

THE UK'S BEST SELLING MAGAZINE FOR AMATEUR RADIO ENTHUSIASTS

AUGUST 1995 £1.90

# practical **Wireless**

## ANTENNA SPECIAL

**18**  
Pages of Antenna  
Features

*Featuring*

**THE SLIM COBRA  
- A CHARMING ANTENNA**

**MULTI-DELTA ANTENNAS**

**SD-610 MULTI-BAND  
ANTENNA REVIEW**

*plus*

**THE KEY TO  
IRELAND'S  
AMATEUR RADIO**

**SPECIAL PRIZE  
COMPETITION**

**PLUS ALL YOUR  
REGULAR  
FAVOURITES!**



**reviewed**  
**ALINCO DX-70 HF  
TRANSCEIVER**



ISSN 0141-0857




08 >

9 770141 085020

**NEW**  
Dual Band HT

# Dual Band Handheld FT-51R

Only one Dial/Volume knob required for easier use.

## The First Dual Band HT with **WINDOWS!**

Three dual receive configurations VHF/VHF, UHF/UHF, or VHF/UHF with main band frequency on right or left side. Flexible programming allows transmit on main or sub band.

An 8 character alpha-numeric user help menu scrolls operation instructions in the bottom of the large, backlit display.

MH-29A2B  
LCD Display Mic  
with Remote  
Functions.  
(Optional)

The new FT-51R Dual Band HT is state-of-the-art, and easy to use!

So easy, you won't need an operating manual. Its exclusive, scrolling instruction menu located in the large, backlit display "window", guides you through total operation while simultaneously viewing the main display window.

You'll like some of the other new, exclusive features, too. Like Spectrascope™. This unique feature displays real time, continuous scanning of activity on adjacent frequencies in VFO mode or 8 of your favourite

"I can see two frequencies and alpha-numeric all at the same time."

"Scrolling instructions tell me what to do next!"



"I use the Spectrascope to find new contacts faster."

"Yaesu did it again!"

Digital battery voltage readout displays condition of battery in use. Scan skip function allows individual memory channel lock-out during scanning mode.

Spectrascope™ displays active adjacent frequencies in real time with relative signal strength.

FT-51R  
2 1/4" W x 4 3/4" H x 1 1/8" D  
(2 Watt version shown.)

### Specifications

- Frequency Coverage
  - VHF RX: 110-180 MHz
  - TX: 144-146 MHz
  - UHF RX: 420-470 MHz
  - TX: 430-440 MHz
- Spectrascope™ Display
- Scrolling User Help Menu
- Alpha-Numeric 8 Character Display
- Up/Down Volume/Squelch Controls & Display
- Selectable Sub-Band TX Mute
- Automatic Tone Search (ATS)
- Digital Battery Voltage Display
- AM Aircraft Receive
- Scanning Light System (SLS)
- 120 Memory Channels (80 w/Alpha-Numeric)
- Large Backlit Keypad & Display
- Automatic Repeater Shift (ARS)
- Multiple Scanning Modes
- 3 Selectable Scan Stop Modes with Scan Skip
- User selectable lock function w/15 combinations
- Automatic Power Off (APO)
- TX/RX Battery Savers Built-in
- Handy Cloning Feature
- 5 Selectable Power Output Levels
- Message system with CW ID
- Selectable RX Smart Mute™
- Cross-Band & One-Way Repeat Functions
- DTMF Paging/Coded Squelch Built-in

#### Accessories

Consult your local dealer.

# YAESU

Performance without compromise.™

YAESU UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Rd., Hounslow, Middlesex, TW4 6DR

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.

# practical Wireless

AUGUST 1995 (ON SALE JULY 13)  
VOL. 71 NO 8 ISSUE 1061  
NEXT ISSUE (SEPTEMBER)  
ON SALE AUGUST 10

## EDITORIAL & ADVERTISEMENT

### OFFICES

Practical Wireless  
Arrowsmith Court  
Station Approach  
Broadstone  
Dorset BH18 8PW  
☎ (01 202) 659910

(Out-of-hours service by answering machine)  
FAX (01 202) 659950

PW's Internet address is:

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

### Editor

Rob Mannion G3XFD  
Technical Projects Sub-Editor  
NG ("Tex") Swann G1TEX  
Production/News  
Donna Vincent G7TZB  
Editorial Assistant  
Zoë Shortland  
Art Editor  
Steve Hunt  
Assistant Art Editor  
Richard Gale

### Advertisement Manager

Roger Hall G4TNT  
PO Box 948  
London SW6 2DS  
☎ 0171-731 6222  
Mobile (0585) 851385  
FAX 0171-384 1031

### Advert Sales and Production (Broadstone Office)

Lynn Smith (Sales),  
Ailsa Turbett G7TJC (Production)  
☎ (01 202) 659920  
FAX (01 202) 659950

### CREDIT CARD ORDERS

☎ (01 202) 659930  
(Out-of-hours service by answering machine)  
FAX (01 202) 659950

Front Cover Photographs of DX-70 by Craig  
Dyball. Antenna insert photograph courtesy  
of Rascal Antennas Limited.

Copyright © PW PUBLISHING LTD. 1995. 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:  
(01 202) 659910. Printed in England by Southwesterly (Wich) Press Ltd.  
Distributed by Seymour, Windsor House, 1270 London Road, Norbury,  
London SW19 4DH, Tel: 0181-679 1899, Fax: 0181-679 8997, Telex: 8812945.  
Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.,  
South Africa - Central News Agency, Subscriptions INLAND £22, EUROPE  
£25, OVERSEAS (by ASP1 E7), payable to PRACTICAL WIRELESS.

Subscription Departments, PW Publishing Ltd., Arrowsmith Court, Station  
Approach, Broadstone, Dorset BH18 8PW. Tel: (01 202) 659920. PRACTICAL  
WIRELESS is sold subject to the following conditions, namely that a share  
not, without written consent of the publishers first having taken place, 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 £45 per year by PW Publishing Ltd.,  
Arrowsmith Court, Station Approach, Broadstone, Dorset  
BH18 8PW, UK Second Class postage paid at Middlesex,  
N.J. Postmaster: Send USA address changes to Practical  
Wireless, c/o Permit to post at Hickonsack pending. The  
USPS (United States Postal Service) number for Practical  
Wireless is 007075.



- 9 **EDITOR'S KEYLINES**  
Rob Mannion G3XFD has news of some  
interesting changes to 'Valve & Vintage'.
- 10 **RECEIVING YOU**  
PW readers share their views
- 12 **NEWS '95**  
The 'Newsdesk' reports on what's new this  
month.
- 16 **NOVICE NATTER**  
Elaine Richards G4LFM passes on hints and  
tips for Radio Beginners of all Ages.
- 20 **CLUB SPOTLIGHT**  
Zoë Shortland puts more radio clubs in the  
'Spotlight'.
- 24 **SPECIAL PRIZE  
COMPETITION CORNER**  
Over £350 of prizes to be won in this  
month's Spot the Difference competition.
- 25 **SUBS CLUB/READER OFFER**  
Your chance to buy an MFJ-948 antenna  
tuner at a very special price.

- 25 **RADIO DIARY**  
Radio rally dates.

## ANTENNA SPECIAL

- 26 **CONTROLLING THAT  
MAGNETIC LOOP**  
Gordon Lumley G3DJE shares his design for  
controlling a magnetic loop antenna.
- 28 **A CHARMING IDEA - THE  
SLIM COBRA**  
John Heys G3BDO describes a portable  
antenna for use on the h.f. bands.

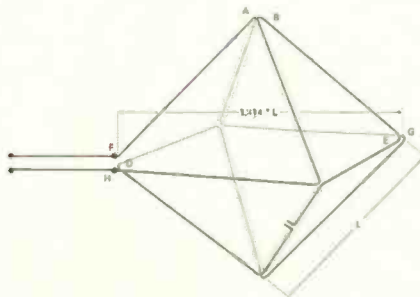
- 31 **REVIEW**



### - THE ALINCO DX-70 HF TRANSCIVER

Read why Rob Mannion G3XFD thinks that  
Alinco's first venture into the h.f. market  
has given them an 'Award Winning Rig'.

- 34 **MULTI-DELTA ANTENNAS**  
Denis Payne G3KCR experiments by folding  
antennas into three dimensional shapes.



- 37 **REVIEW - SD-610**  
John Goodall G0SKR tries out the Sigma  
SD-610 h.f. multi-band antenna.

# CONTENTS

## August

- 41 **PASCOE'S PENNY PINCHERS**  
Dick Pascoe G0BPS has come up with some  
practical 'penny pinching' antenna projects  
for you to try.
- 44 **ANTENNA WORKSHOP**  
'What A Good Idea' say six PW readers as they  
share their simple antenna project designs  
with you.
- 46 **GOODALL'S GOODIES**  
John Goodall G0SKR looks at and comments  
on a range of antenna associated products.
- 50 **THE TWO-FOLD**  
Kevin James G6VNT's 144MHz beam antenna  
has a useful feature - it folds up for transport.
- 52 **EQUIPMENT  
SPECIFICATIONS**  
Ian Poole G3YWX looks at Direct Digital  
Synthesis.
- 54 **FRIENDSHIP - THE KEY TO  
IRELAND'S AMATEUR  
RADIO**  
Radio tales from the Emerald Isle.
- 55 **VALVE BOOK VICTORY**  
Practical Wireless reviews five American valve  
data reference books.
- 56 **VALVE & VINTAGE**  
Ron Ham opens the PW vintage 'wireless  
shop' for his last session.
- 58 **HF FAR & WIDE**  
Leighton Smart GW0LBI introduces PW's 'HF  
Initiative'.
- 61 **BITS & BYTES**  
Mike Richards G4WNC brings you the latest  
computing in radio news.
- 62 **VHF REPORT**  
David Butler G4ASR has news of the proposed  
changes to the h.f. and v.h.f. bands.
- 64 **BROADCAST ROUND-UP**  
Peter Shore takes his monthly look at the  
broadcast bands.
- 65 **FOCAL POINT**  
Andy Emmerson G8PTH rounds-up the latest  
news from the ATV world.
- 67 **BARGAIN BASEMENT**  
Looking for a bargain? - your chance to buy,  
sell or exchange equipment.
- 71 **BOOK SERVICE**  
Browse through our comprehensive list of  
radio-related publications.
- 75 **ENDNOTES**  
News of what's coming soon in the UK's best  
selling radio magazine.
- 76 **ADVERTISER'S INDEX**

**SCOOP PURCHASE**

# UNBELIEVABLE PRICES ON STANDARD HANDHELDS!

The SMC bargain hunters have done it again. We have purchased the entire stock of Standard amateur handhelds in the UK, and we can offer them at amazingly low prices – Never before possible. We also have some accessories available for the older models. Please ring for further details



## C558

- \* 2m/70cm Dual band handi
- \* Twin volume/squelch controls
- \* Cross band operation
- \* VHF/UHF dual frequency display
- \* Hi, mid, low power output settings
- \* AM airband receiver built in
- \* 6 to 16v operation with supplied DC adaptor

**NOW ONLY £289**  
PREVIOUS PRICE £459



## C468

- \* 70cm full keypad handi
- \* Clear LCD display
- \* Hi, mid, low power settings
- \* 7 mode scan operation
- \* Excellent receiver sensitivity

**NOW ONLY £169**  
PREVIOUS PRICE £279



## C188

- \* 2m lightweight handi
- \* Keypad with slide cover
- \* Hi, mid, low power settings
- \* Automatic power off
- \* Main and sub UFO's

**NOW ONLY £169**  
PREVIOUS PRICE £279

ACCESSORIES SUPPLIED WITH ALL MODELS  
ANTENNA, CELL CASE, BELT CLIP AND HAND STRAP

**Head Office**  
9-5pm Tel: (01703) 255111  
Showroom/Mail Order  
9.30-5pm, 9-1pm Sat  
Tel: (01703) 251549  
Service Dept 9-5 Mon-Fri  
Tel: (01703) 254247

**SMC HQ Southampton**  
S M House, School Close  
Chandlers Ford Ind Estate  
Eastleigh, Hants SO5 3BY  
Tel: (01703) 251549/255111  
Fax: (01703) 263507  
HQ Monday - Friday

**ARE Communications**  
6 Royal Parade  
Hanger Lane, Ealing  
London W5A 1ET  
Tel. 0181-997 4476  
9.30am - 5.30pm Monday-Friday  
9.30am - 1.00pm Saturday

**Reg Wa**  
1 Weste  
West Str  
Axmins  
Devon l  
Tel. (01:  
9.00am -

# SMC, ARE & RE

*37 years and still*

## THIS MONTHS SPECIAL YAESU



**save £600**

2m/70cm  
25w d  
opt  
**ONLY**

### BUY NOW AT PRE INCREASE PRICES

Both Kenwood & Yaesu prices increased as of the quantities of equipment from both manufacturers, we are stocks last!! **Buy now to avoid disappointment.**

### HF TRANSCEIVER

YAESU			KENWOOD		
FT-1000	list £3999	our price £2895	TS-950SDX	list £3995	our price £2895
FT-990	list £2399	our price £1795	TS-850S	list £1809	our price £1795
FT-990/DC	list £2099	our price £1645	TS-85SAT	list £1959	our price £1645
FT-900	list £1399	our price £1095	TS-450S	list £1499	our price £1095
FT-900AT	list £1599	our price £1245	TS-450SAT	list £1649	our price £1245
FT-840	list £959	our price £725	TS-50S	list £1059	our price £725

### VHF TRANSCEIVER

YAESU			KENWOOD		
FT-736R	list £1999	our price £1549	TS-790E	list £1959	our price £1549
FT-8500	list £749	our price £659	TM-255E	list £949	our price £659
FT-5200	list £729	our price £595	TM-455E	list £1059	our price £595
FT-5100	list £679	our price £515	TM-733E	list £739	our price £515
FT-2500M	list £399	our price £295	TM-251E	list £419	our price £295
FT-2200	list £419	our price £329	TM-702E	list £579	our price £329

### VHF/UHF HANDI'S & PORTABLES

YAESU			KENWOOD		
FT-11R	list £324	our price £269	TH-79E	list £479	our price £269
FT-41R	list £369	our price £299			
FT-51R	list £529	our price £395	TH-22E	list £254	our price £395
FT-416G	list £369	our price £249			
FT-290R2	list £599	our price £425	TH-42E	list £289	our price £425
FT-690R2	list £649	our price £445			
FT-790R2	list £749	our price £535	TH-28E	list £319	our price £535

# G WARD

Number 1

## SU FT-736R

multimode base station.  
Output on both bands +  
options for 6m & 23cm

**£1399**

WHILE  
STOCKS  
LAST

## WHILE STOCKS LAST

1st July. Having purchased large  
able to offer the old prices while

## RS

ICOM	list	our price	PHONE
195 IC-7750SP	£3700	£1685	
1489 IC-736	£1969	£1435	
1625 IC-738	£1649	£1175	
1249 IC-729	£1325	£775	
1435 IC-706	£1195		
2895 IC-707	£889		

## RS

ICOM	list	our price
1625 IC-820H	£1795	£1549
2799 IC-275H	£1495	£1345
2899 IC-281H	£449	£409
2645 IC-2000H	£369	£339
2489 IC-2340H	£689	£629

## PORTABLES

ICOM	list	our price
2399 IC-21E	£529	£455
2215 IC-2GXE	£255	£225
2239 IC-2GXET	£279	£249
2259 IC-W21E	£329	£299
2259 IC-W21ET	£595	£545

and Co  
Parade  
et  
er,  
K13 5NY  
97) 34918  
15pm Tues-Sat

**SMC (Northern)**  
Nowell Lane Ind. Estate  
Nowell Lane  
Leeds  
Tel. (0113) 235 0606  
9.30am - 5.00pm Monday-Friday  
9.00am - 1.00pm Saturday

**SMC (Midlands)**  
102 High Street  
New Whittington  
Chesterfield  
Tel. (01246) 453340  
9.30am - 5.30pm Tuesday - Saturday

**SMC Birmingham**  
504 Alum Rock Road  
Alum Rock  
Birmingham B8 3HX  
Tel. 0121-327 1497  
9.00am - 5.00pm Tuesday - Friday  
9.00am - 4.00pm Saturday

## ICOM IC-706



HF + 6m + 2m mobile transceiver with remote mount capability. 100w on HF & 6m 10w out on 2m. Rx coverage 30kHz-200MHz + FM W

## AVAILABLE AUGUST ALINCO DX-70



HF & 6m remote mountable mobile transceiver. 100w output HF 10w on 6m. Rx coverage 150kHz-30MHz, 50-54MHz all mode including FM.

## PHONE NOW IN STOCK

## AEA TNC's and Data Modems

**PK12** - A new VHF TNC that offers superb performance and simplicity of operation. **ONLY £119.00 INC Carr B**

**PK12/100K** - 100k Mail Drop Memory Upgrade **£45.00 Carr A**

**PK232/MBx** - An old favourite that still offers state of the art performance. **BETTER VALUE THAN EVER AT ONLY £299.00 INC Carr C**

**PK900** - Deluxe multimode data terminal **ONLY £459.00 INC Carr C**

**PK96** - 9600 Baud packet TNC with 14K of mail drop memory. **£189.00 INC Carr B**

**PAK WIN** - Windows based S.W. programme **ONLY £79.00 INC Carr A**



PS120MIIA	PSU 3-15V 9/12A	£65.00
PS140MIIA	PSU 13.8V 12/14A	£67.00
PS304IIA	PSU 1-15V 24/30A	£119.00
RS40XII	PSU 1-15V 32/40A	£159.00
CN101L	1.8-150MHZ 15/150/1500W	£59.50
CN103LN	150-525MHZ 20/200W 'N'	£68.00
CS201	2 Way Switch S0239 1KW	£15.00
CS201GII	2 Way Switch 'N' 1KW PEP	£23.50
LA2080H	2M L/AMP 1.5-5W IN 30-80W OUT	£136.00
DLA80H	2M/70CM Dual Band Amp 0.5-25W IN 80-60W Out Pre Amps	£345.00
DX10N	2m/70cm Duplexer UHF/N	£19.50
CP10Y6	Cigar plug lead for FT530, etc.	£6.50

## EX DEMO/USED EQUIPMENT

Over 300 items in stock  
Send SAE for complete list

HF TRANSCEIVERS/AMPLIFIERS	Condition	Power	Price
PX FT747GX	Yaesu	Excellent	£499.00
PX FT1000	Yaesu	Unused	£2,495.00
PX FT757GX11	Yaesu	Good	£675.00
PX TS130S	Kenwood	Fair	£395.00
PX FTONE	Yaesu	Good	£750.00
PX FT980	Yaesu	Good Cond	£325.00
PX HL1K	Tokyo	As New	£839.00
PX HT180	Tokyo	Good	£289.00
BX FT101ZDMK3	Yaesu	Good	£399.00
BX FT901DE	Yaesu	Good	£449.00
CX FT101B	Yaesu	Good	£275.00
CX FT101E	Yaesu	Good	£325.00
CX FL7000	Yaesu	As New	£1,495.00
CX FT990AT	Yaesu	As New	£999.00
LX TS820S	Kenw	Good	£400.01
LX TS140S	Kenwood	Good	£595.00
LX FT67GX	Yaesu	V/Good	£1,450.00
LX TS850SAT	Kenwood	Excellent	£575.00
LX FT57GX	Yaesu	Good	£450.00
AX FT902DM	Yaesu	Fair	£360.00
RX TS330SP	Kenwood	Good	£595.00
RX TS670	Kenwood	Fair	£695.00
RX IC735	Icom	V/Good	£425.00
RX FT101Z	Yaesu	Fair	£250.00
RX FT277	Yaesu	Fair	£595.00
RX JS1100	JRC	Good	

VHF/UHF TRANSCEIVERS	Condition	Power	Price
PX FT36R	Yaesu	Good	£1,195.00
PX FT736R	Yaesu	Excellent	£1,650.00
PX FT73	Yaesu	Excellent	£169.00
PX FT415	Yaesu	Good	£169.00
PX FT530	Yaesu	Ex Demo	£375.00
PX IC2SET	Icom	Excellent	£195.00
PX CS50	Stand	Good	£245.00
PX DUJIE	Alinco	Good	£235.00
PX FT203R	Yaesu	Fair	£120.00
PX FT530	Yaesu	Good	£359.00
PX TH205E	Kenwood	Good	£139.00
PX M5600	Midland	V/Good	£99.00
PX IC900E	Icom	Good	£475.00
BX IC2SE	Icom	Fair	£260.85
BX TS700	Trio	Good	£289.00
CX FT221A	Yaesu	Good	£325.00
CX DJ580E	Alinco	V/Good	£350.00
CX FT2500M	Yaesu	Good	£295.00
CX TH21E	Kenwood	Good	£100.00
CX FT727R	Yaesu	V/Good	£265.85
CX TH205	Trio	Fair	£125.00
CX FT73R	Yaesu	Good	£169.20
LX IC2SET	Icom	Good	£176.00
LX IC251E	Icom	V/Good	£275.00
RX DUJIE	Alinco	Good	£175.00
RX FT277	Yaesu	Fair	£265.00
RX CT148	CTE	Good	£175.00
RX AMR1000	Icom	V/Good	£175.00
RX FT207R	Yaesu	Good	£95.00
RX TR2200GX	Kenw	Fair	£105.00
RX TR2300	Kenw	Fair	£125.00
RX FT790R	Yaesu	Fair	£255.00
RX IC32E	Icom	VGC	£330.00
RX TH78E	Kenwood	As New	£352.00
RX TH77E	Kenwood	Good	£275.00
RX TH241E	Kenwood	VGC	£225.00
RX FT23R	Yaesu	Fair	£145.00
RX KT22	Kenpro	Good	£125.00
RX C78	Standard	Fair	£158.00
RX TH78	Kenwood	Good	£305.00
RX ICW21ET	Icom	V/Good	£385.00
RX IC475H	Icom	Good	£795.00
RX FT470	Yaesu	Fair	£245.00
RX TH28E	Kenwood	V/Good	£169.00
RX IC275E	Icom	Good	£715.00

MISCELLANEOUS	Condition	Power	Price
PX TM100	Nevada	Good	£179.00
PX FC700	Yaesu	V/Good	£169.00
PX NC37	Yaesu	Good	£99.00
PX NC42	Yaesu	Good	£75.00
PX DX1296	SSB	New	£129.00
PX HK804	Himound	Good	£99.00
PX FC757AT	Yaesu	Excellent	£295.00
PX FP757HD	Yaesu	V/Good	£259.00
PX HL180V	Tokyo	Good	£310.00
PX AS-600	Tokyo	New	£165.00
PX MIMX1268	M/M	As New	£120.00
PX IF-100PC	Rico	Recond	£145.00
PX IF-100C64	Rico	Recond	£145.00

# S.M.C., A.R.E. & REG WARD



Tokyo Hy-Power. One can only describe their products as "Japanese design and build quality at its very best"

## HOKUSHIN ANTENNAS

HS-702S	2M/70CM Whip BNC	£12.50
HS430	5/8 Wave Whip BNC	£8.50
88F	2M 8/8 Wave Mobile Whip	£16.50
VM-727RS	2M/70CM Mobile Whip	£32.00
HS-727SS	2M/70CM Mini Mobile Whip	£17.00
EX104B	2M/70CM Mini Mobile Whip	£22.50
SMC12SE	12M Mobile Whip	£16.50
SMC15SE	15M Mobile Whip	£16.50
SMC17SE	17M Mobile Whip	£16.50
HF3	12/17/30 Base Vertical	£59.00
28HS2HB	10M 2EL ZL Beam	£65.00
HS-GP62	2 x 3/8 Base Colinear	£65.00
GP23	3 x 3/8 Base Colinear	£39.00
SO44	2M SWISS QUAD	£45.00
WX1	2M/70CM Base Colinear	£75.00
WX2N	2M/70CM Base Colinear	£99.00
WX4N	2M/70CM Base Colinear	£129.00
WX6S	2M/70CM Base Colinear	£189.00

## HF Antennas

R5	10/12/15/17/20 vertical	£279.00
R7	10 thru to 40m vertical	£369.00
AV-3	14-21-28MHz vertical 4.3m long	£85.00
AV-5	3-5-7-14-21-28MHz vertical 7.4m long	£149.00
AP8A	8 Band Vertical	£199.00
APR18A	Radial Kit	£49.00
40-2CD	2-ele 40m Yagi	£439.00
A3S	14-21-28MHz Yagi	£349.00
A3WS	12/17m 3-ele Yagi	£275.00
A103	30m Extension A3WS	£115.00
204CD	4 ele 20m Yagi	£439.00
154CD	4 ele 15m Yagi	£249.00
D4	Dipole 10/15/20/40m	£229.00
D3W	Dipole 12/17/30m	£169.00
A4S	3-4 ele Yagi 10/15/20m	£425.00

## VHF Antennas

AR-270	2/70 Dual Band Vertical 1.13m long	£60.00
AR-270b	2/70 Dual Band Vertical 2.3m long	£89.00
AR2	2m Vertical 1.2m long	£35.00
AR6	6m Vertical 3.1m long	£48.00
A148-10S	2m 10-ele Yagi 13.2 dBd	£59.00
A144-20T	2m 10-ele Cross Yagi 12.2 dBd	£99.00
13B2	13-ele 2m Yagi	£99.95
17B2	17-ele 2m Yagi	£169.00
A50-3S	3-ele 6m Yagi	£75.95
424B	24-ele 70cms Yagi	£115.00
22XB	2m 22-ele Yagi c/w polarization switching	£199.00
738XB	70cms 38-ele Yagi c/w polarization switching	£185.00

## REXON® VHF/UHF HANDI'S

RL102	VHF handi, 138-174MHz, 5 watt, complete with cell case	£189.00 B
RL402	UHF handi, 410-470MHz, 5 watt, complete with cell case	£199.00 B
RNB111	7.2V 600mAh nicad for RL102	£21.50 A
RNB112	12V 500mAh nicad for RL102	£39.95 A
NC28/REXON	Charger for RNB111	£18.00 A
SMC18/REXON	Charger for RNB112	£18.00 A
RTN100	CTCSS unit	£25.00 A
RTS102	DTMF unit	£19.95 A
RCC101A	Vinyl case RL102/402 + RNB111	£9.00 A
RBX100	AA cell case for RL102/402	£8.00 A
C8B186	Universal belt clip quick release	£14.95 A



**REXON® OFFER**  
**RL102 C/W NICAD & CHARGER ONLY**  
**£189**  


---

**RL-402 C/W NICAD & CHARGER ONLY**  
**£199**

## LINEARS

HL100B/10	10M Linear, 10W in 100W out PEP Suitable for 21/24/28MHz	210 C
HL100B/20	20M Linear, 10W in 100W out PEP	210 C
HL100B/80	80M Linear, 10W in 100W out PEP	210 C
HL66V	6M Linear, 10W in 50-60W out Rx Preamp	169 C
HL166V	6M Linear, 3/10W in Auto select 80/160W out Rx Preamp	299 C
HL37V5X	2M Linear, 0.5-5W in 20-35W out variable gain preamp	109 B
HL62V5X	2M Linear, 5/10/25W in 50W out preamp	235 C
HL35U	70cm Linear, 6/10W in 25/30W GaAs FET Preamp	155 B
HL63U	70cms Linear, 10/25W in 50W out GaAs FET Preamp	259 C
HL180V	2M Linear, 3/10/25W v/p auto select 170W out Rx Preamp	389 C
HL130U	70cms Linear, 3/10/25W v/p auto select 120W out Rx Preamp	485 C

## TRANSVERTORS

HX240	2M to HF 80, 40, 20, 15, 10M 2.5/10W Drive 30-40W o/p	299 B
HX640	6M to HF Specs as above	299 B



## CREATE ANTENNAS

HF	Carr	
714X-3	3-4 ele Yagi 15-20-40m 3Kw PEP	£1369 E
CD218	3 ele Yagi 10-15 1.5Kw PEP	£289 D
CD318JR	4 ele Yagi 10-15-20m 750w PEP	£439 D
CD318	4 ele Yagi 10-15-20m 2Kw PEP	£539 D
CD318B	5 ele Yagi 10-15-20m 2Kw PEP	£589 D
CD318C	6 ele Yagi 10-15-20m 2Kw PEP	£899 D
CL10	5 ele Yagi 10m 2Kw PEP	£299 D
CL15	5 ele Yagi 15m 3Kw PEP	£450 D
CL4B-4	3 ele Yagi 40m 4Kw PEP	£1375 E
CV730V-1	V-Dipole 10-15-20-40m 1Kw PEP	£199 D
CY103	3 ele Yagi 10m 2Kw PEP	£179 D
CY104	4 ele Yagi 10m 2Kw PEP	£239 D
CV48	40m Vertical 2Kw PEP	£275 D
AD385	40/80m Switch box for CV48	£69 B

## MORSE KEYS

HK702	Straight key, 1Kg adjustable tension and contacts	£46.00 B
HK706	Straight key, 0.5Kg adjustable tension and contacts	£29.00 B
HK707	Straight key, 0.5Kg similar 706 with cranked arm	£35.00 B
HK808	Straight key 2.5Kg deluxe marble plinth	£110.00 B
HK711	Straight key, knee mounting	£36.00 B
HK802	Deluxe straight key, bearing less solid brass construction	£82.00 B
HK803	Brass high deluxe telegraph key c/w base plate	£77.00 B
HK804	Brass high deluxe telegraph key w/o base plate	£82.50 B
MK702	Single lever paddle 1.0Kg	£34.00 B
MK704	Squeeze key 0.15Kg	£42.00 B
MK706	Squeeze key 0.7Kg	£34.00 B

## HOKUSHIN MOBILE ANTENNA MOUNTS

GCCA	Gutter Clip & Cable	£19.50
SOCA	4M Cable Assembly	£11.50
SOCAL	6M Cable Assembly	£12.50
HS-TMK	HD Boot Mount & Cable	£19.50
EM-B7	Mini Hatch Mount & Cable	£29.00
BM3	Mini Mount	£14.00
BSD	Bumper Strip Mount	£12.00
FB4N	Cable Assembly Low Loss 'N'	£14.50
SFA-4N	Cable Assembly Very Low Loss 'N'	£25.00
GCD	Gutter Mount	£9.00



## COMET ANTENNA ACCESSORIES

RS20	Mini Gutter Clip	£19.50
RS21		£19.50
CK-3MB	Mini Cable Assembly	£24.00
WS-1M	Window Mount & Cable	£39.00

## COMET STATION ACCESSORIES

CBL-30	HF 1:1 Balun 1KW PEP	£23.50
CBL-200	HF 1:1 Balun 2KW PEP	£29.50
CSW-20N	Switch 2 WAY 'N'	£39.00
CF-30MR	HF Low Pass Filter 1KW PEP	£39.00
CF-50MR	6M Low Pass Filter 1KW PEP	£39.00
CF-30H	HF Low Pass Filter 2KW PEP	£69.00
CF-30S	HF Low Pass Filter 150W PEP	£25.00
CF-50S	6M Low Pass Filter 150W PEP	£25.00
CF-BPF2	2M Band Pass Filter 150W PEP	£47.00
CD-160H	SWR/PWR 1.6-60MHZ 20/200/2000W	£99.00
CD-270D	SWR/PWR 140-525MHZ 15/60/200W	£89.00
CMX-2	SWR/PWR 1.8-200MHZ 20/50/200W	£119.00
CA-21HR	7MHZ Mobile Whip	£46.00
CA-14HR	14MHZ Mobile Whip	£46.00
CA-21HR	21MHZ Mobile Whip	£46.00
CH72S	2M/70CM Whip BNC	£17.00
CH600MX	2/70/23CM Whip BNC	£28.00
HR-50	6M MOBILE Whip	£46.00
CA2X4KG	2M/70CM Mobile Whip	£49.00
Z4	2m/70cm M. whip w/locking collar	£35.00
B-10	2M/70CM Mobile Whip	£21.00
B-22		£39.95
CHL21J	2M/70CM Mobile Whip	£19.00
CA-258	2m/6m Mobile Whip	£29.00
CA-350dB	6M/10M Base Colinear	£149.00
ABC23	3 x 3/8 Base Colinear	£55.00
GP9N	2M/70CM Base Colinear	£135.00
GP15	6M/2M/70CM Base Colinear	£85.00
GP9S	2M/70CM/23CM Base Colinear	£109.00

## COMET DUPLEXERS

CF-305	HF/VHF Duplexer	£25.00
CF-306A	HF/VHF/UHF Duplexer	£37.00
CFX-514	6M/2M/70CM Triplexer	£49.00
CFX-431	2M/70CM/23CM Triplexer	£49.00
CF-520	2M/6M Duplexer	£29.00

# RadioSport-RSGB Events, 1995

*Hitch a ride if you must, but whatever you do, don't miss the*



## STAFFORD AMATEUR RADIO & COMPUTER SHOW

**Incorporating RSGB National Convention**



memory, cpu's etc

disable facilities

amateur radio importers

special interest groups

dfscs & tapes

bring & buy

rsgb committees

talk-in on 2m & 70cm

lectures

antennas

second-hand equipment

computer media

free parking

morse tests

accessories

demonstrations

bar

seminars

catering

components

cables

Concessions  
£1.00

adults  
£2.00

**The County Showground,  
Weston Road, Stafford.  
August 19th & 20th  
(10.00am - 5.00pm both days)**

Presented in co-operation with the Radio Society of Great Britain and Moorlands & District A.R.S. and St. Leonards A.R.S.  
For further details please contact RadioSport Ltd. 126 Mount Pleasant Lane, Bricket Wood, Herts, AL2 3XD.  
Tel 01923-893929. Fax 01923-678770.

# BUY SMART

## SG-230 Smartuner®

### Antenna Coupler

SSB, AM, CW & DATA

You can't buy a smarter tuner than this. An automatic antenna coupler so intelligent it precisely tunes any length antenna - 8 to 80 ft - in the HF band.

The Smartuner® automatically evaluates and switches 64 input and 32 output capacitance combinations, plus 256 inductance combinations in a "pi" network. The amazing result is over a half-million different ways to ensure a perfect match for your transceiver. And the most intelligent feature of all is that the Smartuner remembers the chosen frequency and tuning values, and will automatically reselect those values - in less than 10 ms, each time you transmit on that frequency.

The SG-230 Smartuner.  
Buy smart.



MICROPROCESSOR CONTROLLED • NON-VOLATILE MEMORY  
WATERPROOF • B.I.T.E. INDICATOR • 1.8 TO 30 MHZ RANGE  
10 TO 150 WATTS INPUT POWER • 10ms RETUNING TIME  
8 to 80 ft. ANTENNA (all types)

**SGC**  
NO COMPROMISE  
COMMUNICATIONS



SGC INC. SGC BUILDING P.O. BOX 3526 BELLEVUE, WA 98009  
TEL. (206) 746-6310 FAX: (206) 746-6384

**NEWS FLASH! NEWS FLASH!**

# CASTLE WIN THE TRIPLE CROWNS!

## CASTLE ARE NOW Authorised National DEALERS

and  
Authorised National  
SERVICE CENTRE  
FOR THE BIG THREE!



ICOM

YAESU  
KENWOOD



Yes the big three all under one roof located right in the middle of the country. CASTLE offer a nationwide service. CASTLE can sell you your new rig at the right price and will service it with our own resident engineers... we collect, we fix and we deliver!

TRADE UP! PART EXCHANGE YOUR PRESENT RIGS!

**CALL CASTLE on 01384 298616**

or

**Flash Us A Fax on 01384 270224**

## Castle Electronics

Unit 3, Baird House, Dudley Innovation Centre  
Pensett Trading Estate, Kingswinford,  
West Midlands, DY6 8YZ

Trade enquiries for servicing welcome





**The Hustler 6-BTV, ground mounted**

The Hustler 6-BTV in my opinion is very well made, it looks like it should certainly stand up to a few high winds when other aerals wouldn't (as I've found in the past, despite wind survivability claims!). I've used several commercial trapped verticals over the years, and the 6-BTV worked just as well, if not better, than others. When ground mounted, it gave good performance over unobstructed paths.

The supplied instructions were extremely clear and concise, following these I had the aerial assembled in less than half an hour.

What did surprise me was the relatively low price, for the quality of construction I found this to be very reasonable indeed. If you're in the market for a compact ground-mounted HF multi-band vertical, I wouldn't hesitate in recommending the 6-BTV.

*Chris Lorek G4HCL*



Inc. has been producing HF vertical antennas of unusual electrical performance and mechanical integrity since 1959. Many of those original verticals are still in service after over 30 years of reliable operations.

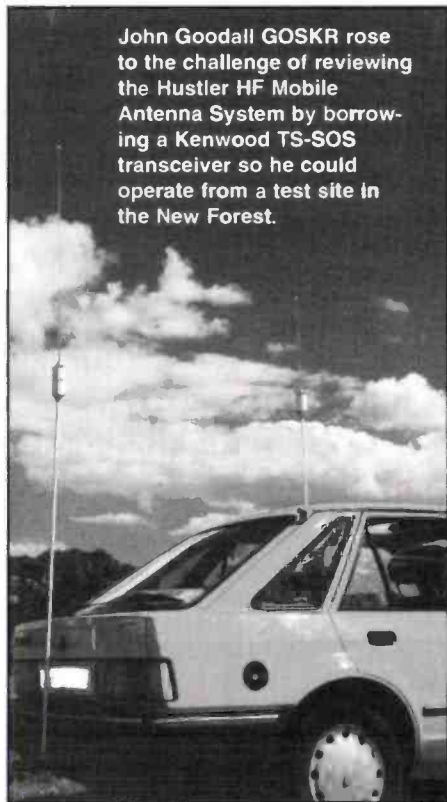
Our exclusive trap design offers the lowest loss possible. A special extrusion process allows us to produce trap covers to an otherwise unattainable close tolerance, assuring accurate and permanent resonances. Our highly accurate traps provide top signal reports and consistent contacts.

Accurate tuning is made possible by the wide range of tuning flexibility designed into our verticals. Not only can you use the normal adjustable tubing to change resonance, but the traps themselves can be field tuned for an additional 2 MHz. shift. This flexibility will enable you to achieve a good S.W.R. even if your installation is not ideal.

All Hustler verticals will easily handle the full legal limit of power and will cover 10/40 meters with a S.W.R. of 1.6:1 at band edges. 75 or 80 metre band width on the 5BTV and 6BTV is 80 Khz. under 2 to 1.

We believe that a fixed station antenna is only as good as its ability to stay up. We further believe that the mechanical design of our verticals is superior to any. Large diameter 1 1/4 inch tubing is used from top to bottom. Our base assembly utilizes a centre tube. With a .315 inch wall thickness, unequaled in the industry. The trap coils are wound around solid one inch diameter fibreglass cores. Our rugged construction is so obvious that we invite you to look at our verticals and compare them to other brands. One glance will convince you.

Solid signals, solid construction and solid value - three solid reasons to purchase a Hustler vertical, from coastal.



John Goodall GOSKR rose to the challenge of reviewing the Hustler HF Mobile Antenna System by borrowing a Kenwood TS-SOS transceiver so he could operate from a test site in the New Forest.

Before long, I had the RM-20S resonant on 14.160MHz, with the s.w.r. reading just above 1.1:1. This was with 360mm of tip protruding from the adjuster.

At 14.058MHz, the FISTS frequency, I found the s.w.r. was acceptable at 1.6:1. The dial reached on 2:1. This proved an even greater bandwidth than that published by the manufacturers.

I worked RA3REM and RK3VWF, both with reports at 5 and 6; YU70GW and 9A1CAH 5 at 9, all on 50W.

I found that using the Hustler HF Mobile Antenna System was indeed a pleasure. I think that the cost of the 'Standard Resonators', which I feel are adequate for this country, is quite reasonable for the excellent quality of the equipment.

Picture and Quote from John Goodhall review in Practical Wireless

**"The best antenna there is for HF!"**

I have tested the Hustler HF Mobile with the rated power and have measured the Q factor and it is the nearest to 300 in any antenna I have seen! I have also fed it with inductive and capacitor matching including both to obtain 50 ohms input on 40/80 mtr and have a band width of between 50 and 75 kcs compared with other mobiles which had only 10 to 15kc band width. The best antenna there is for HF! Since using the Hustler I have contacted stations in "India VU2TTC", "Sri Lanka 457RO", "Trinidad 9Y4TD", Africa 9X5GC", "KA1V/TS, 3DAAOBM, Australia VK7OH, Barbados 3P9EM and the Falklands VP8CGH with signal reports ranging between 5/5 to 5/9, as for 9Y4TO who was surprised when I told him I was mobile due to my signal strength. A station in Johannesburg called me "ZS8BEW" as he thought I was in one of the Johannesburg suburbs, this was when I was in contact with KC9B1 we then had a three way contact, not bad from a car don't you think

As for the antenna, I have tried inductive coupling and capacity matching as per ARRL handbook mobile section and this was not needed. The resonators are very well constructed as so the most which can be used as a 1/4 wave on 6mtr, the band width is as advertised for each band, "as the instructions state 2.1 swr or better", I obtain 1.5 to 1 and less on 10, 15, 20 mHz but what did surprise me was the band width on 80 mtr as with other antennas. I could only move frequency of about 10 kcs either but with this resonator I can move 30 kcs either side of the tuned frequency. Now when I go camping all I take is the required camping equipment and the Hustler antenna which I use with a TM-band adaptor, so I can operate any three frequencies without having to change resonators. The mast is hinged so it can be folded to fit the trunk and apart from that I also use the quick disconnect attachment which I also obtained from Coastal Communications.

To end this letter which sounds like an advert, all I will say to past, present or future mobile operators is, try this antenna and I can tell you that they will not be disappointed with the results and also excellent service from Coastal Communications.

73 David Hudson, G4WOE E. Sussex

**COASTAL COMMUNICATIONS**

19 Cambridge Road,  
Clacton-on-Sea, Essex CO15 3QJ

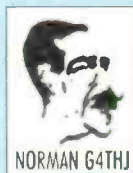
**01255 474292**

**HUSTLER PRICES**

4BTV HF Base 10-15-20-40 meters	£142.95
5BTV HF Base 10-15-20-40-80 meters	£160.95
6BTV HF Base 10-15-20-30-40-80 meters	£179.95
RM-10 10m Mobile Resonator 150-250Khz bandwidth 400W	£17.49
RM-15 15 Mobile resonator 100-150Khz bandwidth 400W	£18.49
RM-20 30m Mobile resonator 80-100Khz bandwidth 400W	£26.49
RM-30 30m Mobile resonator 50-60Khz bandwidth 400W	£26.99
RM-40 40m Mobile resonator 40-50Khz bandwidth 400W	£27.49
RM-80m Mobile resonator 25-30Khz bandwidth 400W	£28.49
RM-10S 10m Mobile resonator 250-400Khz bandwidth 1.5KW	£24.95
RM-15S 15m Mobile resonator 150-200Khz bandwidth 1.5KW	£26.95
RM-20S 20m Mobile resonator 100-150Khz bandwidth 1.5KW	£29.95
RM-40S 40m Mobile resonator 50-80Khz bandwidth 1.5KW	£34.95
RM-80S 80m Mobile resonator 50-60Khz bandwidth 1.5KW	£45.95
MO-1 Mobile mast 54 inches long. tilts at 15 inches	£27.95
MO-2 Mobile mast 54 inches long. tilts at 27 inches	£27.95
MO-3 Mobile mast 54 inches long. solid rubbercoated	£22.95
MO-4 Mobile mast 22 inches long. solid rubbercoated	£19.95
(All masts end in a 3/8 thread, for mounting. Ideal for any strong CB style mount and cable.)	
NB Postage/delivery extra as required	

# ARE

COMMUNICATIONS



ARE...ANNOUNCEMENT...ARE...ANNOUNCEMENT

Hi, I'm Norman, the new boy at ARE. A lot of you know me from Lee Electronics. Bet you thought I was pushing up the daisies! Wrong, I'm back and waiting to take your hard earned cash off you! Now for a little background, sorry there aren't any pictures!

As you might be aware, ARE are part of the SMC group and can therefore offer you a vast choice of equipment both new and secondhand at competitive prices plus a varied selection of aerials and accessories, in fact everything you will ever need, radio wise.

With big company backup, you can buy with confidence knowing that as a thirty seven year old company we will still be here when you need us, and, no matter where you live, with next day delivery, we are only a phone call away. So why not try us?

Regards to all,

*Norman G4THJ and my faithful assistant Jez*

P.S. SPEND £100 PLUS THIS MONTH AND WE WILL PAY THE CARRIAGE!!

## HANDHELD TRANSCEIVERS



**Poky Toky**

2M single channel  
10mW crystal controlled

Now back in stock due to popular demand

From Only  
**£29.99**

## STANDARD HANDHELDS

**C558**

Dual Band Handi  
+ AM Airband RX

Only £289



**C188**

2m Handi  
Keypad controlled

Only £169



Also C468 70cm Handi - Only £169

**+ THE FULL RANGE OF ICOM, KENWOOD & YAESU HANDI'S**

At ARE we can offer the full range of equipment from Icom, Kenwood, Yaesu, Alinco, AOR PLUS Antennas from Cushcraft, Comet, Hokushin, Diamond, Create, Taiwan Serene, Tonna, Oscar. Accessories from Daiwa, Mirage, Tokyo Hy-power, Comet, AEA, Himound, Manson, Rexon, Henry radio Tereleader, TTE, MFJ, Datong, Rotators from Create & Yaesu, PLUS Connectors, Antenna wire ropes etc.

## THIS MONTH'S SPECIAL YAESU FT736R



Only **£1399**

Save **£600**  
while stocks last

## Wanted - Good Used Equipment

Top prices paid for clean rigs

### SECOND USER BARGAINS

#### HF TRANSCEIVERS/AMPLIFIERS

FT902DM	Yaesu	Fair	HF Transceiver Valve PA	£450.00
LA-120	Ham	V.Good	HF 100W amp	£125.00
FT707	Yaesu	Good	HF Transceiver Amateur Bands RX/TX SState	£395.00
TS130S	Kenwood	Good	HF Transceiver	£399.00
FT107	Yaesu	Fair	HF Transceiver PA - 3 x 64168's	£475.00
FT990DC	Yaesu	Good	HF Transceiver DC Model	£1,350.00
FT747GX	Yaesu	Good	HF 12 v Transceiver	£499.00
TS430S	Kenwood	Good	HF Transceiver	£650.00
TS830S	Kenwood	V.Good	HF Transceiver	£575.00
IC725	Icom	V/Good	HF transceiver, boxed	£624.99
IC726	Icom	V/Good	HF & 6m transceiver, boxed	£699.00
FT747	Yaesu	Good	HF Transceiver	£499.00
TS430S	Kenwood	Mint	HF TX/RX FM, CW filter	£650.00
FT890AT	Yaesu	Mint	HF Transceiver with ATU	£1,199.00

#### VHF/UHF TRANSCEIVERS

C500	Standard	Good	Dual Band Hand Held	£225.00
IC-P2ET	Icom	Mint	2m Handheld Keypad entry	£189.00
TS605	Kenwood	V.Good	6m 100w mobile	£250.00
IC22E	Icom	Good	2m Handheld	£179.00
IC-W21ET	Icom	V.Good	Dual Band Hand Held	£299.00
FT530	Yaesu	Good	Dual Band Hand Held	£399.00
DJ580E	Alinco	Fair	Dual Band Hand Held	£250.00
FT290R1T	Yaesu	Good	2m Multimode, case and charger	£299.00
TS770E	Kenwood	Good	2m / 70cms Base Station	£425.00
FT470	Yaesu	V.Good	2m / 70 cm Handi + charger + mik	£285.00
TH78E	Kenwood	Pristine	2m / 70 cm Handi as new	£325.00
IC125	Icom	Good	Commercial Radio	£80.00
C844	Stand	Fair	Handheld	£50.00
IC02E	Icom	V.Good	2m handi + Bits	£150.00
FT728	Yaesu	V/Good	Transceiver	£299.00
MA0FM	HRC	Good	Transceiver	£45.00
TEAMPD		Good	2m handi	£88.99

#### DATA/COMPUTER

MICROREAD	E.R.A.	Good	CW, RTTY, Decoder, Tutor	£110.00
5000E	Tono	V.Good	CW / RTTY / Decoder and Sender	£325.00
CD660		Excellent	Data decoder, boxed	

#### MISCELLANEOUS

AT250	Kenwood	Fair	ATU	£160.00
FAS14R	Yaesu	Good	Remote Antenna Switch	£70.00
PG1	Datong	Good	HF Converter	£65.00
HK703	Himound	Good	Mouse Key Shoght	£25.00
BC11	Kenwood	Good	Charger + 2 Batteries	£50.00
LP144/10	BNDS	Good	2m Linear Amp 10w in 100w out	£149.00
AT230	Kenwood	Mint	Antenna Tuner	£189.00
FC257AT	Yaesu	Good	Automatic ATU	£225.00
AL811X	Ameri	Mint	HF Amp 700watts	£550.00
KG2	Kurari		Pre amp	£44.74
PP1	Icom	Not Working	Phone patch	£139.00
SP520	Trio	Fair	Speaker	£20.00
SW100	Trio	Good	Meter	£49.00
SYNOPTIC	ERA	V.Good	Decoder	£25.00
UC-1	Daton		Converter	£69.00
VLF	Daton	Good	VLF converter	£30.00
FL2025	Yaesu	Unused	25 Watt Amp for FT290R1T	£210.00
PS30411	Daiwa	As New	25 amp P.S.U unused	£89.00
VFO180	Trio	V.Good	Matching VFO for TS180	£90.00

#### RECEIVERS

ICR100	Icom	V.Good	Mobile / Base Scanner	£350.00
RS500	Kenwood	Good	HF Receiver + Internal converter	£825.00
AIR7	Sony	V.Good	Airband Scanner	£169.00
RS37	Signal	V.Good	Airband Receiver Hand Held	£55.00
KCF PRO80	Sony	Good	Hand Held Shortwave RX	£179.00
2001D	Sony	Good	S/wave receiver	£169.00
FRG7	Yaesu	V/Good	HF receiver - Digital	£200.00
FRG7	Yaesu	V.Good	HF Gen Coverage RX	£165.00
AR1500EX	AOR	Good	Hand Scanner + SSB	£225.00
RF3100	Paros	V.Good	Receiver	£199.00

ARE Communications, 6 Royal Parade, Hanger Lane, Ealing, London W5A 1ET.  
Opposite Hanger Lane Tube Station, South West side A406/A40 roundabout junction.

Tel: 0181 997 4476

Fax: 0181 891 2565

Mon-Fri 9.30-5.30 Sat 9.30-1pm



# EDITOR'S Keylines

The 'Valve & Vintage' feature has been a popular column since its introduction into *Practical Wireless*. Because of this, it's with regret I have to announce that Ron Ham, the founding author of the column, has decided to retire from writing regularly, although he will still produce the occasional article for the magazine.

It's always been a pleasure to work with Ron. And although I realise that his retirement had to come eventually, I had hoped he would have enjoyed a slightly less onerous workload, by sharing it with a team of authors.

However, now that Ron has decided on retiring from a regular commitment to *PW* everyone on the Editorial team wishes him well and hopes that both he and his wife Joan continue to enjoy their 'retirement'. (In reality they're working their proverbial socks off!).

Good luck Ron and Joan. I've no doubt the beautiful garden at 'Faraday' will blossom even more now!

When a particular person retires from a job, there's often an indication of the work load involved provided by the replacement machine (in the case of industry) or writers in the case of journalism. And in this case, the Editorial team have decided the only way a column such as 'V&V' can be produced in the future...is with a team of authors, each providing their own speciality and diverse interests.

## Rotating Authors

The term 'rotating authors' may convince you that we've got ourselves in a real 'spin'....but you'd be wrong! In this context we're continuing an approach we introduced very successfully some time ago with the 'Antenna Workshop' page where a panel of authors each take their turn in presenting their ideas (and specialised expertise) on a regular 'rotating' schedule.

So, we're now introducing the 'authors team' approach to 'V&V'. But to make it work we have to ensure there's a team with expertise and outlook required for the innovation to be successful. With that in mind, I'm pleased to announce that our new team of authors for 'V&V' has been chosen.

A team of three will take it in turn to prepare the 'V&V' column in future. This is because basically it seems that the interest in



## Phil Cadman G4JCP

Phil Cadman G4JCP wrote a very interesting series of articles on 'Using Those Versatile Vacuums' several years ago. Phil crammed an enormous amount of facts, hints and tips into the articles (I know...I sub-edited the series!) and he seems to be just the author for the 'V&V' column covering 'doing things' and projects for valve enthusiasts.

Like many readers (including me) Phil Cadman has fond memories of the renowned *PW* 'Blueprints' which for so many years were given away with the magazine. Phil plans to feature some of these well known designs and discuss how they can be built - even today - by the keen valve and vintage enthusiast. Hopefully this will satisfy the readers who ask us to re-publish the designs!

## Charles Miller

Last...but certainly not the least of our new team of authors is Charles Miller. Having written for *PW* regularly in the past, and being an extremely well-known author in his own right with many years of writing experience, Charles doesn't really need much of an introduction from a relative 'Johnny come lately' such as myself.

Along with his experience in writing on the vintage wireless theme, Charles edits his own subscription-only magazine *The Radiophile*. As it's dedicated to the truly historic and vintage scene, the editorial team feel that Charles' experience on *The Radiophile* make him the ideal choice to cover the pre-Second World period on a general radio theme. He's already got some fascinating topics lined up for future issues of *PW*.

So, as we wish Ron Ham well in his retirement in this issue we'll be starting off with the new-look 'Valve & Vintage' with Phil Cadman G4JCP in the September *PW*. And don't forget that if you have any ideas or queries for any of the new authors...you can send them to us at the Editorial offices in Broadstone or write to the authors direct.

valves and valved equipment can be split into three categories (although with softly blurred borders!).

The three categories seem to be valved and vintage amateur and military radio equipment, practical projects and 'things to do with valves' ('gaseous state' technology as Tex Swann G1TEX calls it!) and the really historical side of the subject.

As *PW*'s core subject is amateur radio, it seems only right that the column dealing with valved and vintage equipment should have a licensed radio amateur author who is totally immersed in the subject. That person is Ben Nock G4BXD.

## Ben Nock G4BXD

Of course, Ben Nock G4BXD is already well known to *PW* readers, and I'm pleased to say that I've known him for many years. He's an avid buyer, collector and restorer of equipment and buys, repairs and restores every bit of valved and vintage equipment he can find.

Ben is also very well known for his interest in collecting, restoring and writing about valved and vintage military radio gear. I've no doubt this will please the many enthusiasts for military equipment who have already enjoyed this aspect of 'V&V' as written by Ron Ham.

*Rob Mannion G3XFD*

Please send your letters to the Editorial offices in Broadstone. Reader's letters intended for publication in 'Receiving You' must be original and not be duplicated. Letters are accepted on the understanding that they have only been submitted to *Practical Wireless*. Please ensure that your letter is clearly marked 'for publication in Receiving You' and that it has not been submitted to other magazines. We reserve the right to edit or shorten any letter. The views expressed in letters are not necessarily those of *Practical Wireless*.

# RECEIVING You

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.

## Ham V Prelto....Round II

Dear Sir

Referring to G6QY's suggestion (*PW* June) that the title 'Ham' be replaced by the acronym PRELTO (Private Radio Experimenter - Licensed To Operate), the longer-toothed of us all may recall suggestions by like-minded readers to the correspondence pages of the *RSGB Bulletin* during the immediate post Second World War period. Conceivably the continuation of a pastime enjoyed by those who had latterly held an administrative post in H M Forces or Government Office.

Such was the variance and degree of thought, ingenuity and interpretation concerning amateur radio communication, that one reader's acronym included the letters 'PR' (Public Relations) - by a DXCC member or successful Planning Permission applicant, perhaps.

The universal tribute now given by the media to 'Radio Hams' during emergencies and crises has established their value and potentiality, hence no further designation would seem necessary and certainly, we are not all 'experimenters', as has been suggested.

The title 'Radio Ham' does not denote an inferior status. The four major dictionaries make a distinction between 'Ham' and Radio Ham' or 'Amateur Radio Operator', the media cannot use the former title alone because it is not definitive by itself, ie.. it has several meanings and for us to expect more from them is unrealistic.

Incidentally, for example, *The Concise Dictionary* gives....' (in full, Radio Ham) coll. the operator of an amateur radio station'. Whilst I respect G6QY's stance and well meaning conviction, I think he might consider a re-think of the acronym 'PRELTO'. I would not be happy if mistaken for a member of the latest deviant religious cult from W6 land!

**Frank Rose G2FHV**  
London

## Dayton HamVention

Dear Sir

This is just a brief note to express my appreciation of the efforts you personally expended in making my trip to the Dayton HamVention holiday such an enjoyable one. I particularly enjoyed the visit to the Air Force museum and the Imax cinema, although, of course, the Hara Arena and the flea market will forever remain an unforgettable experience, somehow the Leicester Amateur Radio Show will never seem the same again!

I hope that I will be able to maintain contact with Dick N3AOG and Pat WB3DNI who I met at the Hampton Inn, since they share my interests in microwave operating, as well as many others in the *PW* group without whom the trip could not have been so memorable.

**Geoff Findon G3TQF**  
Leicester

## ★ ★ ★ ★ STAR LETTER ★ ★ ★ ★

### Morse Keys

Dear Sir

I was very interested to read in *Practical Wireless* the articles concerning the construction of Morse keys. I was a member of a small unit during the Second World War just outside Cairo.

One of my concerns was to examine and investigate various pieces of apparatus. We were called upon to produce (as quickly as possible) a number of Morse keys.

The Ministry of Supply produced a large number of knobs and discs. Using one of our own keys as a model, it fell to me to produce the necessary jigs to enable the parts to be correctly drilled.

I brought the jigs and a few spare parts home with me. It was your article which caused me to go through my old kit box.

**W. H. Edwards**  
Sheffield

**Editor's reply: From your photographs Mr Edwards, you seem to have enough components to start a 'Pyramid' selling organisation manufacturing Morse keys!**



## Lynch Letter

Dear Sir

It's not often I write to magazines, but your most recent issue (*PW* May), featuring 'Computing in Radio' was first class. Not only were the articles well written, they were to the point and underline the way in which our hobby is changing as we approach another millennium.

Since February of this year, I have introduced a new area to my shop in London, dedicated to 'Computers in Radio'. Featuring the Peacock brand of PCs, customers can, at their leisure, view a complete wall of the latest computers, ranging from a basic 486DX2-66, to the Pentium 90 Multimedia, costing a considerable amount more.

In April of this year, a further member of staff joined the 'Lynch Mob' whose specific function is to guide newcomers to 'Computers Versus Radio' and help them to understand just how important the PC is in the modern amateur or s.w.l. shack.

