THE UK'S BEST SELLING MAGAZINE FOR AMATEUR RADIO ENTHUSIASTS

practical Wireless

SEPTEMBER 1995 £1.90

VHF/UHF SPECIAL

Featuring

WOODING'S WORLD

OLYMPICS ON SIX

QUICK QUAGI ANTENNA

SIMPLE 6M LINEAR

Plus

CHESTER TO CHINA

GAINING POWER

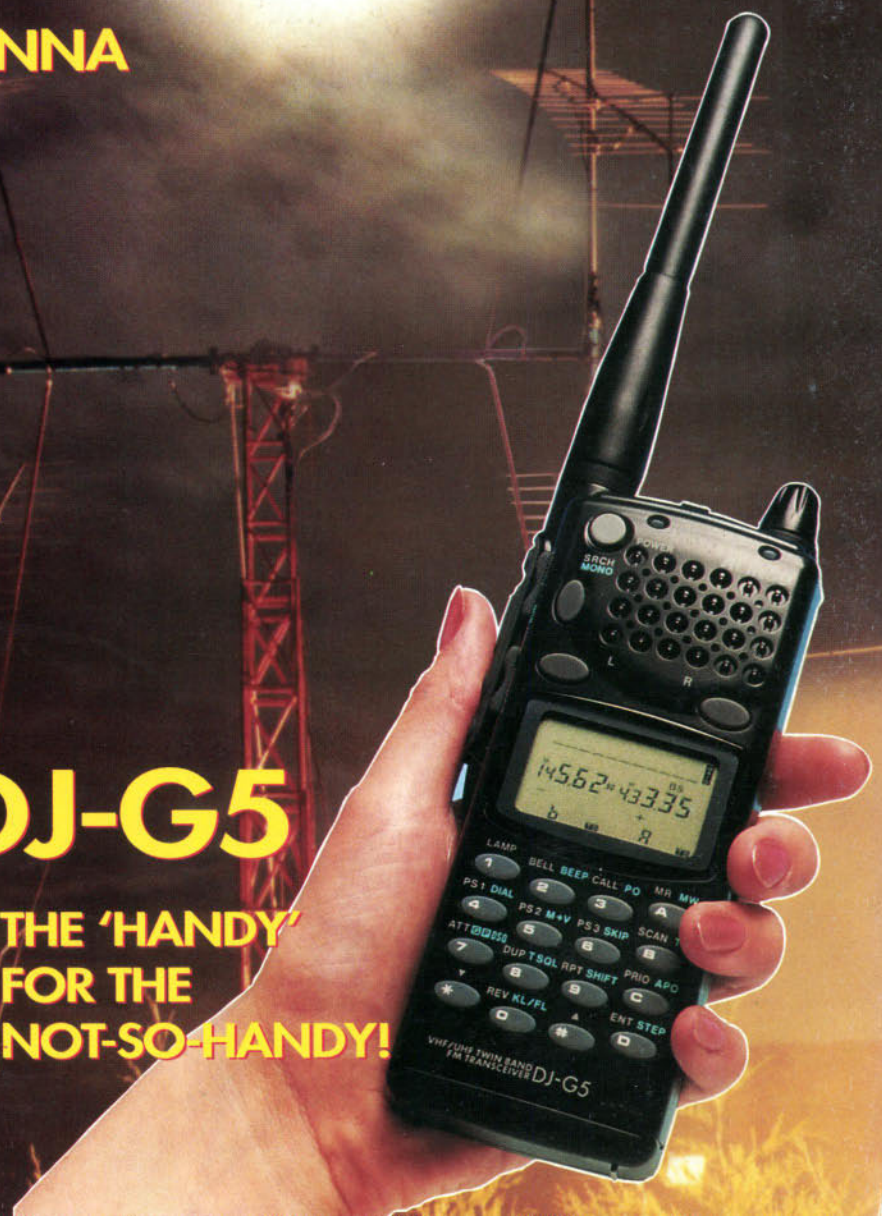
Reviewed

AT-200 & AT-400

ALINCO DJ-G5

ISSN 0141-0857

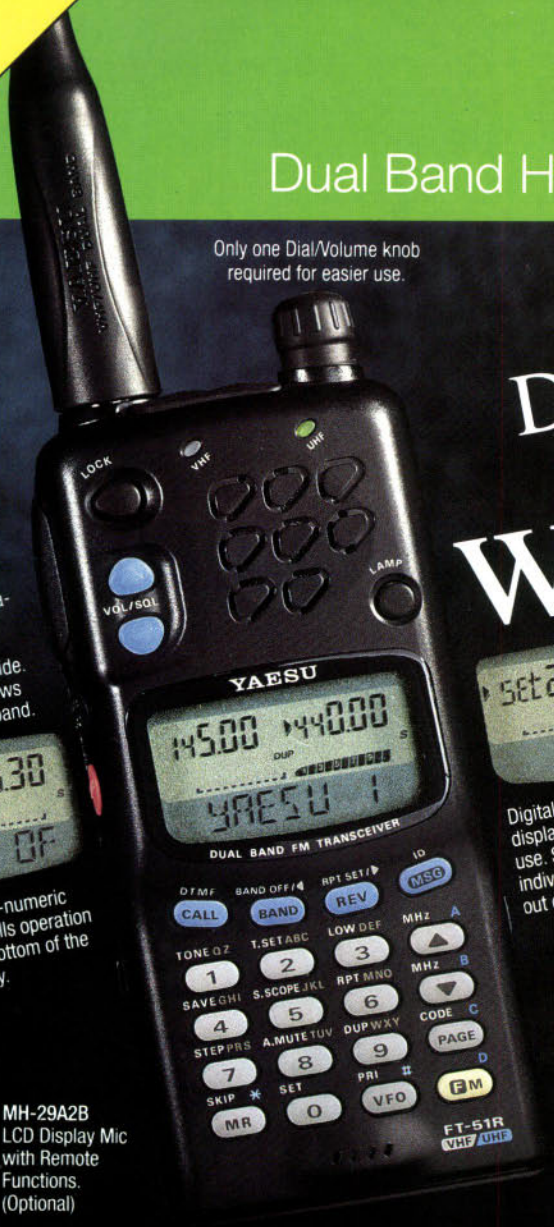
THE 'HANDY' FOR THE NOT-SO-HANDY!



NEW
Dual Band HT

Dual Band Handheld FT-51R

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.

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.

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

FT-51R
2¼"W x 4¾"H x 1⅛"D
(2 Watt version shown.)

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 memories. A cloning feature duplicates favourite channels to another FT-51R.

A digital battery voltage display, five power output levels, the largest backlit dual band HT keypad made, Smart Mute,™ two VFOs on both VHF and UHF, as well as available 2 Watt and 5 Watt versions, round out the exciting FT-51R. Plus, the optional MH-29A2B Display Microphone allows you to control volume and also access Memory, VFO, Call Channel, Band Selection and scanning functions. All of this in world's smallest dual band HT radio!

See the FT-51R with "windows" at your Yaesu dealer today!

"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!"

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

SEPTEMBER 1995 (ON SALE AUGUST 10)
VOL. 71 NO 9 ISSUE 1062
NEXT ISSUE (OCTOBER)
ON SALE SEPTEMBER 14

EDITORIAL & ADVERTISEMENT OFFICES
Practical Wireless
Arrowsmith Court
Station Approach
Broadstone
Dorset BH18 8PW
☎ (01202) 659910
(Out-of-hours service by answering machine)
FAX (01202) 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
Page Layouts Marcus Hall

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)
☎ (01202) 659920
FAX (01202) 659950

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

Main Front Cover Photograph courtesy of Jim Barry and the East Cork Contest Group. (Photo taken at Jim Barry's home just outside Cork).

