDAYS) SAE FOR LISTS AND LITERATURE</p>	<p>MID GLAMORGAN</p> <p>SANDPIPER COMMUNICATIONS</p> <p>Unit 5, Enterprise House, Cwmbach Industrial Estate, Aberdare, Mid Glamorgan CF44 0AE Tel: (01685) 870425 Fax: (01685) 876104</p> <p>A full range of transmitting & receiving antennas available for the amateur commercial market.</p>	<p>LONDON</p> <p>MARTIN LYNCH & Son</p> <p>For all your amateur radio needs 140-142 Northfield Avenue Ealing London W13 9SB Tel: 0181-566 1120 Fax: 0181-566 1207</p>
<p>BIRMINGHAM</p> <p>FREE CB RADIO CATALOGUE PHONE</p> <p>0121-457 7788</p> <p>***** SRP RADIO CENTRE</p>	<p>SCOTLAND</p> <p>JAYCEE ELECTRONICS LTD</p> <p>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</p>	<p>KENT</p> <p>KANGA QRP KITS</p> <p>We stock a complete range of QRP kits for beginners or the more expert! Prices start from just £3.95.</p> <p>Send an SAE for our free catalogue or check out our www pages: http://www.kanga.demon.co.uk</p> <p>Kanga Products Seaview House, Crete Road East Folkestone, Kent CT18 7EG Tel/Fax 01303 891106</p>	<p>EASTERN ENGLAND</p> <p>WATERS & STANTON PLC</p> <p>Spa House, 22 Main Road, Hockley Essex SS5 4QS Tel: (01702) 206835/204965 Fax: (01702) 205843</p> <p>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</p>
<p>DORSET</p> <p>BOOKS BOOKS BOOKS</p> <p>PW PUBLISHING BOOK SERVICE</p> <p>Tel: 01202 659930 Fax: 01202 659950</p>	<p>DORSET</p> <p>THE SHORTWAVE SHOP</p> <p>Novice/C.B./Amateur/SWL Equipment. Full range secondhand equipment always available.</p> <p>18 Fairmile Road, Christchurch, Dorset BH23 2LJ Tel/Fax: 01202 490099</p>	<p>AVON/SOMERSET</p> <p>QSL COMMUNICATIONS</p> <p>We stock all makes of equipment for the Amateur and Listener. Part Exchange Welcome</p> <p>Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare BS22 0BX Tel/Fax: (01934) 512757</p>	<p>SOUTHAMPTON</p> <p>SMC Ltd</p> <p>Main Dealer for: Yaesu, Kenwood, Icom AOR & Cushcraft</p> <p>SM House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY Tel: (01703) 255111 Fax: (01703) 263507</p>
<p>To reach almost 40,000 readers every month, ring Chris on (01202) 659920 and advertise YOUR company</p>	<p>LONDON</p> <p>HAYDON COMMUNICATIONS</p> <p>For all your amateur radio equipment. NEW, SECONDHAND, EX-DEMO 132 High St., Edgware, Middx HA8 7EL Tel: 0181-951 5781/2 Fax: 0181-951 5782 Open Mon-Fri 9.30-5.30, Sat 9.30-2.00</p>	<p>NORTHWEST</p> <p>ARC Ltd.</p> <p>Everything for the radio amateur under one roof!</p> <p>38 Bridge Street, Earlestown, Newton-le-Willows, Merseyside WA12 9BA Tel: 01925 229881 Fax: 01925 229882</p>	<p>SCOTLAND</p> <p>TENNAMAST SCOTLAND LTD</p> <p>Masts from 25ft - 40ft Adapt-A-Mast</p> <p>(01505) 503824 81 Mains Road, Beith, Ayrshire, KA15 2HT</p>

Index to Advertisers

Aerial Techniques.....	79	Howes CM.....	16, 47	QSL Communications.....	6/7
BARTG Rally.....	79	Icom UK.....	IBC	Radioworld.....	32/33
Castle Electronics.....	66	Interproducts.....	59	RAS Notts.....	79
Centre Electronics.....	79	J Birkett.....	79	RSGB.....	33
Chelcom Aerials.....	22	Langrex Supplies.....	66	Short Wave Magazine.....	83
Chelmer Valve Co.....	16	LAR Communications Centre.....	79	South Bristol AR Rally.....	59
Chevet Supplies.....	58	Leicester Show.....	59	SRP Trading.....	31
Datong Electronics.....	58	Martin Lynch & Son.....	4/5	Sunrise Electronics.....	8
Electromail.....	19	Monitoring Times.....	19	Syon Trading.....	16, 22
Electrovalue.....	16	Moonraker.....	31	Tennamast.....	22
Essex Amateur Radio Services.....	59	Multicomm 2000.....	36/37, 60/61	Waters & Stanton.....	IFC/1, 2
Essex Shortwave Services.....	66	No Nuts.....	16	Yaesu.....	OBC
Hately Antenna Technology.....	22	Number One Systems.....	58		
Haydon Communications.....	49, 50/51	Pervisell.....	79		

ICOM

IC-PCR1000

DON'T MISS THIS CHANCE TO SAVE £100!!!