Once again, *PW* has excelled itself in providing a first class insight into how the hobby is steering itself to total computer control - well done!  
**Martin Lynch**  
The Amateur Radio Exchange Centre  
London

**Editor's reply: Thank you Martin! The team strive to create a balance of subjects in the magazine. We're fully aware that there**

**are a multitude of specialities within amateur radio, and although readers point out to us that there many computer magazines, but only one *PW*, there's certainly an interest shown in this aspect of our hobby in the magazine. Incidentally, computing-in-radio enthusiasts interested in writing for *PW* may like to know it's the one area where we're short of articles, whether it be feature or constructional. So, contact us for a copy of *PW Author's Guide* and get writing if you want to share your own enjoyment of this aspect of amateur radio with other readers.**

## New 430MHz Repeater For Southampton?

### Dear Sir

Whilst on the Novice course at my local school radio club, there was talk of a new 430MHz repeater for our area. This would help many newly licensed Novices in the area to obtain the very best from their new licence and enjoy the hobby as much as possible.

I've been licensed for two years, still no repeater. A small group of dedicated amateurs have spent many long hours obtaining equipment, a site for the repeater and producing expected coverage maps. The work should not go to waste.

Formal proposals have been sent to the RSGB Repeater Management Group (RMG), but have been rejected because, according to them, we have coverage from another local repeater. It's been off the air twice this year.

It's a pity that the RSGB view coverage to be operational from a mobile rig running low into a quarter wave vertical antenna. How many Novices do you know that can do this?

It seems very odd that the RA are encouraging new people into the hobby of amateur radio and yet our National Society doesn't want to help. Forget the free membership, free books and the free pocket diaries, just give us something that we want, a repeater licence would be nice!

**Dave Childs  
Southampton**

### Editorial comment:

*We contacted the RSGB's newly appointed RMG's Publicity Officer Ken Baker G3SPX to comment, and give their own point of view on the topics raised in Dave Child's letter. The letter that follows is Ken's reply:*

### Dear Sir

Thank you for the opportunity to comment upon the matters raised by Dave Childs in his letter to you.

The u.h.f. repeater system in the UK is very comprehensive with over 180 units operational. The southern part of England has many repeaters and the coverage is almost complete.

It is a very dense network and the criteria for u.h.f. repeater coverage are clearly stated in *The Guide to Repeater Licensing*, which states that units should be based roughly upon one unit per 33 kilometre square. This was agreed with the licensing authority in 1976.

The booklet is available to prospective repeater groups from the RSGB headquarters. It also states that u.h.f. repeaters are deemed to be engineered as local units, where as the v.h.f. network fulfils the role of the area coverage roughly equivalent to a county.

As the number of channels is severely limited by the constraints of the many other users on the bands, in many cases in a particular area, the choice of a repeater for a low power hand-held user will be limited. We are trying to reconcile the needs of two distinct categories of users - those like Novices who operate a hand-held rig with low power to a quarter wave and mobile users who use at least 10W to a double or triple five-eighths collinear.

In order to provide a realistic basis for repeater planning, the coverage map produced by the group should show coverage expected for a mobile user with a quarter wave aerial and a 10W transmitter. With a properly sited repeater, this should allow effective hand-held

coverage and RMGs experience is that to obtain hand-held coverage of a city like Southampton, the repeater should be sited on a block of flats or similar structure within the centre of the city and use a down tilt antenna system.

Southampton is covered by three repeaters GB3NF, GB3IW and GB3PH. Unfortunately, GB3NF had to close down earlier this year due to the loss of its site. The group are seeking help in finding a suitable alternative and a message to this effect was broadcast in the RSGB news.

This provides a good opportunity to get a repeater sited in the centre of Southampton to improve coverage to hand-held users. The local RMG committee member has been attempting to contact another group in the area who proposed yet another repeater to see if they can join forces with the GB3NF group in order to provide the sort of coverage needed in Southampton.

It clearly states in the *Guide to Repeater Licensing* that no group should start building a repeater until they receive an agreement in principal from RMG. If we were to have criteria that stated repeater coverage was based upon a quarter wave antenna and a 1W transmitter anywhere in the UK we would, I am sure, be talking of a lot more channels. Perhaps amateurs could consider such a network on the 1.3GHz band.

In view of the pressure for more repeaters in the south of the country, RMG have been attempting to negotiate with the RA the use of some low power repeater channels using the 7.6MHz system, which would fulfil the need for more repeater

## Help Needed

### Dear Sir

I am new to the world of s.w.l./amateur radio. I have purchased a transceiver as an incentive to pass the RAE. I once studied for the exam however, in December of 1991 I was sent to the Gulf War. I have since become disabled and am virtually house-bound and cannot do much for myself.

I would like to ask for some advice. Firstly, I use a 132ft long wire in my loft and a half size G5RV above the bungalow. My problem is that I have constant noise with both antennas at signal strength of 9+. I have a 4ft earthing rod and a short run of earth wire from the a.t.u./rig. I have tried various combinations in my loft and the best is seemingly a north-south position of four runs. Is there anything I can do to reduce my noise levels?

I have tried turning everything off (electrical) and it makes no difference whatsoever. I have disconnected my earth, which does not seem to make any difference at all.

Secondly, I use a Pentium PC 90MHz computer and as soon as I turn it on I get even greater noise level so I cannot use my Badger Board to decode RTTY, etc. I would be most grateful for any help and advice you can offer.

**Tony Davidson  
Hull**

**Editor's reply: Tony has an interesting series of problems. Is there anyone in the Hull area who can help? If so, please contact the PW office.**

channels, but at present, this is on hold due to DSI proposals. As you will be aware, this document proposes a loss of 4MHz on the 430MHz band, which would preclude the use of the 7.6MHz system.

Another alternative would be to re-plan the existing 430MHz band repeater system by imposing a lower e.r.p. limit on all existing units, perhaps reducing firstly to 10dBW and then to 1dBW e.r.p. This could enable more repeaters to be fitted in the existing channels, but whether it could give blanket coverage to hand-helds everywhere in the UK is doubtful.

Many see the Novice license as a first step into the hobby and any Novice who wishes to use higher power levels and experience other parts of the hobby should be encouraged to progress to the full 'B' or 'A' licence. The Novice licence owes a great deal to the RSGB who carried out the negotiations with the RA in order to

produce a workable scheme.

Finally, may I stress that the radio spectrum is under great pressure from commercial areas as evidenced by DSI-2 reports needing radio amateurs and s.w.l.s to join the society, not only to aid the fight for retention and expansion of bands and facilities, but also to speak for the vast majority of radio amateurs in this country. If spectrum pricing were to be adopted in this country, the cost of the spectrum presently enjoyed by radio amateurs would be far beyond the present £15 a year licence fee.

The RMG would be pleased to hear of any comments on the points raised in this letter. Please address your comments to: **The Chairman of Repeater Management Group, Mr G. Dover G4AFJ, 31 Newbold Road, Kirkby Mallory, Leicestershire LE9 7QG. Kenneth Baker G3SPX RMG Publicity Officer**

## Book News



If you were thinking of ordering a copy of *Scanning Secrets* or the *Short Wave International Frequency Handbook* from the PW Book Service, now is the time to do it.

Normally, *Scanning Secrets* would cost you £16.95 plus P&P and the *Short Wave International Frequency Guide* would cost you £12.95 plus P&P.

However, if you order either of these books between July 13 and August 31 you won't have to pay any postage and packing. (Offer only available in the UK).

So, don't delay place your order today by either using the **Order Form** in this issue or by telephoning our **Credit Card Hotline** on (01202) 659930.

# NEWS

## '95

## Cricklewood Catalogue



Cricklewood Electronics Ltd. now have copies of their 17th catalogue available. This 1995 edition contains a wide variety of components and features new ranges in audio, video, security and computer hardware, as well as an extended range of test equipment and tools.

The catalogue also contains £30 worth of money off vouchers. There are five £1 discount vouchers which can be used against orders of £15 or more and five £5 discount vouchers for use against orders of £60 or more.

The Cricklewood catalogue is available for **£2.50** or is **free** to companies and schools. To get your copy contact **Cricklewood Electronics Ltd., 40-42 Cricklewood Broadway, London NW2 3ET. Tel: 0181-450 0995 or 0181-452 0161 or FAX: 0181-208 1441.**

### £50 Winner

The Winner of the £50 Prize Draw as featured in the Book Service pages of the June issue of *Practical Wireless* was **E. D. Beston of Berkshire.**

Don't forget we offer a comprehensive list of books for the radio amateur, short wave listener and electronics enthusiast. See pages 71-74 of this issue.

## Air Formation Day

Just as this issue of *PW* was going to press, we received notification of the cancellation of the 21 Signal Regiment's Air Formation Signals Open Day. The event was due to be held on July 22 1995 at Colerne Airfield, Wiltshire.

Due to circumstances beyond the 21 Signals Regiment's control, the event has had to be scaled down and will now take place as a Regimental Families Day only. However, it is still hoped to run the Special Event Station using the call GB4AFS. The 21 Signal Regiment would like to apologise for any inconvenience caused by the change of plans.

## A Week Of QRP

During the week of August 28 to September 2 the Marino Institute of Education in Dublin, Ireland plays host to International QRP Week. The Marino Institute is situated close to Dublin Airport and the city centre and should provide a comfortable and scenic setting for the week's QRP activities.

During the week's programme there will be two major presentations by George Dobbs G3RJV on Practical Electronics and Engineering Laboratory Workshops as well as a fully operational QRP Station (EI3RJV). The programme will include plenty of free time to give you the opportunity to explore the area around the Marino Institute.

The cost for attending this QRP event is: £125 per person for the whole week (Monday morning to Saturday lunchtime, for an extra £10 you can stay on the 27th) or £28 per day per person which includes bed, breakfast, four course lunch, coffee/tea breaks plus all the activities.

For more information and an application form contact **Gerardine Quinn, Marino Institute of Education, Griffith Avenue, Dublin 9, Ireland. Tel (from uk): 00-353-1-833-5111, FAX: 00-353-1-833-5290, Email: donalmie@gpo.iol.ie**

## Worked All Britain Lifeboat



**Anthony Oliver (RNLI) accepting the £12500 cheque from Adrian Keeble G4HPU (WAB Silver Jubilee Award Co-ordinator) at the WAB group's AGM at Drayton Manor Park, on May 14. Mrs Veda Morris (widow of G3ABG) is pictured in the centre with Arnold Matthews G3FZW (Cannock Chase RS) looking on from the side.**

The Worked all Britain Awards (WAB) Group recently presented a cheque for £12500 to the Royal National Lifeboat Institution (RNLI). The presentation took place at the WAB's Annual General Meeting at Drayton Manor Park on May 14.

The donation was made possible as a result of the Worked All Britain Awards Group Silver Jubilee Appeal. The Appeal took place over a three year period and funds were raised by a levy on the sale of WAB books, a special Jubilee award, from donations and covenants and the proceeds of a grand draw held in 1994.

Members of the

WAB organised special event stations from Lifeboat stations around the country, mobile runs, walks and other radio related activities. Money also came from donations as a result of members selling radio equipment and computer programs. The WAB Committee would like to extend their thanks to all the radio amateurs and short wave listeners and other supporters who have contributed to the Appeal commemorating the WAB's Silver Jubilee.

The money donated to the RNLI will provide a D Class Lifeboat which will be named *C. John Morris DFM G3ABG* in the memory of the late

founder of the WAB at a ceremony to be held at the RNLI Headquarters in Poole. The naming ceremony, which will be carried out by G3ABG's widow Veda, will take place during the RNLI's Open Day on Friday July 28 at 2pm and it's open to the public.

Since its foundation in 1969, the WAB group has grown through the voluntary efforts of many

individuals. Their motto is 'To assist others' and following this the WAB have made donations to organisations such as the Radio Amateur Invalid and Blind Club and QTI talking newspapers for the blind.

Lifetime membership to the WAB is by the purchase of a WAB book, there is no annual subscription. If you're

interested in becoming a member of the Worked All Britain Awards Group you should contact the **Membership Secretary, Brian Morris G4KSQ, 22 Burdell Avenue, Sandhills Estate, Headington, Oxford OX3 8ED** or by joining the Nets 3.76, 7.06, 144.43 or 144.4MHz.

## Antenna Coupling

Alan Lake G4DVW has informed the 'Newsdesk' of a new Antenna Coupling Transformer he's just added to the Lake Electronics range. The CT400 is a broad-band component which has been designed to allow the use of standard coaxial feeder in conjunction with any end-fed wire antenna.

When fitted into a convenient enclosure and connected between the antenna and coaxial cable, the CT400 will work with any receiver, in any mode and on any of the h.f. bands. The CT400 is supplied with full instructions and costs just £6.75 plus £1 P&P.

If you'd like to order a CT400 contact **Lake Electronics at 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: 0115-938 2509.** More details on the CT400 can be obtained on receipt of an s.s.a.e.

## Dayton '95

**Jeff Stanton G6XYU provides the following report on the 1995 Dayton HamVention.**

A unique event occurred at the Dayton 1995 HamVention, the largest amateur radio show in the world. It didn't rain! (Well not much anyway).

Between April 28 & 30th thousands of radio enthusiasts from all over the world made the pilgrimage to the Hara Arena. They went to see everything new in radio and an incredibly large 'flea' market with more than 1000 stalls selling everything from wartime aircraft transceivers to the latest in packet radio.

Kenwood, Yaesu, Icom, Alinco and the major American manufacturers displayed their wares in a show which took all three days to see properly. As in previous years, a party of enthusiasts from the UK joined *PW*'s **Rob Mannion G3XFD, Donna Vincent G7TZX** and **Kathy Moore** on an organised trip to Dayton and came back loaded with bargains!

Next year, 1996, the HamVention will be staged later, in May, which should guarantee good weather and an even bigger attendance! **G6XYU**



**At the 1995 Dayton HamVention the new Alinco DX-70 h.f. transceiver was displayed and the designer Mr Hirohata JA3XGS flew in especially for the show.**

## Another Alinco

With Alinco Electronics already having launched several new radios this year we didn't think there could be more on the way - but there is! Following the huge success of the DJ-580 Alinco have launched its replacement, the DJ-G5.

The DJ-G5, described as a compact dual-band hand-held was officially launched at the Dayton HamVention in April. It is said to include many new features.

The DJ-G5 offers full transmit coverage on 144 and 430MHz plus wide-band receive, has built-in CTCSS tone encode and decode, a total of 200 memory channels and a new high efficiency power MOSFET designed to give high output even with a low battery voltage. Other features include: a channel scope facility that allows the user to monitor five channels above and below the displayed frequency or five memories in any mode or any frequency either side to the one displayed together with a central i.c.d. display with illuminated keypad.

The UK distributors Waters & Stanton Electronics say they are expecting first stocks of the DJ-G5 in early July and that the price has been provisionally fixed at £479. *Practical Wireless* hopes to review the DJ-G5 as soon as possible and more information can be obtained direct from **Waters & Stanton on (01702) 206835.**



## Jamboree News

The 18th World Scouting Jamboree is taking place in the Netherlands from August 1 to 11th and is expected to attract over 25 000 Scouts from all over the world. The site of the Jamboree is near to the town of Dronten which is 40km east of

Amsterdam at the bottom of the former IJsselmeer, which has fortunately now been drained, but just hope it doesn't rain!

Ever since 1957 the World Jamboree's has run an amateur radio station and has enabled Scouts to experience radio contact. This year's station will be on the air continuously during the event using the callsign PA6WSJ.

Scouts attending the World Jamboree will be able to use the radio equipment. The following is a list of frequencies and times which will offer the best contacts: Australia & New Zealand on 14MHz at 0800-1000; South East Asia on 14MHz, 0800-1400; Africa on 21 & 14MHz, 1700-2000; North America on 14MHz, 2000-2400; South America on 21 & 14MHz, 2000-2400; Europe on 7 & 3.5MHz, 0900-1800. World Scout frequencies will be used throughout.

For more information on the World Jamboree contact the **Jamboree Secretariat, c/o Amateur Radio 4.72.01, PO Box 1995, NL-3830 EZ Leusden, Netherlands.**

## Sharing Printer Links

South Midlands Communications of Hampshire are currently distributing a new printer sharing system. The Auto Link LU7000RX and LU7000TX allow one printer to be shared by up to four computers.

The LU7000RX is fitted to the Centronics connector of your printer and takes its power from that socket. It has four telephone style sockets and is capable of accepting data from up to four PCs. The LU7000TX takes its power from the 25pin parallel printer port



on a PC and is supplied with a 5m length of telephone style connecting lead.

Both Auto Link modules are sold separately to allow for the possible expansion of your printer sharing set-up at a later date. The LU7000 series connectors are available for £19.95 each plus VAT from **South Midlands Communications Ltd., S. M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO53 4BY. Tel: (01703) 255111.**

**Editorial note:** Mike Richards G4WNC has a review of the Auto Link LU7000RX/TX in this month's 'Bits & Bytes' column.

## High Frequency Convention

The 1995 RSGB International HF Convention is being held on September 9 & 10th at the Beaumont Conference Centre, situated a few minutes from the M25 and Heathrow Airport. The conference is once again being organised by the

HF Committee of the Radio Society of Great Britain in connection with the HF Contest & IOTA committees and the Chiltern DX Club.

The programme for the HF Convention will include talks on DXpeditions, equipment, IOTA, DX-

Clusters, EMC HF DXing, Antennas and Contesting. There are to be displays of the latest radio equipment from major manufacturers as well as the presentation of the Young Amateur of the Year Award. A full prospectus and booking form for the

Convention will be available shortly from **Marcia Brimson, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.**

Please enclose an s.a.e.

# HAYDON COMMUNICATIONS

## PRICE BUSTERS

### KENWOOD'S LARGEST UK DEALER

30 DAY SPECIAL

\*\*\*\*\*

### TH-79E

UK's best selling dual-band handheld. Rx available 108-180/400-512/850-950MHz. £479

30 DAY SPECIAL **£399.95**



FREE SPEAKER MIC

### NEW MS-107K

Miniature speaker microphone with P.T.T. L.E.D. indicator, suits all Kenwood handhelds.

Introductory offer **£14.95**



### KENWOOD MOBILES

### TM-251E

2m FM compact mobile transceiver with 70 cm receiver + packet connector. (50w). For one month only we are giving away a FREE 30 amp P.S.U. worth £90 with every TM-251E sold.

OUR PRICE **£389.95**



FREE PSU WORTH £90

OTHER MOBILES ON SPECIAL OFFER

TM-255E	2m all mode	£899	EPHONE
TM-455E	70cm all mode	£999	EPHONE
TM-451E	70cm mobile	£429	EPHONE
TM-733E	dual band	£729	EPHONE
TS-790E	triband base	£1849	EPHONE

### KENWOOD H.F.

### TS-50S

HF mobile transceiver (100w)

Ex-demo **£825**



### ALINCO PRICES SLASHED

DJ-180	£899.00	£199.95
DR-130	£369.00	£299.95
DR-150	£389.00	£329.95
DR-610	£729.95	£629.95
DR-M06SX	£359.00	£309.95
DX-70	£1099.00	£999.95

### STAR BUY ICOM IC-T21

2m FM transceiver (6w with 12v)  
 • Multi function keypad with backlight • Full duplex crossband operation  
 • High speed scan and crossband scan function • CTCSS tone scan facility (with UT81 fitted) • Auto power off • 5 selectable power levels • Incl's nicads & charger • Rx available if required - 116-180/400-512/850-950MHz.  
 Incl's Nicads & Charger



£329.95 Limited stock **£229.95**

### Icom IC-Z1E

Dual band hand-held transceiver with a control panel that detaches from the body of the radio (free speaker mic) ~~£529~~ SPECIAL OFFER



**£429.95** LIMITED STOCK

### NEW

### IC-706 NOW IN STOCK

HF/VHF all mode transceiver. Icom UK have advised us a small shipment will arrive in early August. So we advise early ordering. All we ask is a £50 deposit and we'll secure you an IC-706 at **£1099**

and we'll chuck in a free 25 amp PSU to make it worth your while

### YAESU FT-840

The UK's most popular HF transceiver. ~~£950~~

**£749.95**

### OTHER YAESU SPECIALS

FT-51R	<del>£529</del>	£399.95
FT-11R	<del>£329</del>	£229.95
FT-290RII	<del>£589</del> our price	£429.95

### ACCESSORIES

### VC-300DLP

300W A.T.U. with built-in dummy load

OUR PRICE **£129.95** plus £4 P&P  
 \*New VC-300M, 300W A.T.U. .... **£89.95\***



### Coax switches

CX-401 4Way (SO-239) (1kW)	£39.95
CX-401N 4Way (N type) (1kW)	£49.95
CX-201 2Way (SO-239)	£16.95
CX-201N 2Way (N type)	£21.95

£2.00 P+P ON SWITCHES

### MA-339

Mobile holder suitable for all handhelds. Superb - no marks - "It just grips your handy" - fits anywhere - quick "push button release". To top it all there's an optional airfreshener facility!



INTRO OFFER **£9.99**

### NEW RS-402

Low priced VSWR/PWR meter

- 1) Large meter display
- 2) Sel. FWD PWR, REV



PWR, AVE/PEP for SSB

- 3) Meter illumination
- 4) Easy/Accurate operation

**RS-402** 125-525MHz (200w) **£69.95**

**RS-102** 1.8-150MHz (200w) **£59.95**

NB:- Send stamped address envelope for colour leaflet

### THE SCANNER SPECIALIST

### Yupiter MVT-7000

UK's most popular hand-held scanner (1-1300MHz) Includes Nicads, charger

**£269.95**



MVT-7100	£419	£335.95
MVT-8000	£389.95	£335
VT-225	£269	£225
VT-125	£169	£169

### AOR AR-8000

The most comprehensive scanner (hand-held) to date! Includes Nicads, charger, etc., ~~£449~~

**£389.95**



AR-2700	£289	£269
AR-3000A	£999	£899
AR-3000 Plus	£1099	£999
SDU-5000	£799	£719
AR3030	£699	£639

### PRO-44

Air/Ham/Marine and much more  
 Covers 66-88/108-174/380-512

**£114.95**



CA-7200	case	£14.99
Nicads/p.s.u. charger		£15.99

### OPT-3300

The latest mini freq finder from Optoelectonics (smaller than a pack of cigarettes). Inc. Nicads/Charger/Ant. (1MHz-2.8GHz) ~~£169.95~~



OUR PRICE **£139.95**

New OPTO Scout - now in stock (the ultimate) ~~£399~~  
**£349.95** Incredible features!

NB: ALL PRICES INCLUDE VAT

★ Outside office hours 0850 586313 ★ Mail Order: Same Day Despatch ★

SALES PHONE - **0181-951 5781/2**

132 High Street, Edgware, Middlesex HA8 7EL  
 Close to Edgware underground station (Northern Line). Close to M1, M25, A406.

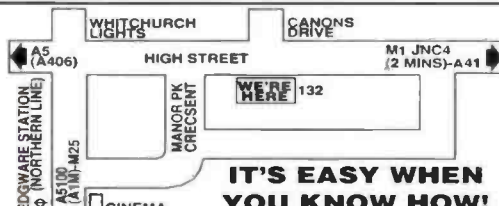


Fax: 0181-951 5782



OPEN: MON-FRI 10-6PM SAT 10-5PM

DELIVERY (UK MAINLAND) 24HR £10 / 48hr £7.50



IT'S EASY WHEN YOU KNOW HOW!



# WE'LL BEAT ANY GENUINE ADVERTISED PRICE!

**BY UP TO**  
**£25**  
PHONE FOR DETAILS

## BASE & MOBILE ANTENNAS TO SUIT YOUR POCKET

We are the UK's largest factory appointed distributor for Taiwan serene antennas. Trade/Export enquiries welcome. Club & Raynet discounts available

### TAIWAN SERENE BASE ANTENNAS HIGH QUALITY MOBILE ANTENNAS

			EQUIVALENT BRANDS PRICE	OUR PRICE
TSB-3315	GF	144/70, 8.5/11.9dB (5.4m)	£189.95	£129.95
TSB-3301	GF	144/70, 6.5/9dB (3m)	£129.95	£79.95
TSB-3302	GF	144/70, 4.5/7.2dB (1.7m)	£82.95	£64.95
TSB-3303	GF	144/70, 3/6dB (1.1m)	£59.95	£44.95
TSB-3002	AL	144MHz, 6.5dB (2.8m)	£49.95	£39.95
TSB-3001	AL	144MHz, 3.4dB (1.4m)	£39.95	£29.95
V-2000	GF	6m/2m/70cms, 2.1/6.2/8.4dB (2.5m)	£139.95	£119.95
GP-15N	GF	6m/2m/70cms, 3/6.2/8.6dB (2.4m)	£139.95	£124.95

DB-7900	144/70 cms, (5/7.6dBs) (1.5m)	All mobile	£49.99
DB-1208	144/70 cms, 3.5 /6dB (1m)	antennas	£32.95
DB-770M	144/70 cms, 3 /5.5dB (1m)	have a	£26.95
DB-122	144/70 cms, 3.5 /5.5dB (1m)	hinged	£22.95
DB-1304	144/70 cms, 2.15 /3.8dB (.41cms)	base	£39.95
DB-1209	144MHz, 5.2dB (1.6m)		£29.95
DB-EL2E	144MHz, 5.8ths, 4.5dB (1.8m)		£29.95
DB-285	144MHz, 5.8ths, 3.4dB (1.3m)		£15.95

FREE carriage this month on any base antenna!!

### ACCESSORIES P&P £1.00 on the following

TSA-6001N Duplexer (+Coax) 2/70	£24.95
TSA-6003 Duplexer (Sockets) 2/70	£19.95

### ACCESSORIES P&P £2.50 on the following

MT-3303 Trunk Mnt + 5M Coax	Top Quality	£19.95
MT-1301 H/Duty Mag Mnt + Coax	Top Quality	£24.95
MT-3302 H/Duty Hatch/Trunk Mnt	Top Quality	£24.95

THE ABOVE ANTENNAS ARE AVAILABLE FROM US AND ALL GOOD DEALERS INCLUDING POOLE LOGIC - DORSET - 01202 683093, SRP TRADING - BIRMINGHAM - 0121-460 1581, DEE COMM - W. MIDLANDS - 01384 480565, SOUTH EAST COMMS - EIRE - (051) 71278, RAS NOTTS - NOTTINGHAM - 01159-280 267

### P-2512

An incredible power supply! 25-30 amp cont. P.S.U., variable volts (3-15) Dual meters (Vs and amps) £89.95 Over voltage protected

**£89.95**



### P-3012

Also available 30 amp (fan cooled version of above)

**OUR PRICE £119.95**

### NB-30W

2m H/Held amp (1 1/2-5W input-30W o/p) 13.8V

**OUR PRICE £44.95**

£2 P&P



### TSA-6601

Pocket VHF/UHF SWR/PWR meter. 144-440MHz (60W)

**OUR PRICE £34.95**



£1 P&P



**AEA PRODUCTS**

**PK-232 MBX** Tried and tested & still Number one **OUR PRICE £299**

**PK-900-DELUXE** Multi terminal (9600 Board) **OUR PRICE £459**

**PK-12-A** VHF T.N.C that offers outstanding value for money **OUR PRICE £119**

### AUDIO FILTERS

#### TIMEWAVE DSP-9 PLUS

Top rated digital audio/data filter **OUR PRICE £229.95**

**DSP-50 plus** Now available **OUR PRICE £289.95**

#### DATONG FL-3

An old favourite that still offers top performance **OUR PRICE £134.95**

**MFJ-784** Great performer **OUR PRICE £229**

### SECONDHAND AND EX-DEMO BARGAINS

JRC-JST 135 as new	£999.95	YAESU FT-11R as new	£199.00	FT-290RI VGC	£299.95
IC-761 as new	£1399.00	TH-78E as new	£339.00	AZDEN PCS-6000 VGC	£189.00
FT-DNE as new	£899.00	IC-2SRE 2m Tx 25-1300	£279.95	ALINCO DR-112E as new	£229.00
ICDM IC-735 VGC	£749.00	DJ-580E immaculate	£329.00	FT-211RH VGC	£269.95
FT-747 GxII as new	£569	FT-727R + desk charger	£249.00	FT-280 same as 480	£329.00
FT-990DC ex-demo	£1549.00	PK-232 VGC	£119.95	ICF-2001D VGC	£219.95
FT-840 ex-demo	£725.00	IC-W2E VGC	£279.95	TS-50S as new	£749.00

WE GIVE TOP PRICES ON GOOD AND CLEAN SECONDHAND EQUIPMENT

Elaine Richards G4LFM has more hints and tips for you from the 'natterings' she's received this month.

# NOVICE Natter

## Air Cadets Radio



Whilst at the London Amateur radio Show in March I met **Alex Genner 2E1DBP** from 57 Squadron ATC, Potters Bar. I didn't realise that the Air Training Corps (ATC) did any amateur radio work, I thought they just had their own communications. How misguided can you get?

The Air Training Corps is a national Voluntary Youth Organisation aimed at encouraging a practical interest in aviation, adventure and sport. It's for 13 to 18 year olds, both young men and women.

Another activity that the ATC get involved in is tuition in radio operations. The ATC Cadets don't need a Novice

## For Radio Beginners of all Ages.

Elaine Richards G4LFM, PO Box 1863,  
Ringwood, Hants BH24 3XD.

This month Elaine Richards G4LFM looks at special event stations, has some ideas for some summer reading and asks if you've ever thought about joining RAYNET.

Licence to get on the air as the RAF have allocated several frequencies to the ATC.

There is an assortment of frequencies in the h.f. and v.h.f. bands as well as two spot frequencies in the 430MHz amateur band. Many ATC



groups have Novice classes too, which makes for interesting radio work.

Once again the Air Cadets will be helping during Flight Activities Week at the RAF Museum, Hendon between August 12 and 20. The call sign for the event will be **GB4ATC**.

If you're interested in getting involved with the ATC, then either contact your local group - the public library should be able to help you there - or ATC HQ on **(01949) 20771 ext. 7350**.

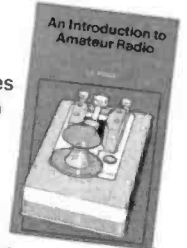
**Alex Genner 2E1DBP is an Air Cadet from the 57 Squadron based at Potters Bar.**

## Summer Reading

With the long summer holidays ahead of us, it's time to think of holiday reading. Whilst I'm sure there must be a dozen new novels out at the moment, how about turning your attention to a technical book?

I've picked out two Babani books by Ian Poole G3YWX as good starters. They aren't too heavy as they are written in a mainly non-technical style.

The first one I read was *An Introduction to Amateur Radio*. It's not an expensive book at £3.50, but with about 140 pages of writing will take a while to get through.



The book starts with the question 'What is Amateur radio?' and discusses the beginnings of the hobby and where it's going now. After that the author moves on to deal with things like the type of transmissions you could use, the jargon you will hear and on through to the various bands you can be licensed for.

The book goes on to talk about receivers, transmitters, antennas and finally how to get started. It's assumed that the reader will be a non-licensed person interested in taking up the hobby.

I found it interesting as it deals with topics that I take for granted, such as do you buy a receiver first or a transceiver in anticipation of getting your licence. *An Introduction to Amateur Radio* is available from the **PW Book Service** for **£3.50 plus £1 P&P (UK), £1.75 P&P (overseas)**.



The other book I thought was a good one to read is *Setting Up An Amateur Radio Station*. How to set-up your station, what should I buy first, what is the best antenna, what test equipment is essential? - all these questions are ones frequently asked by those just starting out. The book discusses all these questions along with ones like, do I buy new or second-hand?

The author takes the time to explain why he makes decisions about the antenna choice and also how to use the test equipment chosen. If you are just starting out in the hobby, the summer months are a good time to do all the reading and planning so that you can spend the long winter months actually getting going.

*Setting Up An Amateur Radio Station* is just **£3.95 plus P&P** from the **PW Book Service**

## Special Event Stations

I enjoy logging and hunting special event stations. For a start they feature some of the most interesting QSL cards and are often on air long enough for you to be sure of the station and all its details. The trouble is they are not always easy to find if you don't know which ones are likely to be on the air.

I've been sent some details of several stations that are going to be on the air over the summer. The National Trust is celebrating its Centenary and so there are a whole range of special stations using the callsign **GB100NT** from all over the country.

Date	Location	Radio Club Involved
July 8/9	Flatford Mill	Colchester ARC
July 15/16	Orford Ness	Leiston ARC
July 22/23	Penrhyn Castle	Dragon ARC
July 29/30	Patterson's Spade Mill	Ballymena ARC
August 5/6	Ickworth	Bury St Edmunds ARS
August 12/13	Wimpole Hall	Cambridge & District ARC
August 19/20	Sheringham Park	N.Norfolk ARG
August 26/27	Aberdulais Falls	Swansea ARC and Port Talbot ARS
September 2/3	Calke Abbey	S.Derbyshire and Ashby WARG
September 9/10	Mullion Cove	Poldhu ARC

The QSL address for all the GB100NT stations is **Roger Powell G4VAA**. Don't forget that all these stations are run by volunteers and I'm sure they wouldn't say no to a bit more help - even if all you can do is make the coffee and tea.

Why not contact the club nearest you and introduce yourself. I'm sure they'll welcome any new helpers!

## First Steps

### RAYNET

Not everyone who has started in the radio hobby will know what RAYNET is all about. I expect many of you will have heard the name, but what is it and why does it exist? Well, RAYNET (or Radio Amateur's Emergency Network) is a national body of volunteer radio amateurs who will provide communications in times of emergency and disaster.

### History

The RAYNET organisation was formed after a disaster on the east coast in 1953. During severe flooding, radio amateurs provided emergency communications.

According to the amateur licence, amateurs are not allowed to pass on messages for third parties. So, agreement had to be reached so that third party messages on behalf of 'user services' was permissible. The list of 'user services' are those such as police, fire brigade, British Red Cross, St John Ambulance, government bodies, etc.

### Get Involved

If you decide to get involved with RAYNET, you will have to have

### Zonal Co-ordinator

Frank McLoughlin G1GAD  
Brian Tindall G4HVA  
Dave Hocking G4FSS  
David T Seabrook G6HPY  
David Whiteman G1ADW  
Cthy M Clark G1GQJ  
Chris Hampson G8RXA,  
C. Madeley Smith G8KVU,  
David G C Hicks G6IFA  
Iain Stracham GM4FLP  
Tom Stewart GM0BKX

### Address

21 Darwin Crescent, Gosforth, Newcastle upon Tyne NE3 4TT  
Hunters Moon, Newton-le-Willows, Bedale, North Yorkshire DL8 1SX  
10 Garfit Road, Mirby Muxloe, Leicester LE3 2DE.  
Lyndene, 5 Mill View, Gazeley, Newmarket, Cambs CB8 8RN.  
17 May Close, Chessington, Surrey KT9 2AP.  
9 Conigre, Chinnor, Oxon OX9 4PY.  
7 Merryfield Close, Bransgore, Christchurch, Dorset BH23 8BS.  
48 Sherbourne Crescent, Coundon, Coventry CV5 8LE.  
Beggars Roost, 12 Toll Bar Road, Christleton, Chester CH3 5QX.  
Hope Cottage, 238 Coupar Angus Road, Muirhead, Dundee DD2 5QN.  
104 Barrhill Road, Cumnock, Ayrshire KA18 1PU.



an agreement with your employer so that they will release you from work if an emergency arises. Obviously, training is important with a volunteer group like this.

The RAYNET organisation provide local training exercises and also provide additional communication at events like fun runs, marathons, car rallies, yacht races, Scout and Guide events, etc. This is an ideal time for them to hone their message handling techniques and to make sure that events such as these pass without incident.

It is vital that all members of the group know how to pass a message and how to receive them accurately too. If ever a RAYNET group is called upon in an emergency then this training will be invaluable.

There are about 3000 RAYNET members country-wide and these are all organised into local groups. All the groups have a controller and there are Country and Regional controllers too.

### Communications In Disaster

The members of RAYNET have provided communications in disasters such as Zeebrugge and Lockerbie as well as smaller, more local, emergencies. Overseas work has involved passing on messages from disaster hit countries to relatives here.

If you think you'd be interested in helping with the work of RAYNET then you need to contact the Zonal Co-ordinator nearest you. The following is a list of Zonal Co-ordinators throughout the UK.

## Novice Fund Raising

**Robert Snary G4OBE** has found a way of fund raising to help with the costs of his extra *Novice Training Notes and Worksheets*. He has been given a large number of ZTX753 transistors when Ferguson's closed down their factory in Enfield.

Robert says the transistors are ideal for keying on c.w. sets and great for the QRP operator. They are mounted in a cardboard Bandelier and have come direct from the production line.

If anyone would like some of these transistors, they are available for 50p plus a self addressed label for 10 transistors from **Robert Snary G4OBE, 12 Borden Avenue, Enfield, Middlesex EN1 2BZ**.

The specification for the ZTX753 transistors is: General purpose high current pnp small signal transistors; E-line case;  $I_c = 2A$ ;  $P_o(\max) 1W$ ;  $V_{ce}(\max) -100V$ ;  $V_{cb} \max -120V$ ;  $f_{he} 100-300$  at  $I_c = 0.5A$ ,  $V_{ce} -2V$  and  $F_t 140MHz$ .

Oh yes, if you do take up this offer from Robert, drop me a line with details of how you are using the transistor. Best idea gets a prize from the Editorial Office!

## Competition Results

The 'Time Check' competition, which I ran in the May issue of *PW* to win a multipurpose l.c.d. clock timer donated by Maplin Electronics has now closed. The answers were: **Q1:** 1955; **Q2:** +12.

The first three names out of the biscuit tin were: **John Bytheway 2E1DVE, Dorset; Mr Rigby, Lancs and Eric Parvin, York**. The Editorial Office will be organising the dispatch of your prizes. Many thanks to those who entered.

*That's all the 'natterings' I have for you this month. Don't forget I look forward to receiving your letters and suggestions for this column, so get writing and let me know what you've been up to in the world of radio. All letters to the address at the top of the column please.*  
*Cheerio for now.*

*Elaine G4LFM*

# LISTENING TO

## New from JPS Communications

### JPS, leaders in the field of DSP filter technology now introduce the ANC4 Antenna Noise Canceller

The ANC4 cancels noise from:

- \* Power lines
- \* Computers
- \* TV sets
- \* Refrigerators
- \* and many other electrical appliances

The ANC4 is an r.f. device designed to provide cancellation of locally-generated noise from signals received by a primary antenna. The unit is employed right at the antenna connector of the receiver or transceiver to cancel locally-generated noise, to allow reception of signals well below the noise level induced by the local interference. This will typically give you a 40dB drop in interference signal level, so you can see just how effective it is!

This unit may be used with any receiver or transceiver with r.f. power out put of 150W p.e.p. or less. An r.f. detector built into the unit automatically bypasses the network whenever transmit r.f. is detected. This unit is NOT designed to be used at the output of a high power linear power amplifier, but must be installed at the lower r.f. level of the transceiver, if transmitting is anticipated.

Controls are provided on the front panel to allow adjustment of both the phase and magnitude of the local interference, providing extremely deep cancellation of the offending interference.

The unit connects between the main station antenna and the receiver antenna connector. The d.c. power mating connector for the ANC4 is supplied with each unit. UHF (SO239), which mates with a PL259 plug) connectors are used for the outside antenna and the output to the receiver. A short wire antenna and a short collapsible unit to act as the noise pick-up antenna.



### Also from JPS is the new NIR12 - a true state-of-the-art DSP audio filter.

*NIR12 Professional Dual DSP Noise and Interference Reduction Unit.*

- ★ Digs out weak, difficult to read signals
  - ★ Both spectral subtraction and dynamic peaking noise reduction provided
  - ★ Operates on audio from any radio receiver
  - ★ All modes useable simultaneously
  - ★ Access to the dual d.s.p.s via RS232 for experimenters
  - ★ Greatly reduces listener fatigue
  - ★ Manual and automatic NIR control
  - ★ Dual digital signal processors
  - ★ Notch filter removes all tones from voice signals, including c.w. and RTTY
- ★ **SPECIAL OFFER** – previous model NIR10 £299 to clear. While stocks last.

#### INTERNET ADDRESS:

orders@lowe.demon.co.uk  
info@lowe.demon.co.uk  
New check out Lowes new

pages on the World Wide Web  
http://www.demon.co.uk/lowe/index.html

#### BERKSHIRE

3 Weavers Walk  
Northbrook Street  
Newbury

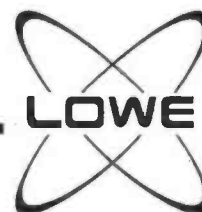
Tel: (01635) 522122

#### NORTH EAST

Mitford House  
Newcastle Int. Airport  
Newcastle Upon Tyne  
Tel: (01661) 860418

#### WALES & WEST

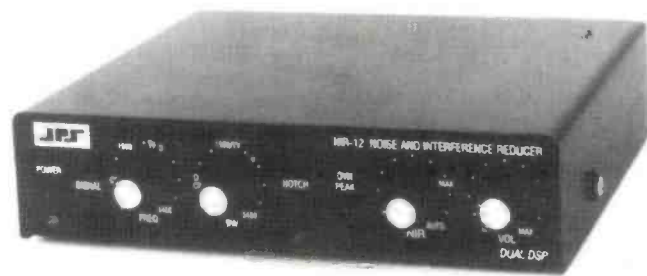
79/81 Gloucester Rd  
Patchway  
Bristol  
Tel: 0117-931 5263



LOVE  
Chesterfield Road

# THE WORLD

The NIR12 is an advanced audio signal processor designed to provide the user with maximum flexibility of removing interference from voice, c.w. and data transmissions. The unit uses dual Digital Signal Processing (DSP) to provide simultaneous bandpass operation, noise reduction and multiple tone/heterodyne removal. The special notch filter provides cancellation of multiple heterodynes from tune-ups adjacent carriers, c.w., RTTY or similar signals without interfering with voice signals when a voice bandwidth has been selected. The notch filter operates in five milliseconds or less. A multi layer printed circuit board provides superior shielding to virtually eliminate r.f. radiation from the DSP data bus.



For experimenters, access to the dual DSPs is provided via RS232 on an internal header. A section in the manual is devoted to describing how to use this input to generate your own filters and develop other uses for the dual DSP chips.

This is the ultimate DSP unit! If you haven't already invested in a d.s.p. filter, try this one out. By the time this ad appears we should have received our first batch - make sure you're one of the first and give us a call right now to reserve yours. Just £399 will get you the ultimate DSP.

## Vårgårda Radio AB

All good things come in threes and our third bit of good news this month is that we've just been appointed UK distributors for the Vargarda range of antennas and what's more, our tremendous buying power has enabled us to make quite a few price reductions across the range. If you've never considered a Vargarda Antenna before, now's the time. These Swedish made antenna use superb quality materials and are really built to last. Long spacing between elements ensures higher gain for a smaller number of elements and gains figures are quoted in real dBs, not 'isotropic', so don't be fooled by the numbers when comparing them with other makes. If we are going to make any comparisons, I guess we could call Vargarda the 'Volvo' of the antenna world - we'll leave you to decide who the 2CV is!

	Model	Description	Boom Length	Gain	Price
2m antennas	VDIP2	144MHz vertical dipole	0.15m	0	£30.00
	HDIP2	Horizontal dipole 2m	0.15m	0	£35.00
	Active2	2-ele 2m beam	0.4m	5dBd	£30.00
	3EL2	2-ele 2m beam	0.8m	7dBd	£35.00
	6EL2	6-ele 2m beam	2.25m	10dBd	£45.00
	9EL2	9-ele 2m beam	4.5m	13.0	£60.00
70cm antennas	VDIP70	vertical dipole 70cm	0.15m	0	£30.00
	HDIP70	horizontal dipole 70cm	0.15m	0	£35.00
	6EL70	6-ele 70cm beam	1.0m	10dBd	£35.00
	13EL70	13-ele 70cm beam	2.5m	13dBd	£50.00
	19EL70	19-ele 70cm beam	3.95	14.5dBd	£75.00
6m antennas	3EL6	3-ele 50MHz beam	1.7m	7dBd	£80.00
	5EL6	5-ele 50MHz beam	3.6m	9dBd	£120.00
4m antennas	3EL4	3-ele 70MHz beam	1.6M	7DBD	£70.00

**SOUTH EAST**  
Communications Hse.  
Chatham Road  
Sandling, Maidstone  
Tel: (01622) 692773

**YORKSHIRE**  
No. 12 Station Road  
Crossgates  
Leeds  
Tel: 0113-232 8400

**SOUTH WEST**  
117 Beaumont Road  
St. Judes  
Plymouth  
Tel: (01752) 257224

**EAST ANGLIA**  
152 High Street  
Chesterton  
Cambridge  
Tel: (01223) 311230

# we Electronics

, Matlock, Derbyshire DE4 5LE Tel: (01629) 580800 Fax: (01629) 580020

## Scouting Around

During the Easter weekend April 14-17th, the **Torfaen Scouts Amateur Radio Club** provided an Amateur Radio Station for the 72 Welsh Scouts that are to attend the World Scout Jamboree in Holland this coming August. The station operators were **Bill GW0FGO**, **Richard GW0VAW** and **Dave GW8SZL**.

The campsite/station was located in the Black Mountains on the eastern side of the Brecon Beacons. This turned out to be a rare WAB square - SO22. NGR: SO257257, WW Locator IO81LW.

The station was set-up using an FT-980 running 100W into an 'old faithful' G5RV antenna. There were also two packet stations, one in the shack and another in a tent at the other end of the campsite.

The reason for the packet operation is that many of the youngsters today prefer to 'talk' using the keyboard, rather than on a microphone. The Scouts were soon communicating with each other over the packet system and as the club were located in a valley, there didn't seem to be much chance of reaching anyone else.

At the end of the first day, Dave GW8SZL (Computer/Packet Manager) conducted a few tests and actually found a route out of the valley using 144.650MHz. The following day saw a sudden increase in the number of visitors to the packet system located in the tent.

The interest was due to Dave connecting to an 'outside' station and the Scouts were suitably impressed. Dave also managed a connection to a BBS and was able to demonstrate how packet messages can be distributed world-wide.

On 3.5MHz, activity was mostly h.f., as this provided inter-G contacts and by using the club callsign GC0UKT/P allowed the club to get Scouts to pass greetings messages (yes, they did use a microphone!). Conditions changed quite rapidly, but many contacts were made and the scouts were kept quite busy.

A link-up was also obtained with scouts at Milton Keynes (GX0SMK). It was great fun for the scouts to hear other scouts pass their greetings messages.

The Torfaen Scouts Amateur Radio Club were very pleased to have been asked to participate in the Welsh Scout



Training Camp and are very grateful to all of the radio amateurs who took the time and trouble to make contact with them. Their

patience during long 'overs' was very much appreciated.

The Torfaen Scouts ARC will always welcome any radio amateur that would like to help out with Radio Scouting activities. You can contact **Dave GW8SZL @ GB7IMB** (Packet Manager) or direct to the Secretary **Richard GW0VAW** for more information.

# CLUB Spotlight

Send your information to the 'Club Spotlight' newshound **Zoë Shortland** at the PW Offices.

## Steaming Ahead

The **Scarborough Special Events Group** will commence their summer season of Special Event Stations by celebrating the 150th anniversary of the opening of the Scarborough to York Railway line during the weekend on July 8-9 1995.

George Hudson's York and Midland Railway Company built the 42 mile line in less

than a year and sparked the dramatic development of the resort as a tourist destination. A carnival atmosphere swamped the town on July 7 1845 when the 'Hudson' and 'Lion' steam locomotives, drawing 35 first class carriages, completed the journey between the coast and the county's capital city.

The Special Event Station will be on the air as part of a week's celebrations, culminating in a series of trips between Scarborough and York by the steam locomotive 'George Stephenson'. A special full coloured QSL card will be issued to celebrate the occasion and will be number 11 in the Group's series of commemorative QSL cards.

Operation of the special event station will be around 3.725 and 7.055MHz s.s.b. on the h.f. bands, plus a c.w. station and 144/430MHz activity. The callsign GB150SY has been requested from the RA.

Further information on this event can be obtained from **Roy Clayton G4SSH, 9**

**Green Island, Irton, Scarborough YO12 4RN.**

**Peter G3JBR, Roy G4SSH, Andrew 2E1AUZ and Phil 2E0ABI (L to R) alongside 'George Stephenson'.**



## Aid For Croatia

Members of the **Bromsgrove Amateur Radio Society (BARS)**, recently provided a full set of h.f. equipment to the war-torn Croatian town of Lipik, in a bid to bring a little joy to the school children there. Members of the Bromsgrove Society decided to help the children, and fellow Croatian radio amateur **Professor Biscanin**, (Headmaster), after hearing of their plight from Bromsgroves **Dr. Tony Pratt**, Director of Aid International Direct, which is a charitable organisation providing aid to Croatia and Bosnia.

Before the war, the Croatian school ran a very successful and enthusiastic amateur radio station, which was destroyed by Serb and Croatian invasions. The new station will provide the town with a vital means of communications with the outside world.

Dr. Pratt took the equipment with him on an aid trip at the end of February. The members of Bromsgrove Amateur Radio Society are now awaiting the first contact.

The rig supplied was a Kenwood TS-830S h.f. transceiver, which BARS had serviced and tested, plus the usual ancillary equipment, including an a.t.u., s.w.r./power meter, c.w. key, headphones, desk microphone, etc. The antenna, a full size G5RV plus coaxial feeder and all connections, was very kindly donated by DeeComm of Brierley Hill.

The Bromsgrove Amateur Radio Society is now 12 years old and has 15 full members, who are very friendly and helpful, especially to their fellow amateurs. Meetings are held on the 2nd and 4th Tuesday of each month at the **Lickey End Social Club, Alcester Road, Burcot, Bromsgrove**. The Secretary is **Barry Taylor** and he can be contacted on (01527) 542266.



**John Yarnall G1JLQ (BARS Chairman) handing the equipment over to Dr. Tony Pratt, watched by BARS Secretary Barry Taylor G0TPG.**

## Rooster Net Breakfast

**Paddy G0TOR** shares his story of GB3WD and the 'Rooster Net'.

After I retired from the armed services, I put my roots down in south west England and after finding a job, set about getting myself a hobby. As I'd been interested in s.w.l. from about the age of 13, I thought I'd give the RAE a go, to see if I could get on the air and talk to some of those amateurs that I'd listened to for all those years.

I got my pass and soon got myself a hand-held, which I fitted into the car along with a 5λ8 whip. So now for the real test, would anyone speak to me? I put out a call on the local repeater 'Whiskey Delta' and was soon chatting away with some of the locals.

As I made my way to work each morning, which is about 11 miles from my QTH, I spoke with many of the local amateurs in the area. One of the leading lights on the Net was **Ray GOKZQ**, who acted as a sort of Net controller and kept

everyone informed about everything from the weather to whose turn it was to speak next.

Ray would come on air at about 0630 until 0900 and knew exactly where everyone was and how long they would be on the road before arriving at work. A typical response from Ray would be 'We better bring Paddy in as he must be at the Derriford Roundabout and hasn't got too far to run', and you could bet your bottom dollar he wouldn't be far wrong!

One morning on the way to work, a strange voice was heard, it was **George K4DSB** who was over on holiday from the USA. George had been to Plymouth many times over the years, and had in fact married a local girl, Pattie, who he had met when over here with the US Navy.

George told us all about the Net in Florida they called the 'Rooster Net' and how that once a month they would hold a breakfast so that everyone could meet up and have a chat.



Members of the Devon 'Rooster Net' showing (L to R) **George K4DSB** and **Ray GOKZQ** in the front row.

George and his good lady Pattie returned to the States, and Ray thought he'd try and get a 'Rooster Breakfast' off the ground, over here in the west country.

That was over two years ago now, and since then, usually on the first Saturday of the month, a breakfast is held at a different location somewhere either in Devon or Cornwall. The most we have had at one of these gatherings is about 45.

The 'Rooster Breakfast' has been a huge success and we've had s.w.l.s, and amateurs from other countries who have been here on holiday come along for support. There are no fees, you don't even have to have breakfast, just a cup of tea if you like.

Since I have moved down to the south west, I have been impressed by the good manners and all the help I have received from everyone who uses GB3WD. I have now got my Morse, but still use 'WD' every day as that is where I met most of my new friends.

So, if you are coming this way for your holidays, tune into GB3WD and find out where the next 'Rooster Breakfast' is being held. Come along, you'll be in for a pleasant surprise!

## Peak 95

During the week of July 29 to August 5, the **South Notts Amateur Radio Club** (SNARC) are operating the special event station **GB2PIC** to celebrate Peak 95. Peak 95 is a Scout and Guide Camp, held every five years, in the grounds of Chatsworth House in the Derbyshire Peak District National Park, the ancestral home of the Duke of Devonshire.

The event will be attended by approximately 6000 scouts and guides from all over the world. The special event station GB2PIC will be operating on h.f. and v.h.f. and will QSL direct via **SNARC, PO Box 4, Clifton, Nottingham NG11 9DE** or via the RSGB QSL bureau.



Thursday May 18 marked a new era for the **Barry Amateur Radio Society**, when **Clive Trotman GW4YKL**, President of the RSGB, together with the Mayor of the Vale of Glamorgan presided at the official opening of their radio shack. The President, in his speech, recalled the time years

## New Era

Group photo of members and guests at the official opening of the **Barry Amateur Radio Society**.

ago when the Barry Club was a flourishing well attended concern, and was pleased to learn that after some years in the 'doldrums' and at one stage almost becoming extinct, was now staging a comeback.

A new management team ably led by **Glyn Jones GWOANA** has, in the space of barely seven months, revived the club's fortunes, found a venue in beautiful surroundings at Sully on the Bristol Channel coast barely three quarters of a mile from the spot where Marconi made history in May 1897 by exchanging radio messages across open water.

The shack was formerly a disused storeroom and was converted with the assistance of club members to well laid plans masterminded by **Jorge GWOAGA**, the incumbent Shack Manager. The future looks very promising with lots



Chairman of the Barry Amateur Radio Society **Glyn Jones GWOAGA** handing the scissors to **Clive Trotman GW4YKL** before ceremoniously cutting the tape and declaring the shack officially open. **Colin Dunkley**, Mayor of Vale of Glamorgan Council is shown on the far right.

of interest being shown, membership increasing and emphasis being placed on future activities, which will surely reflect those aspect of our hobby, which perhaps in the past had tended to become neglected.

## Air Cadets Airborne

At this year's Royal Tournament, the **Air Training Corps** will be operating an h.f. special event radio station. This station will be on air between 1100 and 2200 hours local time, for the duration of the Tournament, which is being held on the July 18 to 29 1995.

Air Cadets will be on hand to pass and receive greetings messages. Alongside will be a demonstration station operated by Air Cadets, using their own allocated Air Cadet frequencies.

Further information can be obtained from **Malcom Wood, 12 Lime Tree Walk, Enfield, Middlesex EN2 0TJ** or by telephoning **0171-438 6053**.

01702  
206835

# Waters & Stanton

Quote Visa or Access No.  
For Immediate Despatch

Waters & Stanton

Radio Communicat

**NEW SUMMER CATALOGUE OUT**  
More Products - More Articles



**£1.50**  
Add 45p  
Postage

Catalogue & More

Phone Your  
Order Today



### DR-610 2M /&70CMS

50 Watts 2m 35 Watts 70cms  
AM/FM Wideband Receive  
120 memories CTCSS

£729.95



### DR-150 2M Transceiver

50 Watts 2 metres  
AM/FM Wideband Receive  
100 memories CTCSS

£389.95



### DR-MO6 6M Transceiver

10 Watts 6m  
FM Wideband Receive  
100 memories CTCSS

£359.95



### DX-70 HF + 6M Transceiver

100Watts HF 10 Watts 6m  
SSB - CW - FM - AM  
Narrow filters Included

£1095



**Free Credit on ALINCO**  
20% deposit - balance 12 months  
0% APR - no arrangement fees

**NEW**



### DJ-G5

2m / 70cms

The new dual bander from ALINCO has been released. What a specification! Don't consider anything else until you have received the full story! **£479**

Includes a host of exciting features. You get CTCSS

built-in, 200 memories as standard and a wideband receiver covering 108-174/420-470 / 800-950MHz. You'll love its compact size and you'll be amazed at all its hidden features. Send today for full details of tomorrow's handheld.

### Watson Hand-made keys

These keys are hand-made and finely crafted for the CW enthusiast. No plastic is used - only natural wood, brass and alloys. Once you have experienced the silky smooth movements and balanced response, you'll never use anything else.

Watson GMI  
Iambic **£49.95**

Watson GMV  
Straight **£44.95**



Watson GMC  
Straight

**£34.95**



### WATSON

### Mobile Aerials

Low cost - high spec.

This new range of mobile aerials offering amazing value. Stainless steel whips, foldover bases and perfect matching. These are the best performers we have ever stocked! Resonated for European band and designed to take the higher powered rigs.

**£24.95**

2M  
70c  
200

In Stock

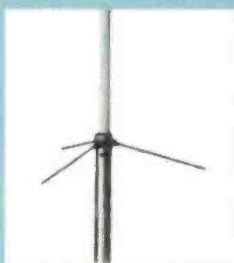
W-285 2m 5/8th stainless steel whip  
PL-259 1.32m 3.4dB 200W ..... **£15.95**  
W-770HB 2m/70cm black whip  
PL-259 1.1m 3/5.5dB 200W ..... **£24.95**

### WATSON

### Base Aerials

2m/70cms

Fibre Glass - SO-239 - Tuned for UK Bands!



The low cost alternative that does not sacrifice quality or performance!

W-30 **£39.95**

3/5dB gain. 1.15m

W-50 **£54.95**

4.5/7.2dB 1.8m

W-300 **£69.95**

6.5/9dB 3.10m

**70cms Handys**  
2 Watts Out  
Keypad Entry

Brand new units with 1750Hz tone, 20 memories, direct 12V socket, 4 & 6 x AA cell boxes, carry strap, belt clip, antenna. NI-cad packs £19.95  
Chargers £9.95



**£149**  
Post £8

**Few Only!!**

### DPS-2012 22 Amp PSU

Fully variable  
Fully Protected

30 Amp model also available. Same design.

**£119.95**



**£89.95**

### ICOM IC-706 160 - 2m

Nobody Beats Our Price!



Phone

### Professional Headsets

Ask about New PTT Option



**£32.95**

Ideal for HF and VHF operation, Contesting, etc. Superb transmitted audio quality. Supplied with FREE mic lead adaptor for Yaesu or Kenwood 8 pin sockets (state which). Use VOX or external PTT. Now you can sit back or wander round the shack whilst talking with both hands free and no echo.

## Price Crash

**DISCOUNTS - A Great time to buy!**

Model	List	Our Price
FT-1000	£3699	£Phone
FT-990AC	£2299	£Phone
FT-990DC	£1999	£Phone
FT-900AT	£1549	£Phone
FT-900	£1349	£Phone
FT-840	£899	£Phone
FT-736R	£1789	£Phone
FT-51R	£499	£Phone
FT2500	£369	£Phone
FT-8500	£700+	£Phone

### Price Match

We will match our competitors' advertised prices on genuine new UK sourced stock. We give a true "on our premises" service warranty.

**Great Deals on Kenwood Too!**



# Everything For The Amateur

## VSWR Meter Bargain!



**£69.95**

Add £4.40

125 - 525 MHz 5 / 20 / 200 Watts p&p  
Average & PEP Size: 185 x 105 x 80mm

## "SCANNING SECRETS"



Exciting New Book!