Published on the second Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659910. Printed in England by Southernprint (Web Offset) Ltd. Distributed by Seymour, Windsor House, 1270 London Road, Norbury, London SW16 4DH. Tel: 0181-679 1899. Fax: 0181-679 8907. Telex: 8812943. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd., South Africa - Central News Agency. Subscriptions INLAND £22, EUROPE £25, OVERSEAS (by ASP) £27, payable to PRACTICAL WIRELESS, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659930. PRACTICAL WIRELESS is sold subject to the following conditions, namely that it shall not, without written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever. *Practical Wireless* is Published monthly for $45 per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, Royal Mail International, c/o Yellowstone International, 87 Burlews Court, Hackensack, NJ 07601, UK Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/o Yellowstone International, 2375 Pratt Boulevard, Elk Grove Village, IL 60007-5937. The USPS (United States Postal Service) number for Practical Wireless is: 007075.

CONTENTS September

SMC, ARE & REG WARD

37 years and still Number 1

THIS MONTHS SPECIALS

KENWOOD TS850S *only* **£149.95**

save £350 TS850S

save £370 TS850SAT

KENWOOD TS850SAT *only* **£1589.95**

★ *LIMITED STOCKS OF BOTH ITEMS* ★

HF TRANSCEIVERS

KENWOOD

TS-950SDX	list £3995	our price **£3195**
TS-850S	list £1809	our price **£1489**
TS-85SAT	list £1959	our price **£1625**
TS-450S	list £1499	our price **£1249**
TS-450SAT	list £1649	our price **£1435**
TS-50S	list £1059	our price **£895**

YAESU

FT-1000	list £3999	our price **£2895**
FT-990	list £2399	our price **£1795**
FT-990/DC	list £2099	our price **£1645**
FT-900	list £1399	our price **£1095**
FT-900AT	list £1599	our price **£1245**
FT-840	list £959	our price **£725**

ICOM

IC-775DSP	list £3700	our price **£PHONE**
IC-736	list £1969	our price **£1685**
IC-738	list £1649	our price **£1435**
IC-729	list £1325	our price **£1175**
IC-706	list £1195	our price **£PHONE**
IC-707	list £889	our price **£775**

VHF TRANSCEIVERS

ICOM

IC-820H	list £1795	our price **£1549**
IC-275H	list £1495	our price **£1345**
IC-281H	list £449	our price **£409**
IC-2000H	list £369	our price **£339**
IC-2340H	list £689	our price **£629**

KENWOOD

TS-790E	list £1959	our price **£1625**
TM-255E	list £949	our price **£829**
TM-455E	list £1059	our price **£925**
TM-733E	list £739	our price **£645**
TM-251E	list £419	our price **£349**
TM-702E	list £579	our price **£499**

YAESU

FT-736R	list £1999	our price **£1549**
FT-8500	list £749	our price **£659**
FT-5200	list £729	our price **£595**
FT-5100	list £679	our price **£515**
FT-2500M	list £399	our price **£295**
FT-2200	list £419	our price **£329**

VHF/UHF HANDI's & PORTABLES

YAESU

FT-11R	list £324	our price **£269**
FT-41R	list £369	our price **£299**
FT-51R	list £529	our price **£395**
FT-416G	list £369	our price **£249**
FT-290R2	list £599	our price **£425**
FT-690R2	list £649	our price **£445**
FT-790R2	list £749	our price **£535**

ICOM

IC-Z1E	list £529	our price **£455**
IC-2GXE	list £255	our price **£225**
IC-2GXET	list £279	our price **£249**
IC-W21E	list £329	our price **£299**
IC-W21ET	list £595	our price **£545**

KENWOOD

TH-79E	list £479	our price **£419**
TH-22E	list £254	our price **£219**
TH-42E	list £289	our price **£249**
TH-28E	list £319	our price **£269**
TH-48E	list £369	our price **£319**

STANDARD TRANSCEIVERS

C558	sale offer price	**£289**
C468	sale offer price	**£169**
C188	sale offer price	**£169**

On some items supplies are limited at our offer prices

DAIWA

Proven Reliability for Today's Amateur!