GREAT NEWS... YOU CAN NOW PICK UP THE FANTASTIC ICOM PCR1000 FOR JUST £249 INC. VAT. A MASSIVE SAVING OF £100!!! HURRY - THE OFFER MUST END 30TH SEPTEMBER 1998.

The explosive growth of the Internet in recent years has brought a wealth of information to PC users the world over. However, long before the Internet even existed, the airwaves have been filled with communications of all kinds - broadcast radio and television, Ham, special services and aviation to name just a few. The IC-PCR1000 is a versatile, new radio interface that lets you listen to this exciting world from your computer.

- An exciting new radio receiving idea!
- For today's listener who doesn't want to miss a thing!
- Not a knob in sight, use your keypad 'n' mouse instead.
- **3 Interface screens to choose from -**
 1. Display screen showing all you need, as on a real receiver.
 2. Component screen for tuning and mode choice etc.
 3. Radio screen shows presets for stations and frequencies etc.
- External connection for your PC or laptop.
- Real-time bandscope function for easy location of the busiest frequencies.
- All-mode Rx - 100kHz~1300MHz.

SAVE £100!!!

- **NEW!!!** UT-106 DSP Digital Filter Unit for Automatic Notch Filtering and Improved Noise Reduction.



Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.
internet: <http://www.icomuk.co.uk> E-mail: info@icomuk.co.uk

Count on us!

FT-847

Ultra-Compact Satellite
and All Mode Transceiver

4 into 1 does go!

Technology moves inexorably onward, evolving, adapting, forever changing. At the same time, today's Radio Amateur puts even more demands upon designers to build quality, sophisticated, but easy to use stations for Voice, Packet, Satellite, CW, VHF, UHF, HF, just to mention a few. Yaesu's designers took on that challenge, and following in the footsteps of the revolutionary FT1000, FT1000MP and FT920 are now proud to offer today's Radio Amateur the station in a box - the all new FT-847!

The Yaesu FT-847 Ultra-Compact Satellite and All Mode Transceiver has jumped the technology with a transceiver ready for the new millennium. With its high-tech design

and revolutionary features, the FT-847 is truly the one radio that can do it all! Massive band-width coverage from a single unit, the FT-847 has many features to keep it at the top of the evolutionary pile. These include crystal clear 100 watts on HF and 50MHz, a massive 50 watts on 2 meters and 70cms, Yaesu's effective DSP for bandpass, noise reduction and notch filter, and direct input of frequency on the supplied keypad. Silky smooth tuning with 0.1MHz tuning steps, Cross band and full duplex, CTCSS and DCS encode and decode built in. And for Satellite reception, normal and reverse tracking. A matching ATU (Automatic Antenna Tuning Unit) is also available as an option.

FEATURES

- All band performance (SSB, CW, FM, AM)
- 100 Watt output on HF/50MHz bands
- 50 Watt output on 144/430 MHz bands
- Cross-band full Duplex operation
- Normal/Reverse tracking for satellite operation
- CTCSS & DCS encode/decode built-in
- High resolution 0.1Hz tuning steps for ultra smooth tuning
- Digital Signal Processing filters (Bandpass, Notch, Noise Reduction)
- Simplified tuning with Shuttle Jog control
- Direct frequency keypad entry
- Dedicated satellite memories, with 8-character Alpha Numeric Labels
- TX Freq. (MHz): 1.8 - 50 (amateur band) 144-146/430-440
- RX Freq. (MHz): 0.5-30/50-54 108-174/420-512
- Emission modes: LSB, USB, CW, AM, FM, PACKET(9600/1200bps: External input.)
- Freq. Steps(Min): 0.1Hz for SSB and CW 10Hz for AM and FM
- Modulation Types:
 - SSB: J3E Balanced, filtered carrier
 - AM: A3E Low-level (early stage)
 - FM: F3E Variable reactance
 - FSK: J1D, J2D, F2D Audio frequency shift keying (external input), F1D Frequency shift keying (V/UHF: external input)
- Options:
 - FC-20 Automatic Antenna Tuning Unit (External)
 - FVS-1A Voice Synthesiser
 - ATAS-100 Active Tuning Antenna System

YAESU
...choice of the World's top DX'ers



<http://www.yaesu.co.uk>

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

FT-920

The highest performing HF/6 meter rig in its price class with Yaesu's renowned Omni-Glow™ display



YAESU UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Road, Hounslow, Middlesex, TW4 6DR, U.K. 0181-814-2001