**£16.95**

Available  
MAPLIN  
Stores

## 2M Budget Handhelds

### ADI - from Taiwan AT-200 Handheld

A 2 metre handheld of amazing value. It's made in Taiwan by one of the largest computer manufacturers. We are one of the selected dealers

- 144 - 146MHz Tx
- 130 - 170MHz Rx
- 5 Watts on 12V DC
- 3 Power levels
- 20 Memories
- 6 Channel steps
- 1750Hz Tone
- CTCSS Option
- 5 - 15V operation
- Scanning / Call
- Battery Saver
- DTMF
- 6 x AA dry pack



Maplin Code  
BD-74

**£179**

## Price Match



### YAESU MASTER DEALER KENWOOD Main Dealer

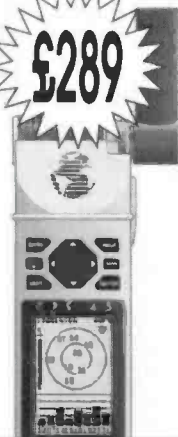
We'll match or beat our competitors advertised prices on genuine new UK stock. Just give us a call and quote their current advert and magazine - it's that simple! We also now give FREE 24 months warranty on Yaesu! And nobody stocks more products than us. Get our catalogue and see for yourself. It's the best ham radio read in the business listing all the very latest products with specs.

## Our ROAD SHOW goes to STAFFORD

August 19th & 20th

### Garmin Handheld GPS-45

**£289**



This Month's  
SPECIAL

- Latitude/Longitude
- National Grid
- 49ft accuracy
- Forward Speed
- Beam headings
- Height ASL
- Miles or Metres
- 250 Waypoints
- Moving Map / Zoom
- Route Programming
- Arrival Alarm
- Backlit switch
- Satellite Display
- Signal Strengths
- Uses 4 x AA cells
- Ext 12V DC socket
- Built-in antenna
- BNC for remote antenna
- 156 x 51 x 31mm

### FT-990DC HF Transceiver

Factory Fresh

Inc FREE PSU  
**£1769**



### FT736 - VHF & UHF

The "Classic"

Price Match  
Promise



### Throat Microphones

Superbe audio quality. You'll be amazed. Includes PTT box and suits all modern handhelds. For Kenwood ask for "K" version.



**£39.95**

### Ear-Talker

This unit will fit all modern ALINCO, YAESU and ICOM handhelds. Supplied with PTT micro switch with jacket clip and volume control. Please specify if Kenwood or Yaesu, Icom, Alinco model required.



**£29.95**

### ALINCO DJ-180 2m 5W "A Great little Rig"



- 144 - 146MHz Tx
- 130 - 170MHz Rx
- 5 Watts on 12V DC
- 10 Memories
- 6 Channel steps
- 1750Hz Tone
- CTCSS Option
- Scanning / Call
- Battery Saver
- Auto Power Off
- 7.2V Ni-cad Pack
- AC charger

Maplin Code  
CM-87

**£229**

#### Listing of Stores in Alphabetical Order

Belfast	01232 683 929	Hammersmith	0181 748 0026
Birmingham	0121 348 8411	Ilford	0181 599 0100
Bradford	01274 728 938	Ilkley/Headley	
Brighton	01273 620 930	Chesham Hill	0161 632 2560
Bristol	0117 923 2014	Chorley Rd	061 236 0281
Cardiff	01222 464 554	Middleborough	01642 242 300
Chesham	01634 818 588	Milton Keynes	01908 652 720
Coventry	01203 550 504	Northampton	01604 756 728
Dublin	01284 488 011	Nottingham	0115 941 0242
Edinburgh	0101 313 5551	Plymouth	01705 654 411
Gateshead	0191 498 9565	Preston	01772 258 484
Glasgow	0141 353 3323	Reading	01734 588 638
Leeds	0113 244 8200	Sheffield	0114 285 5482
Leicester	0116 260 3888	Slough	01753 551 419
Liverpool	0151 230 0366	Southampton	01703 225 831
London		Southend	01702 302 000
Edgeware	0181 951 0960	Stockport	0161 480 4900
Forest Hill	0181 291 9192	Stoke-on-Trent	01782 749 947

Shop and Mail Order; 22, Main Rd., Hockley, Essex. SS5 4QS Tel: (01702) 206835 Fax: 205843

**VISA** Branch Shop: 12, North Street, Hornchurch, Essex. RM11 1QX Tel: 01708 444765 **ACCESS**

MAIL ORDER To Hockley - 24 Hour Answerphone and Fax. Open 6 Days 9am - 5.30pm



# SUBS CLUB

## Get Tuned Up With This Month's Subs Club/Reader Offer!



As this month is our 'Antenna Special' issue, we've got a rather special offer for members of the Practical *Wireless* Subs Club in the shape of the **MFJ-948 Deluxe Versa Tuner II**.

The MFJ Company describe it as "The World's Best Selling ATU" and you can try it out for yourself for a very special price! And, this month we are able to extend this offer to non-subscribers as well.

The Versa Tuner II features up to 300W power handling from 1.8 to 30MHz, cross needle metering (with illuminating facilities) and shows s.w.r., forward and reflected power simultaneously. The a.t.u. will read peak or average power on 30 or 300W ranges, tunes dipoles, verticals, random wires, beam, whips and short wave listening antennas.

The a.t.u. will take coaxial cable feed, random wire or balanced line and has a built-in 4:1 balun. The operator can use the front panel switch to select between coaxial fed antennas, random wire or balanced lines or by-pass for direct connection or external dummy load.

The MFJ-948 Deluxe Versa Tuner II normally retails at **£149.95** including VAT, plus P&P but *PW* Subscribers' Club Members can get theirs for **£129 including VAT & P&P**. Non-subscribers can also take advantage of this offer and can get their MFJ-948 for **£129 including VAT plus £5 P&P**.

**All P&P prices apply to UK, overseas readers please contact the *PW* Post Sales Department for postage prices.**

So, now you can enjoy versatile antenna tuning with the MFJ-948 Deluxe Versa Tuner II and get *Practical Wireless* delivered to your door every month.

**Offer open until August 11 1995 (UK), August 25 1995 (overseas).**

To take advantage of this offer just fill in the details on the order form on **page 70** of this issue. Alternatively call **Ann** or **Michael** on our **Credit Card Hotline on (01202) 659930** and quote **SCPW8** to place your order.

## Isn't It Time You Became A Practical Wireless Subscriber?

### \*PRACTICAL WIRELESS & SHORT WAVE MAGAZINE IN ATTENDANCE

**July 16:** The Norfolk RAYNET Barford Rally will be held at the Village Hall, Barford, on B1108, Norwich to Watton Road. Doors open 10.30am to 3.30pm. There will be trade stands, a raffle and refreshments. Free car parking and talk-in on S22. Further details on (01603) 625833 daytime or (01362) 820820 evenings.

**July 16:** The 12th McMichael Rally and Car Boot Sale will take place at the Haymill Youth and Community Centre, Burnham Lane, Slough, near Burnham Railway Station. Talk-in on S22. Doors open at 10.30am. Admission is £1.50. For more details contact Dave G3SET on (01628) 486554.

**July 23:** Britain's biggest Outdoor and Leisure Show is due to take place at Powderham Castle, Nr. Exeter, Devon between 10am and 6pm. The show is situated in the grounds of the magnificent Powderham Castle on the edge of the River Exe. The show has a variety of different sections to cater for all, new and used sailing and power boats, used boat jumble, new equipment and lots more. There is to be an amateur radio section (new and used equipment) and a special event station is planned. Any enquiries to: **The Outdoor Boat and Leisure Show Ltd., c/o The Estate Office, Powderham Castle, Exeter, Devon EX6 8JQ** or you can ring (01626) 890243.

**July 29:** Computer Fairs (Northern) held at the Clayton Arms Sports Hall, Fulwood Park Road, Boundary Park, Oldham (next to Oldham Athletic Football Club). There is free parking. There will be a Bring & Buy stall and computer games, etc. Admission is £2 for adults, £1 children/OAPs and £5 for families. Doors open 10am to 3pm. 0161-627 2502.

\***July 30:** Scarborough Amateur Radio Society will be holding their Radio Electronics and Computer Rally at the Spa, South Foreshore, Scarborough. Doors open at 11am. There will be many traders a Bring & Buy, refreshments and a bar. Ross Neilson G4ZNE on (01377) 257074.

**July 30:** The Rugby ATS are holding their 7th annual Amateur Radio Rally at the BP Truckstop on the A5, three miles east of Rugby and just 2.5 miles north west from junction 18 on the M1 motorway. Doors open from 10am and admission is £1 per car. Facilities include a good cafeteria and toilets. Talk-in on S22 by GB7RRR. Peter (01455) 552449.

# RADIO Diary

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.

\***August 6:** The RSGB Woburn Rally is being held at Woburn Abbey, Bedfordshire. Further details from Norman Miller G3MUV on (01277) 225563.

\***August 13:** Flight Refuelling ARS Hamfest '95 will take place at the Flight Refuelling Sports Ground, Merley, Wimborne. The event will run from 10am to 5pm and will include the usual mix of traders, Bring & Buy, craft exhibitors, car boot sale and field events. Talk-in on S22. New traffic routing - please follow signs. Richard Hogan G4VCQ (01202) 691021.

**August 18:** Cockenzie & Port Seton Amateur Radio Club are holding a radio junk night. Bring your own junk and sell it yourself. Tables will be provided on a first come, first served basis (no charge for the table), 6 to 9pm. Raffle at approximately 8.30pm. Entrance fee is £1 and refreshments will be available. All money raised is being donated to the British Heart Foundation. Further information on this event from Bob GM4UYZ on (01875) 811723 or via GB7EDN.

**August 19/20:** The Stafford Amateur Radio & Computer Show, (incorporating RSGB National Convention) is to be held at The County Showground, Stafford. Doors open at 10am to 5pm.

There will be Morse tests, special interest groups, a Bring & Buy and lectures on each day. There will be free parking, bars and catering. FREE stands available to radio/computer clubs and societies! (01923) 893929.

**August 20:** The Kings Lynn Amateur Radio Club will be holding their 6th Great Eastern Rally at The Cattle Market, Hardwick Narrows, Nr. Kings Lynn. Doors open at 10am (9.45am for disabled visitors). There will be an outdoor car boot area, a Bring & Buy, Talk-in on S22. There is a spacious indoor area with major national exhibitors, and easy access for disabled people. Refreshments and free parking too. Further info. from Ian Cooper G0BMS on (01553) 765614 or @GB7OPC Packet BBS.

**August 27:** The Galashiels Club are holding their Open Day at the Focus Centre, Livingstone Place, Galashiels. Doors open at 11am till 4.30pm. There will be many traders, a Bring & Buy, club stalls, a raffle and refreshments will be available. John Campbell GM0AMB. Tel/FAX. (01835) 822686.

**August 27:** The East Coast Amateur Radio & Computer Rally is to be held at the Clacton Leisure Centre, Vista Road, Clacton-on-Sea, Essex. Doors open at 10.30am to 4pm. There will be major suppliers and manufacturers of radio equipment, computers and computer software, accessories, antennas and second-hand gear. There will also be a Bring & Buy, plus a bar and cafeteria available from 11am. Free car park and talk-in on S22 and SU22 (GB1ECR). Further information can be obtained from **Sharward Promotions** on (01473) 272002 or FAX: (01473) 272000.

**August 27:** The Torbay Rally is being held at the Clenon Valley Leisure Centre, Paignton, Devon - where there's room to stop and chat! Doors open at 10am. There will be trade stands, a Bring & Buy, special interest displays, the use of leisure facilities, a restaurant and bar. For the family, only a four minute walk away, there is a beach, boating lake, steam railway and a flume water park. Further details can be obtained from John G3YCH, QTHR. (01803) 842178.

**August 28:** The Huntingdonshire Amateur Radio Society are holding their Radio Rally at St. Peter's School, St. Peter's Road, Huntingdon, Cambridgeshire. Doors open at 10am and admission is £1. Refreshments available. There will be two halls and a car boot sale. Talk-in on S22. David Leech G7DIU. (01480) 431333.

# Controlling That Magnetic Loop!

*Gordon Lumley G3DJE shares his experience of developing an interesting system to remotely control the increasingly popular form of antenna - the 'magnetic loop'.*

**M**y article is further to the large number of words that's been written on the so called 'Magnetic Loop Antenna'. My idea is to overcome a problem area which can arise in tuning the loop to resonance as it's vital to tune the antenna accurately.

When tuning a remotely sited 'magnetic loop antenna', it's quite likely that the operator will soon lose all track of the approximate position of the capacitor vanes when they are free to rotate through 360°. 'Pigtail' connections might be employed on the capacitor. And if the loop is out of sight will cause problems when the limit of capacitor travel is reached and the 'pigtail' tightens.

You can imagine a state of affairs with the 'pigtail' tightened and the tuning motor stalled. With the loop being out of sight, resonance will never be found because the operator is attempting to rotate a stalled motor, quite unable to move the tuning capacitor.

## Suitable Solution

A suitable solution can be found by fitting a semi-circular Perspex (or other suitable material) cam on the capacitor spindle. This would be used together with a pair of microswitches mounted on the adjacent end plate.

The technique I've suggested is not as difficult as it might sound in some cases. Provided one or other end plate can be temporarily removed and the spindle is available to fit the cam, it's well worth while reading on!

## Important Cam

To understand the system, it's important to realise that the cam is fitted and shaped so as to trip the microswitches when the vanes are fully open. They must also do the same when they're fully closed, each switch changing over at these positions.

In practice, the semi-circular cam is placed in coincident plane with the vanes. In other words, it looks like an additional moving

vane, in line with the others. It could be placed in opposition to the moving vanes, but the wiring of the microswitches would then need to be changed.

The device is basically simple. It employs a two colour l.e.d. to indicate when the vanes have reached their limits, fully open or fully closed. The motor drive current is interrupted at these points and thus protects any 'pigtail' which might have been fitted.

To help, the system also tells the operator which end of the tuning scale has been reached. This is because when the capacitor is fully closed, the l.e.d. lights red and when the vanes are fully open, the colour changes to green.

No further tuning will be possible until the limit switch and over-ride button is used. This eliminates the problems already mentioned.

A three position, centre-off, two-pole switch is used for tuning. This is nothing other than a polarity reversing switch as can be seen from the diagram.

The legend on the panel can show the up position of the switch as green and the down as red. Note that the cam holds microswitch S4 'pressed' and S3 'free', except (and only when) the capacitor is fully open.

## Motor Mention

The motor supply is worthy of a mention. The control potentiometer is a wire wound item

and the large capacitor following it is important.

I've used a large capacitor as it's used to store a charge at full power pack voltage when tuning is not taking place (no load condition). This enables the motor to start, even at minimum speed (maximum potentiometer setting) since the fully charged capacitor provides the 'kick start' necessary to overcome static friction of the drive chain.

Static friction being greater than dynamic friction, means that once the motor has started, it will continue to run while the tune switch is used. It will continue to do so, even at minimum speed setting.

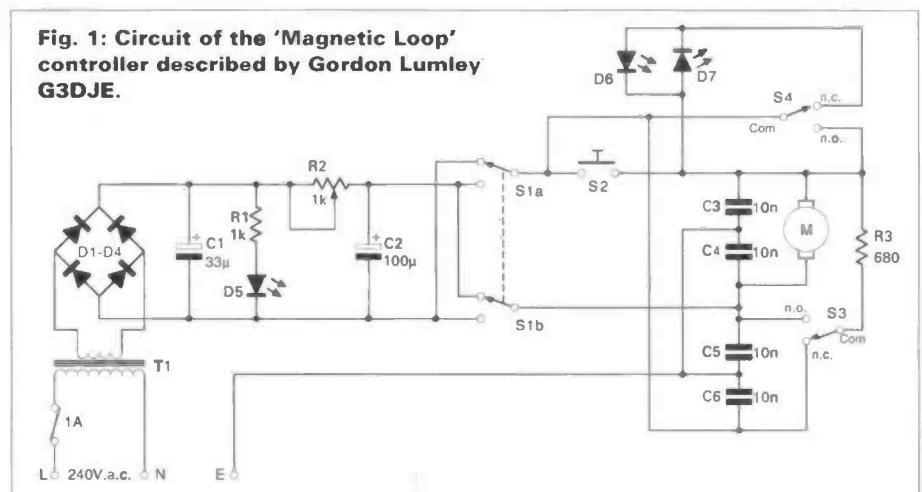
## Tuning Frequency

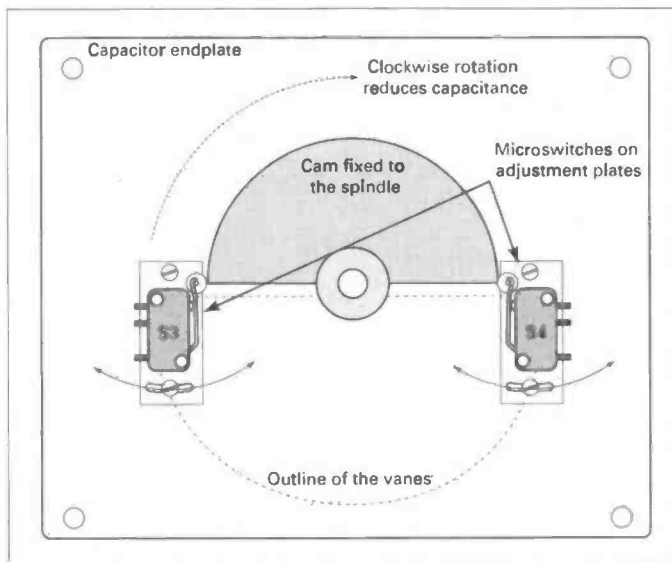
When tuning to a particular frequency, the tune switch is used in the normal way. It's operated to produce a maximum signal from the receiver and then a minimum s.w.r. on low power transmit.

If your station log shows the frequency last used, it's a simple matter to know whether to tune red or green (increase and decrease frequency) on the tune switch.

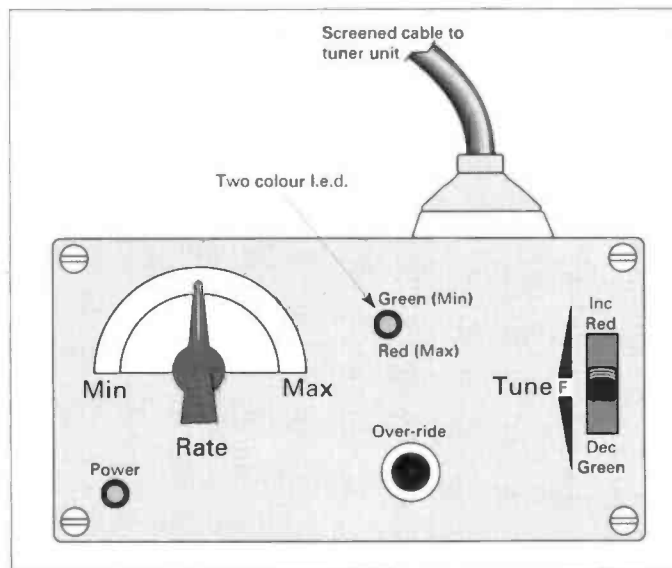
Should the resonance point not be achieved before the l.e.d. lights, then the resonance point has been overshoot and missed. Alternatively, it could mean that the tune switch has been turned in the wrong direction.

**Fig. 1: Circuit of the 'Magnetic Loop' controller described by Gordon Lumley G3DJE.**





**Fig. 2: The system described by G3JDE relies on a separate cam, fabricated from Perspex (or similar) material, mounted on the rear shaft of the loop antenna's variable capacitor. The author stresses the importance of setting the microswitches (operated by the cam) for correct operation (see text).**



### Shopping List

#### Resistors 5% 0.4W

680Ω	1	R3
1kΩ	1	R1
Variable 5W wirewound		
1kΩ	1	R2

#### Capacitors

Disc Ceramic		
10nF	4	C3, 4, 5, 6
Electrolytic 35V working		
33μF	1	C1
100μF	1	C2

#### Semiconductors

1N40054	D1, 2, 3, 4
i.e.d.s	3 D5, 6, 7 (colours to suit)

#### Miscellaneous

Suitable small motor and gearbox (probably a 3-12V version designed for driving models with a gearbox giving up to about one revolution per minute at maximum voltage), T1 is a suitable transformer capable of supplying the maximum current, two changeover microswitches (S3 and 4), a two-pole changeover switch (S1) and a single-pole push-to-make switch, connecting wire, multistrand linking wire, suitable boxes to house the project parts, a protractor to make the cam, and various pieces of insulating material to make other support sections (each case is individual).

**Fig. 3: Suggested control panel for the loop control system. See text for details and recommendations for materials and cable types and lengths.**

Whichever problem has occurred, the error cannot persist for long. This is because the colour of the i.e.d. will indicate which limit has been reached, either fully open capacitor vanes (green) or fully closed (red) and the motor will cease to run.

At this point, the operator should reverse the tune switch. This is because there's nothing else that can be done if re-tuning is to continue in the opposite direction.

The i.e.d. will change colour upon reversing the tune switch. This tells the operator to over-ride the limit microswitch by simply pressing the over-ride button until the i.e.d. is extinguished. The motor can now tune the loop once again.

Should the tuning operation continue and (by some ridiculous mischance) the other limit be reached, the i.e.d. will light once again. It's important to note that when the i.e.d. lights, the tune switch must be reversed before the over-ride button is pressed.

Once the i.e.d. has been extinguished, the over-ride button must be released. This sequence comes quite naturally when the unit is in use.

### Controller Box

The controller should be housed in a metal box as good screening is essential. I used a 150 x 80mm cast aluminium box, some 45mm deep for my prototype.

The six-way, plus screen, control cable should terminate in a suitable plug/socket at both ends. All earth connections should be made to the loop earth itself (the bottom of the loop diametrically opposite the capacitor) via the screen.

The decoupling capacitors at the loop end of the cable are bought to the same common loop earth point. Mica or some dielectric similarly acceptable at h.f. should be chosen and it's preferable to avoid low voltage types (low voltage disc ceramics for example).

The microswitches are single-pole changeover types, biased to one side. The diagram Fig. 2 shows the connections and the normal switch conditions (these are important points, otherwise the system will fail to work).

My prototype model worked very well with over 7m of connecting cable. There was no sign of r.f. leaking back to the controller once the decoupling capacitors were fitted.

Strange results occurred when the loop was

tested in my conservatory and rotated. The loading factor (radiation resistance) then changed considerably...the conservatory's wooden glazing bars had been waterproofed on the outside with aluminium faced adhesive tape. Taking the loop into the garden eliminated the problem!

### Elegant Stand

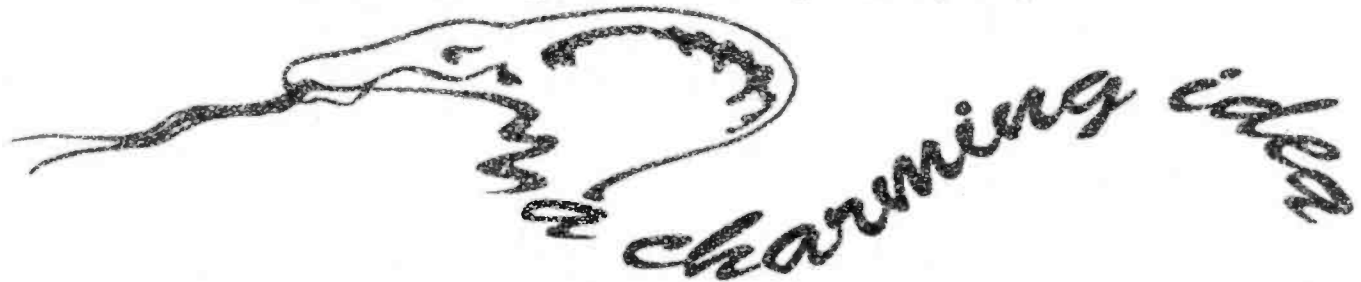
I was able to make an elegant stand for the loop by adapting one of those rotary clothes line! You know, they look somewhat like the framework of an umbrella! With the washing line removed I inverted the device and altered the geometry to reduce the height and to widen the base now formed by the three spokes.

A suitable tube on the 'magnetic loop' fitted into the tubular centre stalk of the clothes drier. A 'stop' on the centre tube located the whole thing, but permitted orientation of the loop.

So, now that I've described my practical approach perhaps you'll have a go. The design and testing has been done, all you've got to do is build your version!

PW

# The Slim Cobra



John Heys G3BDQ's describes a portable antenna - the Slim Cobra - for work on the h.f. bands.

I first saw a description of the Cobra antenna in a little book entitled *S-9 Signals*, which was written by Bill Orr W6SAI in 1959. It appeared again in a slightly modified form in his later book *Simple Low-Cost Wire Antennas*.

In May 1990 and in July 1991, W. Sykes G2HCG had articles in *Radio Communication*, which described Controlled Feeder Radiation (CFR) antennas, which were very like the earlier Cobra systems. \*

The W6SAI and G2HCG antennas used bulky chokes or current baluns at their lower feed ends, which were made by either coiling the coaxial cable or winding it on a ferrite end. These items had inspired the word 'Cobra' for they suggested the head of such a reptile above which was the wire 'body'.

I have used ferrite beads slipped on a length of RG58C/U coax to make current baluns just beneath the feed points of dipoles for several years. They are used here in my 'Slim Cobra' design.

## Half-Wave Antenna

The Slim Cobra is an end-fed half-wave antenna. The far end quarter-wave used wire and the quarter wave at the feed end is made from 50Ω coaxial cable.

The coaxial cable braid is not connected to any part of the antenna. But its centre conductor joins the wire section.

About one quarter wavelength below this connection is a current balun. This performs as an insulator at the quarter wave end where high r.f. voltages are present.

The half-wave Cobra antennas work because of r.f. currents at h.f. flow on the

surface of a conductor. This is known as 'skin effect'.

The surface conducting the r.f. currents can be either the outside, or the inside of a tubular conductor such as coaxial braid. In simple terms, the power from the transmitter goes up to the centre of the Cobra antenna via the inner surface of the coaxial cable braid.

At the antenna centre, the r.f. divides between the end wire quarter-wave and the outer surface of the braid. The cleverness of the Cobra design is that the last quarter wave of the coaxial feeder is also an active quarter wave radiator and is half of a dipole.

## The W6SAI Design

In the 1959 W6SAI design, the active length of coaxial cable and the wire quarter wave were equal in size. However, in his later design, and also in the case of the CFR antennas described by G2HCG, the coaxial cable section is slightly longer than the wire quarter wave.

The coaxial section is longer because the usual 'end effect' of insulators at the ends of a half-wave antenna is not present when the current balun or choke is located.

The wire section of the 'Slim Cobra', Fig. 1, is a normal quarter wavelength long ( $l_1$ ), whereas the coaxial section ( $l_2$ ) must be approximately 0.27 of a wavelength long.

To achieve the best

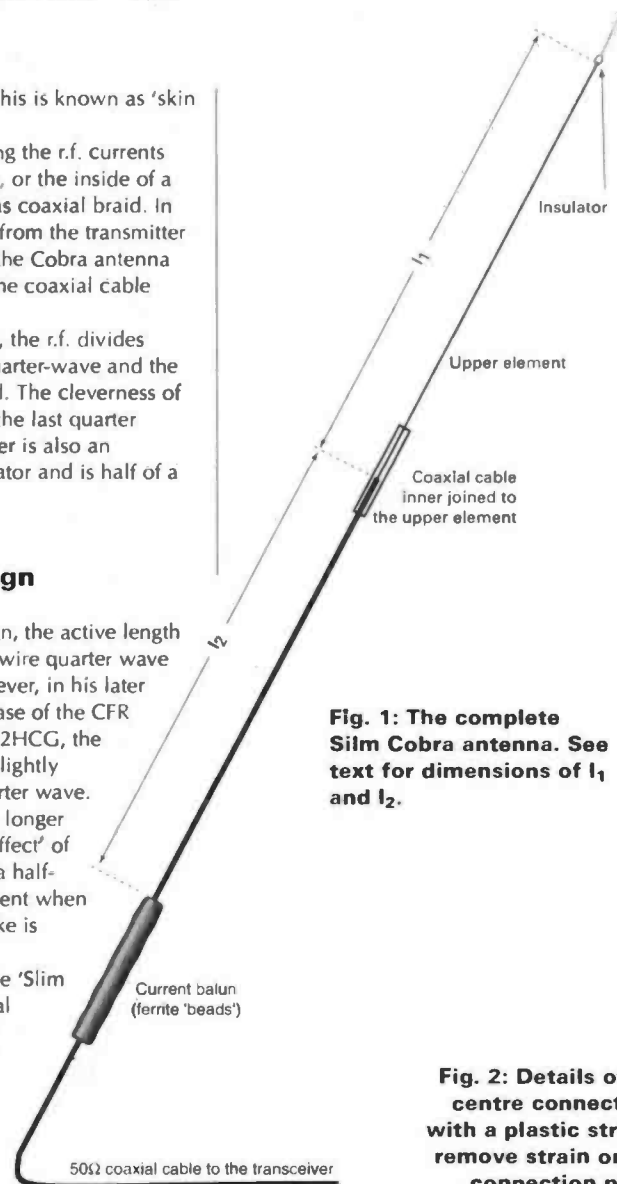
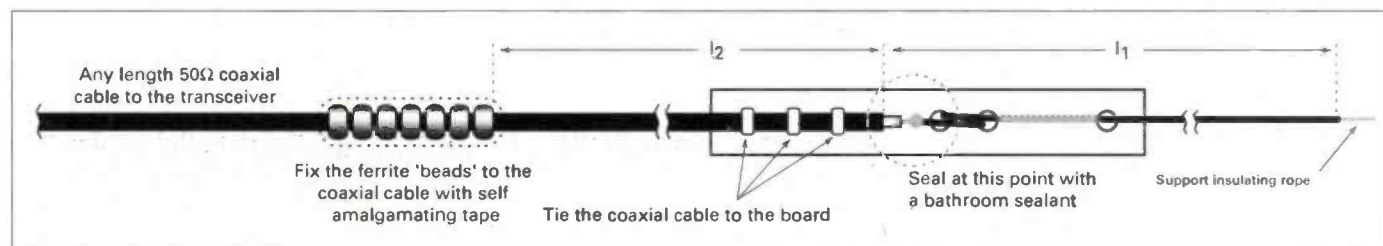


Fig. 1: The complete Slim Cobra antenna. See text for dimensions of  $l_1$  and  $l_2$ .

Fig. 2: Details of the centre connections with a plastic strip to remove strain on the connection point.



match with the lowest s.w.r., the coaxial section must be adjusted in length. This can prove a difficult task when the current balun is wound onto a ferrite toroid or a ferrite rod. But, by employing ferrite beads, which can be slid along the coaxial cable, the adjustment for lowest s.w.r. becomes easy.

## Practical Details

Let's now look at the practical details. The wire section,  $l_1$ , should not need trimming and its length for the different bands is shown in **Table 1**.

Starting point lengths for  $l_2$  are also given in **Table 1**. And in most cases will prove to be accurate without any adjustment of the ferrite beads.

The beads are made from Type 73 material, which works well over the 1.8 to 30MHz frequency range. The number of beads used depends upon the lowest frequency use envisaged.

For the 14 to 30MHz range of frequencies, 30 beads will be ideal. If an antenna for 10 or 7MHz is made, I would suggest 50 beads. The beads can be obtained from Messrs. Ferromagnetics and are type FB-73-2401.

The beads are a tight fit on RG58C/U, but by lubricating the coaxial cable sheath with a little 'Three-in-One' oil, fitting becomes easier. Twisting the beads on the coaxial is more effective than pushing.

It's best to space each bead from its neighbours by about 1mm. This allows easier cable flexing and better heat dissipation. Slight heating will occur, for the beads have to absorb the unwanted r.f. current trying to flow back along the coaxial braid.

## Little Heating

With 100W output from the transmitter, very little heating will be noticed. And it's unlikely that many portables will be running at the full legal 400W output.

The junction of the wire section and the coaxial is shown in detail in **Fig. 2**. A 100mm strip of insulating material is used and the wire is anchored quite simply by threading it through a couple of holes and tying it into a knot.

The coaxial cable must be held in place securely with nylon cable ties. However, taken note that the coaxial cable braid **does not connect** to anything.

My Slim Cobra was thoroughly weatherproofed by a liberal application of silicone rubber sealant. This is particularly important at the end of the coaxial cable to stop any ingress of moisture by capillary action and corrosion of the copper braid.

A flexible multi-strand plastic covered wire is the best choice for the wire quarter-wave. The end insulator can be a home-brew job using strong plastic or a commercial

glass or ceramic item. **Do not use wire between the insulator and the antenna support point.**

## On The Air

Now it's time to get on the air, and you should remember that the antenna is a half-wave dipole and its radiating characteristics are those of a dipole antenna. This means that the higher it's placed, the better will be its DX performance.

The Cobra is ideal for hanging from a tree branch and then using it as a 'sloper'. This arrangement will give low angle radiation away from the low end of the antenna and means that it may be positioned to point in any desired direction.

**Do not use a metal support** as it will influence the operation of the antenna. The coaxial cable below the ferrite bead balun will be 'dead' to r.f., so a length of cord or rope can be tied there to lift the lower part of the Cobra and vary the slope angle.

When the angle is more acute than 45°,

the antenna will behave like a vertical half-wave and be vertically polarised. This can be useful if you're contemplating working 29MHz f.m.

## Third Harmonic

A 7MHz Slim Cobra will also work well on its third harmonic (21MHz) and have a low s.w.r. on that band. It may be possible to achieve the ideal s.w.r. ratio of 1:1 with this antenna, and mine, which was designed for 14MHz, had an s.w.r. of between 1:1.2 and 1:1.5 over that band.

The s.w.r. readings of the order I obtained mean that there's very little power loss due to mismatch. Low s.w.r.s also mean that the portable expedition will not need an a.t.u. and tuning up is simplified.

All you need in addition to the gear is a hard rubber ball on a nylon cord to throw over that really high tree branch. You also need reasonable h.f. conditions and, of course, a little fine weather!

PW

**Table 1**

Frequency	$l_1$	$l_2$
29MHz	2.46m	2.66m
28.1MHz	2.54m	2.74m
21.1MHz	3.38m	3.65m
18.1MHz	3.95m	4.26m
14.1MHz	5.07m	5.47m
10.1MHz	7.07m	7.64m
7.05MHz	10.14m	10.95m

### Clive Hardy G4SLU comments on his prototype construction of the Cobra antenna:

I made up several versions of the Slim Cobra antenna. I stripped off the outer and used the coaxial cable inner for  $l_1$  rather than an extra piece of wire. The first antennas I made were for the 28MHz band and then for the 21MHz band. For both I used 30 and then 50 ferrite beads.

Starting with John's suggested dimensions the s.w.r. for all the antennas was around 3:1. There wasn't any noticeable difference using 30 or 50 beads. The antennas were slung about 2m above ground level to keep them within easy reach for adjustments.

I juggled around with the length of  $l_1$  and the position of the beads to try and improve the tuning. With all the antennas I got the s.w.r. to around 1.7:1, but no better. Having tuned the antennas, the s.w.r. was pretty flat across each band. Both the 21 and 28MHz bands were very quiet at the time so I couldn't properly test the antennas.

There's always a worry with any new antenna that it might turn out to be an elaborate dummy load! To find out I also made a 14MHz version with 50 beads. Instead of trying to improve on the 3:1 s.w.r. by adjustment I used an a.t.u. to keep the transmitter happy. Using 10W s.s.b. I worked around Europe with good signal reports being received.

I tried to obtain the beads from several suppliers, but only succeeded with Ferromagnetics. The beads cost £19 for 50 including postage.

When sliding the beads onto the coaxial cable the outer covering can crease up between them. Keeping the cable taut helps and John's suggestion to use a lubricating oil is very helpful (Hellerman Oil, used for sliding sleeves onto cable, although not cheap, is ideal for this job). Avoid cable with a soft outer covering. Although they look alike, there are also slight variations in the diameters of cables. A piece of UR43 that I tried seemed a little thinner than some RG58 types. Loose beads could be held in place with adhesive.

G4SLU

# ALINCO - "NOW YOU'RE TALKING"

Look What's Being Said -

**PREVIEWED IN JUNE  
HAM RADIO TODAY**

*"Performed very well indeed during CQ worldwide contest"*  
- Mike Dennison G3XDV  
- Editor, Radio Communication

*"Very good transmit & receive audio"* - Andy Durrant G7OEC  
- Coastal Communications

*"Award Winner - absolute delight to use - Amazing first venture into HF"*  
- Rob Mannion G3XFD  
- Editor, Practical Wireless

**REVIEWED AUGUST  
ISSUE PRACTICAL  
WIRELESS**

*"Superb for mobile use - Alinco have surprised the world"*  
- Chris Lorek G4HCL



**DX-70**

The DX-70 is the world's smallest HF transceiver - providing 100 Watts all-modes & 10 Watts on 6 metres. General coverage receive is included, and wideband transmit available for export. Detachable front panel for remote mounting & security. Plus superb specification and performance.

**£1095**

**REVIEWED  
AUGUST ISSUE  
RADIO  
COMMUNICATION**

*"The audio is unbelievably good"*  
- Martin Lynch G4HKS

*"It's brilliant"* - Chris Taylor G1FMH

## Two superb new transceivers for 1995

**AVAILABLE AT ALL  
GOOD RADIO STORES**

*"I tried one at the Friedrichshafen Exhibition - it's superb"*  
- Mark Francis G0GBY

The **ALL-NEW** DJ-G5 compact dual band handheld transceiver replaces the well known DJ-580 which was a best-seller worldwide. Packed with state-of-the-art features including CTCSS tone encode & decode. 200 memory channels. Alinco's amazing 11 channel MonitorScope & new high efficiency power MOSFET module. Includes wideband receive coverage: 108-174MHz & 420-470MHz. Also 850-950MHz included.

**REVIEWS  
COMING  
SOON**

**DJ-G5**  
**£479**



**PHONE ON**  
**01702 206835**  
FOR FULL DETAILS  
**OR FAX ON**  
**01702 205843**

ALINCO is distributed in the UK by:

Tel 01702 206835

**WATERS & STANTON ELECTRONICS**



# Alinco's Award Winner

The DX-70, Alinco's first entry into h.f. operations. The transceiver also offers 50MHz coverage and an indication of its size is provided by the hand-held microphone which is itself smaller than standard.

Rob Mannion G3XFD has tried the new DX-70 h.f. plus 50MHz mobile transceiver. Rob's so impressed...he thinks it's got to be "Alinco's Award Winner".



## The DX-70 HF & 50MHz Multi-mode Transceiver

It's not often I think I can lay claim to be 'in' on the start of a major new project other than those we're preparing for publication in PW. However, I really do think I've some justification in claiming some credit for encouraging Alinco to enter the h.f. market with a transceiver.

Over four years ago I was busily suggesting to Alinco's European representative that his company should enter the market. Now, they have!

Despite my delusions of grandeur, I have my feet firmly anchored to the ground! Knowing how inscrutable the gentleman are, I have no doubt they were probably already working on the project.

There are only a very few Europeans who can penetrate the very formal barriers around the Japanese manufacturers and their designers and I'm not one of them. However, it's good to think that I may have influenced Alinco to develop their new DX-70, which I'm sure is going to be an award winner. It certainly gets my vote!

So, what's so interesting about the new DX-70. How does it work, and why do I like it so much?

### Feel Comfortable

One of the major points with a new rig is that the operator has to feel 'comfortable' with it (especially with the ever increasing cost of professionally built transceivers). And I can report that I was immensely impressed with the

DX-70 from the very start, the ergonomics and the very look of the rig with its simple panel and well-styled appearance was most impressive.

Yes, it's got its faults. But, for a first time entry from a manufacturer new to h.f. transceiver design...I can honestly say I'm amazed that they have done so well!

Nowadays, with the expertise available from many sources, it should not be surprising that a manufacturer new to h.f. should do so well at the first attempt. However, I was a little disappointed that Alinco had not tried to keep their well known budget price advantage.

Instead of aiming for the budget price market with their new rig, Alinco decided on including 50MHz. And although I'm a keen v.h.f. operator, it's not really clear to me whether or not there will be a demand for 50MHz built into a rig of this nature.

On the other hand, I think there will be a demand for a well laid out, extremely easy-to-operate transceiver, such as the DX-70. Especially as it comes fitted with features either not offered on other rigs, or which are sold as extras.

### Design Package

So, what's in the design package of the new Alinco DX-70? Let's take a look at what you get for the money.

Basically, the rig covers all the amateur bands from 1.8 to 28MHz, plus the 50MHz band. It operates in the s.s.b., a.m., c.w. and f.m. modes.

The Alinco DX-70 provides a maximum of 100W on the h.f. bands. On the 50MHz band the transceiver provides a maximum output of 10W.

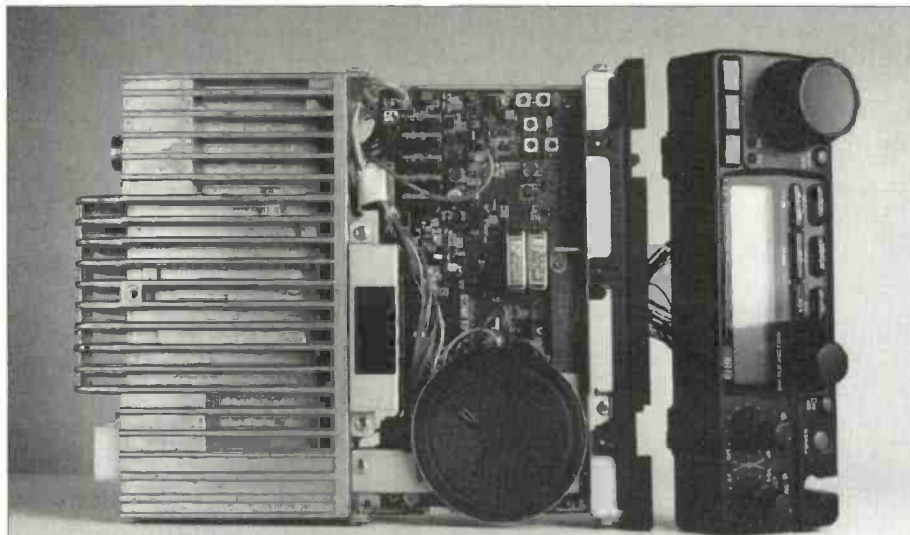
A double conversion superhet forms the basis of the receiving side of the transceiver. The first i.f. is high at 71.75MHz, with the second i.f. being the standard 455kHz.

In common with other manufacturers, Alinco have provided a general coverage receiver in the design package. However, unusually, the manufacturers have fitted narrow filters for c.w. reception as standard (more of this later).

Detachable front panels are becoming almost standard nowadays and the Alinco DX-70 has been provided with this helpful facility. And in fact, this is the area where I have to congratulate and criticise Alinco at the same time!

Alinco obviously decided (wisely in my opinion) to fit the DX-70 with the type of robust microphone plug and socket arrangement so commonly found on amateur radio equipment. They've neatly got over the problem of allowing the front panel to detach, by mounting the microphone onto the main rig by 'tunnelling' the cable through a slotted gap on the front panel. Very neat and effective.

However, I was not impressed by Alinco's plug and socket arrangement and associated wiring which connects the rig to the detachable front panel. I hope the manufacturers modify this in production because I feel it could be a source of problems in the long term to the detriment of what I think is an otherwise excellent transceiver.



**A view from above the Alinco DX-70, with case removed, showing detachable front panel and main circuitry and substantial heat-sinking.**

## First Impressions

My first impressions of the Alinco DX-70 were that I liked it very much indeed. It 'felt right', operated extremely well and I (despite my very large fingers) had no problems with the controls on this extremely attractive and compact rig.

In fact, I was on air within moments of unpacking the rig, as it's so simple to operate. My yardstick (or should that be metrestick now?) is based on how quickly I can get on the air without having to delve into the (albeit comprehensive and well laid out) handbook for the simplest instructions. The DX-70 scored very highly in this respect.

Tuning, switches and general operation of all the controls on the DX-70 are pleasing, positive and simple to carry out. The display is also good, with clear i.c.d. enunciators.

Personally, I would have preferred to have had the tuning rate on the receive side completely under my control. As supplied though, the operator has no direct control of the tuning rate, the steps being automatically changed to a rate decided on by Alinco, depending on whichever mode is selected.

## Important Controls

As far as I'm concerned, the important controls and functions under the direct selection of the

operator should include: r.f. gain, i.f. gain, and variable selectivity. And in the past I've often criticised manufacturers for not providing what I consider to be vital controls.

When I first discovered that the Alinco DX-70 didn't have a fully variable r.f. gain control I was dismayed. However, after experiencing the efficient way the r.f. amplifier could be switched in and out, with the option of cleverly chosen attenuators, I decided I could live with it!

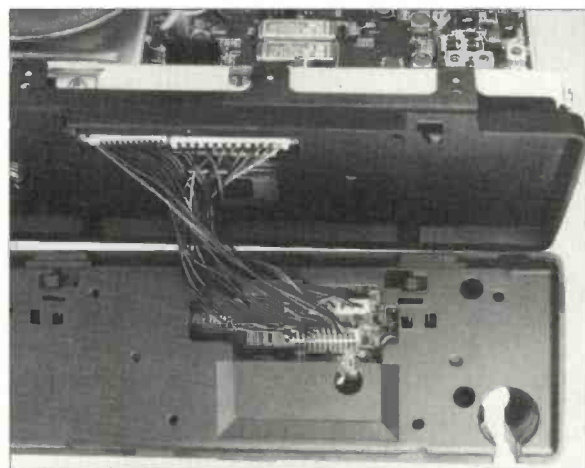
I was also very surprised and pleased to find that the DX-70 came supplied with a narrow band filter as standard. The provision of the i.f. shift facility also proved to be extremely helpful.

However, from a personal point of view, I would have gladly sacrificed some of the 100 memory facilities in return for a variable i.f. gain control and a fully adjustable r.f. gain control. Perhaps Alinco will offer this as an option later?

## On 50MHz

During the review period I didn't hear anyone on 50MHz! However, with the advent of this type of transceiver, perhaps it will be a band where people appear on occasions other than DX openings!

Personally speaking, I would not buy this rig just because it provides 50MHz. But having said that, I feel sure that once there are more multi-mode transceivers around for this band, there will be a great deal of fun to be had, especially bearing in mind the fascinating results which keen mobile operators can get on the nearby 70MHz. The potential on



**Left: Close-up view of interconnecting wiring between the detachable front panel and main transceiver and 'tunnel' for microphone connection (see text for comments by G3XFD).**

50MHz is mind boggling!

A separate 50MHz antenna connection is provided on the DX-70. Once the rig is established I wonder how long it will be before someone modifies one to cover 50 and 70MHz?

## On The Air

I was keen to get on the air, and despite the fact that h.f. conditions weren't good, I worked some good DX. The DX-70 immediately proved itself under very difficult conditions on 3.5 and 7MHz.

In practice (and I must say that I was surprised) the simple system for controlling r.f. gain seemed perfectly adequate for the day-to-day operations on 3.5 and 7MHz. Even under the very heavy QRM on 3.5MHz in the evening I found I could copy everything.

Working with the combination of the i.f. shift, the in-built narrow filter (ideal for the c.w. operator) and the r.f. attenuator I found that the rig was operating and coping very well. And in fact (just in case you're thinking it's a 'twee' little rig) it continued to pump out its 100W hour after hour with no trouble.

In fact, the only problem I discovered was that the particular DX-70 I had, seemed to be unhappy if the supply voltage was less than 12V. This meant that when I was operating from the car, I had to run the engine every now and then to keep the volts up.

Anyone operating the DX-70 will soon find themselves forgetting it's not a 'main station' rig. In fact, if you're considering buying one, I suggest that you regard it as being the 'main' rig. The on-air performance certainly endeared the transceiver to G3XFD.

I found that on c.w. I was able to work consistently into the USA and Canada, despite much near European QRM. And even though I found that the extra power (100W) available to me proved invaluable in raising the DX, I could still work them at 50 and 30W.

Break-in for c.w. seemed to be excellent. There was a choice of full break-in, semi break-in and auto break-in (delay time automatically adjusts to your keying speed!).

However, the c.w. side-tone was not at a comfortable level for me and during the review period I was unable to discover how to adjust it! But, given time I've no doubt that I would have found how to do it, with the help of the comprehensive manual.

Audio reports obtained when I operated on s.s.b. were very good, particularly from people who knew my voice. However, the DX-70 seems to share a common problem along with other compact rigs...in that it suffers from odd audio distortion when receiving a relatively strong incoming signal.

The received audio problem disappears immediately headphones are plugged in. And I can only assume that the odd distortion is caused by the strong magnetic field from the speaker (mounted on the top of the cabinet) affecting the audio amplification chain.

I don't see the audio distortion on the DX-70's speaker as being a problem. This is because when it's used mobile most operators will normally use a single headphone/microphone unit (or should do for safety) or a separate loudspeaker for better audio reproduction.

## General Coverage

The general coverage receiver facility is a great asset for anyone interested in broadcast listening. I found that I had the DX-70 tuned to my favourite 49metre band broadcast station - Radio Netherlands from Hilversum - a great deal.

In fact, with the Alinco DX-70, you don't really need another rig. It's especially likely to be popular with keen travellers and the performance on the h.f. broadcast bands is very good. It will keep you in touch with the BBC World Service and other English language programmes, provide amateur radio h.f. and 50MHz into the bargain!

## Award Winner

In my opinion, I think Alinco have got themselves an award winner in the DX-70. It looks good, feels good and provides excellent service on h.f. (and no doubt on 50MHz when you can hear anyone!).

Yes, the Alinco DX-70 does have one or two little problems, but none that would really make me hesitate in buying one. The audio problem on strong signals is directly due to the small speaker, which has to be a compromise.

I also think that in the long run Alinco will have to pay attention to the interconnecting wiring between the detachable front panel and the rig. But that won't stop the transceiver from being an excellent prime mover.

With its clear l.c.d. display, user friendly controls and attractive looks, the DX-70 is going to appeal to many radio amateurs. It's an excellent little transceiver, a delight to use and Alinco have to be congratulated for an amazingly well designed transceiver for their first entry into the h.f. market.

I think the DX-70 will be with us for a very long time. A transceiver such as this amazing little package will establish itself and become an industry standard. Personally, I wouldn't be surprised if the DX-70 is still being made in 10 years time, albeit with the production modifications that all manufacturers introduce into their popular range.

Well done Alinco. I really do think you've got a winner with your DX-70 first time entry into the 'h.f. stakes'.

My thanks for the loan of the Alinco DX-70 go to Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS. Tel. (01702) 206835, FAX (01702) 205843, who can supply the DX-70 for £1095.

PW

**After seeing a copy of the G3XFD review, Jeff Stanton G6XYU of Waters & Stanton Electronics sent us the following comments:**

Thanks for giving me the chance to comment on Rob Mannion's very comprehensive (and enthusiastic) review of the DX-70. Regarding pricing, of course the strong Yen is not helping us importers to fix low prices.

However, at only £100 more than the TS-50, the Alinco rig offers additional features including the 50MHz (6m) band, detachable front panel and comprehensive filtering compared with the Kenwood.

Alinco chose individual flexible leads to the front panel after exhaustive testing as the alternative 'flat ribbon' connection is more rigid and difficult to use.

Finally, DX-70 accessories are appearing now including a manual a.t.u., EDX-1 at £249. No auto a.t.u. yet, but the Kenwood or Icom ones will work nicely.

G6XYU

## Manufacturer's Specifications

### General

Operating mode	J3E (l.s.b., u.s.b.), A1 (c.w.), F3 (f.m.)	
Number of memory channels	100	
Antenna impedance	50Ω unbalanced	
Power requirement	13.8V d.c. ± 15% (11.7 to 15.8V d.c.)	
Grounding method	Negative ground	
Current drain	Receive	1A max
	Transmit	20A max
Operating temperature	-10°C to +60°C	
Frequency stability	± 10ppm (-10°C to +50°C)	
Dimensions	178 x 58 x 228mm	
	(179 x 71 x 268mm with projections included)	
Weight	Approx 2.7kg	

### Transmitter

Transmit frequency coverage (US version)	160m band	1.8000 to 1.9999MHz
	80m band	3.4000 to 3.9999MHz
	40m band	6.9000 to 7.4999MHz
	30m band	9.9000 to 10.4999MHz
	20m band	13.9000 to 14.4999MHz
	17m band	17.9000 to 18.4999MHz
	15m band	20.9000 to 21.4999MHz
	12m band	24.4000 to 24.9999MHz
10m band	28.0000 to 29.9999MHz	
6m band	50.0000 to 53.9999MHz	

Power output h.f. bands	s.s.b., c.w., f.m.	100W (high) Approx 10W (low)
	a.m.	40W (high) Approx 4W (low)

Power output 50MHz band	s.s.b., c.w., f.m.	10W (high) Approx 1W (low)
	a.m.	4W (high) Approx 0.4W (low)

Modulation	s.s.b.	Balanced modulation
	a.m.	Low power modulation
	f.m.	Reactance modulation

Spurious emission	h.f. bands	Less than -50dB (-45dB in 10MHz band)
	50MHz band	Less than -60dB

Carrier suppression	More than 40dB	
Sideband suppression	More than 50dB (at 1kHz)	
Maximum f.m. deviation	h.f. bands	± 2.5kHz
	50MHz band	± 5kHz
Microphone impedance	2kΩ	

### Receiver

Receiver circuitry	Double conversion superheterodyne	
Receive frequency range	0.1500 to 30.0000MHz	
	50.0000 to 54.0000MHz	
Intermediate frequency	71.75MHz (1st) 455kHz (2nd)	
	500kHz to 1.8MHz	0dB (1μV)
s.s.b., c.w. (S/N 10dB)	1.8 to 30MHz	-12dB (0.25μV)
Sensitivity	50 to 54MHz	-16dB (0.15μV)
a.m. (1kHz, 30%, mod S/N 10dB)	500kHz to 1.8MHz	+20dB (10μV)
	1.8 to 30MHz	+6dB (2μV)
	50 to 54MHz	+6dB (2μV)
Selectivity	s.s.b. (narrow)	2.4kHz/-6dB, 4.5kHz/-60dB
	s.s.b. (narrow), c.w. (standard)	1kHz/-6dB, 3kHz/-60dB
	c.w. (narrow)	500Hz/-6dB, 3kHz/-60dB
	a.m. (standard), f.m.	9kHz/-6dB, 20kHz/-50dB
Spurious and image rejection ratio	> 70dB	
Audio output power	> 2.W (at 8Ω, 10% THD)	
RIT/TXIT range	± 1.4kHz	

# Multi-Delta Antennas

Denis Payne G3KCR, has been doing some experiments folding-up antennas into three dimensional shapes. Here are some he made earlier!

Most antenna enthusiasts are always looking for new antenna ideas, particularly antennas requiring limited space. The reduction of physical size with some designs has been achieved in many different ways, but the primary task is to reduce the length of the basic dipole.

The three basic ways to reduce the physical size of dipoles and maintain resonance are: inductive loading, end loading and by bending the elements. Inductive and end loading follow a set of parameters that are known. But many, if not most designs, have their own limitations of low impedance, poor bandwidth and efficiency.

Bending the elements is one method which still lends itself to experimentation. Some of the methods currently used are shown in Fig. 1. A careful examination of various bent and folded antennas was carried out to find a shape that had the minimum of inductance and very little cancellation of the radiation.

A bent form antenna should also be easy to construct. In my experiments I found the equilateral triangle was the most suitable for experiments.

I reasoned that when formed into a chain, each consecutive loop inductance is cancelled by the next loop. This should result in an overall low inductance compared with a straight wire inductor.

My reasoning for the reduction in inductance is illustrated in Fig. 2. With the exception of the two outer legs, each vertical (approximately) leg has an opposing inductive effect.

In theory, reversing the current loop to reduce inductance should cancel the radiation properties. This effect doesn't appear to be the case though.

Measurements I've made, using the same length and gauge of wire, to check the difference in inductance between various wire forms are shown in Fig. 3. The results I obtained are listed in Table 1.

## Inductance Bridge

I used a digital inductance bridge operating at 1kHz for all the measurements. I found that measurement of a straight wire inductance was not practical on the bridge. Reverting to theory, the inductance was calculated to be 0.8µH at low frequency.

The folded antennas, shown in Fig. 3, may be summarised as follows:

In Fig. 3a shows the standard method of minimising the inductance of a wire, but this of course would cancel most of the radiation, while the forms shown in Fig. 3b and c are commonly used forms of antenna.

The multiple isosceles (equal sided) triangular layout is shown in Fig. 3d. This is the form I was interested in, and has less inductance than the single loops.

Changing the winding method to that shown in Fig. 3e is a way of further reducing the overall length of winding. This is a flat winding, in that you are moving to the right, or left, all the time. However, this winding method has the cost of increased inductance.

I've shown two other winding forms in Figs.

Fig. 1: Some variation to shorten the overall length of a dipole.

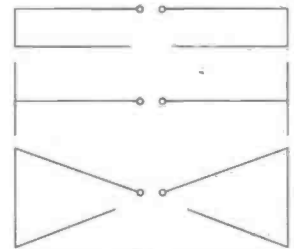


Fig. 2: (Below) Folding an antenna in this form cancels some of its natural inductance.

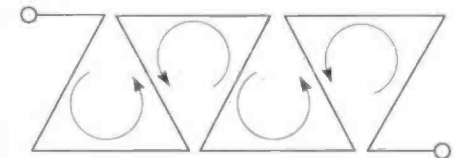
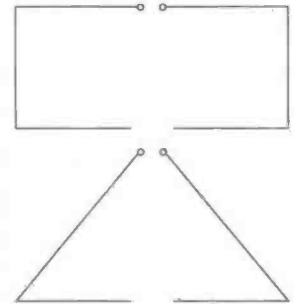


Table 1

Figure Number	Inductance (µH)
3a	0.5
3b	1.58
3c	1.50
3d	1.01
3e	1.05
3f	3.00
3g	2.12

All measurements were made with a 1200m length of 0.6mm pvc covered copper wire.