PS120MIIA	PSU 3-15V 9/12A	**£69.00**
PS140MIIA	PSU 13.8V 12/14A	**£72.00**
PS304IIA	PSU 1-15V 24/30A	**£129.00**
RS40XII	PSU 1-15V 32/40A	**£169.00**
CN101L	1.8-150MHZ 15/150/1500W	**£59.50**
CN103LN	150-525MHZ 20/200W 'N'	**£68.00**
CS201	2 Way Switch SO239 1KW	**£17.50**
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	**£22.50**
CP10Y6	Cigar plug lead for FT530,etc	**£6.50**

cushcraft CORPORATION

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	**£89.00**
AV-5	3-5-7-14-21-28MHz vertical 7.4m long	**£159.00**
AP8A	8 Band Vertical	**£199.00**
APR18A	Radial Kit	**£49.00**
40-2CD	2-ele 40m Yagi	**£459.00**
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	**£459.00**
154CD	4 ele 15m Yagi	**£259.00**
D4	Dipole 10/15/20/40m	**£249.00**
D3W	Dipole 12/17/30m	**£179.00**
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	**£52.00**
A148-10S	2m 10-ele Yagi 13.2 dBd	**£62.00**
A144-20T	2m 10-ele Cross Yagi 12.2 dBd	**£99.00**
13B2	13-ele 2m Yagi	**£99.95**
17B2	17-ele 2m Yagi	**£179.00**
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	**£189.00**

TNC's and Data Modems

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

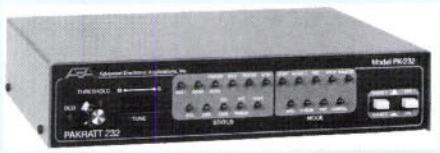
PK12/100K – 100k Mail Drop Memory Upgrade **£47.00** Carr A

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



MIRAGE KLM

Mirage is not a new name in amateur radio products. We believe that their current range offers outstanding performance at realistic prices.

LINEAR AMPLIFIERS

B108G	2m, 10W input, 80W output preamp	£199	C
B1016G	2m, 10W input, 160W output preamp	£299	C
B2516G	2m, 25W input, 160W output preamp	£269	C
B5016G	2m, 50W input, 160W output preamp	£269	C
D1010N	70cm, 10W input, 100W output	£349	C
D3010N	70cm, 25W input, 100W output	£329	C
RC1	Remote switching unit for Mirage amps c/w 18ft cable run	£38	B

MAST HEAD PREAMPS

KP2/2M	2m GaAs fet 0.6db NF 20–25dB gain or 10–15dB adjustable 165W through power	£165	B
KP2/440	70cm GaAs fet 0.6dB NF 20–25dB gain or 10–15dB adjustable 165W through power	£165	B

POWER METERS

MP2	50–200MHz, 50–500–1500W average and PEP reading + SWR 9–13.6VDC internal battery	£189	B
MP4	1260–1300MHz, 1–10–100 watt average and PEP reading + SWR 9–13.6VDC internal battery	£229	B

HOKUSHIN ANTENNAS

HS-702S	2M/70CM Whip BNC	£14.50
HS430	5⅛ Wave Whip BNC	£10.00
88F	2M 8/8 Wave Mobile Whip	£16.50
DB144	2M F/G ¾ mobile whip	£14.95
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 ⅝ Base Colinear	£65.00
GP23	3 X ⅝ Base Colinear	£39.00
SQ44	2M SWISS QUAD	£45.00
WX1N	2M/70CM Base Colinear	£89.00
WX2N	2M/70CM Base Colinear	£115.00
WX4N	2M/70CM Base Colinear	£149.00
WX6S	2M/70CM Base Colinear	£189.00

NEW PRODUCTS

YAESU FT8500

Yaesu's latest dual band mobile with FS10 smart controller.

OUR PRICE **£659** **Save £90.00**

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

PHONE FOR LATEST PRICE

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.