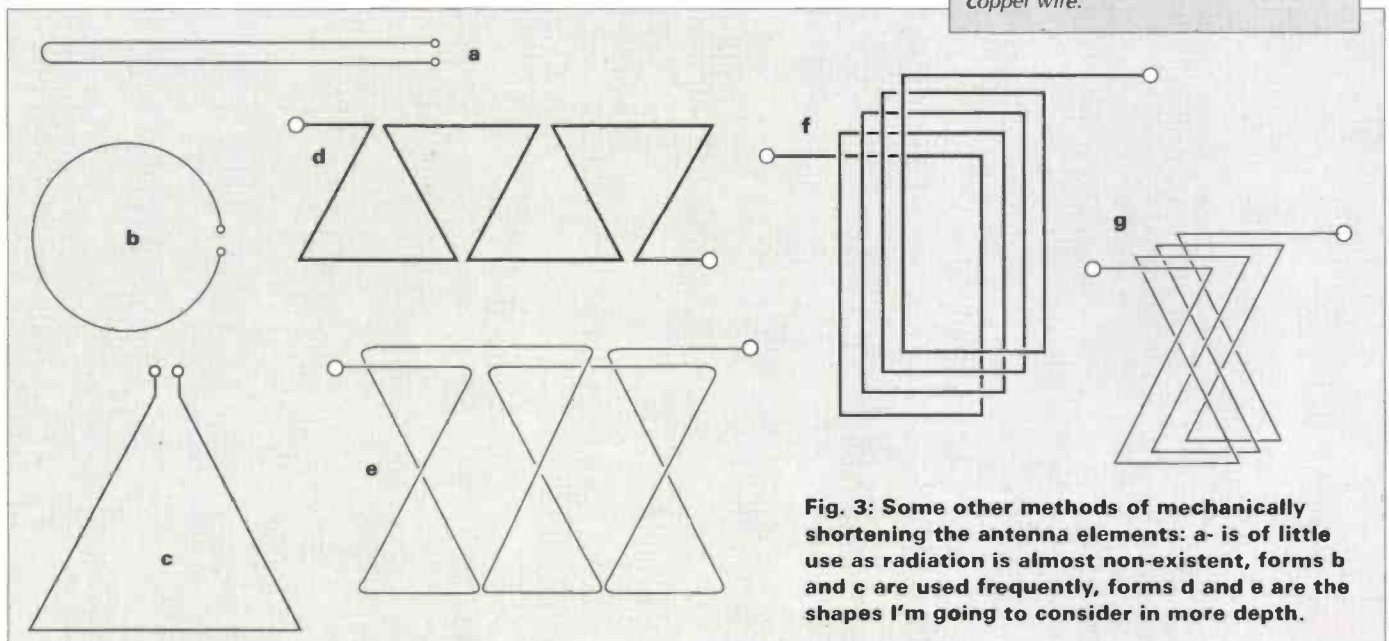


Fig. 3: Some other methods of mechanically shortening the antenna elements: a- is of little use as radiation is almost non-existent, forms b and c are used frequently, forms d and e are the shapes I'm going to consider in more depth.

3f and g to show the effect of overlay windings of the rectangular and triangular forms. From Table 1, you will see that the inductance is greater with these shapes. The box form is sometimes used to make medium and short wave frame antennas.

## Basic String

The basic form of a stringing triangles I've shown in a little detail in Fig. 4. You can use this to form the dipole shown in Fig. 5. This is a good starting point for experimenters.

Leaving the centre, or inner portion straight increases the radiation resistance, and with it a general increase in efficiency. I've found that 2.5% of a wavelength each side is a good compromise.

I've also found leaving another straight section of about 1-1.5% of a wavelength each end has a beneficial effect. And I've found that leaving this short length lowers the Q and improves the bandwidth.

After experiments, I've found the size of the triangles doesn't effect the shortening factor of the antenna. For example, one triangle with a side of one metre length uses the same amount of wire as three triangles with side lengths of 330mm. This is best illustrated in Fig. 6.

Folding an antenna in this way is fine but there is an important factor to be remembered. A dipole folded using this triangular method requires more wire than the standard length to resonate at the desired frequency. This length increase can be as much as 30% for antennas wound with small triangles.

## Back To Resonance

This additional length of wire to bring the antenna to resonance (as a percentage) reduces as the size of the triangle increases. The exact relationship between triangle size and wavelength is not yet known, but when the length of one side of the triangle increases to  $0.16\lambda$  or greater, the percentage increase effectively reduces to nil.

There are many ways of utilising the triangular shape winding. I've shown a variety that I've tried in Fig. 7. The shape Fig. 7a can be made on a flat surface using thin nails. Ensure all the angles of the triangles are  $60^\circ$ , and that all sides are equal. I've used this form in a roof space.

Another flatform variation is shown in Fig. 7b using narrow strips made from thin (0.5-2mm thickness) plastic material. Cut notches down each side in appropriate places. The notches are the equivalent of the pins in Fig. 7a. Using this shape, an antenna can be made to fit into standard plastic material drainpipe.

A further variation, Fig. 7c, shows a 'figure-8' winding version. Using this winding method has a greater shortening effect.

The variants shown in a, b and c are 'flat', I've also tried a version that uses a 25mm diameter former. This could be either a wooden dowel or plastic water pipe. Short panel pins, spaced 43mm apart are placed in a straight line along the former.

Look at the illustration Fig. 7d, and I'll explain. Assume the wire is coming from the left hand side. The wire goes: around pin b, is wound back to go around pin a. From here it is taken to pin c, where it is again wound back to pin b. From pin b the wire is taken to pin d, when it is wound back to pin c. This shape of path is followed as long as necessary.

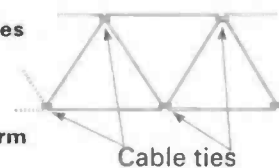
I've used this method to construct an antenna for the 21MHz band, shown as a thumbnail sketch in Fig. 8.

The main element is wound around a 25mm diameter dowel, two metres long. Some 15 panel pins were inserted in a straight line from each end. The spacing between pins was 43mm.

I used 0.6mm single strand, pvc covered wire, and formed the windings as shown in Fig. 7d. Leaving a short length at each end (to connect to the 'capacity hat'), I started each winding from the 'capacity hat' end.

From the windings, the wire was brought to the centre for the feeder junction. Both sides of the antenna were held in place (going between the pins) with insulating tape. To finish off, the

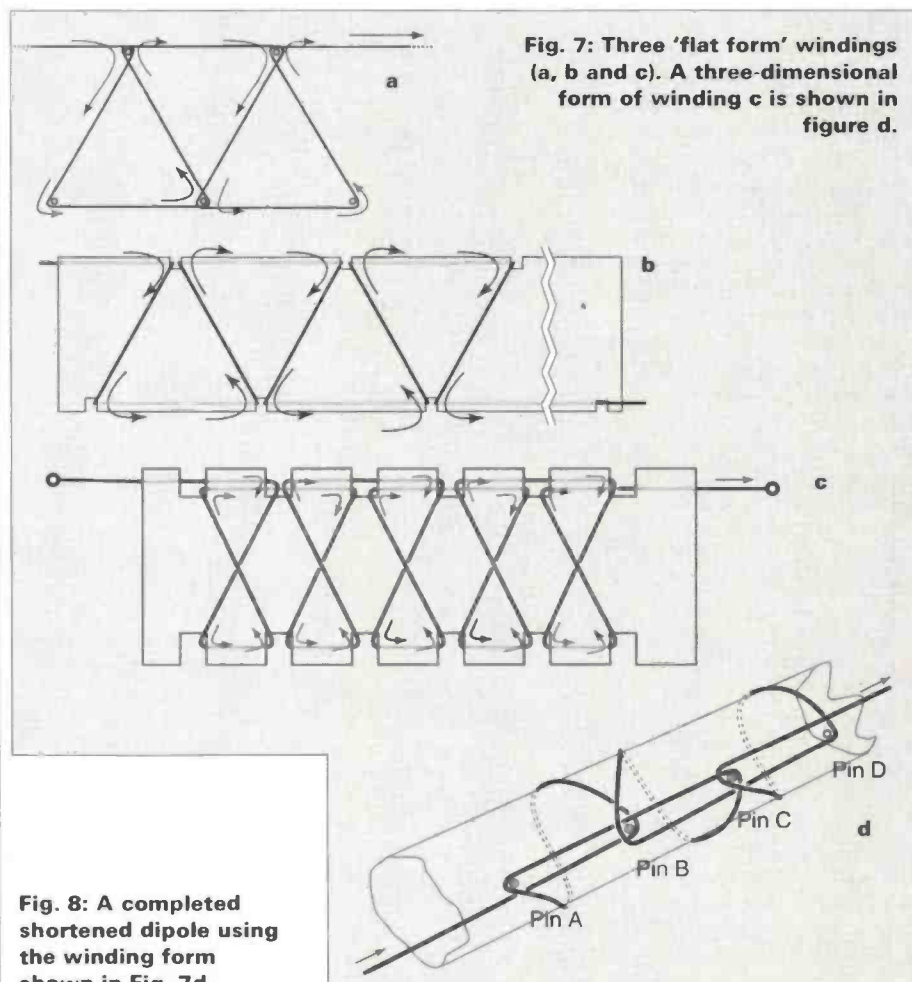
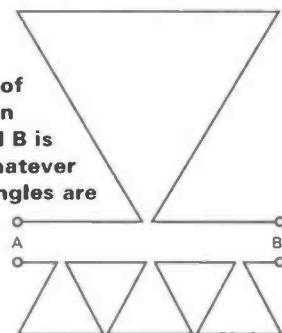
**Fig. 4: When using isosceles triangles to shorten elements, this is the form used.**



**Fig. 5: A physically short dipole with the sides made up as shown in Fig. 4.**

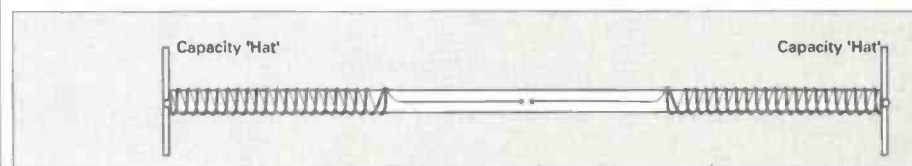


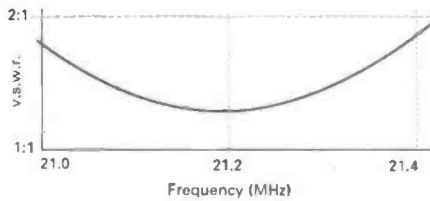
**Fig. 6: The total length of wire between points A and B is the same whatever size the triangles are made.**



**Fig. 7: Three 'flat form' windings (a, b and c). A three-dimensional form of winding c is shown in figure d.**

**Fig. 8: A completed shortened dipole using the winding form shown in Fig. 7d.**





**Fig. 9: The v.s.w.r. graph of the antenna of Fig. 8.**

pins were then removed and a complete second layer of tape applied.

At each end of the dowel a capacity hat was mounted and connected to the outer ends of the windings. Each capacity hat consists of four 180mm length rods of 3mm diameter.

The method of tuning the antenna to resonance, was to check the antenna then, if needed, trim the longest rod at each end before checking again. I found the radiation resistance to be some  $43\Omega$ , and I've shown the s.w.r. graph of my antenna in Fig. 9.

## Excellent Results

The results from the 21MHz antenna have been excellent, with good reports from all continents. Because of limited space it has not been possible to compare it by switching to a dipole at the same height.

I plan to convert the antenna to a beam by adding a second element. It's worth noting that the current is in the same direction in all parallel parts of the wire.

I've tried many experiments over several years and made dozens of variations of multi-delta antennas for both h.f. and v.h.f. Some versions, using the forms already shown, were disappointing. Although resonance and a reasonable impedance were achieved, the operating results were poor.

## Three Dimensional

Some experiments with three dimensional versions have resulted in the ideas shown in Fig 10 and Fig. 11. The flat construction is using plastic tubes or canes taped to the wire. Fig. 10 has nine equal edges, or sides.

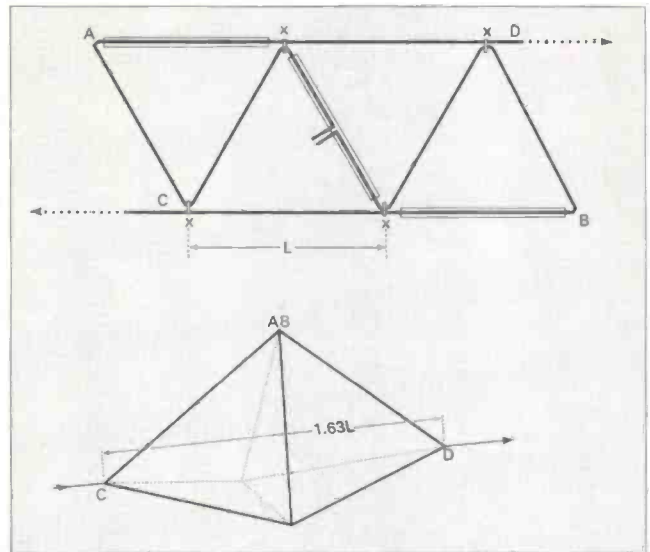
This shape was formed into a cage by folding the ends 'A' and 'B' up to meet above. The overall length of the cage is 1.63 times the length of one of the triangle sides.

The resulting cage antenna can be fed at the centre and used as a dipole, or fed at one end as a quarter-wave. It can be strung horizontally or vertically using a single pole. A third method is to use two identical cages as shown in Fig. 11.

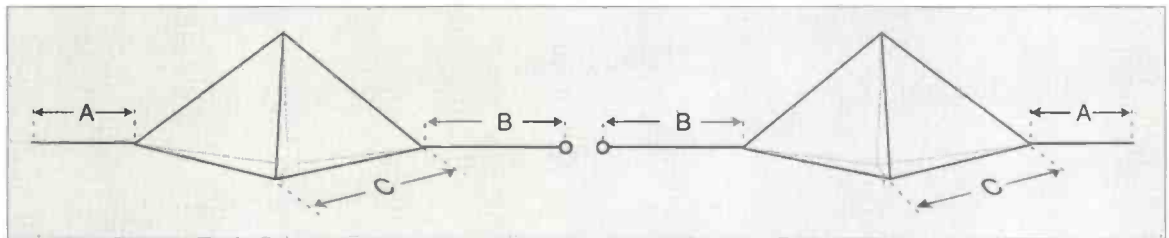
The balanced form of Fig. 11 was used to make a dipole for the 28MHz band, with an overall length of 1.65m. The resulting antenna had a radiation resistance of  $36\Omega$ , and the resulting s.w.r. graph is shown in Fig. 12.

Again, the results of this antenna were good, and for QSOs with the USA the received signals

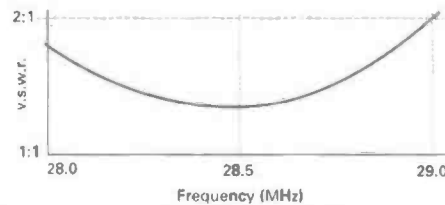
**Fig. 10: The flatplan and three-dimensional view of a cage antenna. See the text for more details.**



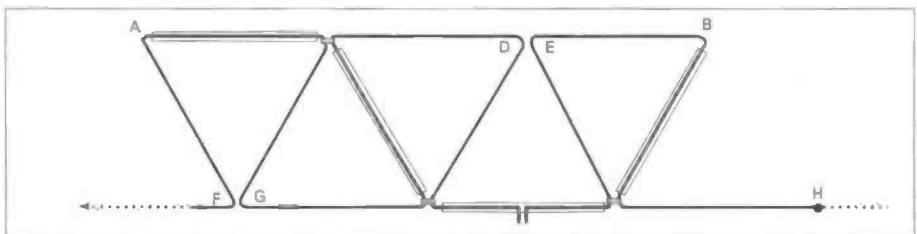
**Fig. 11: (below) Two cages almost 'back-to-back' make an ideal antenna for the 28MHz band. Dimensions are: A = 255mm, B = 125mm and c = 310mm.**



**Fig. 12: The v.s.w.r. graph of the antenna of Fig. 11.**



**Fig. 13: (below) Adding one more triangle to the cage antenna of Fig. 10 allows a 3D diamond shape (far bottom) to be built.**



were one S point up compared to a conventional ground plane antenna. The completed antenna was pinned across the corner of my shack!

A vertical form of the antenna shown in Fig. 10, was constructed to resonate at 14.2MHz. I found it required an extension of about 150mm at each end. In this shape the v.s.w.r. was within 1.7:1 over the whole band.

The experiment revealed that the total wire required in this form is less than that required for a standard dipole. This suggests that some inductance has been introduced. With the two ends joined together by a straight wire, an inductance of  $1.6\mu\text{H}$  was measured at the feedpoint.

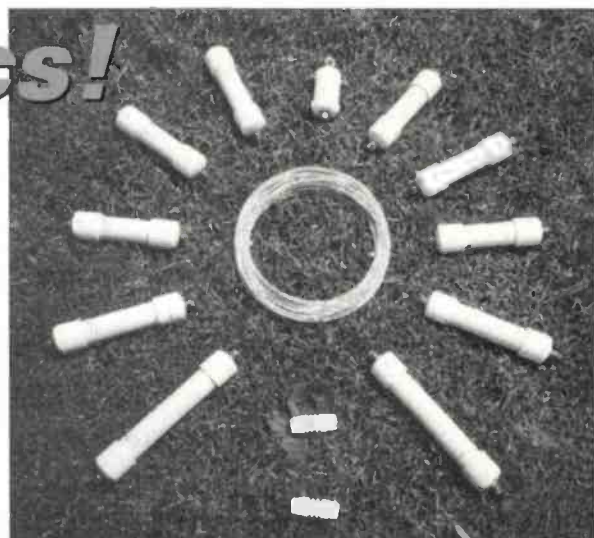
I plan to try some other experiments with more complex shapes to see what effect they have. But I hope the general principles outlined in this article will give rise to further ideas in both two and three dimensional models.

Your comments and the results of your trials performed but others would be most welcome.

PW

# Antenna Antics!

John Goodall G0SKR, invited to try out the Sigma SD-610 h.f. antenna for PW, recruited some of his many friends and got on with the job and presents a rather different equipment review!



The Sigma SD-610 unpacked and ready for assembly by 'Team G0SKR'.

Window shopping was never one of my favourite pastimes, but, window shopping with the thrill of trying what I see, is something quite different! And this month I've had the pleasure to view some items having the common theme of antennas.

I started off by trying the SD-610 multi-band, 10 trap dipole from Sigma Communication Products. This was the interesting antenna I had the pleasure of reviewing.

The SD-610 antenna is designed for operation on 1.8 through 28MHz, excluding the WARC bands, without an antenna tuning unit.

## Self Assembly

The SD-610 antenna arrived in kit, or rather self assembly form. It was neatly packaged, and inside I found one roll of copper coated, multi strand steel wire, approximately 56m in length.

There was also one centre connector (an SCE-1 de-luxe), two low loss end insulators and ten traps of varying sizes. These included two each of ST-10 (28MHz), ST-15 (21MHz); ST-20 (14MHz), ST-40 (7MHz) and ST-80 (3.5MHz).

The centre connector is a heavy duty tubular device. It's made from a waterproof sealed white hard plastic type material.

The connector has two heavy duty, non ferrous screw terminals for connecting each leg of the antenna. There's also one stainless steel support hook and an SO239 connector for the connection of the coaxial feed line.

Wire supplied with the SD-610 is steel, copper coated. And because of this should present no problems of stretching during its life.

Each of the ten heavy duty traps, are manufactured from waterproof sealed tubular enclosures of identical white material to the centre connector. The tubing is 32mm in diameter.

The enclosures vary in length according to the frequency band for that particular trap and have at each end, a cap of similar material. These end caps are 40mm in diameter, 38mm

in length and sealed to the trap tubing.

Fitted within each end cap are the heavy duty non ferrous, solderless screw terminals. No jumper leads are needed with these traps!

## Total Length

The total length of each trap are as follows: ST-10 184mm, the ST-15 184mm, the ST-20 184mm, the ST-40 208mm and ST-80 245mm.

The cable, centre connector and traps are made to an extremely high standard. I feel that once in place they should require no servicing for many years.

Though quite large, the SD-610 traps will accommodate up to full legal power limits in the UK. But having an added high current centre connector, the SD-610 PRO-C, they will accept up to 3kW!

Whilst on the subject of the traps I feel black would have been a preferable colour. I am aware of the problems with the carbon content of black plastic, but I feel the traps do have a striking resemblance to high voltage insulators, and would have looked better somewhat darker in colour.

The instructions for the full range of multi-band trap dipoles were contained on a single side of a single sheet of A4 paper. Clear though the measurement details were, I thought the actual working and assembly details could have been more elaborate, particularly for first time antenna installers.

## Garden Space

My home and garden being somewhat on the postage stamp size, does not offer any way near the required space for the SD-610. That's because the published length (end-to-end) is 44.8m!

The space problem offered me the opportunity of going 'stroke portable'. A fine weather day was duly ordered and upon its arrival, with the consent of the Flight Refuelling Sports and Social Club, Merley, Dorset for the use of one of their football pitches, I set forth with the neatly packaged SD-610.

Single-handed the task would have proved to be (although I'm now partly bionic!), impossible on crutches! So, I summoned the assistance and able bodies of four willing (and local) radio amateurs: Don G0IJE, Roger G0TYX, Walter G0WAL and Chuck G0MDK.

The contents of the packed SD-610 were carefully laid out on the grass. We took extra care to ensure that none of the trap-end, wire retaining screws, had gone missing as a magnet would have proved worthless in finding any!

All items were present and correct. We then needed something to hang the antenna from. For the centre point of the antenna a guyed portable mast was used. Once this was erected on the centre spot of the football pitch, the delicate job of uncoiling, measuring and cutting the multi-strand wire started.

## Skill And Dexterity

The measuring and cutting procedure took the skill and dexterity normally only found in Neuro Surgeons! "Cut Here!" then "No, Here!" and "What about the extra 250mm!" followed by "No that's the wrong end!"

Each and every measurement was treble checked with the site foreman. This was whoever happened to be holding the instruction sheet at that time, and the required surplus added.

The instructions recommend allowing a surplus of around 250mm for each length of

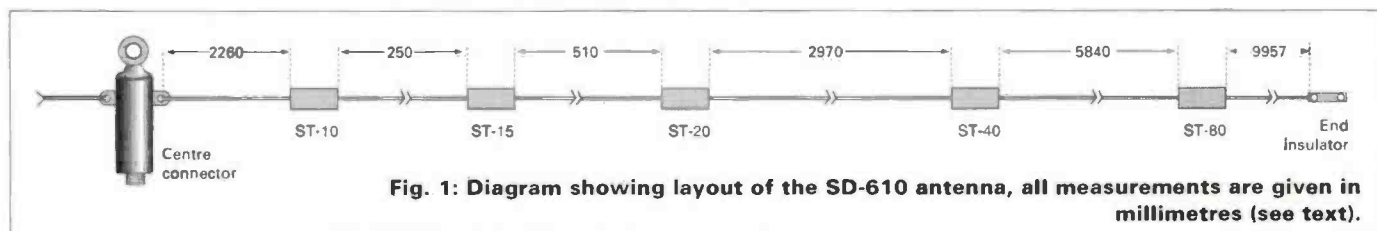


Fig. 1: Diagram showing layout of the SD-610 antenna, all measurements are given in millimetres (see text).

# Antennas

Call 0181-566 1120

## TONNA ANTENNAS LOWEST PRICES!

<b>2 METRES</b>		
20804	4 ELE FIXED	£36.95
20809	9 ELE PORTABLE	£44.95
20089	9 ELE FIXED	£41.95
20816	11 ELE FIXED	£68.95
20811	9 ELE CROSSED	£72.95
20817	17 ELE FIXED	£79.95
<b>70CM</b>		
20909	9 ELE FIXED	£39.95
20919	19 ELE FIXED	£45.95
20438	19 ELE CROSSED	£83.95
20921	21 ELE FIXED	£59.95
<b>6M</b>		
20505	5 ELE FIXED	£62.95
<b>23CM</b>		
20623	23 ELE FIXED	£42.95
20635	25 ELE FIXED	£50.95

## CUSHCRAFT ANTENNAS

R7 VERTICAL	£369.00
R5 VERTICAL	£279.00
A4S 4ELE BEAM	£428.00
A3S 3ELE BEAM	£349.00
A3WS 18/24 BEAM	£275.00
D3WS 10/18/24	£179.00

## TS SERENE ANTENNAS

<b>BASE</b> <small>THE LOWEST PRICES. HIGHEST QUALITY</small>		
TSB-3315	2/70 BASE 8.5/11.9db	£119.95
TSB-3304	2/70 BASE 6.0/8.4db	£79.95
TSB-3303	2/70 BASE 3.0/6.0db	£42.95
TSB-3301	2/70 BASE 6.5/9.0db	£74.95
TSB-3302	2/70 BASE 4.5/7.2db	£59.95
TSB-3302	2M BASE 6.5db	£37.95
<b>MOBILE</b>		
TSM-1005	2M 7/8TH 5.2db MOBILE	£39.95
TSM-1320	2/70 2.1/3.8db MOBILE	£19.95
TSM-1326	2/70 2.1/5.0db MOBILE	£27.95
TSM-1332	2.70 4.5/7.2db MOBILE	£42.95
TSM-1607	2/70/23 2.8-8.8db MOBILE	£49.95

## PRO-AM ANTENNAS

IF YOU WANT TO BE HEARD RUNNING MOBILE "HF", THEN CHOOSE THE FAMOUS "PRO-AM" RANGE FROM VALOR, USA.

PHF-160	Enormous 160m Centre Loaded Whip	£54.95
PHF-80	Almost as big 80m Centre Loaded Whip	£24.95
PHF-40	The mts nuts on 40m, at a mere	£22.95
PHF-20	The way to DX, (safely) on 20m	£18.95
PHF-15	You guessed it, the same but on 15m	£18.95
PHF-10	I'll give you one guess	£18.95
AB-5	5 bander 10-80 in one antenna, it works!	£69.95
BB-2	Massive Spring mount for LF Whips	£48.95
116-NP	Gutter mount with 3/8" thread	£6.95
142-ADP	Body mount with 3/8" to SO239	£9.95

## DIGITAL FILTERS

TIMEWAVE DSP9+	£229.00
TIMEWAVE DSP9MK11	£179.00
TIMEWAVE DSP59	£279.00
JPS NTR1	£199.00
JPS NIR10	£399.00
MFJ 784	£239.00

## AEA PRODUCTS

DIRECT USA  
FACTORY  
APPOINTED

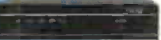


<b>PK-900</b>	Deposit £47.95, 12 x £36.00 plus FREE software worth £29.95!.....RRP £479.95
<b>PK-232MBX</b>	Deposit £29.95, 12 x £25 plus FREE software worth £29.95!.....RRP £329.95
<b>NEW!! PK-96</b>	.....RRP £199.95
<b>ISOLOOP 10-30MHz</b>	The very best LOOP ANTENNA!
Deposit	£39.95, 12 x £30.00.
<b>FREE CARRIAGE!</b>	.....RRP £399.95
<b>IT-1 IsoTuner for ISOLOOP</b>	.....RRP £269.95
<b>KK-1 Keyboard Keyer</b>	The ultimate Morse Keyer.....RRP £229.95

IF YOU SEE ANY AEA PRICES CHEAPER - CALL US!!!

!!NEW!!

PK-12  
RRP £139.95



# THE IC-706



Frequency Range: RX:30kHz-200.000MHz continuous  
Transmit: 1.8-30MHz+50-54MHz+144-146MHz  
Modes: LSB/USB, CW, RTTY, (FSK), AM, FM and WFM (RX only).  
Power: 1.8-30MHz 100W, 50-54MHz 100W 144-146MHz 10W  
Dimensions: 167(W)\*58(H)\*200(D) mm  
Weight: 2.5kg (5.8lb)  
Memories: 101, incl. 9 Alphanumeric.  
AUTO ATU available: Yes, as option (external)  
Removable Front Panel: Yes

PLACE YOUR ORDER  
**HERE**

If I had a pound for everyone who's asked me "have you got the new IC-706 in yet?", I could probably retire. Icom's new baby has set the Amateur Radio world alight with enthusiasm and eagerness at its early, (bit too early) announcement. There are all sorts of amazing offers on this little marvel, from a FREE PSU, to a FREE HOLIDAY with Tom Crosbie in MARBELLA. You name it, even though the new toy didn't exist in production form in JULY, it didn't stop the FREE GIFT brigade trying to tempt you. And why not indeed. I think, however, that a FIVE YEAR WARRANTY is far more interesting (and probably more sensible on a new design). Buy a new IC-706 off Lynchy and you can have a staggering 5 years worth of trouble free cost free operation at our expense.

IC-706 with FIVE YEARS WARRANTY THROWN IN. £1195.00

Also available on special LOW COST FINANCE TERMS, call SALES for details. 0181 566 1120

## HEIL SOUND

## New Products Corner

At last the excellent range of Bob Heil's Headset and Boom microphones, together with his famous replacement microphone inserts are now available.

### Heil Proset-5

Professional Quality Boom Headset, dual padded earphones, flexible mic boom, includes HC-5 "Full range" insert for superb speech quality. Requires AD-1 cable ADAPTOR for KENWOOD/ICOM. £119.95 incl. VAT

### Heil Proset-4

Identical to Proset-5, but includes HC-4 "DX" microphone insert. Ideal for punching through the pileups. £119.95 incl. VAT

Heil HC-4. Replacement microphone insert for existing fist or base microphones. With 10DB peak at 2KHZ and the low end rolled off sharply at 500HZ, (12DB per octave), the HC-4 is the ultimate DX mic insert. £28.95 Incl. VAT

### Heil HC-5

Identical to HC-4, but High Articulation, offering superb SSB quality, rolls off sharply under 350HZ and above 3100HZ, peaking at 2.4KHZ. "Hi-Fi" SSB Audio. £28.95 incl. VAT

### Heil AD-1K/Y

Adapter leads to interface the proset Headset/boom microphones to 8 pin Yaesu, Icom or Kenwood transceivers.

AD1-I "Blue" Lead for Icom	£11.95
AD1-Y "Yellow" Lead for Yaesu	£11.95
AD1-K "Red" Lead for Kenwood	£11.95



As used on by the award winning contest group GWORD! on the recent RSCG 6M Trophy.

## Linear Amp UK

Peter Rodmell has been busy refining his excellent range of high power LINEAR AMPLIFIERS. New anode tuning mechanisms, new case design and much improved paint schemes have boosted the U.K. based company's export sales through the roof! A full range of linears from HF through, to 70cm are now available. Employing Eimac 3CX800A7 high mu triodes for the VHF "Discovery" Linears, (or 8874's in the 70cm version), Eimac 3500-Z tubes for the "Hunter" HF Range, all units are fully self contained, including power supply, delay timer to ensure valve cathodes are thoroughly warmed up and if specified, a low loss set of change over relays. Full legal output can be achieved with drive from as low as 10 watts, (400 watts) and where licensing permits, 1 kw output is obtainable with only 35 watts of drive. (Slightly less on 70cm).

Available on INTEREST FREE FINANCE, the new Linear AMP UK range is available from only £1199.00.

## ICOM IC-775DSP - WITH FIVE YEARS WARRANTY!

First, a little history lesson...The new top of the range IC-775DSP is advanced today as the IC-701 was, fourteen years ago. Whilst the rest of the worlds Amateur Radio manufacturers were still producing sets with "VFO's", Icom steamed in with a world first - an HF transceiver with a REAL synthesizer. It was literally YEARS before the rest caught up. How long will it be with Icom's latest IC-775DSP - the worlds first HF Transceiver with proper Digital Signal Processing? Icom's new baby really deserves six pages to describe the advance in design the new IC-775DSP has to offer. It has been designed from the ground up using serious high quality components and offers features and performance you'll find nowhere else.



The new IC-775DSP is so good, MARTIN LYNCH is arranging appointments to fully explain the operating features offered by the worlds most advanced HF Radio. Compare with the very best YAESU and KENWOOD can offer, with all three sitting side by side. To arrange a "test drive" call the LYNCH Sales Desk today. 0181 566 1120.

For those of you who can't visit the London Showroom, we would be delighted to send you details. Just call or write.

## ATTENTION FT-290R MK2 OWNERS!

Three years ago, muTek and LYNCH bought you an improved version of the Yaesu FT-736R. By installing the "ROX" boards the two and seventy were greatly improved. 1995 brings another great muTek design - a newly developed "optimised" preamplifier for the Yaesu FT-290R mk2. The SLNA290S consists of a low loss relay for TX/RX switching, a low noise amplifier based on the BF998, a variable attenuator such that the gain can be varied without affecting the noise factor or dynamic performance of the L.N.A., and a matched filter to reject out of band signals.

Supplied with fitting instructions for the FT-290Rmk2 is £39.95 p&p £3.00 or fitted in our workshops for £79.00, + £7.50 return carriage.



*Yes I Would Rather Buy From Martin Lynch!*

## NEW LIST PRICES FOR YAESU, KENWOOD & ICOM

### HF EQUIPMENT

ICOM	LIST	ML PRICE
IC707	£889	ML PRICE
IC738	£1649	ML PRICE
IC736	£1969	ML PRICE
FT840	£899	ML PRICE
YAESU	LIST	ML PRICE
FT900	£1399	ML PRICE
FT900AT	£1599	ML PRICE
FT990DC	£2099	ML PRICE
FT990AC	£2399	ML PRICE
FT1000	£3999	ML PRICE
FL7000	£2399	ML PRICE
FRG100	£599	ML PRICE

PHONE FOR LATEST DISCOUNTED PRICES

KENWOOD	LIST	ML PRICE
TS50S	£1059	ML PRICE
TS450S	£1499	ML PRICE
TS450SAT	£1649	ML PRICE
TS850S	£1809	ML PRICE
TS850SAT	£1959	ML PRICE
TS950SDX	£3999	ML PRICE

### VHF/UHF MOBILE, BASE & HANDIE

ICOM	LIST	ML PRICE
IC281H	£449	ML PRICE
IC2340H	£689	ML PRICE
IC820H	£1795	ML PRICE
IC21E	£529	ML PRICE

PHONE FOR LATEST DISCOUNTED PRICES

YAESU	LIST	ML PRICE
FT11R	£324	ML PRICE
FT41R	£369	ML PRICE
FT23R	£259	ML PRICE
FT51R	£529	ML PRICE
FT290RII	£599	ML PRICE
FT690RII	£649	ML PRICE
FT790RII	£749	ML PRICE
FT6500	£749	ML PRICE
FT736R	£1999	ML PRICE
FT5200	£729	ML PRICE
FT2500M	£399	ML PRICE

PHONE FOR LATEST DISCOUNTED PRICES

YAESU	LIST	ML PRICE
TM733E	£729	ML PRICE
TM251E	£419	ML PRICE
TM451E	£459	ML PRICE
TH79E	£479	ML PRICE
TH22E	£254	ML PRICE
TH42E	£289	ML PRICE

PHONE FOR LATEST DISCOUNTED PRICES

ALINCO	LIST	ML PRICE
DRM06E	£359	ML PRICE
DR150E	£399	ML PRICE
DR-70	£1095	ML PRICE

REMEMBER! ANYTHING OVER £200 WE CAN FINANCE, EVEN HEAVILY DISCOUNTED PRICES, USUALLY AT ZERO APR! JUST CALL OR WRITE FOR DETAILED INFORMATION.

It's now June and I'm already writing copy for August! Yaesu and Kenwood have just sent me their new price lists. The bad news is all prices are up. The good news is I've cleared Yaesu and Kenwood's stocks of popular lines in their warehouses and it's now sitting in mine - ALL AT PRE-INCREASE PRICES!! If you are serious on buying that new piece of kit then hurry - otherwise suffer another 8-12% !!

### TRADE PRICES ON NEW BOXED YAESU FT-736R



Part of the increase in prices, the versatile Quad Bander from Yaesu has almost pipped the £2000 mark. (Who said Amateur Radio wasn't a good investment?). I've got a vault full of the things and I'm prepared to sell them to you at TRADE PRICE!  
**Yaesu FT-736R RRP: £1999.00**  
**ML PRICE: £1499.00**

### YAESU FLAG SHIP, FT-1000 AT TRADE MONEY - TWO PIECES ONLY!!



Actually, LESS than Trade. I have two new boxed FT-1000's at 5% less than trade price. No catch, just helps when you buy stock before the prices leap up!  
**Yaesu FT-1000 RRP: £3999.00**  
**ML PRICE: £2899.00**

### SAVE TWO HUNDRED POUNDS ON A NEW DUAL BANDER!



Another "bulk purchase", give me £529.00 and I'll give you a BRAND NEW BOXED FT-5200, High Power Dual Band Mobile. No catch, full manufacturers warranty. (RRP £729.00), If you order mail order add £10.00 for post & packing.

### MICROWAVE MODULES

MICROWAVE MODULES ARE BACK! FIRST - FROM MARTIN LYNCH

MML432-30LS 25-30W 70CM LINEAR WITH PREAMP, 1/3 DRIVE	£169.95
MML432-60S 50W 70CM LINEAR WITH PREAMP, 10-15W DRIVE	£169.95
MML432-100S 3/10W DRIVE	£329.00
MML144-30LS 30W 2M LINEAR WITH PREAMP, 1/3W DRIVE	£99.95
MML144-100S 100W 2M LINEAR WITH PREAMP, 10W DRIVE	£179.95
MML144-200S 3/10/25W in	£329.00
MML 70-100S 100W 4M LINEAR WITH PREAMP, 10W DRIVE	£179.95
MML 50-30LS 30W 6M LINEAR WITH PREAMP, 1/3W DRIVE	£99.95
MML 50-100S 100W 6M LINEAR WITH PREAMP, 10W DRIVE	£179.95
MML 50-100LS 100W 6M LINEAR WITH PREAMP, 1/3W DRIVE	£199.95

### RADIO READY PC's



**PEACOCK**  
 All items are available on Low Cost Finance, call for details. Please note: The QUAD speed CD-Rom, 16 Bit sound card & speakers shown in the photograph are optional extras costing £295.

All machines are loaded with HAM software, including Log Program, Packet Controller, Word Processor, DOS V6.2, Windows for Work Groups V3.11, plus lots more. \*Pentium 90 and DX4700 Machines are also available. Carriage extra at £20 per system, UK Mainland.

### FOUR OF THE BEST PEACOCK DX2/66 BASIC PC

4Mb RAM, 420Mb Hard Disk	Price incl. VAT, £999.00
<b>PEACOCK DX2/66 'PREMIUM' MULTIMEDIA QUAD PC</b>	
4Mb RAM, 540Mb Hard Disk, 2Mb VGA Mem, Quad Speed CD-Rom, 16 Bit Sound Card, Speakers	Price incl. VAT, £1499.00
<b>PEACOCK PENTIUM 75 PC</b>	
8Mb RAM, 730Mb Hard Disk	Price incl. VAT, £1499.00
<b>PEACOCK PENTIUM 75 'TAKE' MULTIMEDIA QUAD PC</b>	
8Mb RAM, 730Mb Hard Disk, Quad Speed CD-ROM, 16 Bit Sound Card, Speakers	Price incl. VAT, £1789.00

PRICE REDUCTIONS AND INCREASED SPEC!

### NEW!!!!!! Peacock notebooks!!

From June '95, Peacock have introduced a selection of notebook PC's to their collection.

Peacock 450 Notebook	Peacock 590 Notebook
DX2 50MHz CPU	Intel 90MHz CPU
4MB Ram	8MB Ram
241.3mm Mono LCD (colour LCD see below)	10.3" Dualscan Colour LCD**
250MB HD (Upgradeable to 520)	250MB HD (Upgradeable to 520)
Dos, FWWG 3.11	Dos, FWWG 3.11
£1239.00 incl VAT, MONO.	£2799.00 incl VAT, Dualscan
£1599.00 incl VAT, COLOUR.	£3999.00 incl VAT, Active Matrix TFT Colour LCD



CONTACT STEVE JELLY - OUR DATA COMM'S EXPERT FOR FULL INFORMATION

24-HOUR B.B.S. LYNCHLINE IS NOW OPEN



5 YEAR UK WARRANTY FOR AMATEUR RADIO AVAILABLE

OFFICIALLY APPOINTED YAESU UK MASTER DEALER



### WORKSHOP FACILITIES

One of the biggest advantages of moving to the new showroom eighteen months ago was the increase in workshop space. Graham Tingey heads the service team and together with Brian Greenaway our Customer Services supervisor, we guarantee to get your sick radio or accessory back quicker than anyone in the U.K. Our servicing rates are competitive too. Linked directly to the main distributors for spares and the only company able to offer a whole year of extra warranty once your set has been repaired, (provided it's less than eight years old), try MARTIN LYNCH next time you need a repair service. You'll be pleasantly surprised. Contact Brian, G3THO on 0181 566 1120.

YOU CHOOSE THE BEST WAY TO PAY



### OR FREE FINANCE - WITH NO CATCHES

No catch, no extended payment schemes - no interest! If you are in full time employment or retired/invalidity benefit then you can probably take advantage of our free finance option. Call or write today for details.  
**IF YOU DON'T WANT TO TAKE ADVANTAGE OF MY FREE FINANCE AND WOULD RATHER PAY CASH, CHEQUE, CREDIT CARD OR TRADE-IN, THEN CALL 0181 - 566 1120 TODAY FOR EXPERT ADVICE. I promise you the best overall deal in the U.K. Get ringing, or you'll miss the bargains!**  
 \*Please NOTE prices & monthly payments are based on 17.5% VAT & no more price increases! E&O. £10 p&p on all major items.

Martin Lynch is a licensed credit broker. Full written details are available on request.

WE'RE ALWAYS AVAILABLE FOR ADVICE & INFORMATION...CALL

# 0181-566 1120

AFTER HOURS: 0973 339 339  
 FAX: 0181 - 566 1207  
 B.B.S.: 0181 - 566 0000

Opening Times  
 Monday - Saturday 9.30 - 6.00

wire to accommodate fastening to the trap screw terminals, leaving around 100mm to be wrapped back on itself, loosely at this stage to allow for any tuning adjustments.

## Large Coil

Anyone who has never worked with a large coil of high tension steel wire has never lived. And although I've no wish to try and teach my proverbial grandparents to suck eggs, this type of wire must be rolled carefully from the coil not pulled off.

The consequences of pulling the wire off would leave you with a superb wire 'bird's nest' requiring two weeks spare time to unravel. Take care and unroll it...you have been warned!

## Trap Polarised

Each trap is polarised and identified as such with a heavy indented dot in one end cap. This end of the trap must be facing in the direction of the centre connector.

Luckily, we only had three traps to turn around! Only one leg of the antenna measurements are shown on the instructions for simplicity, the other being a mirror image.

From the centre connector to each end insulator, the five traps are separated by six different lengths of wire. The connectors and traps being set out as follows: Centre Connector - measured wire - ST-10 - measured wire - ST-15 - measured wire - ST-20 - measured wire - ST-40 - measured wire - ST-80 - measured wire - end insulator (see Fig. 1).

Wire measurements between the centre connector, traps and end insulators, as set out on the instructions, were the starting point for each band. Fine tuning for the required segment of each band, would be achieved after the complete assembly of the antenna.

**Table 1**

To each of the following measurements an extra length of 250mm for fixing and later fine tuning purposes.

Centre Connector	To ST-10 (28MHz Trap)	2.26m
ST-10 (28MHz Trap)	To ST-15 (21MHz Trap)	250mm
ST-15 (21MHz Trap)	To ST-20 (14MHz Trap)	510mm
ST-20 (14MHz Trap)	To ST-40 (7MHz Trap)	2.97m
ST-40 (7MHz Trap)	To ST-80 (3.5MHz Trap)	5.84m
ST-80 (3.5MHz Trap)	To End Insulator	9.957m



The team finally have the complete antenna up for testing.

## Minimum Height

Sigma recommend the centre of the dipole to be a minimum height of 12.2m above ground. And if it's used in any form of sloping or inverted 'V', the ends should be at least 4.6m above ground.

Unfortunately, on the day we could only reach a centre height of just under 3.7m, with the ends about 2.7m from the ground. The ends were in fact tied off to the cross bar of each goal post!

The overall length of the completed review antenna was 48.6m, somewhat larger than the published length. The difference can easily be explained, as all five of my trusty team were schooled in Imperial measurements.

Added to the 'imperial only' problem, the tape I used, only gave Imperial measurements, and our grey matter was none to quick at converting from the metric. This explains the slight discrepancies with the given conversions. (When asked to comment. Eastern Communications said that although the measurements weren't given in furlongs they were available in inches!).

## Antenna Hoisted

The antenna centre connector was then connected to the feed coaxial, and the antenna hoisted up the mast. We kept the mast vertical by pulling each dipole leg outwards.

The total weight of the antenna at this stage is quite high. So, the supporting cord for the centre and each end insulator, must be strong enough for the load and the stress and strain when the antenna is finally in position.

The strength aspect should not be overlooked. It's not recommended to be in mid QSO with a much sought after DX, as one leg of your antenna clatters against the centre pole as the retaining cord snaps!

Before connecting the feed to the transceiver, we carried out a quick check with the antenna analyser to establish what part of each band we had to play with. The results from this revealed that the s.s.b. segment of all bands was fully useable and even certain parts of the c.w. segment.

Our tests showed that 14MHz was the only band with a v.s.w.r. reading of over 1.3:1. And even then 14.170 - 14.300MHz with the 1.3:1 reading was workable. Heath Robinson would have been proud of us!

## Antenna Orientation

The antenna orientation, end-to-end was almost north east to south west, providing stronger transmitted signals north west to south east. This was borne out by a 5 and 1 signal report from Dave G4AQY near Greenwich, almost in a direct line with the end of the antenna.

The first QSO was then followed by a 5 7-9 report from Janice GWOKPD from near Port Talbot. Both contacts on the same frequency on the 3.5MHz band.

Without an a.t.u. and the antenna running directly into my Kenwood TS-140S I was impressed with the performance of the SD-610, on all bands from 1.8 to 28MHz, not counting the WARC bands. However, with the a.t.u., the 10, 18 and 24MHz bands were available.

From scratch (discounting hiccups in assembly), the SD-610 was erected and operational in just over two and a half hours. Although impractical in my case, the nature of the multi-strand copper coated wire meant that cutting and premeasuring would have reduced assembly time.

## High Standard

To round off the review, I must say I think that the Sigma Communication Products SD-610 Multi-band Trap Dipole is manufactured to an extremely high standard. And providing space allows, for fixed or portable use, it would be a very useful single antenna for multi-band operation.

However, I feel that at a price of £349.95, for a wire antenna, it's a little on the high side of expensive. This is my own personal view and in no way should it detract from the superb quality and excellent performance of the antenna.

Also, Sigma Communication Products produce over 150 wire antennas for every pocket, requirement and location. The SD-610 being one of their two most expensive antennas. However, you do need to bear in mind that there are ten traps included, which makes the overall cost of the SD-610 not that high for a complete h.f. antenna.

I would also like to thank all those amateurs contacted during this review, who for space alone, have not been named. A special thanks go to the trusty team who gave up a day's sanity to assist me. Thank you Don G0IJE, Roger G0TYX, Walter G0WAL and Chuck G0MDK, without you this review would not have been possible. Thanks also to Flight Refuelling Sports and Social Club for the use of the football pitch!

Finally, my thanks go to Eastern Communications of Cavendish House, Happisburgh, Norfolk NR12 0RU, Tel: (01692) 650077, FAX: (01692) 650925, for supplying the review antenna which costs £349.95 including UK P&P.

PW

# Pascoe's Penny Pinchers

Dick Pascoe G0BPS has come up with some more of his practical 'penny pinching' antenna projects. This time Dick has been playing around on h.f.



I know of several radio amateurs who have a selection of towers, some as high as 60m with single band Yagis on each one. That's a selection of towers at one location for the use of just one amateur!

The lucky people I'm thinking of have single band beams for the h.f. bands from 28MHz right through to 7MHz two element beams. Some are even rotatable. I mean the whole is rotatable including the tower!

The beams are fixed to the uprights of the metalwork at various spacing. A huge gearbox at the bottom turns the whole thing.

Something like the station I've just mentioned would only fit into a very large plot. And this one belongs to a friend in the mid USA.

My American friend's antenna farm cost thousands of dollars. But what most of us need is a simple system that will still provide gain (over a dipole) at a cost of a few pounds and in most cases just a few pence.

## Size Problem

Size is of course the main problem with most of us in the United Kingdom. Our gardens are much smaller than the average American house plot but we do have one area that we can exploit. If we cannot go out we can (in most cases) go up!

Those readers who regularly go to their local rallies should keep an eye out for the large rolls of wire often found on sale. (Go for the multi-stranded, not the single strand as this has more inherent strength).

The larger the roll of wire the better. Often these will be found for just a pound or maybe two and with this you'll have the makings for a selection of antennas.

## Cheap Insulators

Look out for the cheap egg insulators on sale at rallies. If they cannot be found, don't despair, a section of plastic bottle can be used, as in Fig. 1.

The resultant insulator I've shown in Fig. 1, has been cut from a polycarbonate bottle. They're easy to cut out...but be careful when using the scissors!

The first thing to do when contemplating a new antenna system is to make a small drawing of the area available. You should note the high points such as the roof, trees and where poles can be fitted.

Next, you should locate the north. If this is difficult there's an easy way. On a sunny day go out at midday GMT (not BST) and look for the

sun. It will almost due south of you and will (within a few degrees) be accurate.

Long, in terms of wavelength, dipole type antennas mounted in a north - south direction give good lobes off in the 45° in all four directions. This is good for North America, South America and of course for the far east. It's not good for the south and Africa, but we have to do what we can!

## What Antenna?

Having drawn the layout and decided on the high points you can now decide what type of antenna is best for the space you have available.

The simple dipole needs a support at the centre but the Windom antenna needs support at the one third point. If the rear garden is long and the front short then some form of array may be of use.

Small house plots can be terrible to fit an antenna into. But I well remember getting a full size 7MHz loop in a garden that most would consider impossible.

In the space of this article it would not be possible for me to say which one is the best for you. I will however, remind you that the antenna that works extremely well here may not work well at your home, and of course the reverse may apply.

## Notable Success

Most of the antennas I'm describing in this article have been built at some time or other by me and I've achieved some notable success.

Try out different ways of erecting the antennas. The Delta Loop for example may be mounted horizontally. The main aim is not to spend your hard earned cash on the antennas but to save that for more important things.

The measurements I'm providing are all for an antenna working on the 14MHz band. It's centred on 14.100MHz.

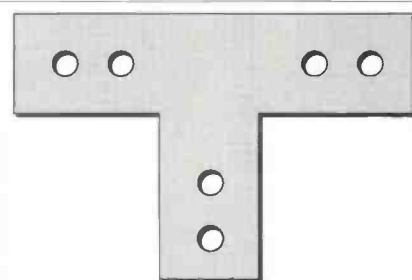


Fig. 1: Simple and effective insulators can be cut from polycarbonate plastic bottles (see text).

Each length should be cut slightly long and then trimmed to resonance. For those who have never done this, don't worry, it's very easy to do.

There are two easy ways to set the antenna up. One method uses a valved grid dip oscillator, or the a transistorised 'dip' meter. Both types of dip oscillator are known as grid or gate dip oscillators (g.d.o.) even if it uses an ordinary transistor.

In use, the dip meter is coupled to the antenna, and the resultant 'dip' as the meter tunes across the antenna resonant frequency will indicate resonance. If the dip is below the frequency required the wire is too long and some will have to be removed.

## Other Method

The other method requires a transmitter for the frequency required and a good power meter or an s.w.r. meter. To start off, 'fire-up' the transmitter and check the v.s.w.r. or reflected power, and then take a reading.

Next, change the frequency by about 50kHz and take another reading. If the frequency reading is lower, then the wire is again too long. If it goes high you have cut the wire too short.

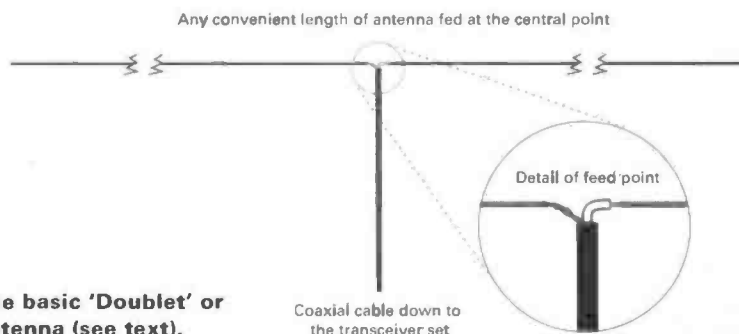
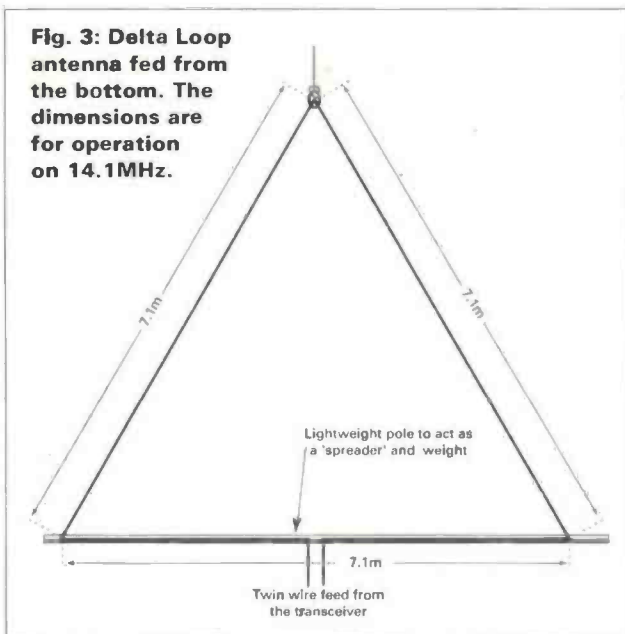


Fig. 2: The basic 'Doublet' or dipole antenna (see text).

**Fig. 3: Delta Loop antenna fed from the bottom. The dimensions are for operation on 14.1MHz.**



Keep trimming until you get close. A few centimetres at a time to start with should be satisfactory, and then reduce gradually down to a few millimetres or so until resonance is obtained.

## Doublet Antenna

The 'doublet' is the simplest of all h.f. antennas to use. And it's the antenna I'm currently using at my home at the time of writing.

In practice, the doublet is comprised of two equal lengths of wire fed either by coaxial cable or by twin feed. The length of the wire is unimportant as long as it is greater than a quarter wave long on the lowest band intended to be used.

So, if 3.5MHz is your favourite band, each leg of the doublet must be at least 20 metres long. The actual length doesn't matter as long as you use an antenna tuning unit to resonate the system.

As usual the higher the antenna goes, the better it will work. And even if the antennas 'legs' sag a little or even bend at the ends...does it matter so much? No, it doesn't!

You're looking for an antenna that will radiate a signal. But if you really want gain then try one of the following, or go ahead and buy that very expensive beam antenna!

## Delta Loop

As its name implies the Delta Loop is a simple loop made of a single wire and hung from a suitable high point. It's a full wavelength long on the band required.

For the centre frequency of 14.100MHz the Delta Loop will require 21.3m total length of wire. Each side is 7.1m.

I've used the Delta Loop at home, and as it 'fires off the sides of the loop it has a small amount of gain. It can also be turned by the used of a rope to the corner much like a rotatable beam, Fig. 3.

If the loop of wire is used as a box configuration, then a change of feed point from one corner to the middle of the bottom, or even one side may give a better radiated signal. Experiment, try them out!

## Bruce Array

The Bruce antenna based on the Array, Fig. 4, may provide slightly more gain, as it acts as a broadside array. This means that the main lobe of the signal is off the sides of the wire.

A rope slung between two points such as the house and a tree will carry the Bruce Array easily. In a perfect world it should be at least a quarter wave above ground. But we don't live in a perfect world so give it a try as high as you can. It will still work!

Another version of the Bruce Array array is to use them in phase. By using 300Ω ribbon as the phasing line a good array may be obtained.

Start by using just one side and cut it for resonance on half the required frequency. This

will provide the two outside elements.

Next, cut a dipole at the resonant frequency which will be the middle element. The two phasing lines should also be resonant at a quarter wave and fitted as shown in Fig. 5.

The beauty of the Bruce Array is that because the phasing lines should not radiate they may be rolled up and tucked away! It leaves an antenna that looks much like a dipole!

## The W8KJ

The only difficulty with the W8KJ or 'Lazy H' antenna one is the feed point. You connect the feed to the middle of the two legs and adjust for resonance.

The W8KJ is one antenna that I have not yet tried. But I've heard of reports where it has been used with some success.

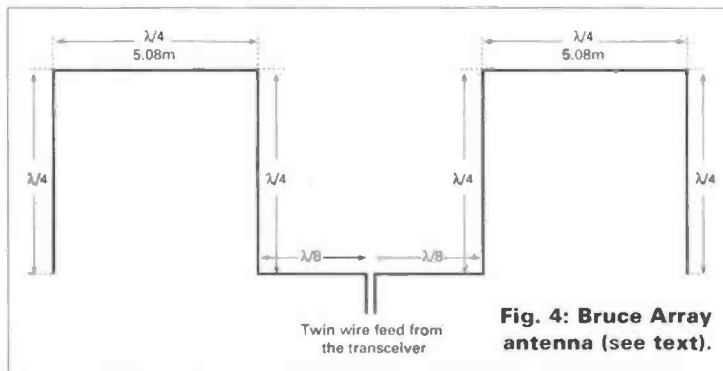
Of course there are many more wire antennas that you may try. There's a multitude of books on the subject!

## Fence Antenna

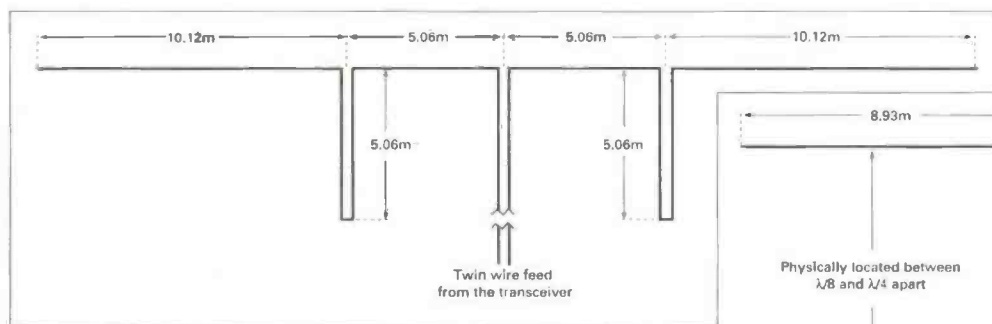
I have even used a barbed wire fence as an antenna. I had nothing else available, but I still made the contact I wanted!

Even a length of wire thrown over the house can be used for a simple antenna. Just remember that with any of these you cannot compete with a big beam or cubical quad antenna systems.

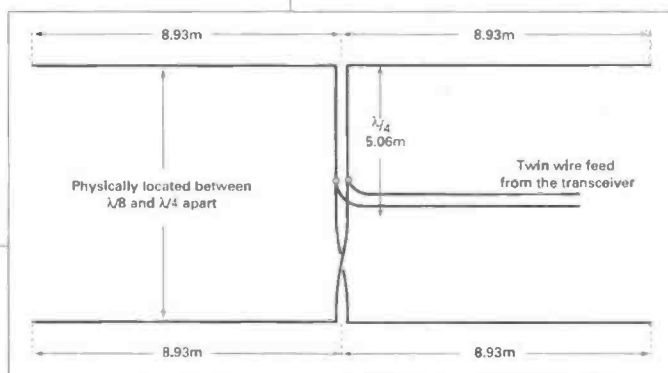
But you can, and will radiate a signal that will work the world. You may not break the pile-ups so easily but you'll still have lots of fun in this fascinating hobby of ours.



**Fig. 4: Bruce Array antenna (see text).**



**Fig. 5: Alternative version of my version of the Bruce Array (see text).**



**Fig. 6: The W8KJ or 'Lazy H' antenna (see text).**

# AKD

Unit 5  
Parsons Green Estate  
Boulton Road  
Stevenage  
Herts SG1 4QG



THE FILTER SPECIALISTS



MAIL ORDER DEPT.  
Stock Items Normally  
Despatched within 48 hours,  
21 days latest.  
TEL. 01438 351710

## TV INTERFERENCE PROBLEMS??!

Are you having trouble receiving a watchable picture on your TV? If so, the cause may be aerialborne interference. For many years AKD has manufactured a low cost range of in-line interference suppression filters that are easily inserted into the aerial system to help reduce the effects of interference from local taxi radio, CB, amateur radio, airport radar, etc. Each filter is terminated in standard aerial co-ax plug and socket and requires no external power. Fitting could not be more simple. No technical knowledge is needed. There are 13 standard stocked filters in our range, but individual filters can be tuned to reject interference at specific frequencies if required. If you are not sure which filter type to order or have any questions regarding interference phone our helpline on 0438 351710 and ask for John who will be pleased to assist you in making the best choice of filter.

### THE FILTER RANGE IS AS FOLLOWS:

#### FILTER TYPE RBF1

A range of filters designed to eliminate Radar Blip, especially noticeable on video recorders. Stocked on channel 36 and 846MHz (RAF Boulmer interference) can be tuned at our factory from 420MHz to 890MHz. **£8.50 + 50p p&p**

#### FILTER TYPE TNF2 (Suitable for UHF TV only)

A range of Tuned Notch filters stocked on generally useful frequencies used by Amateur Radio operators, CB users, Private Taxi companies. Can also be factory tuned to reject any spot frequency up to 300MHz. Now stocked at 50 & 70 MHz. **£9.85 + 50p p&p**

#### FILTER TYPE HPF1

Used in weaker reception areas for general interference problems. Use with UHF TV, Video & Pre-Amps. **£8.50 + 50p p&p**

#### FILTER TYPE HPFS

Used in strong signal area for severe interference on UHF only. **£9.25 + 50p p&p**

#### FILTER TYPE BB1

A general purpose filter that can be used on its own or together with other filters in our range for severe interference problems. Ideal at the Input of VCR and Pre-Amps. **£8.50 + 50p p&p**

#### WA1 WAVEMETER £29.96 + £1 p+p



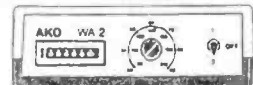
Our Wave Absorption meter for 2 Mtre transmitters meets licensing requirements range 120MHz to 450MHz, very sensitive, can also be used as field strength meter within its range. Requires PP3 type battery (not supplied).

#### HFC1 CONVERTER £49.95 +75p p+p

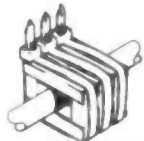


For the FRG 9600/965 new HF Converter, connects to the aerial socket, and powered direct from the 8 Volt o/p of the FRG 9600. Gives tuning range of 100kHz to 60MHz, uses double balanced mixer, with low pass filter on input. **\* Can be supplied with BNC termination for other scanners \***

#### WA2 WAVEMETER £29.96 + £1 p+p



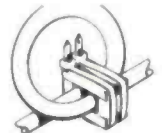
Our Wave absorption meter for the 50 & 70MHz Bands. Meets licensing requirements. Can also be used as field strength meter within its range. Requires PP3 battery (not supplied).



### Unifilter 'CLAMP-ON' RADIO-FREQUENCY CHOKE



Allows leads to be toroidally protected without the need to cut or remove plugs or connectors. Ideally suited for moulded plugs, leads, ribbon and large diameter cables. Can easily be fitted and stacked in multiples to increase rejection. 'UNIFILTER' works by suppressing the interference currents that flow along the outside of cables without affecting the signals or power flowing inside. This means that you don't need to worry about upsetting normal operation or invalidating guarantees. Suitable for both reducing the emission of, or rejecting the effect of, 'common mode' interference as experienced on computer, hi-fi & speaker leads, as well as the normal mains & aerial cables.



UF 4 KIT (SUITABLE FOR SMALLER INSTALLATIONS) £12.20 + 50p p+p

UF 8 KIT (FOR MULTI INSTALLATIONS) £24.25 + 75p p+p

ALL PRODUCTS ARE AVAILABLE FROM US DIRECT  
MAIL ORDER OR WHY NOT MAKE USE OF OUR ACCESS  
& VISA FACILITIES TO ENSURE MINIMUM DELAY

ALL AKD PRODUCTS CARRY THE USUAL AKD 2  
YEAR GUARANTEE. PRICES QUOTED ARE  
CORRECT AT TIME OF GOING TO PRESS AND  
INCLUDE VAT, POSTAGE & PACKING

TRADE ENQUIRIES WELCOME  
TRADE ORDERS CAN NOW BE PLACED BY  
FAX ON 0438 357591

Props: RT & VEL Wagstaffe. Technical Adviser: John Armstrong

# C.M.HOWES COMMUNICATIONS

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



## GREAT PROJECTS TO BUILD!

### CLEAN UP YOUR RECEPTION with this DUAL BANDWIDTH AF FILTER for £29.80!

- 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 'speaker' or 'phones' • Suits all general coverage receivers and transceivers • ASL5 Kit plus HA50R hardware: £29.80 (plus P&P).

Read the review in the June issue of RadCom!



### Multi-Band SSB/CW RECEIVER KIT

The DXR20 covers 20, 40 & 80M bands plus any other HF frequency with optional plug-in modules. The photo shows the receiver built with DXR20 and DCS2 ("S meter") kits and HA20R hardware pack (case etc.). Excellent performance and compatible with many of our transmitter and accessory kits. Optional bands include 160, 30, 15 & 10 Meters.

Reviewed in the May issue of RadCom - "...dependable results, fine design..."  
DXR20 electronics kit: **£39.90**. HA20R hardware pack: **£28.90**

### PROJECTS FOR EVERYONE WITH HOWES KITS!

Please send an SAE for a catalogue/data sheet or give us a ring to discuss the details of the kits and optional hardware packs. Kits are also available as assembled and tested modules at extra cost. Not all kits are listed!

#### ACTIVE ANTENNA KITS

AA2 150kHz to 30MHz £8.90  
AA4 25 to 1300MHz Compact £19.90  
AB118 High Performance VHF Airband £18.80  
SPA4 Scanner Pre-amp. 4 to 1300MHz £15.90

#### RECEIVER KITS

MW1 Medium Wave + 160M inc. H/W £29.90  
DCRx Single band 20, 40 or 80M £16.90  
DXR10 10, 12 & 15M SSB/CW £27.50  
TRF3 5.7 to 17MHz TRF £15.50

#### TRANSMITTER KITS

CTX40 40M QRP CW inc. crystal £15.50  
CTX80 80M QRP CW inc. crystal £15.50  
AT160 80 & 160M AM/DSB/CW £39.90  
MTX20 20M 10W CW inc. crystal £29.90  
HTX10 10 & 15M SSB Exciter 50mW £49.90  
HPA10 10 & 15M 10W Power Amp £39.90

#### TX TYPE ATU KITS

CTU30 30W HF & 6M with balun £39.90  
CTU150 150W 1.8 to 30MHz £49.90

#### ACCESSORY KITS

AP3 Auto Speech Processor £16.80  
MA4 Mic Amp with active filter £6.20  
CM2 Electret Mic with VOGAD £13.50  
CSL4 SSB & CW Filter for DcRx etc. £10.50  
DCS2 "S Meter" for DC receivers £10.90  
DFD4 Add-on Digital Readout £49.90  
DFD5 Digital Frequency Counter £54.90  
ST2 Side-tone/Practice Oscillator £9.80  
SWB30 SWR/Power indicator/load £13.90  
XM1 Crystal Calibrator LF to UHF £16.90

#### HARDWARE PACKS

Hardware packs contain custom made case, knobs, nuts and bolts etc. for the projects. There is not enough space to list them all here, but we have hardware to build transceivers, receivers and for most accessory kits. Please enquire for details.

### Top Value SWL ATU



The HOWES CTU8 SWL ATU covers medium and shortwave bands (500kHz to 30MHz). Increases wanted signals by providing impedance matching, and at the same time reduces spurious signals and interference with "front end" selectivity for the receiver. Kit contains case and all parts. Top value general coverage receiving Antenna Tuning Unit.

Reviewed in December Shortwave Magazine - "Recommended for all s.w.l.s"  
**Kit: £29.90 Fully assembled, ready to use: £49.90**

PLEASE ADD £4.00 P&P, or £1.50 P&P for electronics only kits.

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. Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

# Antenna Work

## Terrarium Antennas

I've been interested in unusual antennas. I've made v.h.f. antennas that sit in a window, and h.f. antennas that ran up a drainpipe. These antennas are made up from an adhesive backed copper foil that I found at a shop specialising in Terrarium ornaments.

The tape used is available in a variety of widths. I've found that I use mainly the 7/32in (5.56mm) wide rolls. These rolls cost only a few pounds for some 30+ metres long. The adhesive is very tenacious and sticks to glass very well. The copper side is very solderable, making joints very easy to create.

There are several widths of tape available up to about 25mm. I've also seen larger sheets, up to about 300mm square that could be used as earth planes for u.h.f. antennas. Out of the terrarium, into the pile-up perhaps.

Ian Wye G00KY  
London

## Ring Pull Ropes

How often have you cut and trimmed a length of polypropylene, or nylon rope, and then found it frayed and was impossible to get through the narrow holes? Then you found out that if you held a flame to the end, as you cut the rope, the end sealed and didn't fray anymore.

However, after sealing the end of the rope you found it had congealed into a massive blob that still wouldn't go through the hole. I suppose you then discovered that if you pulled the blob before it hardened you could get it to become a tapering blob, that will go through the holes. But, pulling molten blobs of nylon (or polywhatsits) removes vast areas of skin in the most painful way possible.

Enter my 'ringpull' method. You don't use a ringpull, but the rope is put through a ring (a washer with a suitable sized hole). Once the washer is in place you can set a match to the end of the rope to seal it, then smartly pull the rope back through the washer.

Pulling the rope through the washer tapers the molten blob into a hole-fitting size without causing blistered fingers. Go on, pull-a-ring-a-rope, it's safer!

Godfrey Manning G4GLM  
Middlesex

## QRP ATU For 50MHz

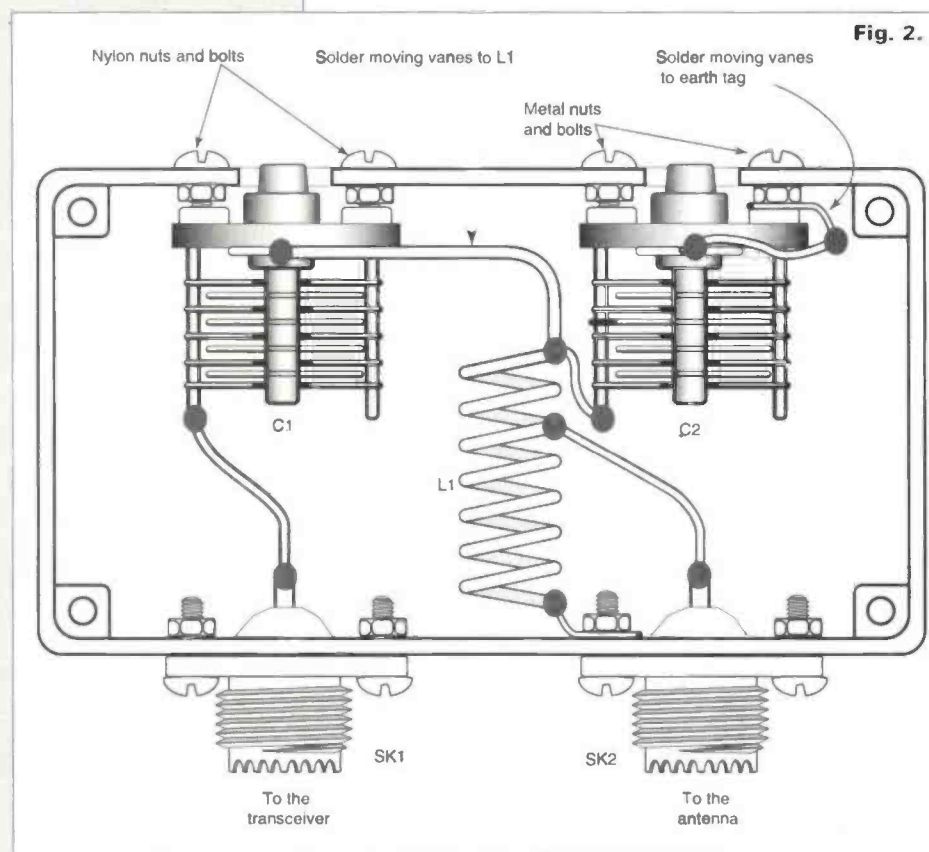
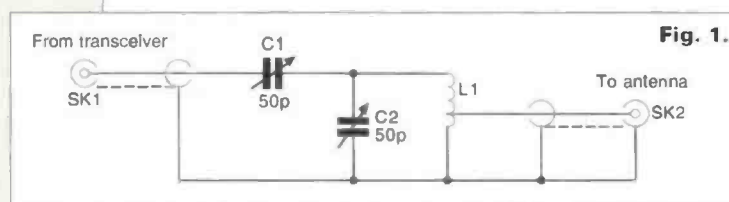
This compact unit should fit into even the smallest shack. Using this unit I can cure the mismatch from my 3-element Yagi. In fact, I can even load up the G5RV on 50MHz.

As you can see the circuit, Fig. 1, is extremely simple, both capacitors C1 and 2 are both 50pF (C804 types). The coil consists of seven turns of 1.5 - 2mm diameter copper wire wound with on a 15mm former. After winding the coil, the former is removed and the turns are pulled to cover about 21mm.

The output tapping point is two turns down from the 'hot' end as shown in the drawing, Fig. 2. Should you be unable to bring the s.w.r. down to unity, then try adjusting the tapping point one turn more or less.

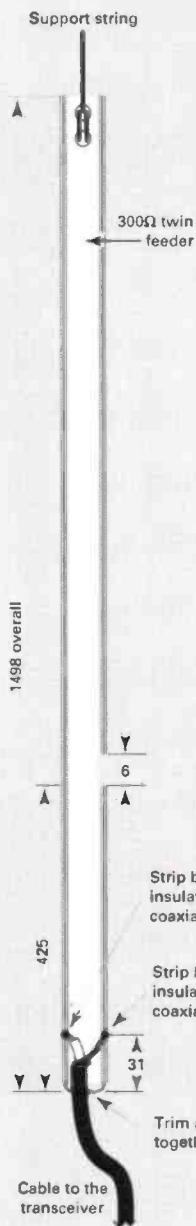
All the items I used came from the scrap box so it was a simple and cheap item to build.

Ken Grover G3KIP  
Tunbridge Wells



# rkshop

Antennas, ancillaries and ideas!  
One roll-up, a stick-up, a tune-up  
and some pointers to make your  
station prettier or safer.



## Pocket Pole

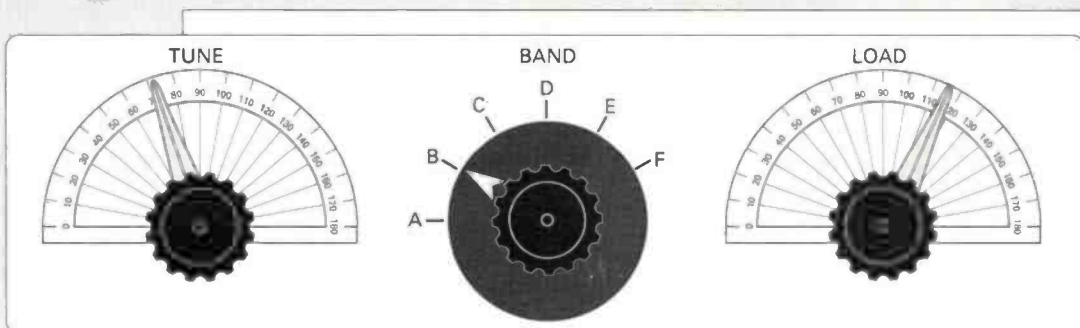
An easy to make antenna for 144MHz

One day at breakfast, while on holiday in Saint Johns (In 'VE' land), I was handed a single sheet of paper with the design for a portable 'J' pole antenna for 144MHz. I didn't have time to try it whilst I was over there, so it had to wait until I got back.

When I got back I built the antenna as described, but found that the v.s.w.r. was at least 3:1 over the band. Then it struck me that their band was wider than ours (144-148MHz) and that the design was resonant at 147MHz.

A few changes later I came up with the design shown here in Fig. 1. The v.s.w.r. was now acceptable over the band and makes a useful antenna to stick in a pocket when going out with the hand-held.

**Arnold Moon G3RGB**  
Middlebrough



**Scales From The Schoolroom**

**Fig. 1.**

I suppose that most of you haven't seen the humble 180° protractor since you left school however many years ago. But I have found an excellent use for them.

Have a look at the sketch, Fig. 1, if you are building your own a.t.u. then what better way to put a reference scale on it. I use white cartridge paper, or card, as the front panel. The protractors are stuck to the card with Copydex adhesive. I leave the panel drying overnight with a heavy weight on top of it to make sure it's flat.

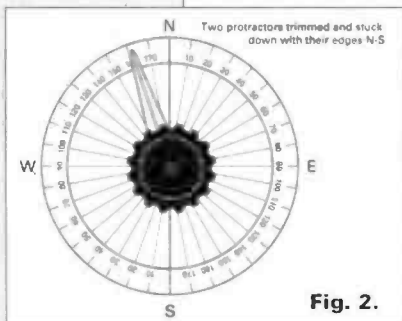
You could use an instant, cyanoacrylate, glue to fix the protractor onto the sheet. But for goodness sake don't use the polystyrene type of modelling glue. You will probably end up with an awful mess, as it will probably dissolve the protractor.

The pointers are from Maplin Electronics (order code HP47B) and are the pointers sold as being for the 6:1 reduction drive. But if you are a dab hand with tools, you could make your own.

Another idea is to glue two of them together as shown in Fig. 2. Make your own rotator scale with two of them. You will need to trim off the section below the 0-180° line on both protractors.

As scales for all sorts of projects, the humble 'school' protractor is unbeatable. There are two sizes, 100 and 120mm, available cheaply from many newsagents and other shops. Can you think of an easier way of creating an accurate scale?

**J. Bolton G4XPP**  
Co. Durham



**Fig. 2.**

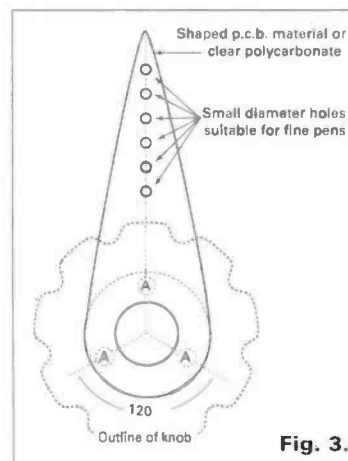
## Personal Pointers

Many times when looking for items to finish off projects I've come across a need for a pointer to attach to knobs. Being handy with a few tools has its advantages as the drawing of Fig. 1 shows, you just make one!

The beauty of making your own is that they fit the job in hand, and are just the right size. The drawing shows the type of knob that I tend to use. It was designed to have a pointer added, as it has three small threaded holes on the bottom suitable for 8BA bolts, (shown marked 'A' in the drawing).

A further possibility is to drill a series of small holes along the centre line of the pointer. If these holes are just big enough for a fine line drawing pen, then a series of fine parallel lines can be drawn around controls on the front panel. You can make up your own scales.

**William Andrews G3DVW**  
Liverpool



**Fig. 3.**

# Goodall's Goodies

John Goodall G0SKR has been busy looking at a range of antenna accessories and he's come up with some rather interesting gadgets.

This month I have had the pleasure to view some items having the common theme of antennas. But unfortunately this heading covers far too many items to list, even using every page of *Practical Wireless!*

However, with a small cross section of antenna-related equipment, I hope to whet your appetites with a number of items, some new and some not so new. So, here goes!

## Sigma Communications

Sigma Communications is a name that has been around for many years, though I feel not associated with amateur radio. Nowadays though, they produce no less than 150 wire antennas for the amateur radio market.

It would seem from the extremely comprehensive array of wire antennas and accessories, that aside from a general move to the 'Black Box' trend, radio amateurs would much prefer to purchase custom made wire antennas.

There are still many amateurs out there who enjoy the trials and tribulations of the home-brewed antennas. You know the 'twice round the garden - up the side of the house - over the roof - down the chimney and into the shack' type of wire antenna!

But why go to all the trouble? You can, for a few pounds, get a wire antenna, purpose-made for your location 'over the counter' and be up and running in a couple of hours.

Multi-band trap dipoles, multi-band trap slopers, single-band dipoles, single-band slopers, all-band balanced line antennas, off centre fed dipoles, shortened dipoles, baluns, antenna shorteners, lightning arresters are all available. This gives some idea of the extensive range available from Sigma Communication Products.



From Diamond Antennas, the SX-200 s.w.r. and power meter.

The MFJ-934 antenna tuner and artificial ground (top) and the MFJ Deluxe Versa Tuner II.



From the same stable of Sigma, I also reviewed a range of antenna shorteners. These comprised type SLC-40; SLC-80 and SLC-160. And as the name Antenna Shorteners implies, they do just that!

## Limited Space

For those with limited space, the 'Shorteners', are used singly for a vertical sloper, and two for a dipole. They are manufactured to the same high standard as the traps, and of the same high quality materials but having longer tubing between the end caps.

The SLC-40 is for 7MHz. It's 198mm long end-to-end and makes a dipole for that band only 11.5m long.

Next, there's the SLC-80 which is for 3.5MHz. This version is 248mm in length and makes a dipole at 21m long.

Then there's the SLC-160 for 1.8MHz. This model is 334mm long and makes a 'Top Band' dipole 30m in length.

All the Shorteners are for single band operation, on the bands specified. They provide a half-wave dipole for each with a maximum distance, end-to-end as I've already mentioned.

In practice, the SLC-160 for 1.8MHz Shorteners are inserted half way along each leg of the dipole. On 3.5 and 7MHz respectively, the SLC-80 and SLC-40 Shorteners are fixed at slightly over halfway from the centre connector, on each leg.

Due to shortened dipoles or slopers, having a narrower bandwidth than a full size half-wave dipole, a tuner could be used to increase this bandwidth. The Shorteners are available from Eastern Communications and are priced as follows: the SLC-40 7MHz version at £19.95 and the SLC-80 3.5MHz and SLC-160 1.8MHz Shorteners cost £21.95.

## Antenna Safety

It seems appropriate to include a mention at this point on antenna safety aspects. And to this end Sigma produce a couple of quality lightning arresters, and a small range of antenna coaxial switches incorporating lightning arresters.

To start off, there's the SLA-2000 lightning

arrester. This is a beefy little number contained in a die-cast aluminium box measuring 92 x 38 x 30mm, having an SO239 at each end, for operation up to 500MHz at 2kW.

The secret of the SLA-2000's efficiency is not just due to the usual spark gap protection, instead it uses a replaceable ceramic gas filled tube.

The gas-filled component is 8mm in diameter and 6mm deep and it's aptly named the 'Arc-Plug Cartridge Pill'. It's soldered within the SLA-2000, and it can also be found in the SLA-250 and the small range of antenna coaxial switches.

## Antenna Switches

There are two antenna switches, the Delta-2, or the four antenna switch the Delta-4 available for either SO239 or N type coaxial plug and socket fittings. The review model was the Delta-2N.

The Delta-2N is rather a large item, measuring 140 x 90 x 32mm deep. But the switch's cast alloy casing is also used for the four antenna switch models.

The Common output from the Delta 2, is on the upper edge, midway between the two Input connectors. The switch has three and five switched positions respectively.

The centre switched setting is the Earth position. This switches the centre conductor of all inputs to ground.

## Lightning Pill

The output of the switch is protected against lightning surges by the Arc-Plug Cartridge Pill. This ceramic pill can be replaced by simply unscrewing a carbon plug on the front of the switch, and removing the 'pill' with a magnetic screwdriver.

The instructions state that the ceramic pill will short to earth should your antenna system be unfortunate to suffer a lightning strike. The accompanying literature says that "The pill will remain shorted to earth and need replacing, in the event of a severe strike", but "will return to open circuit with a less severe hit".

A separate ground should be connected to both the arresters and the switches. A hefty brass



screw terminal on the SLA-2000 provides this facility.

The coaxial switches are provided with a connector, to attach to the ground lead and fasten under the left hand of two fixing holes. The alloy around this hole is milled to expose bare alloy for the purpose.

The SLA-2000, (500MHz at 2kW) is priced at £59.95 and the Delta-2 Coaxial Switch (500MHz at 1.5kW) costs £59.95.

The Delta-2N (1300MHz at 1.5kW) is available for £69.95 and the Delta-4 (500MHz at 1.5kW) costs £79.95.

Finally, the Delta-4N (1300MHz at 1.5kW) is priced at £89.95. The replacement cartridge pill costs £8.95 and although this price may seem high - but should we price safety?

## Flex-Weave

I also tried a range of reasonably priced wire antennas using Flex-Weave multi-strand copper wire. The range included the ever popular full size G5RV antenna at £45, with the half-size G5RV available at £35. There was also the full size G5RV Plus, having Flex-Weave copper wire and 450Ω feeder with balun at £68.95.

A half-size G5RV Plus was also available in the Flex-Weave copper wire, 450Ω feeder and balun, at £57.95. There was also a Windom type antenna covering 3.5 to 28MHz including the WARC bands, at £65.

Another Windom type antenna provided 7 to 28MHz, and is available at £55. There's a Long Wire Balun at £39.65.

Finally, there's a Long Wire For Restricted Locations. This comprises 20m of Flex-Weave copper wire, having an insulator at one end and the long wire balun at the other allowing coaxial feed from the long wire into the shack. This is an excellent antenna, and is the type I use for my own station, and it's priced at £59.95.

All the wire antennas can be obtained from Southern Scanning and Shortwave, who I should like to thank for the use of the review models.

## Antenna Analyser

Antenna analysers are fast becoming much sought after items for use in amateur radio. And some makes and models are more sophisticated than others.

Prices don't always reflect what levels of sophistication you are buying. You should always thoroughly check the specifications to establish if the item you are about to buy does the job you want it to do!

One relative newcomer to the world of amateur radio r.f. analysers is the Autek RF Analyst RF1. This is obtainable from Eastern Communications, at a moderate price of £159.95 inclusive of delivery within Europe.

Appearances are often deceptive when it comes to specifications and the microprocessor powered RF1 is no exception. Its black plastic casing measures only 105 x 65 x 38mm. Placing two standard audio cassette cases back-to-back will give you some idea of its size.

On its front or upper surface the RF1 has seven push-to-make microswitches. There's one for each of the following functions: Band Selector, Frequency Read-out, SWR Read-out, Z

(impedance) Read-out, L (inductance) Read-out, and C (capacitance) Read-out.

The RF1 also has a large 43 x 18mm four digit l.c.d. read-out; plus two sensibly-sized rotary tuning knobs. External connections are via the SO239 and an earthing post.

Although the RF1 is powered from an internal 9V PP3 battery (not supplied) it can be powered from any external d.c. source providing 6.5 to 15V at around 75mA. Sadly though, the unit does not have any external d.c. jack facility and connections for an alternative power supply would have to be through home-brew leads.

Instructions supplied with the RF1 are comprehensive and not over technical. They give details of how to operate and perform all of the many tasks and tests necessary.

On first powering up the RF1, after borrowing a PP3 from a nearby smoke detector, the first brief reading on the display gives the internal software version. In this case Pc 2.2.

The borrowed battery was from the Duracell range, and for those not familiar, this battery is of slightly larger proportions than the average 9V PP3 off the shelf. This slight oversize caused the battery housing cover on the review model to distort.

I didn't find any problem with the opening and closing of the cover on the RF1. The careful paring away of two small swages on the cover would have prevented the Duracell battery distorting the cover.

Microswitches are used for selection of the various modes of operation of the RF1. They require only a slight tap to operate.

Band switching on the RF1 toggles through the available frequency bands. This is (in the case of the review model) from 1.12 and 36.33MHz. Five bands are available giving the following coverage with coarse and fine tuning, one rotary knob for each.



The Autek Research RF-1 r.f. analyser.

Band	Coarse Tuning	Fine Tuning
1	1.120MHz - 2.364MHz	12 to 90 kHz
2	2.111MHz - 4.548MHz	21 to 130kHz
3	3.753MHz - 8.432MHz	31 to 165kHz
4	7.930MHz - 18.82MHz	47 to 170kHz
5	14.83MHz - 36.33MHz	60 to 320kHz

You can use the Autek RF1 to tune an antenna, cut one quarter and one half-wave coaxial cable for phasing or matching. It can also indicate the velocity factor of a length of coaxial cable, check baluns and carry out many more tests (too numerous to mention here!).

When tuning an antenna, by simply tapping the RF1's Frequency and SWR buttons together, the read-out alternates between the frequency in use and the s.w.r. reading. This makes life somewhat easy if you have to climb a tower! And in fact, pressing any two buttons together will cause the display to alternate between the two chosen readings.

## Highly Popular

One analyser that has become highly popular over the last twelve months, is the MFJ-259. This instrument has two moving coil meters plus a large clear l.c.d. display.

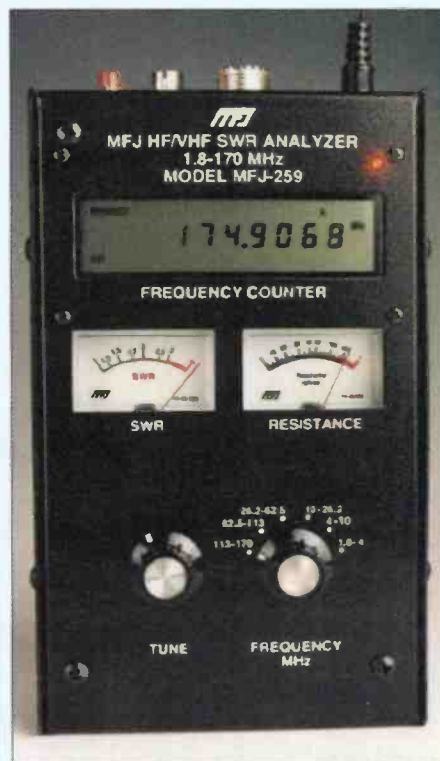
The MFJ-259 can also be used as a frequency counter. It can count up to 200MHz as well as analyse antennas operating on frequencies from 1.8 to 170MHz.

Although portable and having its own internal power supply, the MFJ-259 is powered from eight AA batteries and is much larger than the Autek RF1. Cased in black plastic covered aluminium the MFJ-259 measures 173 x 102 x 60mm. It can also be powered from any external d.c. power source giving between 8 and 18V, at around 200mA, via the unit's standard d.c. chassis plug.

Comprehensive instructions supplied with the MFJ-259 cover all aspects of its use. And for example, when it's used for tuning an antenna, the operating frequency is set on the l.c.d. read-out. This is done by switching the multi-position inductor switch to the relevant position and then turning the left hand tuning knob until the exact frequency required is displayed.

On the MFJ-259's two moving coil meters the s.w.r. can be read from the left hand meter, and the resistive load measured on the right. Additionally, by simply altering the rotary tuning knob, the resonant frequency of the antenna can be quickly found.

Used as a frequency counter, the MFJ-259 has four different gate times for measuring frequencies from a few Hertz to 200MHz. The gate time on power up 0.01sec with 0.1sec, 1sec, and 10sec being available on each press of the Gate Time push button on the top of the case.



The MFJ-259 h.f./v.h.f. s.w.r. analyser.

## ANTENNAS

Antenna input on the MFJ-259 is via an SO239 socket. The frequency counter input employs a BNC socket, and both are fitted on the top of the case.

Testing and the tuning of stubs, transmission lines, determining the velocity factor and a host more tests are possible with the MFJ-259. I think it's an extremely useful piece of equipment for the amateur radio operator.

Priced at £249.95 the MFJ-259 is available from **Waters & Stanton Electronics**, as is the optional foam-filled pouch to protect the instrument in use. (The pouch catalogue reference is MFJ-29) and it costs £35. I think it's well worth buying so as to protect your investment in the MFJ-259.

### Budget Priced



**The MFJ h.f. s.w.r. and wattmeter.**

While looking at meters I reviewed a budget priced s.w.r./power meter which is useable on h.f. frequencies from 1.8 to 30MHz. This model, the **MFJ-816**, also reads s.w.r. and power up to 300W.

Power measurement on the MFJ-816 is provided in two ranges, up to 30 and then 300W. It's small in size (measuring 112 x 76 x 58mm) and is ideal for mobile or portable use. Connections to the transceiver and antenna are made via SO239 sockets on the rear panel of the meter.

On the front panel the MFJ-816 has a small but easy to read meter. This has calibrated scales for s.w.r., power 300W and power 30W. There's also one push **On/push Off**, **Forward/Set** and **Reflected/SWR** switch and the rotary calibration knob with marked settings for 30 and 300W.

The MFJ-816 is simple to use and comes complete with circuit diagram and instructions. It's priced at £35.95 and is available from **Waters & Stanton Electronics**.

### Diamond Variety

Diamond Antennas produce a variety of s.w.r./power meters. I had just a 'taster' in the shape of the **Diamond SX-200 Precision SWR:Power Meter**. All meters from Diamond are manufactured to an extremely high standard and are state-of-the-art in technology, design and finish.

The SX-200 measures 155 x 105 x 62mm, and it has a large moving coil meter with easy to read scales for high and low power, s.w.r., and 5, 20 and 200W power levels. Three triple position switches control **Range**, **Function** and **Power**.

The **Range** positions reflect the scale readings, 200, 20 and 5W. Function positions are **Power**, **Calibrate** and **SWR**. The **Power** switch positions are **Reflected**, **Forward** and **Off**.

Also on the Diamond SX-200's front panel is the rotary **Calibration** knob, together with a push

**On/push Off**, and **Peak Envelope Power**, in position/ **Average Power Out** position switch. The rear panel houses the two SO239 antenna and transceiver connectors along with a d.c. power chassis plug.

The rear mounted d.c. Input chassis plug on the SX-200 allows coupling to an external 13.8V d.c. source, via the supplied power lead. This power source is not essential for the efficient operation of the meter, and when this facility is used, immediately the **Power** switch is moved from the **Off** position, the meter dial is illuminated. The SX-200 can be obtained from **Waters & Stanton Electronics** for £94.95.

### Tuning Units

Two antenna tuning units now from the MFJ stable. They are the **MFJ-949E** and the **MFJ-934**, (a newcomer to the scene).

The MFJ-949E, is described by MFJ as being a "Deluxe 300W Tuner" and has been around for quite a time. The manufacturers say that in a recent survey of world-wide radio amateurs "It proved to be one of the most popular of tuners". The a.t.u. is priced at £169.95, has eight switched antenna positions, four via the tuner and four through the tuner.

The MFJ-949E offers two coaxial line inputs, one balanced line input via a 4:1 balun, a long wire input and an internal 300W dummy load. Three tuning controls make operating this tuner a simple exercise to tune almost any antenna to any transceiver.

The MFJ-934 is a relative newcomer to the UK amateur radio market. It's an a.t.u. that comes complete with an 'artificial ground'.

Any radio amateur who has a shack on upper floors or in fact live in flats, will have come across at some stage the problem of r.f. ground. And to help, MFJ have produced a unit which will match any transmitter to almost any antenna. Additionally, the artificial ground circuit within the tuner cancels out any reactance of a ground lead or counterpoise.

The MFJ-934 uses a 'T' network and operates on all amateur bands from 1.8 through to 28MHz. The manufacturers claim it will work on dipoles, inverted 'V' antennas, verticals, wire antennas, beams and even mobile whips. After trying it, I think the claims could well be correct.

The tuner unfortunately only offers one coaxial input and a long wire or balanced line input. Only one of which can be connected at any one time.

The circuitry for the ground matching, together with the two controls on the front panel for this purpose take up space in the unit. The result is they've substantially reduced the size of the twin needle meter which is now synonymous with the name of MFJ.

To the left of the meter on the MFJ-934 are the ground matching capacitance and inductance controls, whilst to the right is the (smaller than usual) meter. This does I feel, make reading the meter, for those of us without 20/20 vision, somewhat difficult. Having said that, after frequent use, the various important positions of the needles on the meter, can be memorised, not too difficult even for me!

Initial operation of the tuner starts with adjusting the ground capacitance control to '0' and the ground inductance twelve position



**The Delta-2 coaxial switch and surge protector.**

switch to 'A'. The antenna controls are then adjusted to give the lowest s.w.r. reading.

Next, the ground matching controls are adjusted to give maximum forward current. Then the antenna matching controls are again adjusted to give minimum s.w.r. readings.

### Simple Counterpoise

The artificial ground used with the MFJ-934 is achieved via a simple counterpoise. This should have a physical length of as near as possible to one quarter wave of the operating frequency, or multiples thereof.

All instructions supplied with both the MFJ tuners are comprehensive, and easy to understand. The MFJ-934, although not having the facility to by-pass the tuner, is I think good value for £189.95.

Finally, there's also a simple but essential piece of equipment for every shack in the form of a dummy load. It's available in the form of the **MFJ-264**.

The MFJ-264 is an air cooled, 100W for 10 minutes or 1.5kW for 10 seconds unit. It's useable up to 750MHz and costs £79.95.

I don't think instructions should be necessary with the MFJ-264, but I feel one part could have been omitted. I have in mind the part where MFJ state "should the unit become too hot - the cooling process can be speeded up by immersing the load in a bucket of water". Radio shacks and water **do not** mix in my opinion!

Well, that's the lot. I hope you've found something of interest. I certainly enjoyed researching, trying and preparing the article! And of course, my thanks go to all the suppliers of the review equipment. **PW**



**A 1.5kW dummy load unit from MFJ, the MFJ-264.**

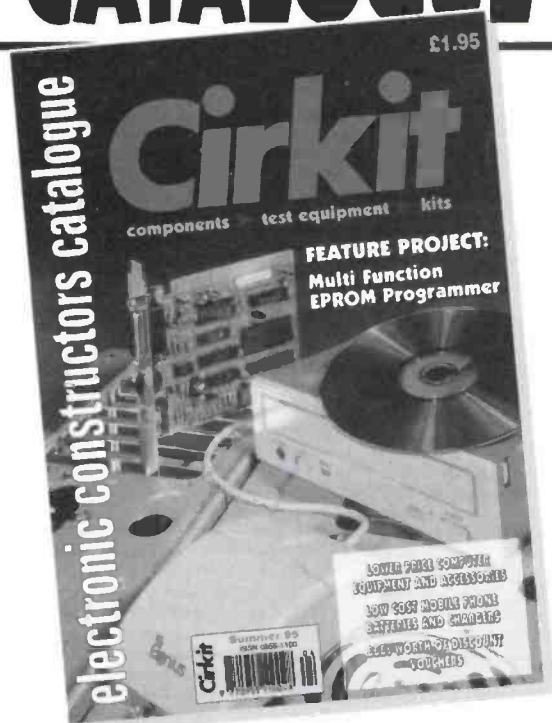
### Contact addresses:

**Waters & Stanton Electronics**, 22 Main Road, Hockley, Essex S55 4QS. Tel: (01702) 206835, FAX: (01702) 205843.

**Eastern Communications**, Cavendish House, Happingburgh, Norfolk NR12 0RU. Tel: (01692) 650077, FAX: (01692) 650925.

**Southern Scanning and Shortwave**, PO Box 2126, Bournemouth, Dorset BH11 9YH. Tel: (01202) 590779.

# SUMMER 1995 CATALOGUE



The Summer '95 edition has 280 pages packed with over 4000 products and now with news and features including a full construction project.

- ▶ The computer section is greatly increased with new ranges of equipment and accessories for PCs including:
  - Mother boards, CPUs and SIMMs
  - CD ROM drives and hard drives
  - Sound cards, I/O cards, disc drive cards and video cards
  - Mice, trackerballs and joysticks
  - Power supplies and cases
- ▶ Feature project for an EPROM programmer
- ▶ New 20MHz 'scope from Leader, training systems from Flight and an extended range of mobile phone batteries and accessories from Uniross
- ▶ Latest addition from Velleman kits including a video digitiser card
- ▶ 280 pages, 26 sections, over 4000 products from some of the worlds finest manufactures and suppliers
- ▶ Available at most large newsagents, from 13th April, or directly from Cirkit
- ▶ **Send for your copy today!**

**£1.95**  
+ 30p p&p

## Cirkit



### Cirkit Distribution Ltd

Park Lane · Broxbourne · Hertfordshire · EN10 7NQ  
Telephone: 01992 448899 · Fax: 01992 471314

# FREE BOOK

Join the Radio Society of Great Britain by Direct Debit and we will give you a **FREE** book!\*

Just look at at what you get from your membership:

- Radio Communication every month
- Use of the QSL Bureau
- Technical Information
- Planning Advice
- EMC Problem-solving
- Discount on books
- Access to RSGB Library and Museum
- Use of the HQ GB3RS Station

**AND**

A free RSGB book voucher to the value of £5 just by taking out a Direct Debit subscription.

\* This offer only applies to those taking out a Direct Debit subscription. Send completed forms including the Direct Debit mandate to the address below and we will send you a book voucher to the value of £5.

Send for a form **TODAY**  
from:



**RSGB (Dept PW395)**  
Lambda House, Cranborne Road,  
Potters Bar, Herts EN6 3JE

# The Two-Fold

**A**ntenna's can be unwieldy things. Especially when trying to transport them in the car to the local DX spot.

If you don't poke your eye out or upset the XYL, you mark the car's upholstery. Then you end up bending the elements of your masterpiece manoeuvring it in or out of the rear passenger door!

So, with all the problems in mind, I decided to design an antenna that would fold down to 550mm long x 50mm square. This little beam would have to be capable of either being pushed under the front seat of the car, or just the job for throwing in the boot, taking up no space at all.

I had considered a folding HB9CV, but discounted it because of the elaborate Z matching arrangement, which would not fold down satisfactorily. So, I set about to design the 'Two-Fold'.

## Beam Results

For the odd bit of DX hunting I think you need a beam of some sort to get results. A 2-element beam is the smallest you can get, (excluding quad loops) and being less to fold up, I chose this approach for the basic design.

Various samples were tried to maximise the gain. A 2-element beam has an optimum theoretical gain approaching 6dB over a dipole (though it's rarely achieved due to losses in matching, etc.).

However, aiming for 4-5dB gain is not unreasonable. With the parameters in mind, the format for the antenna was set.

*Kevin James G6VNT has come up with another interesting antenna design. This time Kevin describes a lightweight 144MHz beam antenna which packs a useful feature - it folds up for transport. There's no excuse for missing that portable operation now!*

## Optimum Gain

Optimum gain for a 2-element beam is achieved around an element spacing of 18% of a wavelength. At 144MHz this means a boom length of around 350mm. (This was increased slightly in this design purely to make it easy to fold up).

Further gain was realised by narrowing the bandwidth, which was centred around 144.300MHz. I achieved a narrower bandwidth by making the difference between driven and reflective element lengths smaller than you would normally use.

## Matching Problem

Reliable matching is always a problem with v.h.f. beam antennas. To help, I chose an unbalanced straight gamma matching arrangement, mounted on a p.c.b.

The matching unit provided good s.w.r., repeatability, ease of adjustment and stability. All the parts should be available at most rallies, and I bought the aluminium tubing used on the prototype from a local TV antenna manufacturer for a couple of pounds.

## Building The Antenna

The task of building the antenna should be well within most constructor's capability. Provided you have some basic d.i.y. constructional skills and a few tools there should be no problems.

You'll only need a vice, padsaw, file, screwdriver, pliers, soldering iron, and drill. Basically, these are all the tools you need. You can now start the construction stage by looking at the information provided in the diagram, Fig. 1.

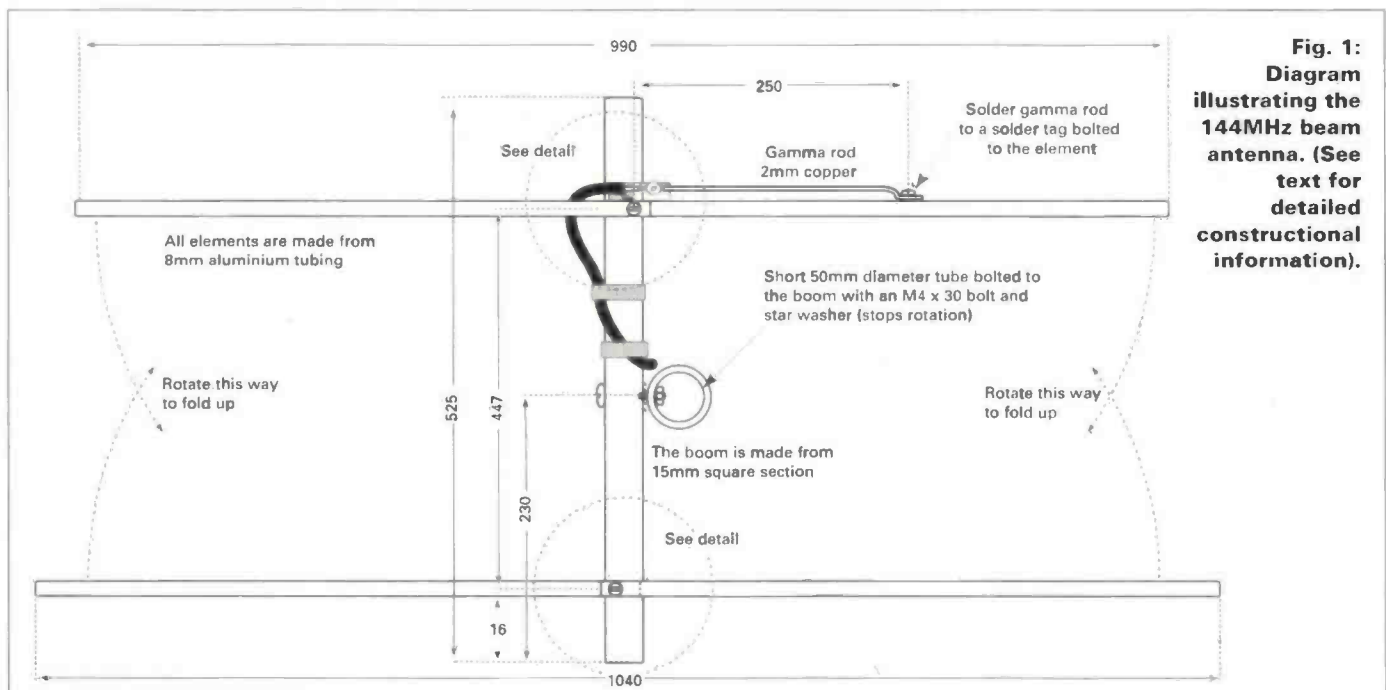
Take a length of 15mm square aluminium tube and cut it to 525mm. This will form the boom of the antenna. Then drill the two 3.5mm holes in the top and a single 5mm hole in the side where shown.

A small groove should now be filed across the boom over each hole. This helps stop the elements rotating whilst it's being hoisted aloft.

The front and rear elements on the antenna are divided in two. This enables them to fold up when not in use thus halving the size of the beam. (For element lengths, refer to Fig. 1).

You now have to drill 3.5mm holes, 10mm in from one end of each half of an element. These will be bolted one half on top of the other, onto the boom.

When the antenna is in the unfolded state,



**Fig. 1:** Diagram illustrating the 144MHz beam antenna. (See text for detailed constructional information).

the front or driven element should have an overall length of 990mm, and the reflector 1040mm. The diagram Fig. 3 shows more detail as to how the folding antenna is constructed.

## Gamma Matching

You'll see from Fig. 2, that a small p.c.b. holds the gamma matching rod and reactance trimming capacitor. It also doubles as a cable clamp.

The cable clamp was found to be very important. This was because after using the prototype antenna a few times, I found that the centre core fractured at the solder joint due to flexing.

Basically speaking, the adjustable capacitor balances out the inductance of the gamma rod. The p.c.b. on which it's mounted, is assembled under the front left hand element so that the large pad is in contact with the element itself.

A small cable tie is passed through the remaining hole. This acts to clamp the RG58 coaxial cable to the board.

I suggest you avoid the use of excessively long lengths of RG58 from the antenna to the radio. This is because the attenuation per metre is quite high at these frequencies.

In practice I recommend that you use no more than four metres, as appreciable losses will be incurred. The RG58 cable was chosen because of its flexibility, particularly in cold weather.

The gamma matching rod itself was made from 14s.w.g. enamelled copper wire. Once formed, it's then soldered between the solder tag on the driven element and the pad on the p.c.b. Follow the gamma length and spacing carefully, or the residual s.w.r. will be high.

## Single Sided Board

The p.c.b. can be made taking a piece of 1.6mm single sided board material. I recommend covering the copper laminate surface with pvc tape or similar material.

Cut the tape off with a sharp knife in the areas where copper is not required. Next place the board in a bath of p.c.b. etchant and agitate until all the uncovered copper is etched away, then drill as shown in the diagram.

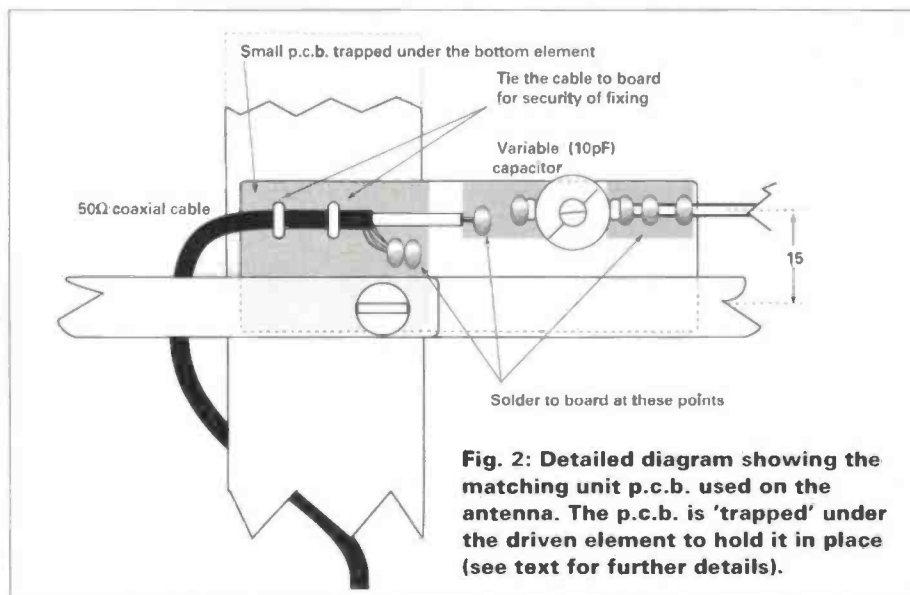
## Portable Mast

I've had a portable telescopic mast for years, and I really think that one should be part of the portable enthusiast's standard kit. Mine was pressed into service yet again with this antenna.

The portable mast basically consists of three 1.25m lengths of aluminium tubing. One has a diameter of 16mm, there's one of 19mm, and finally one of 22mm.

All the mast sections slide conveniently one inside the other. The imperial sizes of the diameters are 5/8", 3/4", and 7/8" respectively.

Springs used in caravan awning stays are fitted on one end of both inner tubes at 25mm in. A 6mm hole is drilled at this point and the spring is pushed down inside the tube until the formed button part pops out through the hole.

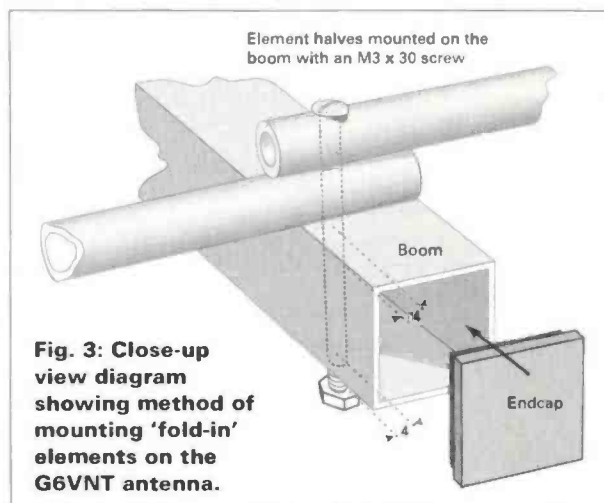


**Fig. 2: Detailed diagram showing the matching unit p.c.b. used on the antenna. The p.c.b. is 'trapped' under the driven element to hold it in place (see text for further details).**

The formed button pops up and into a 6mm hole in the end of the preceding tube. This is also 25mm from the end, and when the mast is fully extended, stops it all collapsing.

Fortunately, the springs are available in most camping shops on the 'Pick-a-Pak' stand for a few pence. They fit a variety of sizes of tubing.

A nylon plug with a 75mm steel spike embedded in it, (used on awning stays) is also available, fitting into the end of a 7/8in tube. This is hammered into the bottom of the mast, and pushed into the ground for stability during in use.



**Fig. 3: Close-up view diagram showing method of mounting 'fold-in' elements on the G6VNT antenna.**

## Setting-Up

Setting-up is easy. Start the process by placing the antenna on top of the un-extended mast, and then stick the mast into soft ground in an open space.

Make sure all elements are parallel and rotated correctly. Now with your s.w.r. meter in line, transmit on low power adjusting the small trimmer on the gamma matching unit with a plastic trimming tool for the lowest available s.w.r. (Once the antenna adjustment is set it should not be necessary to do it again - unless it's knocked somehow).

Now, with some old rag wrapped around the lower part of the mast (so as not to scratch the car), tie it to a door handle or wing mirror with a rubber 'bungy' rope (as used on roof racks). Stick the spike in the ground for stability, extend one section, place antenna on top of mast, then hoist to full height and you're ready to go on air!

## On The Air

I used my Kenwood TS-751E for on-air tests as it's a stable and reliable signal source. I also used a reference antenna (HB9CV), and the mast already described.

With a reading of S9 on the front-end of the beam from a constant signal source at 100ft, swinging the antenna through 180° gave an S4 from the rear. Not a bad front-to-back ratio for only two elements!

Gain (when compared to my standard HB9CV) was identical. The null on the back of the new beam was not as deep as the HB9CV, but I considered this to be a small price to pay for the fold-down portability.

Finally, as the matching unit is open to the weather don't use the antenna in pouring rain it will ruin the capacitor! The whole area could be covered in a silicone sealant (bathroom sealant) after adjustments are complete. But I haven't tried this idea to see how much the antenna is detuned by adding the sealant.

## Memorable Contacts

I'm pleased to report that I've had several memorable contacts to date on this antenna. The QSOs all earned 5 and 9 reports and I'm only awaiting lift conditions to exploit it even further.

And I round off with a final tip. Always choose a good DX spot, it's worth half a dozen elements on a beam...so good hunting on 'two'!

PW

## EQUIPMENT

## SPECIFICATIONS

Ian Poole G3YWX answers the question "What Is Direct Digital Synthesis"?

**M**ost frequency synthesisers used in amateur rigs today use a phase locked loop (p.l.l.) oscillator as their basis. Now a new form of synthesiser known as a Direct Digital Synthesiser (DDS) is starting to appear.

These synthesisers have a number of advantages over the more common p.l.l. versions. But in view of their cost they are generally restricted to the higher priced sets.

### Different Concept

The direct digital synthesiser uses a totally different concept to its more familiar p.l.l. relations. As the name suggests it synthesises or generates the waveform in a direct fashion.

The DDS makes up a digital representation of the waveform which it then converts into an analogue format. After this, the waveform is filtered and amplified as required.

The basic synthesiser consists of four basic blocks. These are a phase accumulator with its reference oscillator and setting information input, a waveform map which is normally a PROM or ROM, digital to analogue converter (D to A), and filter possibly with an amplifier as shown in Fig. 1.

To understand how a direct digital synthesiser works it's necessary first to look at an ordinary sine wave. By looking at Fig. 2 you'll see this is a repetitive waveform, and any point on it can be defined by giving its angle as shown in the diagram. Not all points on the waveform map need to be used.

In fact, the amplitude of the waveform is equal to the sine of the angle for any particular point. The angle at any given point is known as its phase, and as the signal progresses through the sine wave its phase angle progressively increases from 0° to 360°.

The first stage in the synthesiser is the phase accumulator. This is basically a counter which adds a given number to its value every time it receives a clock pulse. When it reaches its maximum value, it resets and returns to zero.

The value held in the phase accumulator is proportional to the phase. As it increases this is equivalent to the phase of the sine wave increasing. Once the maximum value is reached the wave starts all over again.

The next stage is to convert this phase into a digital representation of the signal itself.

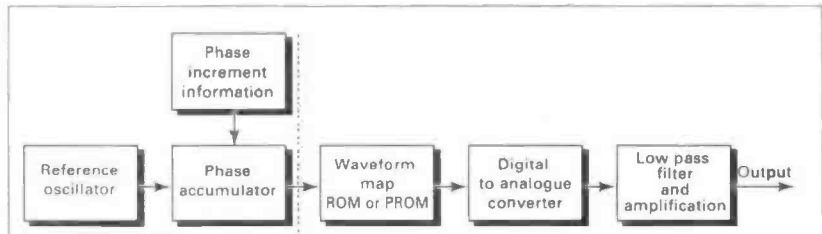


Fig. 1: A block diagram showing the four stages of a basic synthesiser (see text).

This is accomplished by using a PROM or ROM. This stores the digital value of the sine wave for any given value of phase.

Once the digital value for the particular point on the waveform has been generated, it's converted into a real analogue voltage by using an i.c. called a digital to analogue converter. The output from this is then filtered to remove any unwanted signals which may have been produced.

### Number Of Steps

The phase accumulator and waveform map have a very large number of steps. These are way above the limit required to generate a very good representation of the signal.

Often many million points will be stored. If each one was accessed in turn then only one frequency would be available because the reference oscillator is normally crystal controlled and very stable.

The large number of points are stored so that the frequency can be changed. It's not necessary to use every sample and it's possible to change the rate at which the phase advances simply by altering the step size.

For example, one frequency may be generated by adding 5045 to the accumulator at each clock pulse. Then the next frequency is generated by adding 5046, and so on.

A typical phase accumulator may have a 24bit resolution. This will give just over 16 million points on the curve. When clocked with a 5MHz signal it will give a resolution of just 0.25Hz - more than sufficient for any amateur purposes.

### Number Of Advantages

Direct Digital Synthesisers are more expensive than their phase

locked loop counterparts because they demand very high speed i.c.s, and the technology is relatively new. However, it's to be expected that as they become more widespread prices will fall.

Despite the cost, DDS offer a number of advantages. The most important for amateur applications is that they are likely to give a lower level of phase noise than their p.l.l. counterparts. This will result in a much better reciprocal mixing specification.

Direct digital synthesisers can also operate over a very wide frequency range. They are not limited by the range of the oscillator.

The wide frequency coverage makes DDS ideal for any receiver covering a very wide band. Their frequency is only limited by the speed of the i.c.s and this places a top limit on their operation. This means that in many applications they are combined with a p.l.l. synthesiser to obtain the best of both systems.

That's all for this month. I hope I've helped to answer some of your questions surrounding Direct Digital Synthesis. Next month I'll be looking at things to consider when buying a second-hand radio.

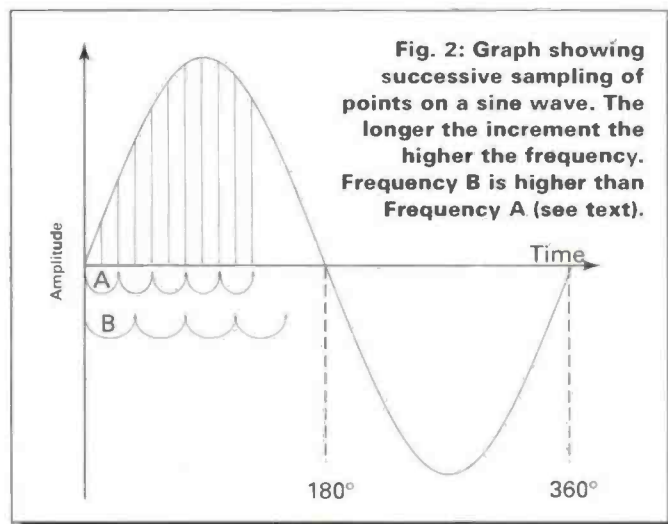


Fig. 2: Graph showing successive sampling of points on a sine wave. The longer the increment the higher the frequency. Frequency B is higher than Frequency A (see text).

**NEW MEMBERS  
SPECIAL OFFER**



**MEMBERS SAVE £££'s  
JOIN TODAY!**

# The United Guild of International Photographers

Even if you are a person who only takes photographs on holidays abroad or just occasionally for fun – you will benefit by joining us. We have special offers FREE NEWSLETTERS and discounts to both ensure you increase your enjoyment and improve your photographic art. Nobody is too old to join us and few are too young. If you love life and people or simply want to save money and develop your interests, please join us today. We can even help you to become an award winning photographer.

*Join us and ENJOY LIFE.*

**AMATEURS – JOIN US TODAY  
& SAVE ON EVERYDAY COSTS**

**PROFESSIONALS – JOIN US TODAY & SAVE ON  
EVERYDAY COSTS – *your account is open***

## THE COST OF JOINING US IS LESS THAN THE PRICE OF THE FREE GIFTS YOU RECEIVE

*Each new member will receive free of charge:-*

- 10 x FREE 35mm films RRP £29.90
- 10 x FREE enlargements up to size 12" x 8" RRP £40.00
- 2 x FREE membership window stickers RRP £6.00
- 2 x FREE 'Official Photographer' badges RRP £8.00

**Total value of FREE gifts . . . £83.90. Plus £25,000?**

**£25,000? PLUS £25,000?**

As a member you will have low cost access to our laboratory services, which use the most modern equipment available in the world today. We are currently offering TO MEMBERS ONLY:-  
Developing and printing each film up to 39 exposures. Prints size 6" x 4". Price just £2.00 x 2.5 'X' rated  
Printing enlargements up to size 12" x 8" price just £1.00 x 2.5 'X' rated.  
Printing 6" x 4" reprints price just 20p each x 2.5 'X' rated

Application form – please complete and send FREEPOST today together with your cheque for £44 to cover 2 years membership  
Cheque to be made payable to: THE UNITED GUILD OF INTERNATIONAL PHOTOGRAPHERS  
**YOU MAY PHOTOCOPY THIS APPLICATION FORM**



MEMBER  
REF: 9185

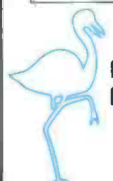
Surname ..... First names ..... Mr/Ms

Address .....

Please tick this box if you wish us to send you a free national lottery instants ticket – top prize £25,000

Please post today together with your cheque for **£44.00** to:  
**THE UNITED GUILD OF INTERNATIONAL PHOTOGRAPHERS, 84 Victoria Road, Horley, Surrey RH6 7AB.**

*Please mark envelope FREEPOST and no postage stamp is necessary*



**GET YOUR BARGAINS – JOIN US TODAY!**  
FOR A FULL MEMBERS ONLY PRICE LIST, PHOTOGRAPHIC HELP LINE AND FURTHER DETAILS, OFFERS AND DISCOUNTS AVAILABLE ONLY TO MEMBERS, TELEPHONE NUMBER FOR MEMBERS AND NON-MEMBERS IS

### 01839-393 001

Calls cost 39p per minute cheap rate and 49p per minute at all other times



# Friendship - The Key To Ireland's Amateur Radio



*In May, Rob Mannion G3XFD, accepted a long standing invitation from Irish friends and ventured over to the Emerald Isle again. It seems that friendship was the key that opened the green door to the famous Irish hospitality for EI/G3XFD!*



**Above: The man who started it all! John Taite EI7BA (the Leprechaun himself) invited G3XFD to stay in Cork.**

**Right: Members of the Cork Club made Rob Mannion very welcome. Aedan EI3EG (front row, second from right) set G3XFD quite a task. He wants someone to read all of PW onto cassette each month. Can you help?**



Anyone who doubts the welcome awaiting them on entering Ireland is in for a shock. The welcome waiting is overwhelming and there's no doubt you'll want to go again!

My old friend **John Taite EI7BA** was at the bottom of it all. 'Echo India Seven Bad Apples', as he phonetically calls himself on the air, had been trying to get me to visit Ireland again for a very long time.

Well, to cut a long story short, after a lot of arranging I found myself on the Pembroke Dock to Rosslare ferry bound for County Cork as the guest of EI7BA, the Irish Radio Transmitters Society, the Cork Club and the Cashel Club in County Tipperary.

I was due to be in Ireland for a week, staying in the old Coastguard Station at Power Head, near to Cobh Harbour in County Cork. It turned out, like the welcome I received from everyone, to be a delightful place to stay. I soon realised that it was a mistake to come for just one week!

## Club Talks

While in Ireland I was due to give some club talks, chat about *PW*, meet old friends and make new ones. However, I was soon in the debt of the President of the IRTS, **Jim Ryan EI3DP**, because he'd arranged that I was to visit only two clubs, rather than three or four. And as it turned out...he did the right thing!

Also, it was my pleasure to have lunch with another magazine Editor. This happened when **Dave Moore EI4BZ**, the IRTS Newsletter Editor took me out to lunch.

Our lunch turned into an afternoon and I ended up fully appreciating that running a national radio society magazine is more difficult than *PW*. I only have to run *PW*, I don't have to do another job during the day as David does.

I had already had a sample of the welcome waiting for me as I travelled from the ferry at Rosslare towards Cork. John EI7BA and all the others were sitting on the Cork 144MHz repeater channel and even at a distance of 100km (warning to all British drivers...all distances in the Irish Republic are now in kilometres, even though they resolutely refuse to metricate a pint of Guinness!) they were waiting up for my very scratchy signal into the repeater.

On Monday May 22 I was guided into the Cork Club by Jim Ryan EI3DP. Without his help I would never have arrived, and that would have been a great pity because several club members had travelled great distances to attend.

The actual club talk about *PW*, its history and what we're planning in the future, went down very well. They were a very appreciative audience and one or two showed me copies of the magazine dating from the 1930s and 1940s.

Also during the meeting, I met **Aedan O'Mara EI3EG**. Aedan is a Vet who gradually lost his sight over the years. But although now completely blind, Aedan now works for the Irish Government Veterinary Service and he's set me a really difficult task!

Aedan EI3EG wants me to find someone to read **ALL** of *Practical Wireless* onto cassettes each month. Do you live in Ireland and can you help? It's likely to be quite a job, but if you'd like to help, please contact me at the *PW* office.

I was quite unprepared for the buffet meal, which was provided after the talk. The Cork Club provided mountains of sandwiches, good humour and rounded off the evening with yet another surprise.

The surprise came in the form of a hallmarked solid Irish silver medallion. It had been engraved with my name in Gaelic, 'Rubard', inscribed in ancient 'omish' writing.

**Dick Bermingham EI6HH** and **Antony O'Rourke EI2HY** presented it to me on behalf of the club, then told me that they think 'omish' (it consists of groups of horizontal lines either side of a vertical line, similar to a code) probably inspired Samuel Morse. He happened to be sailing back to America from Ireland when he dreamed up the code that now bears his name!

I finally arrived back at Power Head at 1.30am! It had been a wonderful evening. I was alright but poor Jim Ryan EI3DP, the IRTS



**Dick Bermingham EI6HH and Antony O'Rourke EI2HY present G3XFD with an inscribed Irish silver medallion on behalf of the Cork Club.**





President (who guided me back through the remote country lanes), had to go to work later that morning.

## Cashel Club

Really speaking, I should have been prepared for the next helping of Irish Amateur Radio hospitality at the Cashel Club in County Tipperary. But their kindness and the welcome still took me by surprise.

I'd had a leisurely drive through the beautiful countryside, had a ride on a (brand new) Irish train from Limerick Junction, before arriving in Cashel. Cashel, as you may have guessed, is Gaelic for 'castle', and it's aptly named because the town is dominated by a fortress, complete with church and ancient fortified tower.

The club, which has only been formed fairly recently, meet in a room above a pub. It looked as if there wasn't going to be enough room for everybody, but we all managed to squeeze in.

I had been busy on 144MHz just after my Labrador Mandy and I had our tea. This was when Hugh O'Donnell EI2HI welcomed me over the air.

Hugh had driven close on 100 miles to be there, as he was a founding member of the club, despite the fact he was working on the other side of Cork. I found out later that he drove back to work after the meeting! (I hope it was worth it Hugh).

**The Cashel Club in Tipperary provided another really enjoyable evening for G3XFD. In front of the friendly throng (to Rob's left) are Liam EI7FE and Janet. On the far right of the picture is Jim Ryan EI3DP, President of the IRTS, with Jim Barry EI8GS to his immediate right.**



## Late Finish

It was another late finish, with plenty of food (they'd heard of my appetite!). However, it broke my heart to have to leave the two pints of Guinness they had served up for me!

Finally, I had to say cheerio to all my new friends at the Cashel club, wishing Liam O'Brien EI7FE and everyone else a goodnight at close on midnight. And I didn't even have to worry about finding my way back to my temporary home as Jim Ryan EI3DP, with Jim Barry EI8GS driving, accompanied me most of the way.

Again, I got back to Power Head at nearly 2am. It had been a wonderful day and I had met

many old friends, and made many new ones.

I slept well that night (or should I say morning) and had a good session on the air later that day. But all good things had to end and I headed for home on Saturday May 27.

However, I enjoyed it so much that I'm going back in the first week of October this year. So, if you'd like to work EI/G3XFD, you can do so later in the year, thanks to the goodwill of John Taite EI7BA and the East Cork Contest Group - EI7M, who extend the welcome and facilities.

Listen out for me on 3.5 and 7MHz. I'd enjoy a QSO with you from Power Head, and thanks to our EI friends in Cork...I can!

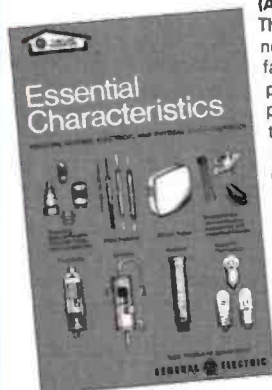
PW

# Valve Book Victory!

One of the biggest problems for anyone contemplating working with valves nowadays...is finding information on particular valves. However, Rob Mannion G3XFD has scored a distinct victory in support of 'valve & vintage' enthusiasts by discovering some interesting American valve data reference books.

On my recent trip to the Dayton HamVention I was delighted to discover some very helpful valve (or should I say 'tube') reference books for sale. I immediately thought of the large number of readers who call us asking where they can buy books with valve details. Well, I've found some and I can tell you they're fascinating to read...even if you're not working with valves! And of course, they're to be found on my bookshelf now!

**Essential Characteristics (Tubes & Transistors)**  
(Original Publishers General Electric)  
Re-published by Antique Electronic Supply (Arizona).



This stiff covered, novel-sized paperback facsimile book is printed on good paper and is packed throughout with information, and connection details (base pin charts) on receiving valves, special purpose valves, cathode ray tubes, thyratrons (still used some older oscilloscopes!), vidicons and many

others (including semiconductors). I regard it as being extremely useful, and (bearing in mind it's a facsimile publication) even the small print is clear and easy to read, even for those of us who are at the bi-focal stage. Highly recommended as a valve reference book. 475 pages. £9.95.

**RCA Receiving Tube Manual**  
(Original Publishers Radio Corporation Of America)  
Re-published by Antique Electronic Supply (Arizona)

This novel-sized stiff covered paperback book is absolutely fascinating for anyone interested in valves! In reality it's a designer's handbook with potted details, characteristic curves, information and descriptions of typical applications for each valve listed. It's even got a section showing receiver circuits and applications! Thoroughly indexed, this is a one valve book I've been looking for, for a very long time. Again, it's a facsimile copy but the quality of reproduction is excellent. If you get a copy I'm sure you'll find yourself building with valves again...particularly the circuits RCA provide. My book is my top choice of those I saw in the USA. Excellent reading and reference. 384 pages. £9.95.

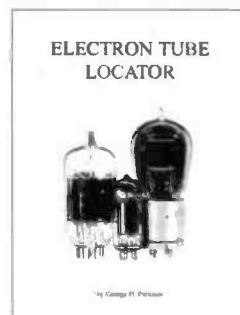
**RCA Transmitting Tubes**  
(Original Publisher Radio Corporation of America)  
Re-published by Antique Electronic Supply (Arizona)

This is a stiff covered paperbacked novel-sized book. And if you've got an interest in transmitting with valves...this is a useful reference source for valves up to 4kW input. The information on the 807 valve (for example) runs to two pages. With a good reference section, I consider it would be a good buy for anyone contemplating building a valved linear. I was amazed

to find out (for example) that RCA state that the 807 can be used at up to 85MHz (officially!). The RCA authors have also included some interesting practical circuits using their valves, including some for s.s.b., v.h.f. (there's an interesting project for 50MHz) and others. Highly recommended reference source. 318 pages. £9.95.

**Electron Tube Locator**  
George H. Fathauer  
Published by  
Antique Electronic Supply (Arizona).

A spirally bound (opening flat) style book, this should prove to be of great interest to valve collectors, historians and anyone trying to identify particular valves. The author has gone to a lot of trouble researching American, British and valve types from all over the world. There's an interesting and seemingly comprehensive description of valve coding and how various countries go about the job of confusing the user (you won't be confused after you've read it). The author provides a comprehensive list of American and British Service valves and 'civilian' equivalents and the valve base details are provided, with description of valve type and although there's no comprehensive valve characteristic information, the filament voltages and currents are given in a clear and precise style. Ideal for the researcher and collector. 350 pages. £19.95.



To order any of the books mentioned here use the Order Form on page 70 of this issue or call **Ann or Michael** on our **Credit Card Hotline on (01202) 659930** to place your order. (Don't forget to add P&P, £1 UK, £1.75 overseas).

Ron Ham, who has been looking after customers in the PW vintage 'wireless shop' since it first opened, announces his retirement this month and prepares to hand over the immaculately kept shop to a new team.

**A**fter 51 years in radio, the time has come for me to retire and hand over 'Valve & Vintage' to Phil Cadman G4JCP, Charles Miller and Ben Nock G4BXD who will be writing the column in future.

I'd also like to thank you for your letters and the kind remarks that you've made about my past efforts. I really have enjoyed writing the column and stretching my memory over the multitude of sets that I have handled in those years.

### Television Sound

However, before 'shutting up the shop', I want to tell you about two of the broadcast receivers which received TV sound. They were built in the late 1930s.

The radio receivers included the television sound channel, 41.5MHz, among their special features. I was reminded about these sets by **Tony Hopwood** (Upton-on-Severn) who found a Pilot U106 in a second-hand shop. It has six-wavebands, eight valves, including a 'magic eye' and a rectifier.

The designer certainly had long-distance listening in mind! Three of the bands are the short wave 12-30, 26-70 and 65-195metre broadcasting bands.

The other bands covered are: 750-2200m long wave, 190-550 metres medium-wave and 4.5-15m (I quote) "Ultra Short Waves".

A write up in the *Broadcaster Service Man's Manual* (July 1938) says of the USW band:

"Television sound received with reasonable strength at about 15 miles. No undue drift, although retuning was occasionally necessary". A drawing of the chassis layout shows the provision for a dipole as well as a long wire antenna.

# Valve & Vintage

### Alexandra Palace

The BBC began a regular television service from London's Alexandra Palace, on 45MHz (41.5MHz sound), in November 1936. But because of the Second World War, it ended in September 1939.

Television was a new and exciting field of entertainment but, the receivers were expensive. And the reception range was limited to between 40 and 60 miles.

However, returning to the special receiver it's interesting to note that apart from the UX based 'magic eye', the Pilot uses International Octal valves types, 6U7, 6B8, 6L7, 6J7, 6Q7 and 6N6.

A similar set, the Marconiphone 561, employs the Marconi range of octal valves types W63, X64, Z63, D63 and KT63. Both are handsome looking table models with polished wooden cabinets and once had a price tag around £25.

According to the *Broadcaster Service Man's Manual* (January 1936) the Marconiphone's "Ultra Short Wave" coverage was 4.85-12m and the TV sound was receivable at about 30 miles.

An article in *Television and Short Wave World* (June 1938) refers to the "exceptional quality" of the Alexandra Palace sound channel. It explains that "Owing to the wide band width available with this sound transmitter, all musical frequencies are radiated with very little distortion or attenuation".

Both sets I've mentioned have large loud-speakers. They also include adequate tone controls and a pair of output valves to provide good quality sound reproduction.

### Younger Collectors

It's good to know that many of our younger readers are preserving sets from the past and are keen collectors. Very often a particular set is associated with a period in

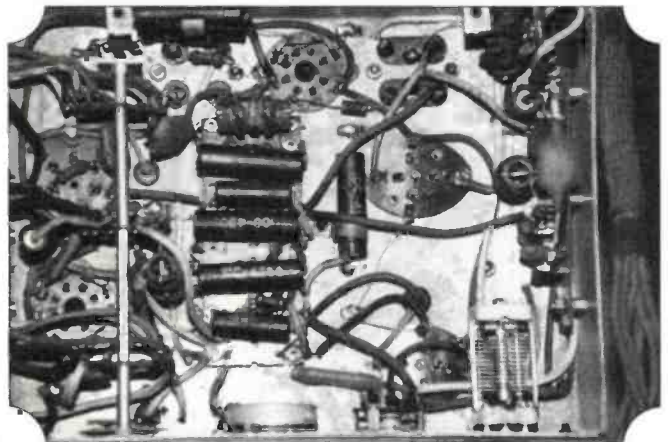


Fig. 1: Under chassis view of the R1224A receiver, built for the RAF (see text).



Fig. 2: Receiver section of the 18 set, removed from case for servicing, showing metal cased tubular capacitors (see text).

history, like those that could receive television sound or the range of sets that were used in anger during the Second World War.

For example, referring to the military gear I wrote about last year, **A. J. Moffat** (Ross-on-Wye) tells me that he used the WS 11 when he served with an artillery signals section. These were later replaced with the 19 and 22 sets. While in Northern Italy he and another operator used a Canadian WS 19 Mark III continually for 12 weeks and it was only switched off for a battery change!

### Collectors' Preferences

Some collectors' preferences are that they like their vintage sets to work, while others keep them in their original state for exhibition. So, with this in mind, let's look at the under-chassis wiring and components of two historic receivers.

Firstly the R1224A, Fig. 1, was built for the RAF in the 1930s. The other unit, the receiver section of the WS 18, Fig. 2, was used throughout the Second World War.

Although Figs. 1 and 2 show

the chassis in their original condition, it's almost certain that after 50 years, the capacitors and resistances will be faulty. The capacitors are likely to have a partial or complete short-circuit, whereas the resistors may have gone 'high' in value or totally open circuit.

Let's take for example, a basic audio stage of a valved receiver. They often use the triode section of a double-diode-triode valve as the driver and an output-pentode as the main amplifier.

The anode of the triode is fed through a resistance from the main h.t. rail and a capacitor is connected from the anode of the triode to the control-grid of the pentode. The resistance ensures that the voltage required by the triode is present.

The audio coupling capacitor 'blocks' the voltage at the anode. But it permits the wanted audio signal to pass to the grid of the output-pentode.

Should the anode feed resistance go 'high', then the audio becomes weak. However, if it went completely open-circuit then the driver stage could not work.

A 'leaky' audio coupling capacitor would cause distorted sound. This happens because some of the voltage from the driver's anode appears on the grid of the pentode.

## Shorted Capacitor

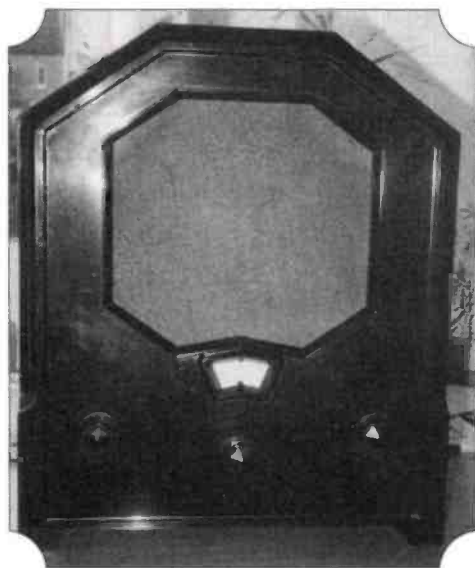
Often a 'shorted' capacitor will destroy the feed resistance. For example, the voltage required for the screen-grid of a pentode, working as a radio-frequency amplifier, is fed through a resistance. A capacitor is normally connected between this junction and earth.

Now, if the capacitor shorts, then a high current is 'forced' through the resistance which consequently overheats and 'cooks'. Both components should be replaced in the event of either one failing.

From my experience I've known the general performance of a set to deteriorate and found that a screen-feed resistance, perhaps 27k $\Omega$ , had gone as 'high' as 1.5M $\Omega$ !

About nine tubular capacitors which are likely to have suffered through age can be seen in each picture. Those in Fig. 1 have waxed cardboard cases. Six are soldered on tag-boards, two are clipped to the upper left side of the chassis and the other is on the base in the centre.

Most of the capacitors are marked with a '10C' Air-Ministry part number. This in itself is historic



**Fig. 3: After reading 'V&V' in a copy of PW he found on a train, a reader remembered that many years ago this vintage GEC (circa 1933) had been stored by his father and when rediscovered this is how it looked (see text).**

and would lost if the component was replaced.

The capacitors in Fig. 2 have metal cases. They're secured to the chassis by pre-formed metal clips.

## Direct Current

My reference to direct current (d.c.) mains in the February issue stirred the memory of Fred Penny (Balham). He built his first 'Telsen' radio in the 1930s followed by a Mullard 'Master Three'. Fred also made an h.t. eliminator using several carbon filament lamps in series with the d.c. supply.

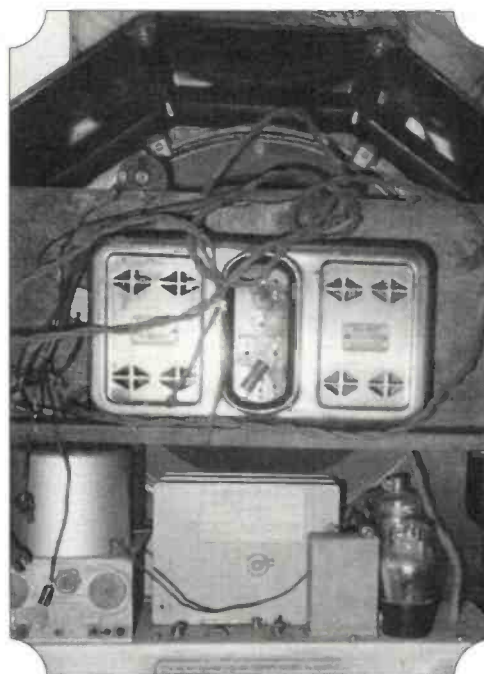
I've also used carbon lamps on d.c. mains for charging accumulators Fred! There was a bank of these in batten type holders on a board and the number of lamps in use was determined by the number of cells on charge.

One day, heavy rain found a tiny hole in the roof. And of course, the cold rainwater just had to hit the hot lamps and shattered the glass!

## Vintage Train

I've received a letter from a gentleman who read 'Valve & Vintage' in a PW which he found while travelling by train. The article reminded him of an elderly radio which was placed in the loft by his father many decades ago.

He then decided to get the receiver down and photograph it. While doing so he noted that the Bakelite cabinet is still in pristine



**Fig. 4: Inside view of the 1933 GEC set (see text).**

condition, as in Fig. 3.

Furthermore, inside, on the battery shelf, Fig. 4, he found a mains operated h.t. eliminator. My correspondent tells me that the set, Cat. No. BC 130, was made in 1933 by the General Electric Co. and the metal-cased, HT Unit, Type D.C. 15/25, was made by Ekco for d.c. mains.

Originally, a 120V 'dry' battery and a 2V 'wet' accumulator powered the set in question. High tension batteries were always expensive and needed replacing two or three times per year.

In many cases a battery set was purchased because the house had no mains electricity. However, when it was installed a mains unit was often purchased to save the cost of a new h.t. battery.

When I gave the original photograph, shown in Fig. 4, a close look, it revealed black and red wander plugs and spade connectors on the ends of the battery leads. The plugs go into the appropriate sockets on the eliminator and the spade connectors slide under the terminals on the accumulator.

## Good Reading

Finally lads and lasses, I'd like to recommend some good reading. It's a book entitled *Wires, Wheels and Wings*, (A Wireless Mechanic's Diary), by Harry Reddin, published by The Pentland Press Ltd. at £16.50 ISBN:1 85821 128X.

Harry Reddin's book is hardbound with approximately 360 pages of good reading. It's not a technical book full of circuits and pictures of valves and sets, but a fascinating life story of the author.

Harry was born in 1914 and attended school during the 1920s. He worked in the family's hardware business as a wireless engineer in the 1930s, served as a wireless mechanic in the RAF during the Second World War and spent the post-war years, until his retirement, as a Murphy dealer in Glastonbury, Somerset.

To my mind, the story of this Yorkshire lad is typical of the men who built the British Radio Industry. Harry grew up with the cycle, motorcycle and car and was interested in most types of engineering.

Harry Reddin was bitten by the 'wireless bug' at an early age. "Scratching away at the crystal with the cat's whisker to find the 'best spot' gave endless satisfaction," he wrote and added that there was no running costs with a crystal set!

Well that's it! Time for me to close the 'V&V' vintage 'wireless shop' for the last time. Cheerio for now.

*Editorial note: Regular readers will be pleased to know that Ron Ham will still be writing for PW on an occasional basis (see 'Keylines'). In the meantime I've no doubt that readers would like to join the Editorial team in wishing him well in his retirement.*

# HF FAR & WIDE

*Leighton Smart GWOLBI welcomes you to the page where you can now get that 'little bit extra' from your h.f. operating.*

This month I would like to offer a brief introduction to *PW's* forthcoming 'HF Initiative', as mentioned by the Editor Rob Mannion G3XFD in the last issue. Already a significant number of readers have responded to Rob's rallying cry.

The broad aim of the initiative is to create *PW* 'monitoring frequencies' where our readers will call CQ in the hope of working fellow readers from around the world. And in the case of s.w.l.s we anticipate that our listening stations will report to this column what they hear.

With the *PW* initiative even if your CQ calls are not answered, you may still get a report via the pages of this column. The report will be provided by one or more of our s.w.l.s readers and if your calls are answered by a fellow reader and a QSO results, so much the better!

The hope is to generate some activity amongst readers of this column, both transmitting amateurs and s.w.l.s alike. In next month's issue I will publish a list of the amateurs and s.w.l.s who have supplied details of their proposed listening times, frequencies, equipment, etc.

Everyone on the *PW* team hopes that both our transmitting and receiving readers will take part. We also hope to publish QSL details for the benefit of those who require confirmation.

I hope that this initiative will grow. I also hope that along with that growth, this column will grow in size with both our regular monthly reports and the new *PW* Listening Watch.

## The 3.5MHz Band

I'll start off with the 3.5MHz band, and the first of our nine reporters this month is Eric G0KRT in Surrey, who has 'gone QRD' so to speak, with a full 5W Index Labs 'QRP Plus' and an 84ft end-fed wire.

Eric worked G2FDF, G0ENS/P, and GMOTGE, all on c.w., but was disappointed that he couldn't find any Novice stations on the band. He'd like to work some of our Novice readers on the band around 3.565MHz or thereabouts. How about our Novice readers helping Eric out here?

Short wave listener Keith

Goodchild in Hertfordshire listened briefly on 3.5MHz, and reports s.s.b. reception of G3WDR (Felixstowe) and G0NFJ (Romford), while G3MYU in Marlow, and G3WMZ Somerset were heard calling CQ. Also logged were G3UUH (Market Harborough) and G0AFT (Buckinghamshire) in QSO.

## The 7MHz Band

It's up to 7MHz now and new reporter Peter Finbow G0DEH spent some time on this band raising 4X6UV Israel at 2210UTC, T14CF Costa Rica, at around 2300, VK4MZ Australia, at 0600, and ZL4BO New Zealand, at 0500, all on s.s.b. Peter uses a Yaesu FT-902 DM at 100W and a 12m long wire in a very restricted location.

Eric G0KRT using his 5W on 7MHz hooked up with RA1AQ Russia, DH1JMH Finland, and EA4AAM Spain, again all on c.w.

Also on 7MHz, s.w.l. Charlie Blake RS96034 (Milton Keynes) has received signals from ZL4BD New Zealand, and VK9NS Norfolk Island at 0500UTC, TL8CK Central African Republic at 21. 26, and YB5UX Indonesia at 0735. Charlie uses a JRC NRD 525 receiver, and an 11m sloping wire at 9m height, his complete station is shown Fig. 1.

## The 14MHz Band

On to 14MHz now and Don Mclean G3NOF in Yeovil, Somerset starts off. Don reports that the best time on this band has been from 1600UTC onwards for the short path to Africa and Asia while North and South America came in during the evenings.

The pick of Don's 14MHz s.s.b. log are A71BY Qatar, BS7H Scarborough Reef, Taya BV5BG Taiwan at around 1700UTC (QSL via Box 215, Chayghua, Taipan, Taiwan). He also raised DX90 Philippines at 1711, Tony HSO/G4UAV Bangkok Thailand, at 1721, J28JJ Djibouti at 1633, VP5/JH7MQD Turks and Caicos Island, and 3V8BB Tunisia at 13.47. Don uses a Kenwood TS-950 transceiver and a TET HB33SP beam antenna on 14MHz.

The 14MHz band was where Steve Locke GW0SGL worked in April and May. Steve reports conditions as

**Fig. 1: Receiving station used by Charlie Blake RS96034. Charlie, based in Milton Keynes in Buckinghamshire is waiting to use the KW2000A (his original listening station) for transmission once he's passed his RAE and Morse.**



excellent particularly in the evenings.

Using a Yaesu FT-757 GX at 100W into a 3-element HI GAIN beam antenna at 10m, Steve worked Hugh 6Y5JA in Kingston Town, Jamaica, 59 at 2214UTC. He then raised FG5GZ (QSL via F6CLK) Guadeloupe Island, 59 at 2110, John HH2J Haiti, 59 + 10db at 2328, and Ed, XT2CH Burkina Faso (QSL via Box 35, Ouagadougou Burkina Faso) 59 at 2247UTC.

John Heys G3BDQ near Hastings used 14MHz for the first time in a long while. John had s.s.b. contacts with VU2BK India, A47RS Sultanate of Oman, JQ3UDL Japan, and Russian Special Event stations UZ100GG, and R100R.

Our Swedish QRP reporter Clemed Nilsson SM7DRH has been using a 3-element beam and a maximum power of 5W to work JR1EYN Japan and VK3CP Australia. Clemed worked G4ZVR England with 20mW!

Clemed also raised KP4P Puerto Rico, at 1020UTC, ZS1AD South Africa at 1911, FY5YE French Guyana (QSL via F5JLU) at 1933, HP1AC Panama, at 1947 and GW3RVF Wales, at 1915 (another 20mW contact!), as well as countless American stations.

## The 18MHz Band

Don McLean G3NOF says that in mid April the 18MHz band was open for a few days between 0900UTC and noon on the short path to Japan. There were also a few Asian signals and Africans came in around 1600, with Americans heard until 2300.

The cream of Don's 18MHz log include BY3AE China, at 1053UTC, D68QM Comoro Islands at 1300, PJ7/WB5JHK Leeward Islands, at 2146, and VP8CQR South Shetland Islands, at 1833UTC amongst a very long list of other contacts.

Charlie Blake RS96034 reports s.s.b. reception of JA1FBB Japan at 1040UTC, Bob AP2JZB in Karachi, Pakistan, at 1240, and AZ1BI Argentina in QSO with W6MHC/MM

on board the research vessel *Sedco BP471* in the Mediterranean Sea at 1503UTC.

## The 21MHz Band

Space is limited, so now let's take a brief look at the 21MHz band. John Heys G3BDQ reports conditions here as very poor, with the solar flux down to 67. Nevertheless John worked 9V/F5FHI Burundi, Z22JE Zimbabwe, Bob 9K2ZZ Kuwait, (QSL via W8CNL) 9Q5TR Zaire, and (a pirate John suspects) 3D1M, and 9J2CW Zambia, all on s.s.b.

Finally, I have received a massive log from John Constance G0VGD. John who reports QRP s.s.b. contacts with T91ENS Bosnia at 1530UTC, VE3VHB Canada at 1510, EA8BZV Canary Islands at 1630, CT3FT Madeira Island at 1202, 9H4CM Gozo Island (Malta's 'garden'), at 1150, RZ6AXO Russia, at 1225, and KA2CYN at 1615UTC. Note that John uses, his 10W Yaesu FT-7 on s.s.b. and an inverted 'V' style G5RV antenna at 5m in height.

## Time To Close

Well, it's time to close the log for this month. My grateful thanks to our reporters for your invaluable help. Without you this column would not be possible, and your reports tell everyone just what can be achieved, even with simple stations.

Photographs of you - facing the camera please! (why are radio enthusiasts camera shy?) and your station are very welcome. Please send them and your reports to me please by the 15th of each month (at the latest) at: 33 Nant Gwyn, Trelewis, Mid Glamorgan CF46 6DB Wales.

**END**

## STUDENT SPONSORSHIP

WOOD & DOUGLAS, a UK independent company specialising in Radio Communication Engineering in the VHF, UHF and Microwave spectrum, is now seeking candidates for sponsorship through Higher Education as part of their ongoing student sponsorship policy.

If you are considering a career in radio engineering, have an active interest in radio as a hobby and are expecting to enter full time University or Polytechnic training in Autumn 1995, the WOOD & DOUGLAS could have a package that will suit both your financial and industrial training needs.

Please enquire in writing initially giving full details of your personal situation, subjects under study and any placement offers received to date.

Send your details to:  
**Student Sponsorship**  
**Wood & Douglas Ltd**  
**Lattice House**  
**Baughurst, Tadley**  
**Hampshire RG26 5LL**



**WOOD & DOUGLAS**

VHF/UHF COMMUNICATIONS PRODUCTS

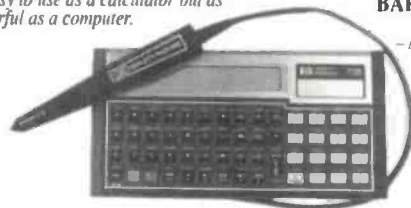


## HEWLETT PACKARD HP71B

As easy to use as a calculator but as powerful as a computer.

### BARCODE READER

Smart wand  
 - Automatically recognises and decodes all major bar-code standards.



- A powerful set of basic functions, statements, and operators - over 230 in all - many larger computers don't have a set of basic instructions this complete.
- Advanced statistics functions enabling computations on up to 15 independent variables.
- Recursive subprograms and user defined functions.
- An advanced internal file system for storing programs and data - the HP71B has continuous memory - when you turn the computer off it retains programs and data.
- A keyboard that can be easily customised for your specific application.
- HP-IL Interface pre-installed to create a system that can print, plot, store, retrieve and display information. Control or read instruments or speak to other computers, 5000 bytes/sec. Built in ROM includes 46 separate commands. Interface to HP-IL, HP-1B, RS232C, GPI/O or series 80. Includes connection cables. These are second user

systems ex NHS are fully tested and working but have no programming.  
 (THAT IS UP TO YOU)

HP71B.....	£29.95
Bar-code reader.....	£12.95
AC Power supply.....	£4.95
(works from batteries normally)	
Keyboard overlay.....	£1.00
(Limited quantities)	
Unknown program memory modules (2 different types).....	£3.00
(Limited quantities)	
Complete kit of HP71B, Bar-code reader and power supply.....	£39.50
(Prices include VAT - delivery next day £3.00)	
(Currently selling in USA for > \$500)	

### INTERCONNECTIONS LTD

Unit 41, InShops, Wellington Centre,  
 Aldershot, Hants GU11 5DB  
 Tel: (01252) 341900 Fax: (01293) 822786

- Please rush me
- HP71B powerful calc/computer @ £29.95
  - Bar-code reader @ £12.95
  - Power supply @ £4.95
  - Keyboard overlay @ £1.00
  - Memory module @ £3.00
  - Complete kit of HP71B, Bar-code reader and power supply @ £39.50

Please debit credit card no.

No..... Exp.....

Name.....

Address.....

Postcode.....

Tel.....

Total payment £..... + £3 delivery = £.....  
 We accept Mastercard, Visa, Cheques or money order - please post the above form to us, or fax it, or telephone with a verbal credit card order

# Amateur Radio Communications Ltd

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

OPEN Tue-Sat  
 10am-5pm  
 FREE PARKING

Use your credit card for same day despatch

## EVERYTHING FOR THE RADIO AMATEUR UNDER ONE ROOF!

We are 1 mile from J23 M6 & 4.5 miles off J9, M62

### AKD BRITISH MADE TRANSCEIVERS AT AN AFFORDABLE PRICE

AKD-2001 2m 25.5W FM .....	£193
AKD 4001 4m 25/5W FM.....	£193
AKD 6001 4m 25/5W FM.....	£193
WA2 VHF/UHF Absorbition	
Wavemeter .....	£32.95
HPF1 High Pass TV1 Filter	£8.50

### PACKET UNITS AVAILABLE

TINY 2.....	£139
KPC-9612.....	£275
KAM PLUS.....	£399
KPC-3.....	£149
PK-232MBX.....	£??

### DEWSBURY RANGE

Star Masterkey 1-55 w.p.m. ....	£59.95
Supa Keyer Flexible operation ..	£85.00
Supa Tuta- For the absolute beginner to the expert.....	£75.00

### KENT KEYS

Standard Morse Key .....	£51.50
KT-1 Morse Key & Mobile Base ..	£62.50
Twin Paddle Morse Key .....	£65.50
Single Paddle Morse Key .....	£54.50
Morse Tutor .....	£57.00
Electronic Keyer.....	£59.50
Morse Practice Oscillator.....	£17.50

### NEW RANGE OF HF TRANSCEIVERS

#### IC-706



- 100W HF Transceiver
- +10W 6M & 2M
- ssb/cw/fm/am
- Detachable Head

Should be with us some time mid September, but with already a large number of forward orders you may have to wait a while to secure one unless you place your order IMMEDIATELY!!

£1150 RRP Deposit £340 + 12 months @ £70

#### DX-70



- 100W HF Transceiver
- +10W & 6M
- ssb/cw/fm/am on all bands
- Detachable Head
- Narrow cw & ssb Band Filters
- Speech Processor - QSK

£1095 RRP  
 Deposit £219 +  
 12 months @ £73

**FREE CREDIT 0% APR**

WE WILL MATCH ANY GENUINE ADVERTISED PRICE BUT AS OUR REGULAR CUSTOMERS WILL TELL YOU WE CAN OFTEN DO A BETTER DEAL WHY NOT PHONE U!!

### SECONDHAND CORNER

IC-765 MINT CONDITION.....	£TEL
TS-940S GOOD CONDITION.....	£1150
TS-450SAT .....	£999
TS-440S + ATU/ssb/cw FILTER .....	£TEL
FT-107M + FC-107/FTV-107R	
FT-726R + 2/670/SAT/FULL	
DUPLEX/cw CRYSTALS.....	£1099
AT-150 .....	£250
FT-290R11 + EXTRAS.....	£TEL
IC-U101 + BX/BK .....	£125
TS-650 LINE UP .....	£899
FT-107S .....	£350
FT-102.....	450
FRG-7700 + FRT-7700/FRV-7700.£??	
AR-1500.....	£225
BC-200XLT .....	£125

**Tel: 01925 229881/Fax: 01925 229882**

**RST LANGREX SUPPLIES LTD RST**  
**PHONE DISTRIBUTORS OF ELECTRONIC VALVES FAX**  
**0181 684 TUBES AND SEMICONDUCTORS AND I.C.S. 0181 684**  
**1166 1 MAYO ROAD · CROYDON · SURREY CR0 2QP 3056**  
**24 HOUR EXPRESS MAIL ORDER SERVICE ON STOCK ITEMS**

AZ31	5.00	EL91	3.00	PY500A	4.00	68A7	5.00	6SK7	3.00
CL33	10.00	EL95	2.00	PY800	1.50	68E6	1.50	6SL7GT	4.50
DY967	1.50	EL360	16.50	PY801	1.50	68H6	2.50	6SN7GT	4.50
E88CC Multl	8.50	EL509	10.00	QOV02-6	12.00	68J6	2.25	6SS7	3.00
E180F	3.50	EM34	18.00	QOV03-10	5.00	69N6	2.00	6U8A	1.50
E810F	22.00	EM81	4.00	QOV03-10 Multl	15.00	68Q7A	3.50	6V6GT	4.25
EABC80	2.00	EM84	4.00	QOV06-40A Multl	30.00	68R7	8.00	6X4	3.00
EB91	1.50	EM87	4.00	QOV03-12	8.00	68R8A	4.00	6X5GT	2.50
EBF80	1.50	EV91 Multl	7.50	UV03-12	8.00	68S7	6.00	12AT7	3.00
EBF89	1.50	EY96	2.50	U19	10.00	68M6	4.50	12AU7	3.00
EFL31	15.00	EY88	1.75	UABC80	1.50	68W7	1.50	12AX7	3.50
ECC33	7.50	EZ80	3.50	UBF89	1.50	68Z6	2.50	12AX7A GE.	7.00
ECC35	7.50	EZ81	3.50	UCH42	4.00	6C4	2.00	12BA6	2.50
ECC81	3.00	EZ81	3.50	UCH81	2.50	6C6	5.00	12BE6	2.50
ECC82	3.00	EZ81	3.50	UCL82	2.00	6C86A	3.00	12BH7A GE	6.50
ECC83	3.00	G232 Multl	8.50	UCL83	3.00	6CD6GA	3.00	12BY7A GE	7.00
ECC85	3.50	G233	4.00	UFR90	4.00	6CL6	3.75	12E1	15.00
ECC88 Multl	6.00	G234 GE	7.50	UL41	12.00	6CG7	7.50	12HG7 12GN7	8.50
ECC91	2.00	G237	6.00	UL84	3.50	6CH6	5.00	30FL12	1.50
ECF80	1.50	KT61	10.00	UY41	4.00	6CW4	8.00	30P19	2.50
ECH35	3.50	KT66 China	10.00	UY85	2.25	6D6	5.00	300R(PR)	110.00
ECH42	3.50	KT88 China	12.00	VRI0530	2.50	6DQ5 GE	17.50	572B	70.00
ECH81	1.50	N78	9.00	VRI5030	2.50	6DQ6B	12.50	805	50.00
ECL80	1.50	OB2	2.70	Z759	25.00	6E4B	3.50	807	5.75
ECL82	3.00	OC3	2.50	Z803U	25.00	6EH5	1.85	811A	18.50
ECL83	3.50	DD3	2.50	ZD21	3.50	6F6	3.50	812A	65.00
ECL86 Multl	3.50	PCF80	2.50	3B28	20.00	6FQ7	7.50	813	27.50
ECL800	25.00	PCF82	1.50	4CX250B STC	55.00	6GK6	4.00	833A	85.00
EF37A	2.75	PCF86	3.50	5R4GY	8.00	6H6	3.00	866A	25.00
EF39	5.00	PCF801	2.50	5V4G	6.75	6H56	4.95	872A	20.00
EF40	5.00	PCF802	2.50	5Y3GT	2.50	6J5	3.00	931A	25.00
EF41	3.50	PCL82	2.00	5Z3	4.00	6J6	3.00	2050A GE	10.00
EF42	4.50	PCL84	3.00	5Z4GT	2.50	6J7	4.00	6751	6.00
EF80	1.50	PCL84	2.90	6AH6	4.00	6JB6A GE	19.00	5763	10.00
EF85	1.50	PCL85	2.50	6AK5	1.50	6J6C	20.00	5814A	5.00
EF86	7.50	PCL86	2.50	6AL5	1.00	6JS6C GE	17.50	5842	12.00
EF91	2.00	PCL805	2.50	6AM6	2.00	6K9GT	3.00	5080	7.50
BF92	2.00	PD500	6.00	6AN5	5.00	6K7	4.00	5146B GE	15.00
EF183	2.00	PL36	2.50	6AN6A	4.50	6K8	4.00	550A GE	20.00
EF184	2.00	PL81	1.75	6AOS	3.25	6L6G	8.50	683B GE	18.00
EL32	2.50	PL82	1.50	6AR5	25.00	6L6GCSYL	12.50	7025 GE	7.00
EL33	10.00	PL83	2.50	6AS6	9.50	6L6G Siemens	7.50	7027A GE	17.50
EL34 Siemens	3.00	PL84	2.00	6AS7G	9.50	6L6G GE	12.50	7199	12.00
EL36	4.00	PL504	2.50	6AT6	2.00	6L7	3.50	7360	25.00
EL80	25.00	PL508	5.50	6AUSGT	5.00	6L06/6J6C	20.00	7581A	15.00
EL41	3.50	PL509	6.00	6AU6	5.00	6G7	4.00	7586	15.00
EL81	3.00	PL519	6.00	6AW8A	4.00	6RH8B/6KN8	12.00	7587	23.00
EL84	2.25	PL802	4.00	6B7	4.00	6SA7	3.00	7868	15.00
EL84 Multl	6.00	PY81	1.50	6B8	4.00	6SC7	3.00	8417GE	20.00
EL86	2.75	PY88	2.50	6B8A	1.80	6S7J	2.50		

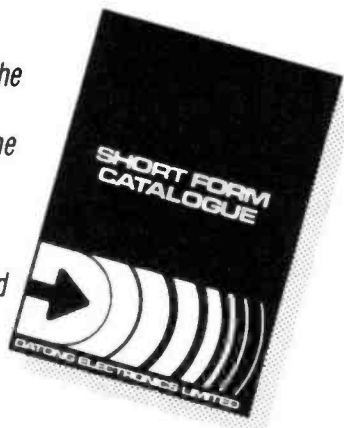
OPEN TO CALLERS MON-FRI 9AM - 4PM. CLOSED SATURDAY  
 QUOTATIONS FOR ANY TYPES NOT LISTED.  
 OVER 6000 TYPES AVAILABLE FROM STOCK.  
 OBSOLETE ITEMS A SPECIALITY.  
 TERMS C W O / VISA / ACCESS  
 P&P 1-3 VALVES £2.00, 4-6 VALVES £3.00 ADD 17.5% VAT TO TOTAL INC P&P

**DATONG**  
 ELECTRONICS LIMITED  
 Clayton Wood Close  
 West Park  
 Leeds LS16 6QE  
 Tel: 0532 744822  
 Fax: 0532 742872

**For products you can rely upon to give amazing results**

For information on Active Antennas, RF Amplifiers, Converters, Audio Filters, the Morse Tutor and Speech Processors send or telephone for a free catalogue and selective data sheets as required.

All our products are designed and made in Britain. Orders can be despatched within 48 hours subject to availability.



— VISA AND ACCESS WELCOME —

**TRANSISTORS + ICS + SEMICONDUCTORS**

**£30 WORTH OF VOUCHERS** in the new **Cricklewood Electronics**

**Very Interesting Catalogue**

- RESISTORS + CAPACITORS + INDUCTORS
- SURVEILLANCE + SECURITY + SECURITY
- PLUGS + SOCKETS + LEADS + CONNECTORS
- TV & VIDEO SPARES (INC. VIDEO HEADS)
- HIFI + DISCO + HIFI GADGETS + SPEAKERS
- AUDIOPHILE COMPONENTS (inc capacitors)
- IN CAR AUDIO + SPEAKERS (inc bass tubes)
- COMPUTER ACCESSORIES + BOARDS
- TOOLS + TEST EQUIPMENT + BENCHWARE

& much much more (over 10,000 lines).  
 send today for the very interesting catalogue.  
 Pay by PO, cheque, credit card or tape coins to paper.

Please send me.....copies of the 1995 Cricklewood Catalogue.  
 I enclose £2.50 per copy (UK & Europe) £5 overseas.

Name.....  
 Address.....  
 .....

Please charge my credit card. No.:.....  
 Expiry Date.....Tel. No.:.....PW

Cricklewood Electronics Ltd, 40-42 Cricklewood Broadway,  
 London NW2 3ET. Tel: 0181-450 0995 Fax: 0181-208 1441

**PRACTICAL WIRELESS PCB SERVICE**

Printed Circuit Boards for Practical Wireless constructional projects are available from the Practical Wireless PCB Service.

The boards are made in 1.5mm glass-fibre and are fully tinned and drilled.

When ordering PCB's please state the article title, magazine cover date and the board number.

Mark your envelope **Practical Wireless PCB Service**.

Cheques to be crossed and made payable to: **Badger Boards**.

Please print your full name and address in block capitals and do not enclose any other Practical Wireless correspondence with your order.

Please allow 28 days for delivery.

Send orders and remittances to:

**Badger Boards, 80 Clarence Rd, Erdington, Birmingham B23 6AR.**  
 Tel: 0121-384 2473

**PW PCB SERVICE**

# BITS & BYTES - COMPUTING IN RADIO

Mike Richards G4WNC tries out a new printer sharing system, talks about d.s.p. shareware programs and summarises the 'Bits & Bytes' special offers.

**G**raham Taylor of South Midlands Communications has just sent me a brand new printer sharing system that they are distributing. The Auto Link LU7000 series enables the automatic sharing of one printer with up to four computers or other devices.

Unlike the simple manual switching system, the Auto Link is extremely compact and uses thin, easily hidden, connecting leads between the various devices. The system comprises two distinct elements, the receiver and remote transmitters.

The receiver is the largest unit yet measures only 84 x 58 x 25mm. This unit connects directly to the printer's parallel port and also derives its power from that port. At the back of the receiver unit are four miniature telephone type connectors that accept the leads from the remote computer or other devices.

At the other end of the link, the smaller transmitters just plug into the computer's printer port. As with the receiver, the power is derived from the computer port, so there are no power supplies to hide away. The connecting leads are no larger than a standard telephone instrument cable and in the review model were approximately 5m long.

Having tried the Auto Link system on my computing set-up, I can confirm that it really is a very simple and trouble free way to share printers. The transmitters and receiver are available separately and currently cost £19.50 plus VAT each.

For more details on Auto Link contact South Midlands Communications Ltd., SM House, School Lane, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO53 4BY. My thanks to Graham Taylor for the loan of the review models.

## Digital Signal Processing

Following my comments on the Digital Signal Processing (d.s.p.) aspect of computing earlier this year, I've now managed to put together what I think is an interesting selection of information.

One of the prime authors in this field is **Johan Ferrer KC7WW**.

Johan has produced a number of shareware programs to support amateur use of d.s.p. And, with his permission, I've put together a selection of software for *PW* readers - more later.

Let's just take a quick look at the principles of digital signal processing. The first stage is to convert a signal (normally audio in our case) into a digital format ready for processing by a computer. In simple terms, this means sampling the signal at frequent intervals and producing a number that represents the instantaneous value of the signal as it's sampled.

In order to build-up a reasonable digital representation of the signal, you have to sample the signal at a rate that's at least twice the highest frequency. So, for h.f. audio, a sample rate of 6kHz or 6000 times a second is required.

Having converted the signal to a digital format, you can process the data to create all manner of complex functions. One of the most common requirements is to filter the audio signal, e.g. to narrow the pass band for c.w. work.

To do this, the d.s.p. software has to examine the incoming digital signal, identify the various frequency components and extract all those that fall outside the pass band. This part of the operation is performed using complex mathematical formulae.

However, because the filtering is a precise mathematical function, a d.s.p. filter can produce results that are virtually unachievable using conventionally analogue components. Once the filtering software has completed its work, the digital signal is converted back into an audio signal.

Completing all this work requires a very fast processor with a command set optimised for this type of work. Fortunately for us, this type of d.s.p. hardware has a wide commercial appeal so the prices are becoming well within the reach of the amateur.

In addition to being able to deliver outstanding performance, d.s.p. systems offer enormous flexibility as you can completely

change the function simply by downloading different software. Probably the ultimate in flexibility is what's become known as adaptive filtering.

Adaptive filtering is where the filter characteristics adapt to suit the incoming signal. So how do you start? Fortunately there are a couple of ways to do this without breaking the bank!

The first option is to use the Texas Digital Starter Kit. This is a very compact ready-built p.c.b. that contains all the basic components for an experimental d.s.p. system.

Signal input and output is handled through miniature jacks with a standard 9-pin connector for linking-up with the serial port of your computer. In addition to the p.c.b., the kit comes complete with comprehensive documentation and development software. If you want to try this route, **Macro, Tel: (01628) 604383** seem to be offering the best prices at around £68 plus VAT and carriage.

The second alternative, is to use the d.s.p. hardware that's included in some of the more sophisticated computer sound boards. One of the best examples is the Orchid Soundwave 32. Not only is this a very good sound board boasting compatibility with all the other standards, but it features an Analogue Devices AdSP-2115 d.s.p. chip.

The heart of any d.s.p. system is the software and that is where the fine work of Johan Ferrer comes to play. He has produced a wealth of software specifically designed to meet the needs of amateurs.

The two main developments are an audio filter system and PACTOR, RTTY, ASCII and AMTOR transceive systems. I'll give a detailed description of these programs next month. However, to help you get started, I've put together a d.s.p. starter disk for the PC that contains a selection of software - see the special offers below for details.

## Special Offers

Here's a summary of the latest special offers for 'Bits & Bytes' readers. I try to turn orders around in

a week or two, but please allow up to two weeks for delivery.

- **DSP Starter** - AMTOR, PACTOR, RTTY and audio filtering software for ASP sound boards plus h.f. modems using Texas DSK.
- **JVFAX 7.0** - FAX & SSTV transceiver for IBM compatible computers.
- **HAMCOMM 3.0** - RTTY, CW & AMTOR transceiver also for IBM compatible computers.
- **NuMorse** - Comprehensive Morse tutor for Windows 3.1 users.
- **UltraPak 2.1** - TNC-2 driver for Windows 3.1 users.
- **FactPack 1 Interference** - Help with those difficult computer interference problems.
- **FactPack 4 JVFX and HAMCOMM Primer** - Receiving your first FAX and RTTY signals.
- **FactPack 5 On the Air with JVFX and HAMCOMM** - preparing for that first transmission.
- **FactPack 6 Internet Starter** - Basic guidance to get you started on The Internet.

To receive any of the offers just send a self addressed sticky label plus 50p per item (£1.50 for four or all eight for £3.00). If you're ordering JVFX/HAMCOMM/NuMorse/UltraPak/DSP Starter you will also need to send a blank, formatted 3.5in 720k disk for each program or just two 1.44Mb high density disks.

That's all I've got room for this month so until next time 'happy computing' and keep sending your computing queries to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3XD. CompuServe: 100411, 3444; Internet: [mike.richards@bbcnc.org.uk](mailto:mike.richards@bbcnc.org.uk)

# VHF REPORT

David Butler G4ASR has some important news about proposed changes to the v.h.f. and u.h.f. bands. He also provides details of the 144MHz Transatlantic Challenge.

In case you haven't already heard, the European Radio Committee is busy. It's currently in the process of conducting the second phase of a Detailed Spectrum Investigation (DSI).

The terms of reference for DSI-2 (as it's known) are as follows: "To investigate the current and foreseen use of the radio spectrum in CEPT countries in the frequency range 29.7 to 960MHz and the way in which it's managed and administered; to produce a detailed document addressing the issues that shall include, as appropriate, recommendations to the ERC of the CEPT".

## A Little Heavy?

Now as the terms as I've reproduced them seem a little heavy, I'll try to explain what this actually means in practice!

A Detailed Spectrum Investigation is being conducted by the European Radiocommunications Office (ERO) on behalf of the European Radiocommunications Committee (ERC).

The ERC is part of the European Conference of Postal and Telecommunication Administrations (CEPT). The ERO (headed incidentally by David Court OZ3SDL/G3SDL) is the centre of expertise on radio communication issues. They also develop proposals for long term European spectrum plans and provide support to the ERC.

The CEPT is a group of 40 European countries. This organisation brings together the various regulatory administrations throughout Europe.

Acting on our behalf in the UK is the Radiocommunications Agency (RA) which is an executive agency of the Department of Trade and Industry (DTI). Phew, I did say it was heavy!

## Spectrum Reviews

In recent years there have been a number of spectrum reviews, carried out on a national and

international basis. The aim is to provide a European table of harmonised frequency allocations and utilisations.

In effect, it's just like our amateur band plans and usage but on a much wider scale. The DSI-1 covered the frequency range 3400MHz to 105GHz.

At a CEPT meeting in March 1995 the ERC agreed to its many recommendations. One of the major gains of the DSI-1 review was the allocation, on a secondary basis, of the band 3400-3500MHz.

Although the UK already had access to the 3400-3500MHz microwave band, many European countries did not. So, it's therefore pleasing to record that administrations in Denmark (OZ) and Switzerland (HB9) have recently issued licences for this part of the spectrum.

As I mentioned earlier DSI-2 has been completed. The results have been published in a document entitled *Results of the Detailed Spectrum Investigation Phase II: 29.7-960MHz and Call for Comments*.

At the moment the published results are only proposals which may change significantly as a result of the ongoing consultation process. The ERC will then consider all inputs later this year.

An initial response from the ERC will be made in April 1996 with the final position being known at the end of 1996. The intention is to implement the agreements by the year 2008. However, it may be possible to implement some proposals earlier than this date whilst some recommendations may require a longer timescale.

## Amateur Radio

As regards the Amateur Radio Service the DSI Management Team have made recommendations applicable to frequencies in the 40, 50, 70, 144, 430 and 920MHz bands.

In the context of the European Table of Allocations the team's recommendations are as follows: That frequencies in the vicinity of 40.68MHz be considered for propagation beacons. The band 50-

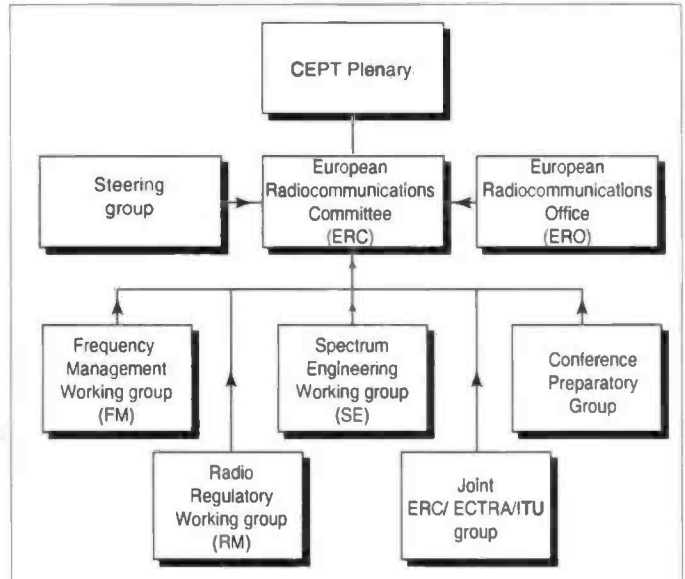


Fig. 1: Block diagram showing structure of European Radiocommunications Committee (ERC) whose activities are discussed in the text.

52MHz be allocated to the amateur service on a primary basis.

The recommendations also suggest that the band 51-52MHz additionally to be allocated to the mobile service. A minimum of 100kHz in the band 70-70.45MHz be allocated to the amateur service on a secondary basis according to national considerations, if feasible, centred on 70.2MHz.

The team also recommended that the band 144-146MHz be maintained with its current status. The band 430-440MHz be reduced to 432-438MHz with primary status for the amateur service. The band 435-438MHz to be allocated to the amateur satellite service on a primary basis.

It is additionally recommended that the 433MHz Industrial Scientific and Medical (ISM) and low power band be reviewed after an appropriate time period to ascertain whether alternative arrangements for ISM and low power render its retention unnecessary. The band 919.5-920MHz be allocated to the amateur service on a secondary basis.

## Implications and Reasons

What are the implications and reasons for the changes I've outlined? Between 30-50MHz there are no allocations to the amateur service in any of the three ITU regions.

So, for propagation studies the absence of reliable and identifiable signals between 30 and 50MHz there can be a problem. Therefore, it's suggested that individual frequencies within the ISM band at 40.68MHz be utilised for low power beacons.

The suggested beacons would operate with an e.r.p. of around 10dBW and would identify with f.s.k. Morse signals with low deviation and minimal bandwidth. (In common with this concept, a similar allocation at 60MHz may prove to be of scientific value. It's believed that this possibility should be re-assessed when television broadcasting is no longer operating below 68MHz).

Regarding the 50-54MHz band, it should be noted that this is already allocated to the amateur service in ITU Regions 2 and 3. The proposal to allocate the band 50-52MHz to the amateur service on a primary basis therefore aligns Region 1 with the other two regions of the world.

In several CEPT countries (G, ZB, 5B4) the amateur service operates in the 70MHz band on a secondary basis. In other countries it's used for sound broadcasting or mobile applications.

The 70MHz band is interesting from a propagation point of view. This is because the allocation is understood to be the currently known extent of F2 ionospheric propagation.



Sound broadcasting in eastern Europe is likely to cease in the 70MHz band within the next 15 years. Because of this and other rationalisations it would therefore seem possible to allow limited access for the amateur service to at least 100kHz centred on 70.2MHz. (It's also hoped that the existing beacon network between 70-70.15MHz can be maintained and extended).

## Exclusive Band

The only exclusive amateur band in the v.h.f. and u.h.f. range is that between 144-148MHz. It's heavily used throughout the world for amateur terrestrial and satellite communications.

A wide variety of modes of emission are in use on 144MHz. Many voice repeaters and data networks are complemented by a number of amateur satellites.

In addition to popular propagation mechanisms like tropospheric scatter or super-refraction radio amateurs communicate on 144MHz by reflection from the surface of the moon (e.m.e.), meteor trails (m.s.) and auroral scatter.

Sporadic-E (Sp-E) events appear much more frequently at 144MHz than was believed possible. Additionally, a number of amateurs have observed propagation phenomena either previously unknown or believed to be extremely rare at these frequencies.

Many amateur beacons support monitoring of propagation conditions. In many areas the already heavy occupancy does not allow for the accommodation of any additional activity despite the rapid growth of the amateur population.

Because the 144MHz band is so busy the IARU has requested the retention of the existing exclusive world-wide allocation of 144-146MHz. They have also suggested consideration of global harmonisation by allocating 146-148MHz segment to the amateur service in CEPT countries.

However, the DSI Management Team could not agree to this latter suggestion. This was in view of the current and foreseen extensive use of the band 146-148MHz by the land mobile service.

## Particular Importance

The 430-440MHz band is of particular importance to the amateur service. Propagation at these frequencies allow for interesting combinations of propagation modes to be used.

Communication on 430MHz can be via tropospheric ducting, and the moon and meteor scatter can be utilised. It's also the only band below 1GHz where amateurs may

use conventional fast-scan television.

The amateur satellite service relies on the sub-band 435-438MHz which presently is the only allocation between 146MHz and 2.4GHz allowing amateur space-to-earth emissions.

## Suffer Interference

Amateurs in CEPT countries, suffer particularly from interference in the 433.92MHz ISM band. Similarly manufacturers of low power systems using this band are concerned at the interference potential of amateur emissions.

The DSI Management Team were concerned with the situation. It's hoped that a recommendation to open up the band 403-404.5MHz for low power devices and establish the band 915-920MHz as a low power and ISM band will, after an appropriate transition period, render the ISM band at 433MHz obsolete in the very long term.

Unfortunately, additional spectrum in the low u.h.f. range is urgently required for land mobile services in the major European cities. As a consequence the DSI Management Team has determined that the band 432-438MHz and the band 435-438MHz be allocated to the amateur and amateur satellite services respectively on a shared basis.

It's believed that amateur television activities should be transferred to bands above 1GHz. This is unless modern digital processing techniques can facilitate such emissions in the available bandwidth (See 'Focal Point' in this issue. *Editor*).

## Requested Allocation

Several contributors requested consideration of a secondary amateur allocation in the range 902-928MHz. This will be to align with the situation in ITU Region 2.

If the recommendation to introduce ISM to the band 915-920MHz is accepted it would seem feasible to allocate the band 919.5-920MHz to the amateur service on a secondary basis.

The DSI document states that it's hoped that the loss of 4MHz of band, 430-432MHz and 438-440MHz will be balanced. The balance could be provided by the improved status of the remaining 6MHz together with a gain of up to 2.95MHz to the amateur service from other parts of the DSI range.

However, a quick look at the 430MHz band plan will show many varied activities and usages within IARU Region 1. Nationally the lower 2MHz sub-band is used for packet radio links and low power repeater input channels.

The upper 2MHz sub-band is also used for packet radio, low

power repeater output channels and fast scan television. It's also worth remembering that much DX Cluster traffic and BBS traffic are passed via high-speed links within the 430MHz band.

So, although you may not directly use this u.h.f. band, indirectly you may well be a user! Every MHz taken away from the 430MHz band will give rise to enormous allocation problems. It is therefore very important to lobby our national society to retain the full 10MHz of band.

Although the RSGB's initial response was required by the RA by the end of May, views on the proposals are still being sought. Any further comment should be sent immediately to: **Dr. Julian Gannaway G3YGF c/o RSGB Headquarters, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.**

Finally, it's interesting to note that among the 99 contributors to the DSI document were the International Amateur Radio Union (IARU), three national amateur radio societies; DARC (DL), OVSV (OE), RSGB (UK) and the UK Six Metre Group (UKSMG).

## Transatlantic Challenge

Since the early days of radio, when Marconi achieved the first transatlantic contact on very long waves, radio amateurs have attempted to challenge and equal his success on very much higher frequencies.

Experience has proved on many occasions that it's possible to increase the maximum usable frequency for transatlantic contacts to at least the 50MHz band. And during years of high solar activity crossband contacts have even been made on the 70MHz band between the UK and Canada.

A few dedicated enthusiasts have even arranged extensive transatlantic tests on the 144MHz band. Although such tests proved very interesting with parts of call signs being heard, no confirmed two-way terrestrial contact has ever been made on the 144MHz band.

Many operators throughout Europe and North America use the 144MHz band for local communications. However, within the hobby exists that special interest known as DXing.

To work consistent DX means fine tuning your station for maximum efficiency to conduct long-range radio contacts. On the 144MHz band this can mean contacts around 2300km via tropo, ionospheric scatter, meteor scatter, Sp-E or aurora.

On occasions contacts have been made with stations over 3000km away. For example, from England to Israel via Sp-E or from

Scotland to the Canary Islands via tropo.

The DX contacts have generated much interest and have motivated some amateurs to establish the first contact on the 144MHz band across the Atlantic Ocean. For this reason a group of like-minded operators from EI, G and GW have, under the auspices of the Irish Radio Transmitters Society (IRTS), approached the Waterford Crystal Company (Ireland).

As a result the Company have kindly donated a pair of Waterford Crystal glass trophies for the 144MHz Transatlantic Challenge. The rules are fairly lengthy (contact me if you require a copy) but I'll provide the basics.

The two stations must be located on land or non-tidal waterways within the continental shelves of Europe and America. The contact must be made via natural reflectors within the atmospheric mantle of the earth.

The use of man-made reflectors such as aircraft or satellites as well as e.m.e. is excluded. Two-way communication will be deemed to be established when each station has; received both call signs in full, received a signal report and received a confirmation (R or Roger).

The generally accepted systems of reporting are the RST or meteor scatter number system. All information must be exchanged within a maximum period of four hours.

The challenge has now been set! Experts would say that this venture is much more difficult to achieve than Marconi's early transatlantic short wave contacts.

Radio amateurs in Europe and the Americas can now prove to the experts that the true spirit of Amateur Radio knows no bounds. Who will be the lucky people to achieve this milestone in radio history. Could it be you?

## News And QSOs

Have you any news or made any interesting QSOs recently? Or if you just wish to pass on any information...please let me know about it.

As usual send details (to reach me by the end of the month) to: **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP** or via packet radio @ **GB7MAD** or the DX Cluster system. Alternatively you can telephone me on **(01873) 860679. Please note the new number!**

**END**

# BROADCAST ROUND-UP

Peter Shore has news of a short wave newsletter aimed at women, details of a computerised RDS tuner plus all the latest programme schedules.

I'll start this month with a letter I've received from **William Rigby** in Morecambe, Lancashire.

William bemoans the fact that it seems difficult to get QSLs from a number of stations. He has sent reception reports to All India Radio, Radio Pakistan, Radio Kuwait, Radio Ukraine International and Radio Yugoslavia. Some reports were mailed in February, complete with international reply coupons, but as yet nothing has come back.

What's the solution? Some stations get thousands of letters every year from listeners, and replying to them all takes time - and costs money. In the world of international broadcasting, money is all too often tight.

So, it can be quite a while before a radio station will get around to replying to your letter. The only answer is to be patient, I'm afraid. But perhaps that increases the thrill when the postman drops that envelope covered with exotic stamps through your letter box when you have all but forgotten about that elusive QSL card.

William goes on to report that he has logged Radio Tashkent with English at 1200 for 30 minutes on 7.285, 9.715, 15.295 and 17.815MHz, and at 1330 on the same channels. At 1930 there is a transmission on 13.785MHz, and at 0100 try 7.19 and 9.715MHz. Radio Tashkent's address is **49 Khorezm Street, Tashkent, Uzbekistan.**

## Not Men?

How many readers of this column are not men? A strange question, I hear you say. Maybe, and then again, maybe not.

Women are definitely in the minority when it comes to short wave listening (and the radio amateur hobby, too), but some people are out to change things.

**Nina Allen and Sylvia Charshoodian** in Massachusetts in the USA have inaugurated a publication called *Wavelengths*. This a short wave newsletter for women.

Nina and Sylvia plan to interview the producers of women's programmes aired by international

stations. They also hope to talk to women producers.

If you are interested in finding out more, contact *Wavelengths* at **PO Box 381766, Cambridge, Massachusetts 02238-1766 USA**

(enclosing an international reply coupon), or FAX on +1 617 489 1249.

## Computerised Tuner

Do you DX the f.m. bands when conditions are right? Do you have a home computer? If so, you might be interested in a new product to arrive on the market, the **MicroTuner**, produced by a small electronics firm in Surrey.

The **MicroTuner** consists of a small box, about the size of a paperback book, finished in a similar style to the housing of a PC, together with a mains adapter, f.m. dipole antenna, connector for loudspeakers and cable to link with the serial port of a computer. There is also a disk which contains the software to operate the device, which is based on the ubiquitous Windows operating system. All this adds up to a computerised f.m. tuner with all the advantages of complete Radio Data System (RDS) compatibility.

Load the software and switch on the **MicroTuner**, click with the computer mouse on one of the icons in the 'Launchpad' window on the computer screen. Up comes a display showing the complete f.m. frequency spectrum from 88 to 108MHz.

Click on 'scan' and the tuner will cruise up in frequency, displaying a peak when it receives a signal. This gives a result rather like a section of very mountainous terrain (**Fig. 1**). You can click on any of the peaks and the tuner instantly calls up that frequency.

If you click on the RDS icon, up comes another window which displays the frequency and signal strength. For those stations transmitting RDS (which most European broadcasters do these

days) the station name, programme type (news, pop music, classical, drama and so on) and alternative frequencies, if there are any for that station are displayed.

You can store up to 32 different frequencies, and recall them instantly simply by clicking on the appropriate number. The beauty of this system from an f.m. DXers point of view is that you can get instant identification of a station, without having to wait for a spoken announcement or to decipher a foreign language jingle.

I have played with the **MicroTuner** for a couple of weeks and think it works well. It has remarkable sensitivity (coupled with a rooftop antenna, signals were coming in from far and wide).

You can leave the unit running while you use a word processor or any other package that you work with. It's ideal for computerised DXing.

The only downside is the cost, at the moment it retails for just under £300 in the UK. More information from **Microgen Electronics, 43 Salisbury Road, Carshalton, Surrey SM5 3HA. Tel: 0181-647 8238.**

## Schedule News

Radio Exterior de Espana carries English to Europe at 2100 for an hour on 6.125MHz, and to North America at 0000-0200 and 0500-0556 on 9.54MHz.

Polish Radio Warsaw is on the air with English at 1200 on 6.135, 7.145, 7.27, 9.525 and 11.815MHz, at 1700 on 6.095, 7.27 and 7.285MHz and at 1930 on 6.095, 6.135 and 7.285MHz.

Croatian Radio has introduced a short wave service. It has ten minute English language news bulletins on the hour throughout the night between 2200 and 0500. You can tune

in on 5.895, 7.37 and 13.83MHz.

Radio Yugoslavia appears to have regained the use of its transmission facilities in Bosnia. Try for English at 1830 on 6.10 and 9.72MHz, and 2100 on 6.10 and 6.185MHz.

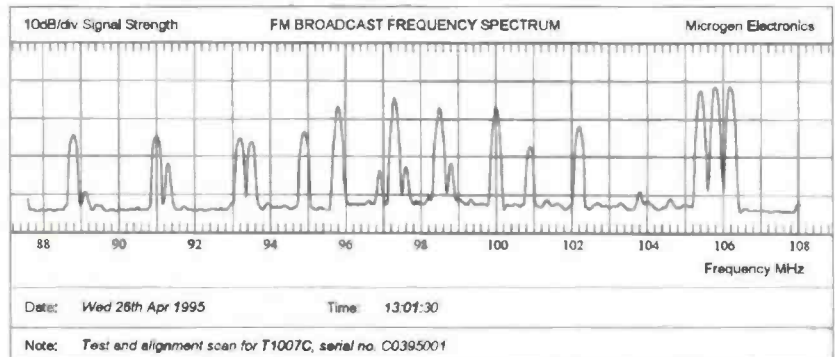
The Voice of Turkey carries English to Europe at 2000 and 2200 on 9.445MHz, and the latter broadcast is also beamed to the Middle East and North America on 11.71 and 7.185MHz. At 0300 there is another transmission to the Americas on 9.445MHz.

Moldova, one of the former Soviet republics, has an international service with English on Monday, Wednesday and Saturday at 2030 for half an hour. Try 15.29MHz. On Sunday, Tuesday and Thursday the previous day's broadcast is repeated on the same channel.

Finally, extreme right-wing political programmes have been dropped from US religious short wave broadcaster, **WWCR**, based in Nashville, Tennessee. Following the bombing of the Federal building in Oklahoma City in which more than 160 people lost their lives, **WWCR** decided that programmes such as *The Intelligence Report* should no longer be aired.

The **WWCR** service is on at the following times: 0000-1100 on 7.435; 0100-1200 on 5.935; 1100-2100 on 15.685; 1200-0100 on 13.845; 1400-2300 on 12.160; 2100-0000 on 9.475 and 2300-1400 on 5.065MHz.

**That's all for this month. Keep writing with details of what you've heard on the broadcast bands. Good listening!**



**Fig. 1: The MicroTuner produces an f.m. broadcast frequency spectrum display. The peaks show when a signal has been received.**

**END**

# FOCAL POINT

*In this edition of his bi-monthly column Andy Emmerson G8PTH rounds-up the latest happenings in the world of Amateur Television.*

**T**he 1996 amateur television rally, organised by the BATC, will be held at the Sky Blue Connection at Ryton, near Coventry. The date to mark in your diary is Sunday May 5.

There will also be a repeat of the BATCs successful biennial convention, probably at Shuttleworth Hall in Bedfordshire again. The date will be in early September.

The Government's Detailed Spectrum Investigation or DSI has the task of reviewing the use of the v.h.f. and u.h.f. radio spectrum. Many of the allocations have not been changed for years, even though many new uses have been devised for radio.

Inevitably, the amateur bands come under pressure and commercial users point out with some justification that they could make more regular use of 'our' bands and put more licence money into the Government's purse to boot. The 430MHz band in particular is being eyed enviously for business radio use and in many (not all) areas, this band has little use most of the time.

To ATV operators, 430MHz is particularly important, since it is the lowest band capable of supporting conventional wideband television signals. It's also relatively economical for newcomers to equip an ATV station.

Nonetheless, it's quite possible that we shall lose at least 2MHz of spectrum on 430MHz, which would put paid to ATV as we know it there. The Radiocommunications Agency has received representations on behalf of the amateur community from the RSGB, who have put forward the BATC viewpoint on behalf of all ATVers.

It's suggested that some other frequencies may be made available to compensate for the loss of 430MHz, including half a Megahertz at 915.50-920.00MHz on a secondary basis, of course, but this will be cold comfort to ATVers. Of course, if the band had been actively occupied by ATV transmissions, this discussion might never have happened, proving the old expression 'use it or lose it'.

## No Decision

No decision has been taken yet, so retaining the current allocation on 430MHz does remain a possibility. If we do lose it, however, what to do?

With every efficient filtering, it could be possible to radiate limited bandwidth monochrome pictures (the Germans call this SATV, ie. narrow bandwidth ATV). This is very effective for DX working when highly detailed pictures are not a consideration anyway. Given the amateur tradition of experimentation, it might be better to start considering digital techniques.

To produce moving pictures, exploiting current information compression technology, you will need a data rate of at least 1Mbit/s, occupying an r.f. bandwidth of 1.5MHz minimum. Initial thoughts are that ATV should use orthogonal frequency division multiplex (OFDM), which is a more spectrally efficient form of modulation than a.m. or f.m., and that ATVers should look at the technology coming out of digital video recorders.

Data-VHS or D-VHS has just been announced and this might be a fruitful starting point, although D-VHS won't be on the market for a few years yet. The NTL has already demonstrated extremely good pictures using OFDM and MPEG-2 coding with test transmissions on channel 34 from Crystal Palace.

At 1kW, the power level was far below what's needed for a.m. television, yet pictures were better. The future really does look very rosy with digital techniques.

## The Internet

Are you on the Internet? If so, you'll be pleased to know there is an ATV service where any news items, queries and answers are mailed automatically to all who find them of interest. Here's the 'low down' from **Doug Ferrell KD4MOJ**.

"Welcome to the ATV Information Server! The ATV ListServe run by Doug Ferrell KD4MOJ is open to any and everyone who has an interest in Amateur Television (ATV).



**The CAT94 amateur television convention last summer saw the usual array of television outside broadcast vehicles owned by BATC members. An ex-BBC Wales truck owned by Dave Caroline G8NND stands alongside a much older BBC vehicle (partly hidden) belonging to Brian Summers G8GQS.**

The ATV ListServe is like a mailing list for E-mail, in that all messages addressed to 'ATV@exchange.th.fl.us' are reflected to all users who are participants of this list.

In this way, a discussion of ATV equipment, information or products are re-directed to each participant's personal E-mail account, no matter where you receive your mail (AOL, CompuServe, Freenets, Internet providers, etc.). The ATV ListServe was created by me because I am interested in ATV and there is little on line information out there.

I have had to savour every bit of information that I run across from magazines (ATVQ is excellent! - a little plug) so, maybe on line input will help those that are new to this exciting hobby such as myself.

Now for the particulars of this list. To add yourself to the list, send a message to **ATV-Request@exchange.th.fl.us** with the following words in the body of the message: **ADD JOIN SUBSCRIBE**.

You can also delete yourself from the list by including any of the following commands in the body of your message: **DELETE UNSUBSCRIBE REMOVE**. Address a message to **ATV@exchange.th.fl.us** to have your message re-directed to the ATV ListServe for others to read and enjoy!

Alternatively, address a message to **Doug KD4MOJ** at one of the following addresses if you have any questions or comments; **doug@exchange.th.fl.us** or **kd4moj@exchange.th.fl.us** Tel Nos: (all USA): Voice: (904) 575-6577, BBS: (904) 575-7900, or FAX: (904) 575-6577. Hope to see you on line".

## Interesting Message

I have been connected to the 'Net' for a fortnight and have already seen several interesting messages. There are several amateur radio conferences on Usenet, although I haven't explored these yet... I waste enough time in the CP/M, obsolete computer and telecomms forums (or is it fora?)

If you know any good Internet addresses and Usenet groups, do write in and share them. I did also find instructions for 'How To Build Your Own Underground television Transmitter Using Commercially Available Parts'!

The file, in Usenet/alt.2600, starts "Yes, for some time now it has been possible to construct a clandestine television station, which you can operate from your Telecommando Lair, or modify for Mobile Media Guerrilla campaigns. We have named this device the Snow Box, due to its cool nature and the snow seen on blank television channels, waiting to be commandeered....".

Much of the information was along the right line, although as always, there was not quite enough information to actually build a station! Fascinating stuff if your aim in life is to overthrow the State!

**That's all for now, normal service will be resumed by next time, meanwhile, keep those letters and photos coming to me Andy Emmerson G8PTH at 71 Falcutt Way, Northampton NN2 8PH.**

**END**

## J. BIRKETT

### SUPPLIERS OF ELECTRONIC COMPONENTS

SURPLUS HOUSE MARKED R.F. POWER TRANSISTORS look like 10 watt.

1.75MHz devices @ £8.95 matched pair.

SILVER PLATED BALL BEARING 1/2" spindle each end air spaced variable capacitors 100pf @ £4.95, 100+100pf @ £5.95.

EX-EQUIPMENT VALVES ECC81, ECC82, 6BA6, @ £1 each, 6AL5, 6AS6, @ 50p each, EF91 @ 6 for £1.50.

GREEN SATIN INDICATOR UNIT as used in V-bombers @ £25, (P&P £1.0) artificial horizon MK2 @ £18 (P&P £5).

FETS 2N3819 @ 35p, MPF102 @ 45p, J304 @ 25p, J230 @ 20p, 2N4869A @ 25p, 2N5480 @ 45p, Dual Gate MOS FETS like 40673 @ 80p, BF981 @ 4 for £1.20.

R.F. POWER FETS MRF 136 @ £14 matched pair, BLF244 @ £7.

VHF/UHF LOW NOISE FET J309 @ 55p each.

R.F. POWER TRANSISTORS BLY89A (2N6082) 25 watt, 12 volt, 175MHz @ £8.95, £16 pair.

R.F. POWER AMPLIFIER PRINTED CIRCUIT BOARD for 2 BLW96 with most components. No information @ £4.

2 HOLE FERRITE BLOCK @ 25p, 6 hole ferrite bead @ 3 for 50p, sub-min ferrite beads @ 12 for 50p.

50 ASSORTED DIL RELAYS 6 to 48 volt fit in 16 pin DIL socket for £5.

R.F. POWER TRANSISTORS BLY89a (2N6082) 25 watt, 175MHz 12 volt @ £8.95, £16 pair, BLY97 @ £3, BFR64 @ £2.50.

AIRSPACED VARIABLE CAPACITORS 15+15pf @ £3.50, 15+15+15pf @ £3.50, 10+10+20pf @ £2.50, 200+300pf @ £3.50, 365+365pf @ £4.95, 365+365+365pf @ £4.95.

SCREW TERMINAL ELECTROLYTICS 10,000uf 25v.w. @ 60p, 15,000uf 40v.w. @ £1, 15,000uf 63v.w. @ £1.30.

AIR SPACED VARIABLE CAPACITORS 3 hole fixing screws supplied 1/2" spindle @ £3.50.

ACCESS, SWITCH and BARCLAYCARD accepted. P&P £1 under £10. Over Free, unless otherwise stated.

C.M. HOWES KITS. Available by post and for callers.



Partners J.H. Birkett  
J.L. Birkett

## AFFORDABLE PACKET

COMMODORE 64/128... ATARI ST... IBM COMPATIBLE PC... SPECTRUM

It is now possible to use the above computers to run Packet Radio with an outlay of much less than £100!

Commodore, PC and Spectrum systems allow HF and VHF working, while the Atari system only offers VHF PMS facilities are available on the Commodore, and the Spectrum if a microdrive is fitted. Digipeating facilities are offered on all versions. The Spectrum modem can also be supplied with a centronics printer port. We supply a fully tested modem, with a free copy of suitable software.

Commodore 64, Atari ST and PC Modems ..... £55.00

Baycom Agency

Spectrum Modem ..... £75.00

Spectrum Modem with printer port ..... £85.00

S.A.E. for details.

£4.50 Post & Packing

## J.&P. ELECTRONICS LTD.



Unit 45, Meadowmill Estate, Dixon Street,  
Kidderminster DY10 1HH Tel: (01562) 753893



## 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

R.A.S. (Nottingham)

R.A.S. (Nottingham)

G6XBH G1RAS G8UUS Tel: 0115-928 0267

## For all WEATHER SATELLITE enthusiasts THE INTERNATIONAL GROUP



RIG publishes a quarterly Journal containing: Many images from space, some in colour. Orbital elements and predictions. Articles about the interpretation of weather images, equipment construction and software. Helplines to advise beginners. All the news about weather satellites.

RIG supplies (to members only): receivers etc. at a discount, shareware of relevant programs, images on disk and CD-ROM.

Send for free information Pack (UK readers SAE please) to:  
RIG-P3, PO Box 142, RICKMANSWORTH, Herts WD3 4RQ, UK

## Annual Clear Out at Woburn Rally Sunday August 6th

Dishes : Offset & Prime Focus - 35cm to 1.5Mtrs (Bring a roof rack)

Receivers and dish positioners : Various old stock and PX Items

LNB's : New and used, including special prices on triples

Various other assorted odds and ends - Call in for a free catalogue

No reasonable (or even unreasonable) offer refused

PLUS

Our new ITT/Nokia Trac converted D2MAC decoder with card reader.

Normally £149.00 but special deal for Woburn Rally only !

## TRAC Satellite Systems

Tel 01642 468145 Fax 01642 440927

### THE VINTAGE WIRELESS LISTING

Published regularly, containing 100s of out of print, old and collectible wireless and TV books and magazines, and now incorporating 'The Vintage Hardware List' that contains for sale - vintage domestic radios, communications receivers, audio equipment, valves, vintage components, etc. Send six 1st class stamps for current catalogue or £3.75 for the next four catalogues.

### NEW BOOKS

**Bargain Offer** - the last 50 copies of Jane's now reduced. **Jane's Military Communications** Eleventh Edition 1990-1991. A vast volume of 886 pages. Large format. wraps. Contains descriptions, photographs and basic details of the world's military communications equipment. Brand new. Published at £80. Special price £35, p+p £5 (overseas postage extra).

**Eddystone Communications Receiver Data 1950-1970**. A facsimile reprint of the circuit diagrams, general descriptions and some service notes for sets from 1950-1970. 50 pages. £9.50 incl. p+p.

**Communications Receiver Type CR100**. Complete handbook, 56 pages, full circuits, layout and alignment notes. Large format. £8.95 incl. p+p.

**Racal RA17 Communications receiver technical service manual**. Facsimile copy, contains general description, operation, alignment and circuit diagrams. Large format. £9.50 incl. p+p.

**Messenger Gods of Battle** by Tony Devereux. The story of electronics in war and the development and military use of radio, radar and sonar, particularly WWII applications. Contains drawings and photos of some of the early wireless equipment and radar installations. An informative study of a little known subject. 322 pages, brand new hardback, published at £32. Our price £14.50, p+p, £2.50.

## Chevet Supplies Limited

Dept PW, 157 Dickson Road, Blackpool FY1 2EU

Phone: 01253 751858 Fax: 01253 302979



### SEARCHLIGHT MIRRORS. 19" dia 3 1/2" deep new. £28.50. MINE

DET Army type 4.C transis with inst book. £26.50. OSC ASS low freq

with 3 gang 500pf tuning cap dial with 6.1 drive etc. £17.50.

HEADSET ARMY lightweight 100 ohm. £12.50. TRIPOD H.D.

Army 5ft open weight 14 lbs £38 MARCONI TF2600 VTM 1 Mill/V

to 300v 12 ranges to 5 Megs mains tested with book. £34.50. COSSOR

CABLE TESTERS portable mains or 12v tests coax to 10K yds tested

with book. £45. MOTOR heavy duty 24v DC 5 amps off load new.

£26.50. SET OF VALVES for Mk.123 T/Rx. £16.50.

RADIOSONDE UNITS xtal cont Tx with tone mod on 404/5 Mc/s

new. £6.50. TUNING DRIVE ASS similar to CR100 as 3 gang 210pf

tun cap with 25/150.1 with scale. £19.50. WATTMETER low pwr

absorb type 50 ohm to 1.5 watt in 3 ranges to 1Gz. £28. GEIGER

COUNTER portable 0 to 300 U/Rongt per Hr req 1.5/120v tested.

£24.50. VARIACS 2 amp 0 to 240v for int int new. £26.50. MORSE

KEY Army enclose adjustable. £16.50.

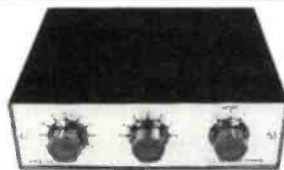
ABOVE PRICES ARE INCLUSIVE GOODS EX EQUIP UNLESS STATED NEW.

### A. H. SUPPLIES

Unit 12, Bankside Wks, Darnall Road, Sheffield S9 5HA

Tel: 0114-244 4278

## NEW! TU3 Antenna Tuner



- Ideal for receivers with a long wire Antenna on the H.F. bands, 1-30MHz.
- Versatile! The touch of a switch gives any one of 3 different arrangements.
- Quality case - black with printed aluminium front & back facias. Measuring only 170-140-50mm.

• Kit complete with ALL components and hardware including pre-punched case and panels.

Price £44 Plus £4.00 P & P

Ready made £54 Plus £4.00 P & P

Send SAE for details of our full range of kits or call 0115 938 2509

## LAKE ELECTRONICS

7 MIDDLETON CLOSE, NUTHALL, NOTTINGHAM NG16 1BX

(Callers by appointment only)



# BARGAIN BASEMENT

Write your advertisement clearly in BLOCK CAPITALS - up to a maximum of 30 words plus 12 words for your address - and send it together with your payment of £3.00 (cheques payable to PW Publishing Ltd.), or subscriber despatch label and corner flash to: **Zoe Shortland, PW Bargain Basement, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**

Subscribers must include the despatch label bearing their address and subscription number to qualify for their free advert.

Adverts published on a first-come, first-served basis, all queries to **Zoe Shortland on (01202) 659910.**

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.

## For Sale

35 years coverage of *Practical Wireless*, September 1957 to end 1993, stored, but reasonable/good condition, offers, complete, but must be collected. Tel: Worcs (01886) 832453.

**Alinco DJ-580E**, this radio is new, never used, still under warranty, £299. Also 144MHz vertical antenna, £45, s.w.r. meter, £10. This shack clearance due to silent key, all must go. Tel: Clwyd (01745) 730013 evenings.

**AMR1000S**, 144MHz, 25W, mobile, complete, unused, £130. Robin, Kent. Tel: (01843) 835328.

**Clark telescopic mast**, type QT9MHP, mint condition (pump operated), perfect for home base or field op., £100 o.n.o. (cost £330). Chas, Hants. Tel: (01425) 470298.

**Collins R390A-URR** nice example. Telefunken comms receiver E127KW/5, excellent. GRC-9 (angry nine) TX/RX, 2-12MHz, excellent. HRO complete, mint, restored. Hallicrafters S27, excellent, sell or swap or w.h.y.? Jim G4XWD, Norfolk. Tel: (01692) 630285.

**Comminique C766** u.h.f. mobile radios, 25W, 4 channels, diode programmable for 430MHz with full info, £30. 144MHz 80W linear, £80. Tel: Beds (01525) 406043.

**D11/R230 station** plus spares/manuals. Not a project for the faint hearted or the loft. In working order, needs some small attention. Buyer collects. Any reasonable offer considered. Tel: Herts (01763) 245887 evenings or (01799) 528120 daytime.

**Datong filter FL2**, £55. Labgear hi-pass filter E5037, 75Ω, £1. 0-500V d.c. 3.5in round panel meter, £1. Papst 4.5in axial fan 12V d.c., £1.50 plus postage. Tel: Kent (01795) 873100.

**Drake TR7/PS7** with full complement of filters, v.g.c., £495. Remote v.f.o. RV7, £85. Fan FA7, £10. Desk mic. 7077, £12. All v.g.c. Tel: Manchester 0161-283 1689.

**Fourteen copies of Morsum Magnificat** magazine, No's 21 to 34, £10 post paid. Tel: Bristol 0117-977 6891.

**FT-707, FC-707, a.t.u., FP-107** p.s.u., FV-707 digital v.f.o., fitted f.m. and narrow c.w. filter, £550 o.n.o. FT-708 430MHz handie, base station, charger, £150 o.n.o. Compaq 286 colour PC, tape streamer, £160 o.n.o. Keith, Essex. Tel: (01992) 714168 day or (01376) 321315 evenings.

**Get on buzzing!** Six metres R and N 25W transverter, 144-50MHz plus 4-element

J-beam, only, £130. Nobby G0VJG, Kent. Tel: (01322) 226101.

**Icom 551D**, boxed, £600. Heathkit for 14MHz, £100. Yaesu FT-620B (50MHz), £280. Yaesu FV-700, £100. J. Nunes, Portugal. Tel: 351-1-7577786, FAX: 351-1-7577981.

**Kenwood TS-811E** 430MHz all-mode base station, totally unmarked, as new condition, little used, selling to make way for dual-bander, cost £925, accept £550 o.n.o. Tel: Cleveland (01740) 651938 evenings or weekends.

**KW Vespa MkII**, manuals, £80. Quad f.m. tuner, manuals, £25. Construction book Osram 912, also Plus, amplifiers, offers, home radio component catalogue '96', £2. Bill, Glasgow. Tel: 0141-649 4345.

**KW2000B transceiver**, 1.8-30MHz, condition practically as new, good working order, excellent reports, complete, boxed with manual/circuits, separate p.s.u./spkr, p.s.u. professionally stabilised, ten spare valves including pair 6146B, £185. G2FZU, Notts. Tel: (01636) 813847. No offers please.

**MC85**, £70. 10, 15, 20 vertical, £60. 144MHz 50W amplifier with pre-amp, £80. Light duty rotator, £35. Kent single paddle key, £20. Hi-mound key, £15. Howes 3.5MHz QRP TX/RX, £25. 144MHz RX, £25. Patrick, Norfolk. Tel: (01953) 884305 or (0860) 633366.

**Morsum Magnificat and Radio Bygones**, all issues, to date, as new, offers. Collect or carriage extra. Trowell, Sheerness. Tel: (01795) 873100.

**Dptoelectronics frequency counter**, 2300. Range 1MHz to 2.4GHz, 600mAh batteries rechargeable, digital read-out, instruction manual, mint condition, £90. ATU 3.5-30MHz Z-match, attractive, enamelled case, well engineered, weight 14lbs, new, variable capacitors, £55. G2FZU, Notts. Tel: (01636) 813847. No offers please, carriage extra.

**Philips bench digital multimeter SBC540**, new, offers or swap for Eddystone, etc. Tel: Essex (01702) 522929.

**Property of late G3CYS**: Air Ministry key, Morse, type D (10A/7373), v.g.c., £45 o.n.o. Eddystone semi-automatic ('bug') key, v.g.c., £40 o.n.o. Small Morse key (base 54 x 42mm) (ex spy set?), £15 o.n.o. Walter G3ESP, Pontefract. Tel: (01977) 611229.

**PW Beaver 50MHz kit**. RX PC built, not tested. TX PC not built. Chassis with tuning capacitor meter plus extras and PW building instructions, £20. G4KJN. Tel: 0191-252 8908.

**Racal RA-17**, matching 799 TX s.s.b. unit. RA-17L auto change unit, £250 the lot. Tel: Beds (01525) 371152 evenings/weekends.

**Redifon R550A** h.f. RX, £200 o.n.o. Mizuho 14MHz portable, £160. Argosy II and p.s.u. h.f. TX/RX, £320. Kenwood TH-27E 144MHz hand-held, £160 o.n.o. Bencher and StarMaster keyer, £59 o.n.o. Supa Tuta Morse tutor and keyer, £30. Steve, Lancs. Tel: (01254) 775637.

**Set valves**, 23 in total includes pairs TT22, 6146, 90C1. Murphy TV V230 1957, missing lead, otherwise complete. Wurlizer cassette player/amplifier C115. Offers invited. Please write first, no telephone. Michael Turnbull, 11 Waverley Avenue, Monkseaton, Whitley Bay NE25 8AU.

**Silent key sale: GW3YXC**. Kenwood TS-520SE, boxed, good, £300. Datong multi-mode filter FL3, £80. Colt 510 120/a.m., f.m., 10m conversion, 28MHz, no other info., £35. Brema a.m., f.m., s.s.b. BRL 35/45W Collaudato 3 amplifier, thought to have been used with above, £15. Tel: Cardiff (01222) 512959.

**Teleprinter parts** for model AH11, including logic, driver and power supply boards. Tel: Essex (01279) 437650.

**Transistors PNP ex-equipment: ACY17** (25), BCY32 (8), OC202 (9), OC44 (1), OC45 (4), OC71 (2), OC81 (4), OC810 (2), 5p each plus postage. Walter Farrar G3ESP, Pontefract. Tel: (01977) 611229.

**Trio R-1000** general coverage receiver, 100kHz to 30MHz, f.m. board fitted, very good condition, operation manual, £240 plus postage. SEM QRM Eliminator, good condition, £70 plus postage. Robert G17VX, Kilkree. Tel: (01693) 762166 after 6pm.

**Two CB hand-helds**, 40 channels, 4W or 1W, unused, boxed, batt or external 12V l.e.d. read-out, squelch, cost £160, accept, £85. Tel: Beds (01234) 720591.

**VersaTower mobile mast**, 10m high, four sections including head, base plate, £995. 70MHz transceiver AKD4001, £110. 144MHz linear A200, £27. 70MHz linear A200, £27. Steve, Mursley. Tel: (01296) 720161.

**Versatower** with header (side of house mounting). Buyer collects, £180. Tel: London 0181-346 4301.

**Yaesu FRG-9600** 100kHz to 950MHz, Maycom modification, f.m.n., f.m.w., a.m.n., a.m.w., l.s.b., u.s.b., 100 memories, video compatible, instructions, boxed, £375 o.n.o. ERA MkII Microreader, c.w., RTTY, Morse tutor RS232, instructions, boxed, £75 o.n.o. Tel: Aberdeen (01224) 899493. Buyer pays postage.

**Yaesu FT-290R MkI**, mint condition, boxed, £230. 25/30A Daiwa p.s.u., five months old, £80. Sinclair Spectrum computer, boxed, £15. 70MHz p.m.r. radios, £10 each. Ian, Walsall. Tel: (01922) 30668 after 5pm.

**Yaesu FT-708** 430MHz transceiver with NCB p.s.u./charger, speaker, mic., new NiCads, base station use, only, £120 or

exchange for colour hand scanner to enable me to get pictures into the computer. Tel: Kent (01474) 707678. **Yaesu FT-840** including c.w. filter, boxed, manual, as new, £600. Tel: Penzance (01736) 788003 after 6pm please.

**Yaesu FT-902DM** h.f. transceiver, 100 p.e.p. with FC-902 a.t.u. and SP-901 speaker, hand mike and manuals, complete station for, £550. No split. Tel: Burton-on-Trent (01283) 563667 after 6pm.

## Exchange

**Packard Bell 386SX16 computer** 3Mb RAM, 40Mb HD for dual-band mobile hand-held or h.f. TXVR, will deliver or collect local area. Tony GOVSU, Dorset. Tel: (01258) 454621.

## Wanted

**All sorts of Sinclair memorabilia**, including calculators, watches, radios, TVs. No computers please. Enrico Tedeschi, 54 Easthill Drive, Portslade, Brighton BN41 2FD. Tel/FAX: (01273) 410749 or (0850) 104725 (mobile) anytime.

**Antenna R5, R7, etc.** G3AOS, Cheshire. Tel: (01260) 252287.

**Any small shirt pocket transistor radio**, working or not. Your price paid (try me!). Also Sinclair Memorabilia, such as radios, black watch, wrist calculator, mini TV, signal injector, etc. Enrico Tedeschi, Brighton. Tel/FAX: (01273) 410749 or (0850) 104725 anytime.

**Camper and Nicholson receiver** model 7020, will purchase outright or exchange for my Eddystone Panadaptor model EP14. Also any Eddystone receivers, particularly models EC10, EB35, 870, 960 please. For cash, collection possible. Tel: (01374) 128170 or FAX: (01372) 454381.

**Capco 'magnetic' loop antenna**, five band 14-30MHz or equivalent make. Trio 430S for sale, all frequencies, perfect, must collect, £475. No offers. John (01283) 221870.

**Dead or alive** - Marconi instruments TF852A, B or C, etc. Alignment oscilloscope, Doug, Winchester. Tel: (01962) 856064.

**Kenwood TS-140** or Icom IC-725, must be in excellent condition, disabled person. Tel: Sheffield 0114-245 4579.

**Radio and Electronic World**, around 1985, photocopy of circuit and information for band pass unit, using Kank 3333-4-5 Toko (have PCB), costs met. Thanks. Bill, Glasgow. Tel: 0141-649 4345.

**Recent pass of RAE(B)**, want gear to start, 0-30MHz scanner, 144MHz TX/RX or w.h.y.? Have for exchange or sale Hallicrafters S27, tatty, but works. Tel: Cornwall (01579) 62908.

**Yaesu FT-790R parts** - control unit and keyboard unit. Damaged radio considered. Paul, Yorkshire. Tel: 0113-267 6672.

Bargain Basement  
August 1995

# Classified Ads

To advertise on this page see booking form below.

## Educational

**COURSE FOR CITY AND GUILDS** Radio Amateurs Examination. Pass this important examination and obtain your licence, with an RRC Home Study Course. For details of this and other courses (GCSE, career and professional examinations, etc) write or phone - THE RAPID RESULTS COLLEGE, DEPT JX116, Tuition House, London SW19 4DS. Tel: 0181-947 7272 (9am-5pm) or use our 24hr Recordacall service 0181-946 1102 quoting JX300.

**HEATHKIT EDUCATIONAL PRODUCTS UK DISTRIBUTOR/SPARES AND SERVICE CENTRE.** Cedar Electronics, 12 Isbourne Way, Broadway Road, Winchcombe, Cheltenham. Glos. GL54 5NS. Tel: (01242) 602402.

## RAE "The Video"

The definitive learning aid for the exam! A full three hour VHS video based on the highly successful training course developed and presented by Chris Budd GOLOJ

This unbeatable package comes complete with a detailed course study booklet, packed with key learning points, facts and diagrams for instant reference and easy revision. Only £22.50 plus £2 postage and packing or available to callers.

Send cheque or postal order to:  
**Tricorn Marketing Ltd,**  
31 Berkeley Square,  
Bristol BS8 1HP  
Tel: 0117-921 5390

## 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 £45; DA100 £75; EL34, EL37 £10; ECC81/CV4024, CV4003, CV4004, ECC83 £3. Valves must be Mullard/GEC, West European to achieve the price. Ask for our free wanted list. Prompt and courteous service. Visitors by appointment only (we are a very busy Export Warehouse).

## SCIENTIFIC SHAREWARE

Discover the true wealth of PD and shareware for the PC. Since 1982 PDSL have supplied the best and latest programs covering all interests.

Business, Leisure, Engineering, CAD, DTP, Maths, Stats, Chemistry, Education, Electronics, Ham Radio, Esoteric, Medical, Raytracing, Programming & languages, Tools, Utilities, WP, Editors, Comms, Special applications, Esoteric, Novelty, Astronomy & hundreds more.

All software can be provided on floppy disc or CD ROM. Whatever your interest in we probably have. Send today for our PC Shareware reference guide. It runs to more than 250,000 words and is probably the most comprehensive catalogue currently available.

Send £2.50 (voucher provided refundable on first order) or Phone/FAX using Access/Visa/MC to:

**PDSL, Winscombe House, Beacon Road,  
Crowborough, East Sussex TN6 1UL  
Tel: (01892) 663298 FAX: (01892) 667473**

## For Sale

**VINTAGE SERVICE DATA**, circuits & manuals - for: HiFi, Military, Radio, Television & car radio up to the 1060's. Free brochure. Savoy Hill Publications, "Seven Ash Cottage", Seven Ash, Combe Martin, North Devon, EX34 0PA. Tel: (01271) 882665.

## WORLD RADIO LOGBOOKS

Ideal for radio amateurs. Full data logbook plus information section including emission codes, world times, morse etc.

ONLY £2.99 Post Paid

## QSL CARDS

ONLY £2.99 per 50  
or £4.99 per 100 Post Paid  
Just add callsign yourself!

(FREE SAMPLES)

Cheque/PO to: **HILMAT MARKETING,**  
6 West Road, Halstead, Essex CO9 1EH  
Prop. K. Matthews

## 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.

## Morse

**LUCID R.A.E.** and morse tutorials one MEG RAM needed very favourable reviews for Atari now Amiga version £15 each. Demo/s SAE plus disk/s. Lucid Publications, 18 Hobart Road, Ramsgate. Tel: 01843 582939.

**SAMSON** top quality German EL-Keyers in use in 160 countries. Widely used by DX'peditions, contesters, R.S.A.R.S., R.N.A.R.S., R.A.F.A.R.S. members. Four models, £45 to £150. Details G5BM. QTHR. Tel: 01531 820960.

**TAKE THE STRAIN OUT OF LEARNING TO SEND AND RECEIVE MORSE.** Works with any PC compatible. ONLY £8.99 from **SHOESTRING SOFTWARE**, 78 Carmarthen Road, Swansea SA1 1HS. (FREE DEMO AND CATALOGUE AVAILABLE, 3.5" DISKS ONLY).

## 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.

## ORDER FORM FOR CLASSIFIED ADS PLEASE WRITE IN BLOCK CAPITALS

The prepaid rate for classified advertisements is 42 pence per word (minimum 12 words), box number 70p extra. Semi-display setting £13.90 per single column centimetre (minimum 2.5cm). Please add 17.5% VAT to the total. All cheques, postal orders, etc., to be made payable to the PW Publishing. Treasury notes should always be sent by registered post. Advertisements, together with remittance should be sent to the Classified Advertisement Dept., Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659920, Fax: (01202) 659950

Please insert this advertisement in the ..... issue of Practical Wireless (if you do not specify an issue we will insert it in the next available issue of PW) for ..... insertion/s. I enclose Cheque/P.O. for £..... (42p per word, 12 minimum, please add 17.5% VAT to total).

Name: .....

Address: .....

Telephone No.: .....

Box Number @ 70p: Tick if appropriate

Category heading: .....


## Wanted

**WANTED FOR CASH** Valve or solid state communication receivers Pre-1980. Preferably working and in good condition. Non working sets considered also domestic valve radios. Items of Government surplus wireless equipment and obsolete test equipment. Pre-1965 wireless and audio components and accessories. Pre-1975 wireless and TV books and magazines. Also, most valves wanted for cash. Must be unused and boxed. CBS, 157 Dickson Road, Blackpool, FY1 2EU. Tel: (01253) 751858 or Fax: (01253) 302979.

**WANTED FERRITE ROD AERIALS** must be half inch in diameter no more or less. Must be six inches long or more. Contact Peter Tankard on Sheffield 0114-234 3030 any time.

## Miscellaneous

**DIY INEXPENSIVE RADIO PROJECTS.** Easy to make, SAE, RYLANDS, 39 Parkside Avenue, Southampton SO1 9AF.

**VALVE ENTHUSIASTS:** Capacitors and other parts At attractive prices! Ring for free list. Geoff Davies (Radio), Tel: (01788) 574774.

## Receivers

**B.F.O. KITS** Resolves single side-band on almost any radio, £16.49. H. CORRIGAN, 7 York Street, Ayr KA8 8AR.

## Computer Software & Hardware

**ULTIMATE MORSE TUTOR** for PC's and ATARI £30 from BOSCAD Ltd, 16 Aytoun Grove, Baldrigeburn, Dunfermline, Fife KY12 9TA or Tel: 01383 729584, evenings for detailed information.

**JVFAX/SSTV**, Hamcomm, Pktmon, 9FD or 25FD PC Transceive Interface, Programmes, Manuals, Pictures. £28.50. G8SLB (QTHR). Tel: 0181-595 0823.

## ELECTRONICS VALVES & SEMICONDUCTORS

We are one of the largest stockists of valves etc, in the U.K.

COLOMOR (ELECTRONICS) LTD.

Phone for a  
most courteous quotation

**081-743 0899**  
Fax: **081-749 3934**

170 GOLDHAWK ROAD  
LONDON W12 8HJ

Please mention

**practical  
Wireless**

when replying to  
advertisements

## KING'S LYNN AMATEUR RADIO CLUB

### 6th Great Eastern Radio Rally

Sunday 20th August, 1995

Doors open 10 a.m. (9.45 a.m. for Disabled)

The Cattle Market, King's Lynn, Norfolk

Bring & Buy and Outdoor Car Boot Area (limited space)

Admission £1.00

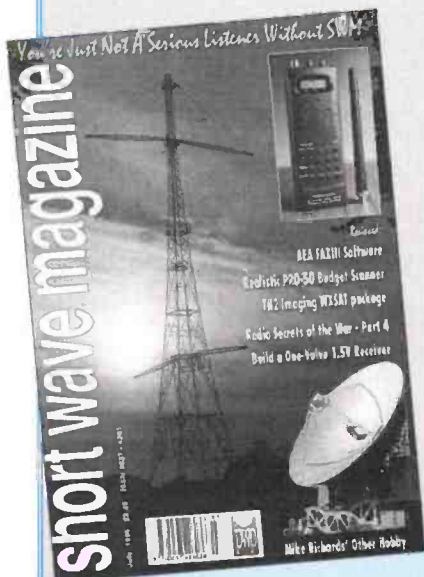
OTHER NEARBY ATTRACTIONS

Sunday Car Boot (only 50 metres away)

TALK IN STATION G3XYZ on 145.550 MHz (S2)

Contact Ian (G0BMS) - 01553 765614

# SHORT WAVE MAGAZINE



## This Month:

### Reviewed:

- ★ AEA FAX III Decoding Software
- ★ TH2 Imaging's Weather Satellite System Components
- ★ Realistic PRO-50 Scanner

- ★ Build - A 1.5V One-valve Short Wave Radio
- ★ Ronnie, Freelance Radio Inspector
- ★ Radio Secrets of the War - Final part

## Plus Regulars each Month

## Coming Next Month: Our Broadcast Special

- ★ Medium Wave DXing
- ★ Atlantic 252
- ★ Radio Havana

- ★ Review: Kiwa Medium Wave Loop Antenna
- ★ Will it Get Foreign Stations?

# ORDER FORM

FOR ALL MAIL ORDER PURCHASES IN PRACTICAL WIRELESS

## SUBSCRIPTIONS

**PRACTICAL WIRELESS - 1 YEAR**

£22.00 (UK)  £25.00 (Europe)  \$45\* (USA)  £27.00 (Rest of World)

## SPECIAL JOINT SUBSCRIPTION WITH SHORT WAVE MAGAZINE (1 YEAR)

£42.00 (UK)  £47.00 (Europe)  \$80\* (USA)  £51.00 (Rest of World)

\* \$ cheques only please.

Please start my subscription with the ..... issue.

## SUBS CLUB/READER OFFER Page 25

I am a **PW Subscriber**. Please send me ..... **MFJ-948 Deluxe Versa Tuner II(s)** @ £129 inc. P&P (UK).

My Subscriber Number is.....

Please send me ..... **MFJ-948 Deluxe Versa Tuner II(s)** @ £134 inc. P&P (UK).

Overseas P&P prices available on application.

## BINDERS

Please send me ... **PW Binder(s)** @ £5.50 each. £

Postal charges: £1 for one, £2 for two or more (UK & overseas surface).

## BOOKS

Please send me the following book/s,

.....£  
 .....£  
 .....£  
 .....£  
 .....£  
 .....£  
 .....£

## Postal charges.

**UK:** £1 for one, £2 for two or more. £

## Overseas:

£1.75 for one, £3.50 for two or more. £

## NEW FASTER NEXT DAY SERVICE (UK)

(For orders received a.m.) £3.75 £

## GRAND TOTAL

£

We have re-designed our Order Form to accommodate the new Cardcharge service for Subscribers. This enables Subscribers to save a lot of hassle by using their credit card to pay for their subscription on an automatic annual renewal basis. To take advantage of this service complete the special Cardcharge form at the foot of this page and we will take care of the rest.

**CREDIT CARD ORDERS TAKEN ON (01202) 659930**  
 between the hours of 8.30 am - 4.30 pm 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.**

## PAYMENT DETAILS

Name .....

Address .....

.....Postcode .....

Telephone No. ....

I enclose cheque/PO (Payable to PW Publishing Ltd.) £ \$

Or  
 Charge to my Access/Visa Card the amount of £ \$

Card No.

Valid from ..... to .....

Signature ..... Tel: .....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. Please note: all payments must be made in Sterling.

**CREDIT CARD ORDERS TAKEN ON (01202) 659930**  
**FAX ORDERS TAKEN ON (01202) 659950**

Use this part of the Order form **only** if you want to use Cardcharge to pay for your subscription. If you want to take out a subscription, or order other items and want to pay by conventional methods, please use the main part of the Order Form.

## CARDCHARGE AUTHORITY (for subscriptions only)

To .....

I authorise you, until further notice in writing, to charge my ..... card unspecified amounts in respect of.....(yearly magazine subscription)

as and when they become due

**Visa/MasterCard** account number

**Expiry date**

**Name** (as on credit card).....

**Full Address**.....

.....

.....

.....Postcode.....

Merchant reference: 6940936

Signature .....

Date .....

This authority may be cancelled by writing to PW Publishing Ltd. at any time.



# BOOK SERVICE

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.



TO ORDER: PLEASE USE THE ORDER FORM ON PAGE 70 OR TELEPHONE THE CREDIT CARD HOTLINE ON (01202) 659930 (24 HOURS)

## NEW BOOKS

This month we've added two new titles to the *PW Book Service*. *Test Equipment For The Radio Amateur and Practical Transmitters For Novices* are both published by the RSGB and we think they'll prove to be very popular. For more information see the individual book listings. **So, don't delay, browse through our book list and order your books today!**

## LISTENING GUIDES

### Airband

#### AIR BAND RADIO HANDBOOK 5th Edition

David J. Smith  
Air band radio listening enables you to listen-in on the conversations between aircraft and those on the ground who control them, and is an increasingly popular and fascinating hobby. A new chapter on military air band has been added. The author, an air traffic controller, explains more about this listening hobby.  
190 pages. £8.99

#### AIR & METEO CODE MANUAL 14th Edition

Joerg Klingenfuss  
Detailed descriptions of the World Meteorological Organisation Global Telecommunication System operating FAX and RTTY meteo stations, and its message format with decoding examples. Also detailed description of the Aeronautical Fixed Telecommunication Network amongst others.  
358 pages. £20.00

#### AIRWAVES 95

The Complete HF/VHF/UHF Aviation Frequency Directory  
Much of the more obscure (especially military) information is made accessible in this volume. Not only are facilities/activities listed, giving their frequencies, but also there are reverse lists - when the frequency is known, the allocated user can be found.

Airways sectors are listed so much more clearly than in the Supplements. The main transponder code groups are included. In fact, the book covers all the way from h.f. up to u.h.f.  
88 pages. £7.95

#### CALLSIGN 95

The Civil & Military Aviation Callsign Directory  
Intended for the aircraft and radio enthusiast to use as a stand alone reference, or as a partner to Airwaves 94. Over 5300 military and 3000 civil callsigns are covered in detail.  
106 pages. £7.95

#### FLIGHT ROUTINGS 1995

Compiled by T.T. & S.J. Williams  
This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's callsign. Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America.  
140 pages. £6.50

#### THE AIRBAND JARGON BOOK

Ron Swinburne  
Designed to give the newcomer some guidance on what to expect from Airband and how to extract the most from listening to it.  
This guide is essential reading for those not involved in the aviation industry. It gives a valuable insight to many aspects of aviation. Explained are the principles of Airband reception, aircraft instrumentation, radio services, weather navigation, etc. and air traffic control. To list but a few. Read this book and you could well be hooked.  
72 pages. £6.95

#### UNDERSTANDING ACARS 2nd Edition

Aircraft Communications Addressing and Reporting System  
Ed Flynn  
Here is the information you need to understand and decode the Aircraft Communications Addressing and Reporting System, otherwise known as ACARS. Deals with the equipment needed as well as message format and type.  
80 pages. £9.95

#### WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY 2nd Edition

Robert E. Evans  
This book covers aeronautical radio communications, voice and digital, within the range of h.f. and v.h.f./u.h.f. frequency bands. Commercial, military and paramilitary operations are included. Divided into logical sections, it provides useful information and frequencies on almost anything and everything airband.  
260 pages. £19.95

### Broadcast

#### A GUIDE TO THE WORLD'S RADIO STATIONS BP355

Peter Shore  
As in 'Broadcast Round-up', his column in PW, Peter Shore has laid this book out in world areas, providing the listener with a reference work designed to guide around the ever-more complex radio bands. There are sections covering English language transmissions, programmes for DXers and s.w.l.s. Along with sections on European medium wave and UK FM stations.  
266 pages. £5.95

#### RADIO LISTENERS GUIDE 1995

Clive Woodyear  
This is the third edition of this radio listener's guide. Simple-to-use maps and charts show the frequencies for radio stations in the UK Organised so that the various station types are listed separately, the maps are useful for the travelling listener. Articles included in the guide discuss v.h.f. aeriels, RDS, the Radio Authority and developments from Blaupunkt.  
68 pages. £3.45

#### POP WENT THE PIRATES

Keith Skues  
A very comprehensive history of Pirate Radio. Thanks to *Pop Went The Pirates* the whole era of people seeking to provide a popular alternative radio service, under

quite considerable opposition, will be remembered. I don't suppose we will ever see or hear the like of it again.  
£14.99

### Datamodes

#### GUIDE TO FAX RADIO STATIONS

15th Edition  
Joerg Klingenfuss  
The new edition of this super reference book covers the world's facsimile stations, their frequencies and methods of working. There is a section covering the equipment needed to receive FAX over the radio. To give you an idea of what is available there are many pages of off-air received FAX pictures.  
392 pages. £20.00

#### GUIDE TO UTILITY STATIONS

13th Edition  
Joerg Klingenfuss  
This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 19549 entries in the frequency list and 3590 in the alphabetical callsign list plus press services and meteorological stations. Included are RTTY & FAX press and meteo schedules. There are 11800 changes since the 10th edition. 534 pages. £30.00

#### POCKET GUIDE TO RTTY AND FAX STATIONS

Bill Laver  
A handy reference book listing RTTY and FAX stations, together with modes and other essential information. The listing is in ascending frequency order, from 1.6 to 26.8MHz.  
57 pages. £3.95

#### RADIOTELETYPE CODE MANUAL 13th Edition

Joerg Klingenfuss  
This book gives detailed descriptions of the characteristics of telegraph transmission on short waves, with all commercial modulation types including voice frequency telegraphy and comprehensive information on all RTTY systems and c.w. alphabets.  
96 pages. £14.00

### Frequency Guides

#### 1995 Super Frequency List

Joerg Klingenfuss  
This new CD-ROM has been designed for use with IBM PCs or clones running Windows 3.1. The CD-ROM comes complete with its own viewing software and includes 14000 frequencies that have been extracted from the Klingenfuss *Guide to Utility Stations*. This frequency listing is supplemented by 1000 abbreviations and 1200 formerly active frequencies. As this list was last updated in January '95 it's well up-to-date.  
£20.00

#### FERRELL'S CONFIDENTIAL FREQUENCY LIST 9th Edition

Compiled by Geoff Halligey  
Spirally bound, this easy-to-use reference book covers 1.6 - 28MHz in great detail, all modes and utility services, with new reverse frequency listing showing every known frequency against each callsign, who's using what frequency and mode, what's that callsign?  
544 pages. £17.95

#### PASSPORT TO WORLD BAND RADIO 1995

This book gives you the information to explore and enjoy the world of broadcast band listening. It includes features on different international radio stations, receiver reviews and advice as well as the hours and language of broadcast stations by frequency. The 'blue pages' provide a channel-to-channel guide to world band schedules.  
416 pages. £14.50

#### SHORT WAVE INTERNATIONAL FREQUENCY HANDBOOK

This book contains a comprehensive frequency listing covering 400kHz - 30MHz and is packed with everything from the basics of short wave listening to explaining FAX and RTTY. In this updated version there are many new broadcast and utility stations listed.  
188 pages. £12.95

#### UK SCANNING DIRECTORY 4th Edition

This spiral bound book lists over 20000 UK spot frequencies from 25MHz to 1.6GHz. Articles on DXing in the UK.  
335 pages. £17.50



## PW BOOK SERVICE



(01202) 659930

(24 HOURS)

### WORLD RADIO TV HANDBOOK 1995

Country-by-country listing of l.w., m.w. & s.w. broadcast and TV stations. Receiver test reports, English language broadcasts. The s.w.l.s. bible.  
608 pages. £15.95

### General

#### EAVESDROPPING ON THE BRITISH MILITARY

Michael Cannon  
For the very first time a book has been published showing how to monitor British military communications. All you need is a short wave receiver, lots of time and patience, and this secret world will open up to you, providing many hours of enjoyment. Also included is the largest British military callsign list ever to be published.  
166 pages. £17.50

#### THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK 4th Edition

Hank Bennett, Harry Helms & David Hardy  
This book is a comprehensive guide to the basics of short wave listening. Everything you need to get started as an s.w.l. is explained in a clear and easily understood manner. Receivers, antennas, frequencies, propagation, Q-codes, etc. are all covered.  
321 pages. £17.95

### Satellite

#### AN INTRODUCTION TO AMATEUR COMMUNICATIONS SATELLITES

BP230 A, Pickard  
This book describes several currently available systems, their connection to an appropriate computer and how they can be operated with suitable software. The results of decoding signals containing such information as telemetry data and weather pictures are demonstrated.  
102 pages. £3.95

#### AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326

F. A. Wilson  
A simple, (with the minimum of mathematics) beginner's book covering satellite communications in a practical way. It provides a handy basic reference source on this complex subject and is aimed at up-dating someone who is familiar with radio communications.  
230 pages. £5.95

#### ARRL SATELLITE ANTHOLOGY

The best from the Amateur Satellite News column and articles out of 31 issues of QST have been gathered together in this book. The latest information on OSCARs 9 through 13 as well as the RS satellites is included. Operation on Phase 3 satellites (OSCAR 10 and 13) is covered in detail.  
97 pages. £5.95

#### NEWNES GUIDE TO SATELLITE TV

Derek Stephenson  
This book, the 3rd edition, is a hard bound volume, printed on high quality paper. The author is a satellite repair and installation engineer and the book covers all information needed by the installation engineer, the hobbyist and the service engineer to understand the theoretical and practical aspects of satellite reception with dish installation and how to trouble-shoot when picture quality is not up to anticipated reception. Mathematics has been kept to a minimum.  
371 pages. £18.95

#### SATELLITE BOOK - A Complete Guide to Satellite TV Theory and Practice

John Bredas  
This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by an expert in that field. It appears to be aimed at the professional satellite system installer, for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology.  
280 pages. £32.00

#### SATELLITE EXPERIMENTER'S HANDBOOK 2nd Edition

Martin Davidoff KC2UB  
The book is divided into four main sections - History, Getting Started, Technical Topics and Appendices. It provides information on spacecraft built by, and for, radio amateurs. In addition, it discusses weather, TV-broadcast and other satellites of interest to amateurs.  
313 pages. £14.50

## SATELLITE TELEVISION

A layman's guide  
Peter Pearson

Pictures from space, that's what satellite television is all about. Orbiting satellites, 35000km high, receive TV signals from stations on the earth and re-transmit them back again. This book explains all you need to know to set up your own satellite TV terminal at home, dish and accessories, cable and tuner.  
73 pages, £1.00

## SATELLITE TELEVISION INSTALLATION GUIDE

5th Edition  
John Breeds

A practical guide to satellite television. Detailed guide-lines on installing and aligning dishes based on practical experience.  
76 pages, £15.00

## WEATHER SATELLITE HANDBOOK

5th Edition

Dr Ralph E. Teggart WB8DQT

This book explains all about weather satellites, how they work and how you can receive and decode their signals to provide the fascinating pictures of the world's weather. Plenty of circuit diagrams and satellite predicting programs.  
192 pages, £14.50

## WRTH SATELLITE BROADCASTING GUIDE

1995 Edition Bart Kuperus

This brand new publication, written by one of the experts from the respected World Radio TV Handbook, will be a great help to everyone interested in the world of satellite radio and television. Featuring over 300 pictures and graphics. All the information you need to know about installing your own satellite system.  
366 pages, £15.95

## Scanning

### AN INTRODUCTION TO SCANNERS AND SCANNING BP311

I. D. Poole

This book is ideal for anyone wanting to know what scanning is, and how it works. There are also chapters on radio in general, covering antennas, radio waves and how they travel, types of transmissions, broadcasting and amateur radio. All in all a superb starter book.  
152 pages, £4.95

### SCANNER BUSTERS

D.C. Poole

This guide to the methodology of beating the electronic beat on Scanning, deals with the subject of scrambling and encryption systems. The author explains in simple terms how p.m.s. works, the new digital cellular radio telephone systems, spread spectrum, frequency hopping and emergency services communication. How to get more from your scanner and a list of frequencies to listen to are also covered. It is a great reference for both new scanner owners and veterans alike.  
64 pages, £4.95

### SCANNERS 2

Peter Rouse GU1DKD

The companion to Scanners, this provides even more information on the use of the v.h.f. and u.h.f. communications band and gives constructional details for accessories to improve the performance of scanning equipment.  
261 pages, £10.95

### SCANNERS 3 PUTTING SCANNERS INTO PRACTICE. New Edition 4th Revision

Peter Rouse

The little Scanners 3 has been chosen to avoid confusion, as the book has undergone a virtual rewrite since Scanners 3rd Edition was published. Although written by the late Peter Rouse, Chris Lorek G4HCL has edited and finished off this, the latest in the Scanners series. Including frequency lists, and for the first time, a section on the h.f. bands. Also listed are full British bandplans from 25 to 2000MHz, as well as a section on scanner and accessory dealers.  
271 pages, £9.95

### SCANNING SECRETS

Mark Francis

The miseries of monitoring explained. Advice on buying and operating your scanner. Where to listen and how to gather obscure frequencies. The myths and folk lore exposed. All the information needed to unlock the potential of your scanner.  
280 pages, £16.95



## AMATEUR RADIO

### Antennas & Transmission Lines

#### 25 SIMPLE AMATEUR BAND AERIALS BP125

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

54 pages, £1.75

#### AERIAL PROJECTS BP105

Practical designs including active, loop and ferrite antennas plus accessory units.  
96 pages, £2.50

#### ALL ABOUT VERTICAL ANTENNAS

W. L. Orr W6SAI & S. D. Cowan W2LX

Covers the theory, design and construction operation of vertical antennas. How to use your tower as a vertical antenna and compact vertical designs for restricted locations. All about loading coils and a.L.U.s.  
192 pages, £7.50

#### ANTENNA EXPERIMENTER'S GUIDE

Peter Dodd G3LDD

Although written for radio amateurs, this book will be of interest to anyone who enjoys experimenting with antennas. You only need a very basic knowledge of radio & electronics to get the most from this book. Chapters include details on measuring resonance, impedance, field strength and performance, mats and materials and experimental antennas.  
200 pages, £8.90

## PW BOOK SERVICE



(01202) 659930

(24 HOURS)

### ANTENNA IMPEDANCE MATCHING (ARRL)

Wilfred M. Caron

Proper impedance matching of an antenna to a transmission line is of concern to antenna engineers and to every radio amateur. A properly matched antenna as the termination for a line minimises feed-line losses. Power can be led to such a line without the need for a matching network at the line input. There is no mystique involved in designing even the most complex multi-element networks for broadband coverage.  
195 pages, £14.50

### ANTENNAS AND TECHNIQUES FOR LOW-BAND DXING (ARRL)

John Devoldere ON4UN

This unusual book will be of particular interest to 1.8, 3.5 and 7MHz operators as it's packed with information on antennas and operating tips for 'Top Band to Forty' fans. There are chapters on low band propagation, operating techniques, equipment and for the computer minded there's a chapter on newly-available low band software.  
393 pages, £14.50

### ANTENNAS FOR VHF AND UHF BP301

I. D. Poole

Antennas are a very important part of any receiver or transmitter and in this book the author gives a general background to antenna operation as well as describing antennas that are suitable for v.h.f. and u.h.f. operation. Chapters include Basic Concepts, Feeders, The Dipole, Aerial Measurements and Practical Aspects. There is something of use for everyone with an interest in antennas in this book.  
104 pages, £4.95

### ARRL ANTENNA BOOK 17th Edition

This volume now in its 17th edition contains essential information regarding propagation and constructional details of just about every type of antenna known to man. Included is a 3.5" diskette contain in PC programs for Yagi analysis, propagation forecasting, transmission line analysis and other. A definite must.  
732 pages, £19.95

### ARRL ANTENNA COMPENDIUM Volume One

Fascinating and hitherto unpublished material. Among the topics discussed are quads and loops, log periodic arrays, beam and multi-band antennas, verticals and reduced size antennas.  
175 pages, £9.50

### ARRL ANTENNA COMPENDIUM Volume Two

Because antennas are a topic of great interest among radio amateurs, ARRL HQ continues to receive many more papers on the subject than can possibly be published in QST. Those papers are collected in this volume.  
208 pages, £9.50

### ARRL ANTENNA COMPENDIUM Volume Three

Edited by Jerry Hall K1TD

As the title suggests, this book is the third in the continuing series on practical antennas, theory and accessories produced by the ARRL. The book reflects the tremendous interest and activity in antenna work, and provides a further selection of antennas and related projects you can build.  
236 pages, £9.50

### ARRL ANTENNA COMPENDIUM Volume Four

The fourth volume in the ever popular series contains 38 previously unpublished articles, covering a wide range of antenna related topics - all the way from the maths intensive, heavyweight discussions to fun antennas for specific purposes, such as a balloon supported Field Day loop.

For the first time in the series there is a disk included with the book, which contains source data used to model many of the antennas. In short, there's something for virtually every antenna enthusiast.  
204 pages, £14.50

### BEAM ANTENNA HANDBOOK

W. L. Orr W6SAI & S. D. Cowan W2LX

Design, construction, adjustment and installation of h.f. beam antennas. The information this book contains has been compiled from the data obtained in experiments conducted by the authors, and from information provided by scientists and engineers working on commercial and military antenna ranges.  
268 pages, £7.50

### EXPERIMENTAL ANTENNA TOPICS BP278

H. C. Wright

Experimenting with antennas is a great way to learn. With this author's approach it's also informative and enjoyable. 70 pages, £3.50

### G-DRP CLUB ANTENNA HANDBOOK

Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRU/GWDLNQ.

This book is a collection of antenna and related circuits taken from Spirit, the G-DRP Club's journal. Although most of the circuits are aimed at the low-power fraternity, many of the interesting projects are also useful for general use. Not intended as a text book, but offers practical and proven circuits.  
156 pages, £6.99

### HF ANTENNA COLLECTION (RSGB)

Edited by Erwin David G4LQI

This book contains a collection of useful, and interesting h.f. antenna articles, first published in the RSGB's Radio Communication magazine, between 1968 and 1989, along with other useful information on ancillary topics such as feeders, tuners, baluns, testing and mechanics for the antenna builder.  
233 pages, £10.99

### HF ANTENNAS FOR ALL LOCATIONS (RSGB)

Les Moxon G6XN

This book provides a reference source for all h.f. antenna work, whether it be for fixed, mobile or using test equipment. In effect it is a manual on antenna work, with useful tips, projects and ideas. 322 pages, £13.99

### INTRODUCTION TO ANTENNA THEORY BP198

H. C. Wright

This book deals with the basic concepts relevant to receiving and transmitting antennas, with emphasis on the mechanics and minimal use of mathematics. Lots of diagrams help with the understanding of the subjects dealt with. Chapters include information on efficiency, impedance, parasitic elements and a variety of different antennas. 86 pages, £2.95

## PRACTICAL ANTENNAS FOR NOVICES

John Heys G3BDQ

In this guide, written especially for newly qualified holders of the UK novice licence, John Heys describes in detail how to build simple but efficient antennas for each of the Novice bands up to 434MHz, as well as useful ancillary equipment to ensure that they are working correctly. A complete chapter is devoted to the safety and common-sense aspects of installing and using a transmitting antenna. This book will be invaluable not only to Novices, but also to any beginning amateur looking for easy-to-build antenna systems that really work.  
52 pages, £5.99

## PRACTICAL ANTENNA HANDBOOK 2nd Edition

Joseph J. Carr

As the name suggests, this book offers a practical guide to everything to do with antennas from h.f. to microwaves. It also has sections on propagation, transmission lines, antenna fundamentals and a helpful introduction to radio broadcasting and communication. The book neatly balances a practical approach with the minimum of mathematics, good diagrams and a lively text.  
437 pages, £23.95

## PRACTICAL WIRE ANTENNAS RSGB

John Heys G3BDQ

Many radio enthusiasts have to be content with wire antennas. John Heys' practical approach to wire antennas provides plenty of ideas and projects to help get the best out of a simple system. A helpful book, and good reference source.  
100 pages, £8.50

## RADIO AMATEUR ANTENNA HANDBOOK

W. L. Orr W6SAI & S. D. Cowan W2LX

Yagi, Quad, Quagi and LPY beam antennas as well as vertical, horizontal and sloper antennas are covered in this useful book. How to judge the best location, DX antenna height, ground loss and radials.  
188 pages, £7.50

## RECEIVING ANTENNA HANDBOOK

Joe Carr

Your receiver is only as good as your antenna. This book is a complete guide to high performance receiving antennas. It is a comprehensive examination of antennas intended specifically for receiving purposes. An essential addition to your technical library, the listeners antenna bible.  
189 Pages, £17.50



## REFLECTIONS (RSGB)

Transmission Lines & Antennas

M. Walter Maxwell W2DU

This will help dispel the half-truths and outright myths that many people believe are true about transmission lines, standing waves, antenna matching, reflected power and antenna tuners.  
323 pages, £14.50

## SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS

W. L. Orr W6SAI & S. D. Cowan W2LX

Efficient antennas for Top Band to 2m, including 'invisible' antennas for difficult station locations. Clear explanations of resonance, radiation resistance, impedance, s.w.r., balanced and unbalanced antennas are also included.  
188 pages, £7.50

## TRANSMISSION LINE TRANSFORMERS (ARRL)

Jerry Sevick W2FMI

This is the second edition of this book, which covers a most intriguing and confusing area of the hobby. It should enable anyone with a modicum of skill to make a balun, etc. Topics include analysis, characterisation, transformer parameters, baluns, multimatch transformers and simple test equipment.  
270 pages, £13.50

## W1FB'S ANTENNA NOTEBOOK (ARRL)

Doug OakMan W1FB

This book provides lots of designs, in simple and easy to read terms, for simple wire and tubing antennas. All drawings are large and clear making construction much easier. There is no high-level mathematics in this book, just simple equations only when necessary to calculate the length of an antenna element or its matching section.  
123 pages, £6.95

## YAGI ANTENNA DESIGN

Dr James L. Lawson W2PV

This book is a polished and expanded version of a series of articles first published in Ham Radio following on from a series of lectures by the author, who was well-known as the expert on Yagi design. Chapters include simple Yagi antennas, loop antennas, effect of ground, stacking and practical antenna design.  
210 pages, £10.95

## Beginners (inc RAE)

### AMATEUR RADIO FOR BEGINNERS (RSGB)

Victor Brand G3JNB

An ideal book for the absolute beginner to the amateur radio hobby. Well illustrated and an interesting read.  
65 Pages, £3.50

### AN INTRODUCTION TO AMATEUR RADIO BP257

I. D. Poole

This book gives the newcomer a comprehensive and easy to understand guide through amateur radio. Topics include operating procedures, jargon, propagation and setting up a station.  
150 pages, £3.50

### AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315

F. A. Wilson

This little book deals effectively with a difficult abstract subject - the invisible electromagnetic wave. Aimed at the beginner, the book with its basic approach to electromagnetics, antennas, waves, propagation and constraints is a good starting point, complete very simple but clear diagrams and the minimum of mathematics.  
122 pages, £4.95

### ELECTRONICS SIMPLIFIED - CRYSTAL SET CONSTRUCTION BP92

F. A. Wilson

Especially written for those who wish to take part in basic radio building. All the sets in the book are old designs updated with modern components. It is designed for all ages upwards from the day when one can read intelligently and handle simple tools.  
72 pages, £1.75

### HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB)

Clive Smith G4FZH and George Benbow G3HB

The background to multiple choice exams and how to study for them with sample

RAE paper for practice plus maths revision and how to study for the exam. The majority of this book is given to sample examination papers so that candidates can familiarise themselves with the examination and assess their ability.  
88 pages. £7.99

### SHORT WAVE COMMUNICATIONS

Peter Rouse GU1DKD  
Covers a very wide area and so provides an ideal introduction to the hobby of radio comms. International frequency listings for aviation, marine, military, space launches, search and rescue, etc. Chapters on basic radio propagation, how to work your radio and what the controls do, antennas and band plans.  
167 pages. £4.50

### TEST EQUIPMENT FOR THE RADIO AMATEUR

Clive Smith G4FZH  
In its 3rd edition, this book provides many up-dated test equipment project designs for the radio amateur, complete with p.c.b. template (in the rear of the book). Areas covered include: current and voltage measurements, oscilloscopes, frequency, r.f., antenna and transmission line measurements.  
170 pages. £9.00

### RAE MANUAL (RSGB)

G.L. Benbow G3HB  
The latest edition of the standard aid to studying for the Radio Amateurs' Examination. Updated to cover the latest revisions to the syllabus. Takes the candidate step-by-step through the course.  
127 pages. £7.99

### RAE REVISION NOTES (RSGB)

G.L. Benbow G3HB  
If you're studying for the Radio Amateurs' Examination, this book could be useful. It's a summary of the salient points of the Radio Amateurs' Examination Manual, the standard textbook for the exam. It's A5 size, and therefore can be carried with you wherever you go. Easy-to-read, it's divided into 13 chapters with topics like receivers, power supplies, measurements, operating procedures, licence conditions and a summary of the formulae all dealt with.  
92 pages. £4.99

### REVISION QUESTIONS FOR THE NOVICE RAE (RSGB)

Esde Tyler G0AEC  
In effect Esde Tyler's book could be considered as being a training manual for the NRAE. Answers are supplied and the book provides a useful reference source.  
60 pages. £5.00

### THE NOVICE LICENCE STUDENT'S NOTEBOOK

John Case GW4HWR  
This is the recommended course book for anyone taking the Novice Licence. Covering all aspects of amateur radio and electronics it would be useful to anyone starting out in amateur radio. Every left hand page is for your own notes of explanation.  
124 pages. £5.99

### TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB)

John Case GW4HWR  
Aimed at the Novice licence instructor this manual provides the syllabus and an excellent framework textbook to help novice, instructor and beginner alike. An excellent basic reference work.  
101 pages. £6.50

### W1FB'S HELP FOR NEW HAMS (ARRL)

Doug DeMaw W1FB  
This book covers everything from getting acquainted with new equipment to constructing antennas, station layout, interference and operating problems to on-the-air conduct and procedures.  
155 pages. £8.95

## Callbooks

### RADIO AMATEUR CALLBOOK INTERNATIONAL LISTINGS 1995

73rd Edition  
The only publication listing licensed radio amateurs throughout the world. Also includes DXCC Countries list, standard time chart, beacon lists and much more.  
Over 1400 pages. £20.95

### RADIO AMATEUR CALLBOOK NORTH AMERICAN LISTINGS 1995

73rd Edition  
Listings of US amateurs (including Hawaii). Also contains standard time chart, census of amateur licences of the world, world-wide QSL bureau, etc.  
Over 1400 pages. £20.95

## Computing

### AN INTRODUCTION TO COMPUTER COMMUNICATIONS BP177

R. A. Penfold  
Details of various types of modem and their applications, plus how to interconnect computers, modems and the telephone system. Also networking systems and RTTY.  
72 pages. £2.95

### ELECTRONIC PROJECTS FOR YOUR PC BP320

R. A. Penfold  
102 pages. £3.95

### HOW TO EXPAND, MODERNISE AND REPAIR PCs AND COMPATIBLES BP271.

R. A. Penfold  
Recently revised, this book has seven chapters dealing with IBM PC/ATs or 'clones'. Starting with an overview of PCs and hardware, before describing upgrading disks, video and memory. Three chapters cover repairs, building a PC from bits, and recent developments. A good grounding in PCs.  
166 pages. £5.95.

### INTERFACING PCs AND COMPATIBLES BP272

R. A. Penfold  
66 pages. £3.95

### NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition

Michael Tooley  
An invaluable compendium of facts, figures, circuits and data which is indispensable to the designer, student, service engineer and all those interested in computer and microcomputer systems. This enlarged third edition covers a vast range of subjects at a practical level, with the appropriate explanatory text.  
256 pages. £12.95

### PCS MADE EASY. Second Edition

James L. Turley  
A friendly, comprehensive introduction to every personal computer - including Macs! This book is packed with valuable tips on every aspect of computer technology available today and will help you to get comfortable with your computer - fast.  
436 pages. £15.95

## PW BOOK SERVICE



(01202) 659930

(24 HOURS)

## EMC

### INTERFERENCE HANDBOOK

William R. Nelson WA6FOG  
How to locate & cure r.f.i. for radio amateurs, CBers, TV & stereo owners. Types of interference covered are spark discharge, electrostatic, power line many 'cures' are suggested.  
250 pages. £9.50

### THE RADIO AMATEUR'S GUIDE TO EMC (RSGB)

Robin Page-Jones G3JWJ  
This paperback book provides essential information and reading for anyone who has an EMC (interference) problem. With the help of the well-illustrated text and techniques, much of the mystery from the troublesome world of electromagnetic compatibility is removed.  
117 pages. £7.99

## Historical

### 1934 OFFICIAL SHORT WAVE RADIO MANUAL

Edited by Hugo Germsback  
A fascinating reprint from a bygone age with a directory of all the 1934 s.w. receivers, servicing information, constructional projects, circuits and ideas on building vintage radio sets with modern parts.  
260 pages. £11.60

### THE BRIGHT SPARKS OF WIRELESS (RSGB)

G. R. Jessop G6JP  
This hardback book is well illustrated with some excellent photographs. It pays tribute to and takes a good look at the personalities behind the early days of amateur radio and the equipment they used. A good read.  
90 pages. £12.50

### WORLD AT THEIR FINGERTIPS (RSGB)

This book comprehensively covers the fascinating history, techniques, equipment used and personalities behind amateur radio from the very beginnings of the hobby to the late 1960s. John Claricoats G6CL.  
307 pages. £6.00

## Maps and Log Books

### AMATEUR RADIO LOGBOOK (RSGB)

This standard spirally bound amateur radio log book has 100 pages and is marked out with the format required in the UK. There are columns for date, time (UTC), frequency, power (in dBW), station worked/called, reports, QSL information and remarks. £2.99

### NORTH ATLANTIC ROUTE CHART

This is a five-colour chart designed for the ATC in monitoring transatlantic flights. Supplied folded.  
740 x 520mm. £6.50

### QTH LOCATOR MAP OF EUROPE

Traxel DK5PZ  
Radio Map Service  
This comprehensive map of the European call sign area has now been updated and enhanced. This well thought out, coloured map covers from N. Africa to Iceland and from Portugal in the west to Iran in the east. Folds to fit into the 145 x 240mm clear envelope.  
1080 x 680mm. £5.95

### RADIO AMATEURS MAP OF THE WORLD

This is a brightly coloured map clearly showing call sign prefixes for the world and is up-to-date with recent European boundary changes. Supplied folded in a clear plastic wallet.  
980 x 680mm. £5.95

### RECEIVING STATION LOG BOOK (RSGB)

£3.50

## Microwaves

### ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL

Various Authors  
A truly excellent manual for the keen microwave enthusiast and for the budding 'microwaver'. With contributions from over 20 specialist authors. Chapters covering techniques, theory, projects, methods and mathematics.  
446 pages. £14.50

### MICROWAVE HANDBOOK RSGB

Volumes 1, 2 and 3  
Edited by M. W. Dixon G3PFR  
Approximately 350 pages (each volume). Vol. 1 costs £9.99, Vol. 2 and 3 cost £14.99 each.

## Morse

### INTRODUCING MORSE

Collected Articles from PW 1982-1985.  
48 pages. £1.25

### SECRET OF LEARNING MORSE CODE

Mark Francis  
Updates for the Novice Licence. Designed to make you proficient in Morse code in the shortest possible time, this book points out many of the pitfalls that beset the student.  
84 pages. £4.95

## Operating and Handbooks

### AMATEUR RADIO TECHNIQUES RSGB

Pat Hawker G3VA  
Anyone who enjoys Pat Hawker's 'Technical Topics' in *Radio Communications* will enjoy this book. An amateur radio manual itself, this paperback book the 7th edition, can only be bettered by a new edition. A truly excellent reference source with a practical bias.  
368 pages. £9.50

### ARRL HANDBOOK FOR RADIO AMATEURS 1995

This is the 72nd edition of this handbook and contains the best information from previous issues. New for this edition is some information on feedback-loop design for power supplies, a new gel-cell charger project, updates on antenna systems and new coverage of baluns, propagation programs are compared and colour SSVT and telephone FAX machines are also covered. Finally there's a new section on 'for the workbench' with new projects for the reader to build.  
1214 pages. £19.95

### ARRL OPERATING MANUAL

Another very useful ARRL book. Although written for the American amateur, this book will also be of use and interest to the UK amateur. Topics covered range from short wave listening through operating awards to repeaters, operating and satellites.  
684 pages. £12.95

### ARRL SPREAD SPECTRUM SOURCEBOOK

Many readers thought an article about spread spectrum communications in the April 1993 PW a spoof, but this book shows the reality of the technique. The ten chapters contain descriptions of the basic theory, the designs, and the techniques involved, and there are basic transceiver building blocks for your experimentation.  
360+ pages. £14.50.

### COMPLETE DX'ER

Bob Locher  
This book covers equipment and operating techniques for the DX chaser, from beginner to advanced. Every significant aspect of DXing is covered, from learning how to really listen, how to snatch the rare ones out of the pile-ups and how to secure that elusive QSL card.  
204 pages. £7.95

### HINTS AND KINKS FOR THE RADIO AMATEUR

Edited by Charles L. Hutchinson and David Newkirk  
A collection of practical ideas gleaned from the pages of *QST* magazine. Plenty of projects to build, hints and tips on interference, c.w. and operating and snippets of information from amateurs who've tried and tested the idea.  
129 pages. £4.95

### MARINE SSB OPERATION

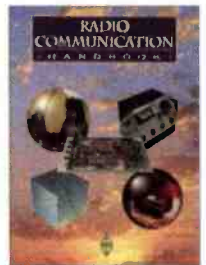
J. Michael Gale  
How do you stay in touch when you sail off over the horizon and into the blue? What you need is a single sideband radio, a marine s.s.b. This book explains how the system works, how to choose and install your set and how to get the best out of it. There is also a chapter on amateur radio with the emphasis on the increasingly important maritime mobile nets.  
96 pages. £10.95

### MARINE VHF OPERATION

J. Michael Gale  
A v.h.f. radiotelephone is essential equipment for any sea-going boat, but what can you do with it? Who can you call, and how do you make contact? Which channel do you use, and why? What is the procedure for calling another boat, calling the family through the telephone system, or making a distress call? This book will tell you.  
48 pages. £7.95

### RADIO COMMUNICATION HANDBOOK (RSGB)

6th Edition  
Dick Biddough G8PDS  
This long awaited new edition has been extensively up-dated and is full of diagrams and photographs. This book is a complete handbook/reference work and project book all rolled into one. The final innovation is that the necessary p.c.b. templates for the featured projects are provided at the end of the book making them much easier to work from when making your own p.c.b.s.  
750 pages. £20.00.



### SETTING UP AN AMATEUR RADIO STATION BP300

I. D. Poole  
Ian Poole G3YWX provides a helpful guide for anyone setting up an amateur radio station and covers: station design, construction, antenna, equipment, lay-out and the construction and use of basic test equipment, and helpful 'on the air' operating hints.  
81 pages. £3.95

## Packet

### PRACTICAL GUIDE TO PACKET OPERATION IN THE UK

Mike Mansfield G6AWD  
Introduces the concept of packet radio to the beginner. Problem areas are discussed and suggestions made for solutions to minimise them. Deals with the technical aspects of packet taking the reader through setting up and provides a comprehensive guide to essential reference material.  
220 pages. £9.95

### PACKET: SPEED, MORE SPEED AND APPLICATIONS (ARRL)

There is a lot to see, learn and do with packet. You don't need to be a 'guni' to join in the fun. This collection of articles and updates from ARRL Computer Networking Conference Proceedings, TAPR's Packet Status Register, QEX, *QST* and the ARRL Handbook promises an exciting ride for both packeteers and future packeteers. Hang onto your seat and start-up your modem!  
144 pages. £12.95

### YOUR GATEWAY TO PACKET RADIO

Stan Horzempa WA1LOU  
What is packet radio good for and what uses does it have for the 'average' amateur? What are protocols? Where, why, when? Lots of the most asked questions are answered in this useful book. It included details of networking and space communications using packet. 278 pages. £8.95

### YOUR PACKET COMPANION

Steve Ford WB8IMY  
This American book goes to considerable lengths to explain in simple terms how the radio amateur can get going on packet, how it works and what the various systems are. There are chapters dealing with assembling a packet station, sending and receiving packet mail and exploring advanced networking systems. Your Packet Companion goes a long way to explain some of the mysteries of packet radio.  
170 pages. £5.95

## Propagation

### AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293

J.G. Lee  
How does the sun and sunspots affect the propagation of the radio waves which are the basis of our hobby? They affect the ionosphere, but differing frequencies are treated differently. Find out how to use charts to predict frequencies that will be the most profitable. What effect will noise have on the signal? Find out with this book. 116 pages. £3.95

### LOW PROFILE AMATEUR RADIO - OPERATING A HAM STATION FROM ALMOST ANYWHERE (RSGB)

Jim Kearman KR1S  
This book delves into the techniques of being a 'hidden Ham'. There are chapters on specialised equipment, operating techniques and antennas to name but a few. If you have a fascination for spy type radio equipment or like the idea of having a complete h.f. or v.h.f. rig built in a suitcase, then this little American book is for you. 124 pages. £5.95

### SPACE RADIO HANDBOOK (RSGB)

John Branagan GMAIHJ  
236 pages. £12.50

## QRP

### G-QRP CLUB CIRCUIT HANDBOOK

Edited by Rev. G. Dobbs G3RJV  
This paperback book has been compiled from circuits published in the G-QRP Club journal Spraf from the years 1974 to 1982. Essentially it's a collection of circuits and projects covering everything from receivers, transmitters, antennas and accessories together with sed QRP test equipment. This book is aimed at the keen constructor and provides all the information required to build the host of projects described. 96 pages. £8.50

### QRP CLASSICS (ARRL)

Edited by Bob Schetgen  
Operating QRP is fun. The equipment is generally simple and easy to build, but often performs like more sophisticated commercial equipment. Some QRP Field Day stations operate a full 27 hours on a car battery - it's the perfect equipment for emergency communication when the power fails. Extracts from OST and the ARRL Handbook. 274 pages. £9.95

### W1FB's QRP NOTEBOOK (ARRL)

2nd Edition. Doug De Maw W1FB  
The new improved and updated 2nd edition of this book, covers the introduction to QRP, construction methods, receivers and transmitters for QRP. This workshop-notebook style publication, which is packed with new designs for the keen QRP operator, also covers techniques, accessories and has a small technical reference section. 175 pages. £7.95

## Television

### ATV COMPENDIUM

Mike Wooding G6IQM  
This book is for those interested in amateur television, particularly the home construction aspect. There isn't a 70cm section as the author felt this was covered in other books. Other fields such as 3cm TV, are covered in depth. A must for the practical ATV enthusiast. 104 pages. £3.00

## Test Equipment

### GETTING THE MOST FROM YOUR MULTIMETER BP239

R. A. Penfold  
This book is primarily aimed at beginners. It covers both analogue and digital multi-meters and their respective limitations. All kinds of testing is explained too. No previous knowledge is required or assumed. 102 pages. £2.95

### HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267

R. A. Penfold  
Hints and ideas on how to use the test equipment you have, to check out, or fault find on electronic circuits. Many diagrams of typical waveforms and circuits, including descriptions of what waveform to expect with particular faults, or distortion in audio amplifiers. 104 pages. £3.50

### MORE ADVANCED TEST EQUIPMENT CONSTRUCTION BP249

R. A. Penfold  
A follow on from Test Equipment Construction (BP248) this book looks at digital methods of measuring resistance, voltage, current, capacitance and frequency. Also covered is testing semi-conductors, along with test gear for general radio related topics. 102 pages. £3.50

### MORE ADVANCED USES OF THE MULTIMETER BP265

R. A. Penfold  
This book is primarily intended as a follow-up to BP239, Getting the most from your Multi-meter. By using the techniques described in this book you can test and analyse the performance of a range of components with just a multi-meter (plus a very few inexpensive components in some cases). The simple add-ons described extend the capabilities of a multi-meter to make it even more useful. 96 pages. £2.95

### PRACTICAL TRANSMITTERS FOR NOVICES

John Case GW4HWR  
This book contains a selection of 'easy to build' transmitter designs which are primarily aimed at Novices. It should also interest any amateur who is building transmitters for the first time. Chapters include: Methods of construction, Amplifiers and Filters, Tools and how to use them and Suppliers of components and many more. 126 pages. £9.00

### TROUBLESHOOTING WITH YOUR TRIGGERED SWEEP OSCILLOSCOPE

Robert L. Goodman  
This book steers you through the various features - old and new - that scope technology provides and is an invaluable guide to getting the best out of your scope. An overview of available scopes will help you choose the one that best suits your needs. Areas covered include spectrum analysis, test applications, multiple-trace displays, waveform analysis, triggering, magnified sweep displays, analogue and digital scopes, etc. 309 pages. £17.50

## PW BOOK SERVICE



(01202) 659930

(24 HOURS)

## VHF

### ALL ABOUT VHF AMATEUR RADIO

W. I. Orr W6SAI  
Written in non-technical language, this book provides information covering important aspects of v.h.f. radio and tells you where you can find additional data. If you have a scanner, you'll find a lot of interesting signals in the huge span of frequencies covered, 100-300MHz & 50, 420, 902 & 1250MHz bands. 163 pages. £9.50

### AN INTRODUCTION TO VHF/UHF FOR RADIO AMATEURS BP281

L.D. Poole  
An excellent book to go with the new Novice or full callsign. Nine chapters and an appendix deal with all aspects and frequencies from 50 to 1300MHz. Topics include propagation, descriptions of the bands, antennas, receivers, transmitters and a special chapter on scanners. 102 pages. £3.50

### VHF UHF Manual (RSGB)

G. R. Jessop G6JP  
The 4th edition of this well known book is in paperback form. Packed with information for the world of radio above 30MHz. It covers everything from v.h.f./u.h.f. radio history and theory and propagation to projects and techniques. An excellent reference source. Approximately 1000 pages. £10.50

## ELECTRONICS

### 50 (FET) FIELD EFFECT TRANSISTOR PROJECTS BP39

F.G. Rayer  
50 circuits for the s.w.l., radio amateur, experimenter or audio enthusiast using f.e.t.s. Projects include f.f. amplifiers and converters, test equipment and receiver aids, tuners, receivers, mixers and tone controls. 104 pages. £2.95

### A REFERENCE GUIDE TO BASIC ELECTRONICS TERMS BP286

F. A. Wilson  
As its title suggests, this book covers the basic terms involved in electronics and with its short, clear and precise explanations is a helpful guide and useful textbook for the beginner and anyone preparing for an examination. 472 pages. £5.95

### A REFERENCE GUIDE TO PRACTICAL ELECTRONICS TERMS BP287

F. A. Wilson  
A reference guide laid out in alphabetic order with an index, this book provides a useful source for the experienced and beginner alike. 431 pages. £5.95

### AUDIO ELEMENTS OF ELECTRONICS - BOOK 6 BP111

F. A. Wilson  
This book studies sound and hearing, and examines the operation of microphones, loudspeakers, amplifiers, oscillators, and both disk and magnetic recording. Intended to give the reader a good understanding of the subject without getting involved in the more complicated theory and mathematics. 308 pages. £3.95

### BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285.

R. A. Penfold  
This book covers a wide range of modern components. The basic functions of the components are described, but this is not a book on electronic theory and does not assume the reader has an in-depth knowledge of electronics. It is concerned with practicalities such as colour codes, deciphering code numbers and suitability. 166 pages. £3.95

### CIRCUIT SOURCE BOOK 1 - BP321

R. A. Penfold  
Written to help you create and experiment with your own electronic designs by combining and using the various standard 'building block' circuits provided. Deals with filters, amplifiers, voltage comparators, etc. 182 pages. £4.95

### CIRCUIT SOURCE BOOK 2 - BP322

R. A. Penfold  
Complimentary to Circuit Source Book 1, helps you create and experiment with your own electronic designs by combining and using the various standard 'building block' circuits provided. Covers signal generation, power supplies and digital electronics, etc. 214 pages. £4.95

### FILTER HANDBOOK - A Practical Design Guide

Stefan Niewiadomski  
A practical book, describing the design process as applied to filters of all types. Includes practical examples and BASIC programs. Topics include passive and active filters, worked examples of filter design, switched capacitor and switched resistor filters and includes a comprehensive catalogue of pre-calculated tables. 195 pages. £30.00

### NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK Second Edition

Vivian Capel  
A concise collection of practical and relevant data for anyone working on sound systems. The topics covered include microphones, gramophones, compact discs, tape recording, high quality radio, amplifiers, loudspeakers and public address. 210 pages. £10.95

### NEWNES ELECTRONICS ENGINEER'S POCKET BOOK

Keith Brindley  
This convenient sized volume is packed with information which everyone involved in electronics will find indispensable. This book is an invaluable compendium of facts, figures and formulae. Managers, designers, students and service personnel will find it useful at all stages in electronics processes. 306 pages. £10.95

### POWER SUPPLY PROJECTS BP76

R. A. Penfold  
This book gives a number of power supply designs including simple unregulated types, fixed voltage regulated types and variable voltage stabilised designs. 89 pages. £2.50

### PRACTICAL ELECTRONIC FILTERS BP299

Owen Bishop  
A useful introduction to the complex world of filters and their design where the author avoids the mathematical approach. The theory of filters, their design and a information on dozen or so practical projects are provided. 189 pages. £4.95

### TEST EQUIPMENT CONSTRUCTION BP248. R. A. Penfold

Describes, in detail, how to construct some simple and inexpensive, but extremely useful, pieces of test equipment. Stripboard layouts are provided for all designs, together with wiring diagrams where appropriate, plus notes on their construction and use. 104 pages. £2.95

### W1FB's DESIGN NOTEBOOK (ARRL)

Doug DeMaw W1FB  
This book is aimed at the non-technical amateur who wants to build simple projects and obtain a basic understanding of amateur electronics. Your workshop does not need to be equipped like an engineering lab to be successful as an experimenter. Don't let a lack of test equipment keep you from enjoying the thrills of experimentation. 195 pages. £8.50

## Data

### ARRL ELECTRONICS DATA BOOK

Doug DeMaw W1FB  
Back by popular demand, completely revised and expanded, this is a handy reference book for the r.f. designer, technician, amateur and experimenter. Topics include components and materials, inductors and transformers, networks & filters, digital basics and antennas and transmission lines. 260 pages. £8.95

### FURTHER PRACTICAL ELECTRONICS CALCULATIONS & FORMULAE BP144

F. A. Wilson 450 pages. £4.95

### NEWNES PRACTICAL RF HANDBOOK

Ian Hickman  
This book provides an easy-to-read introduction to modern r.f. circuit design. It's aimed at those learning to design r.f. circuitry and users of r.f. equipment such as signal generators and sweepers, spectrum and network analysers. 320 pages. £16.95

### PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53

F. A. Wilson  
Written as a workshop manual for the electronics enthusiast, there is a strong practical bias and higher mathematics have been avoided where possible. 249 pages. £3.95

### PRACTICAL ELECTRONIC DESIGN DATA BP316

Owen Bishop  
In essence this book is a helpful collection of designers 'building block' circuits, information, connection data and back-up information complete with an index. 327 pages. £4.95

### RADIO AMATEUR AND LISTENER'S DATA HANDBOOK

Steve Money  
This is a unique collection of useful and intriguing data for both the traditional and modern radio amateur as well as the high-tech listener. Familiar radio topics are covered - abbreviations and codes, symbols, formulae and frequencies - while the newer features of the hobby radio world - decoding, airband, maritime, packet, slow scan TV, etc. are also dealt with. 240 pages. £14.95

### SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL)

Les Hayward W7ZOI & Doug DeMaw W1FB  
Back in print by popular demand! A revised and corrected edition of this useful reference book covering all aspects of solid-state design. Topics include transmitter design, power amplifiers and matching networks, receiver design, test equipment and portable gear. 256 pages. £10.95

## Projects

### COIL DESIGN AND CONSTRUCTION MANUAL BP160

B. B. Babani. 106 pages. £2.50

### HOW TO DESIGN AND MAKE YOUR OWN PCBs BP121

R. A. Penfold  
The purpose of this book is to familiarise the reader with both simple and more sophisticated methods of producing p.c.b.s. The emphasis of the book is very much on the practical aspects of p.c.b. design and construction. 66 pages. £2.50

### MORE ADVANCED POWER SUPPLY PROJECTS BP192

R. A. Penfold  
The practical and theoretical aspects of the circuits are covered in some detail. Topics include switched mode power supplies, precision regulators, dual tracking regulators and computer controlled power supplies, etc. 92 pages. £2.95

### PROJECTS FOR RADIO AMATEURS AND SWLS BP304

R. A. Penfold  
This small book covers the construction and use of radio frequency and intermediate frequency projects, and audio frequency projects. Under the first heading ideas include a crystal calibrator, an antenna tuning unit, a wave trap, a b.f.o. and other useful projects. On the audio side projects include a bandpass filter, a by-pass switch, a c.w./RTTY decoder and many other practical ideas and suggestions for the home constructor. 92 pages. £3.95

### SHORT WAVE SUPERHET RECEIVER CONSTRUCTION BP276

R. A. Penfold  
A general purpose receiver to build, from antenna to audio, described in understandable English. 80 pages. £2.95

### SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275

R. A. Penfold  
Before discussing projects and techniques, the author provides essential information on theory, propagation, receiver designs and techniques. Finally, the author provides design for and describes the construction of practical receivers. 88 pages. £3.95

# ENDNOTES

**W**ell, we've certainly been able to pack some interesting articles into our 'Antenna Special'. The Editorial team hope you enjoy them as much as we did. In fact, the preparation of this issue meant we had to do some very interesting prototype work.

I've been thinking hard on how I could pay tribute to Tex Swann G1TEX's extraordinary efforts to ensure the 'Multi Delta' article would make good reading. This entailed a lot of liaison with the author, and Tex constructing three-dimensional antenna models (using drinking straws and string!) in the office. All this to ensure we provide the best representation of three dimensions in our two dimensional magazine illustrations!

John Goodall G0SKR's article reviewing the multiple-trapped dipole system highlighted an often neglected aspect of our hobby - teamwork. I feel sure that many more of us could benefit from working together, especially erecting antennas. John says he couldn't manage it on his crutches, and I feel sure I'd be a liability up a tree (my hook would be bound to get stuck!). In fact, I've fond memories of Tony Harwood G4HHZ (who was my boss at the time, and our gardens backed onto each other!) climbing a very tall tree to prepare a rope ready to erect an antenna. Teamwork does work, and Tony's efforts were much appreciated, and perhaps a little more of this would help the hobby to help itself.

Finally this month, I hope you enjoyed the article on my recent trip to Ireland. They were a great bunch, and I'm going back soon! And next month I'll be reporting on how PA/G3XFD went 'tram mobile' in the streets of Rotterdam!

Cheerio for now.



## PW SERVICES

### Queries:

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

We will always try to help readers having difficulties with *Practical Wireless* projects, but please note the following simple rules:

- 1: We **cannot** deal with technical queries over the telephone.
- 2: We **cannot** give advice on modifications either to our designs, to commercial radio, TV or electronic equipment.
- 3: All letters asking for advice **must** be accompanied by a stamped self-addressed envelope (or envelope plus IRCs for overseas readers).
- 4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
- 5: Only one problem per letter please.

### Back Numbers

Limited stocks of many issues of *PW* for past years are available at £2.00 each including post and packing. If the issue you want is not available, we can photocopy a specific article at a cost of £1.50 per article or part of article.

Over the years, *PW* has reviewed many items of radio related equipment. A list of all the available reviews and their cost can be obtained from the Editorial Offices at Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW for a large stamped self-addressed envelope.

### Binders

*PW* can provide a choice of binders for readers' use. Plain blue binders are available, each holding 12 issues of any similar A4 format magazine. Alternatively, blue binders embossed with the *PW* logo in silver can be supplied. The price for either type of binder is £5.50 each (£1 P&P for one, £2 for two or more).

Send all orders to PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

### Constructional Projects

Components for *PW* projects are usually readily available from component suppliers. For unusual or specialised components, a source or sources will be quoted.

Each constructional project is given a rating to guide readers as to the complexity.

**Beginner:** A project that can be tackled by a beginner who is able to identify components and handle a soldering iron.

**Intermediate:** A fair degree of experience of building radio or electronic projects is assumed, but only basic test equipment will be needed to complete any tests and adjustments.

**Advanced:** A project likely to appeal to the experienced constructor. Access to workshop facilities and test equipment will often be required. Definitely not for the beginner to attempt without assistance.

### Mail Order

All items from *PW* are available Mail Order, either by post or using the 24hr Mail Order Hotline (01202) 659930. Payment should be by cheque, postal order, money order or credit card (Mastercard and Visa only). All payments **must** be in sterling and overseas orders **must** be drawn on a London Clearing Bank.

Reach those  
'high spots' with *PW* as  
we present our 'VHF'  
Special and explore the  
radio world above 30MHz

# COMING SOON

## IN THE UK'S BEST SELLING RADIO MAGAZINE

Plus all  
your  
regular  
favourites!

- Guest contributor Mike Wooding G6IQM, Editor of *VHF Communications* writes on microwave operating.
- Pye Olympic Modifications.
- Build a Quagi antenna for 144MHz.
- Join Rob Mannion G3XFD as he goes 'Dutch' and explores and enjoys amateur radio in Holland.
- Newly-licensed Donna Vincent G7TZB shares her experience of 'first time on the air' and reviews two interesting hand-helds at the same time.

**DON'T MISS IT! - ON SALE AUGUST 10 -  
PLACE YOUR ORDER TODAY!**



# YOUR LOCAL DEALERS

<p><b>SURREY</b> Chris Rees <b>G3TUX</b> The QRP Component Company PO Box 88 Haslemere Surrey GU27 2RF Tel: (01428) 641771 Fax: (01428) 661794 <i>Stockists of:</i> ✓ Howes Kits    ✓ Jones Keys ✓ Vargarda Aerials ✓ Bits n' pieces!    ✓ Lists</p>	<p><b>SOUTHAMPTON</b> <b>SMC Ltd</b> Main Dealer for: Yaesu, Kenwood, Icom AOR &amp; Cushcraft SM House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY Tel: (01703) 255111 Fax: (01703) 263507</p>	<p><b>ESSEX</b>    01708 374043 1962 <b>G3RCQ Electronics</b> Essex leading supplier of used equipment <b>USED EQUIPMENT BOUGHT/SOLD/PIEX</b> We specialise in old gear, KW, Drake, Swan Hammetlund, Eddystone, anything interesting. We attend most rallies &amp; will sell your gear on commission. <i>73's Dave</i> 9 Troopers Drive, Harold Hill, Romford RM3 9DE CALLERS BY APPOINTMENT ONLY</p>	<p><b>LONDON</b> <b>MARTIN LYNCH</b> G4HKS For all your amateur radio needs <b>140-142 Northfield Avenue</b> Ealing London W13 9SB Tel: <b>0181-566 1120</b> Fax: <b>0181-566 1207</b></p>
<p><b>KENT</b> <b>WANTED</b> <i>We BUY and SELL quality used Amateur Radio's</i> Send an SAE for our list or telephone for a quote on your unwanted equipment. COLLECTION &amp; DELIVERY SERVICE AVAILABLE. <b>KP Trading, Seaview House</b> Crete Road East, Folkestone CT18 7EG Tel/Fax 01303 891106 <i>(KP Trading is a subsidiary of KANGA PRODUCTS)</i></p>	<p><b>SCOTLAND</b> <b>JAYCEE</b> <b>ELECTRONICS LTD</b> 20 Woodside Way, Glenrothes, Fife KY7 5DF Tel: (01592) 756962 (Day or Night) Fax No. (01592) 610451 Open: Tues-Fri 9-5; Sat 9-4 KENWOOD, YAESU &amp; ICOM APPROVED DEALERS <i>A good stock of new and secondhand equipment always in stock</i></p>	<p><b>KENT</b>  <b>KANGA PRODUCTS</b> <i>For QRP kits</i> A variety of kits for <b>RECEIVERS, TRANSMITTERS &amp; TEST GEAR.</b> <i>Send an AS SAE for a free copy of our catalogue</i> Seaview House, Crete Road East Folkestone, CT18 7EG Tel/Fax (01303) 891106    0900 - 1900 (Only)</p>	<p><b>DEVON</b> <b>Reg. Ward &amp; Co. Ltd.</b> The South-West's largest amateur radio stock- ist. Approved dealer for Kenwood, Yaesu and Icom <b>1 Western Parade,</b> West Street, Axminster, Devon, EX13 5NY Tel: (01297) 34918 <i>(Closed 1.00-2.00 and all day Monday)</i></p>
<p><b>NORTHWEST</b> <b>ARC Ltd.</b> <i>Everything for the radio amateur under one roof!</i> 36 Bridge Street, Earlestown, Newton-le-Willows, Merseyside WA12 9BA <b>Tel: 01925 229881</b> <b>Fax: 01925 229882</b></p>	<p><b>C.B. RADIO</b> RETAIL SEND LARGE STAMPED ADDRESSED ENVELOPE FOR INFORMATION OR £2.99 FOR CATALOGUE TRADE MANUFACTURERS/IMPORTERS OF ALL MOONRAKER PRODUCTS TRADE ENQUIRIES WELCOME  MOONRAKER (UK) LTD, UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 6QR TEL (01908) 281705 FAX (01908) 281706</p>	<p><b>AVON/SOMERSET</b> <b>QSL</b> <b>COMMUNICATIONS</b> We stock all makes of equipment for the Amateur and Listener. Part Exchange Welcome Unit 6 Worle Industrial Centre, Coker Road, Worle, Western-Super-Mare BS22 0BX <b>Tel/Fax: (01934) 512757</b></p>	<p><b>YORKSHIRE</b>    <b>YAESU</b>                          <b>ICOM</b>                          Kenwood <b>Alan Hooker</b> <b>Radio Communications</b> <b>42, Netherhall Road, Doncaster</b> <b>Tel: (01302) 325690</b> <i>Open Mon-Sat 10-5 pm Closed Thursdays</i></p>
<p><b>LONDON</b> <b>Locate</b> <b>Communications Ltd</b> 23 BOUSFIELD ROAD, NEW CROSS, LONDON SE14 5TP <b>Independent Radio Engineers</b> We can maintain any of the following systems:- amateur radio equipment, mobile radio systems and IBM PC/Clone computers <b>Tel: 0171-732 8319</b> <b>Fax: 0171-652 5796</b></p>	<p><b>MID GLAMORGAN</b> <b>SANDPIPER</b> <b>COMMUNICATIONS</b> Unit 5, Enterprise House, Cwmbach Industrial Estate, Aberdare, Mid Glamorgan CF44 0AE Tel: (01685) 870425 Fax: (01685) 876104 A full range of transmitting &amp; receiving antennas available for the amateur commercial market.</p>	<p><b>DERBYSHIRE</b> <b>WORLD RADIO CENTRE</b> Shortwave, VHF &amp; UHF receivers from AOR, YUPITERU, DRAKE, ICOM, LOWE... <b>ADAM BEDE HIGH TECH CENTRE</b> <b>DERBY ROAD</b> <b>WIRKSWORTH</b> <b>DERBYSHIRE DE4 4BG</b> <b>TEL: (01629) 825926</b> <b>(MONDAY - FRIDAY 9.30AM - 5.00PM)</b></p>	<p><b>SCOTLAND</b> <b>TENNAMAST</b> <b>SCOTLAND</b> Masts from 25ft - 40ft Adapt-A-Mast <b>(01505) 503824</b> <i>Kiln Mains Road, Bethel, Ayrshire, KA15 2HT</i></p>

## Index to Advertisers

AH Supplies.....66	Interconnections.....59	RadioSport.....5
AKD.....43	J & P Electronics.....66	RAS Notts.....66
ARC Ltd.....59	J Birkett.....66	Remote Imaging Group.....66
ARE Comms.....8	Kings Lynn Amateur Radio Rally.....69	RSGB.....49
Castle Electronics.....6	Lake Electronics.....66	SGC.....6
Chevet Books.....66	Langrex Supplies.....60	SMC Ltd.....2/3,4
Cirkit.....49	Lowe Electronics.....18/19	TRAC Satellite Systems.....66
CM Howes.....43	Maplin Electronics.....cover iv	Waters & Stanton.....22/23
Coastal Comms.....7	Martin Lynch.....38/39	Wood & Douglas.....59
Colomor Electronics.....69	Monitoring Times.....69	Yaesu UK.....cover ii
Cricklewood Electronics.....60	PCB Service.....60	
Datong.....60	United Guild of International	
Haydon Comms.....14/15	Photographers.....53	
Icom UK.....cover iii		

# IC-738

## HF 300kHz-29.995 MHz All Mode Transceiver

- All band, all mode transceiver with a general coverage receiver
- Automatic antenna tuner
- Automatic antenna selector
- Quick split function with pre-programmable offset
- 1Hz tuning steps
- RIT and  $\Delta$ TX with calculate function
- Memo pads
- PBT function and notch filter
- Speech compressor
- VOX function
- Double band stacking register
- 101 Memory channels
- Versatile scans



ICOM manufacture a full range of base-stations, mobiles and handheld transceivers and receivers to cover all popular Ham frequencies... and beyond. No matter what your requirements, ICOM have the radio for you. For the full picture and details of your local authorised ICOM dealer contact: Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 0227 743001(24hr). Fax: 0227 741742.

**NEW**

**FULL COLOUR GUIDE TO ELECTRONIC PRODUCTS**

Sept 1994–Aug 1995

# Maplin



BS 5750  
Part 2 1987

Level B:  
Quality Assurance  
RS12750



**Order your copy of the New MAPLIN Catalogue on sale NOW!**

Pick up a copy from any branch of WHSMITH, branches of John Menzies in Scotland ONLY, Eason & Son in N. Ireland ONLY, and Maplin stores nationwide for just £3.45 or post this coupon now to receive your copy for just £3.95 inc. p&p. If you live outside the U.K. send £7.30 or 18 IRCs for Airmail in Europe (including Republic of Ireland); £6.50 or 16 IRCs for surface mail outside Europe; or £12.30 or 30 IRCs for Airmail outside Europe.  
I enclose £3.95/£7.30/£6.50/£12.30 (delete as applicable).

Name .....

Address .....

Post Code .....

Send to Maplin Electronics,  
P.O. Box 3, Royleigh,  
Essex, England  
SS6 8LR  
rws

Over 800 colour packed pages  
with hundreds of Brand New  
Products at Super Low Prices.

**OUT  
NOW  
ONLY  
£3.45**

Available from all branches of WHSMITH, John Menzies in Scotland ONLY, Eason & Son in N. Ireland ONLY, and Maplin stores nationwide.  
The Maplin Electronics 1995 Catalogue – **OUT OF THIS WORLD!**