£1035 **NOW IN STOCK**

ANTENNA ROTATORS

G-400	Medium duty rotator	£199.00	D
G-400RC	R/C version of G-400	£239.00	D
G-600RC	H/D version of G-400RC	£339.00	D
G-450XL	New medium duty model	£269.00	D
G-650XL	New H/D version of G-450XL	£369.00	D
G-800SDX	450° deluxe model	£419.00	D
G-1000SDX	H/D version of G-800SDX	£479.00	D
G-2700OSDX	H/D rotator 450°	£899.00	D
G-500A	Elevation rotator	£279.00	D
G-5400B	AZ/EL rotator	£519.00	D
G-5600B	AZ/EL rotator H/D	£599.00	D
RC5-1	Medium duty create	£329.00	D
RC5-3	Medium duty + preset	£439.00	D
RC5A-3	H/D v/speed + preset	£659.00	D
RC5B-3	V H/D v/speed + preset	£989.00	D
GS038b	Lowes clamp G-400, 800, 1000	£25.00	B
GS038G	Lowes clamp G-600	£25.00	B
MC 2	Lowes clamp create	£49.95	C
GS-050	Rotary bearing up to 1⅜ mast	£29.00	B
GS-065	Rotary bearing 2" mast	£45.00	B
CK46	Create rotary bearing 2" mast	£57.00	B

STOCK CLEARANCE BARGAINS

FT411	2m handy 1 only	£189.00
FT811	70cm handy 1 only	£209.00
FT815	70cm handy 2 only	£229.00
FT416G	2m handy 5 watts	£249.00
TH78E	Dual band handy	£379.00
TM441E	70cm mobile	£349.00
TH26E	2m handy 1 only	£199.00
IC735	HF transceiver 1 only	£839.00
IC229E	2m mobile 1 only	£279.00
IC229H	2m mobile 50w	£319.00
IC2SRE	2m handy wideband Rx	£349.00
IC3230H	Dual band mobile	£499.00
IC449E	70cm mobile	£359.00
IC729	HF transceiver + 6m	£1095.00
IC737	HF transceiver	£1269.00
ICF SW7600	Sony receiver	£149.00
AR2000	AOR AM/FM scanner	£259.00
AR500Ex	AOR all mode scanner	£289.00

Most items are brand new some may have had some shelf life all carry 12 months warranty.

ACCESSORY BARGAINS

144TV	2m module FTV series	£59.00	B
430/726	70cm module for FT726R	£169.00	B
144/726	2m module for FT726R	£139.00	B
DCT726	DC lead for FT726R	£10.00	A
8C	Charger FT290R	£11.75	A
Q3000020	Telescopic antenna FT290R	£10.00	A
YHA15	Rubber duck FT290R	£10.00	A
NC15	Desk charger FT209, 203, 727 etc	£59.00	B
FNB4A	Nicad FT209, 203, 727 etc	£56.00	A
CSC10	Vinyl case FT209 + FNB3	£10.22	A
CSC17	Vinyl case FT727 + FNB3	£10.22	A
CSC6	Vinyl case FT203 + FNB3	£10.22	A
CSC7	Vinyl cae FT203 + FNB4	£10.22	A
CSC43	Vinyl case FT470 + FNB9, 17	£12.95	A
CSC44	Vinyl case FT470 + FNB10	£12.95	A
CSC45	Vinyl case FT470 + FNB12/14	£12.95	A
CSC46	Vinyl case FT470 + FNB11H	£12.95	A
NB2	Nicad FT208/708 etc	£32.00	A
FVC5	Vinyl case FT208/708	£7.05	A
NC7C	Desk charger FT208/708	£35.00	B
AMUT77	AM unit FT77	£12.77	A
MMB15	Mobile bracket for FT270	£14.86	A
MMB16	Mobile mount FT77	£17.88	B
MMB21	Mobile bracket for FT203/209 etc	£10.22	A
MMB33	Mobile bracket for FT211/711	£20.56	A
MMB46	Mobile bracket for FT470	£12.95	A
FMUT901	FM unit FT901/2	£19.00	A
DCT901	DC inverter FT901/2	£59.00	B
MMB1	Mobile mount FT901/101 series	£10.22	B
XF8.9GA	AM filter FT901/2, 101Z, 707, 107	£10.22	A
XF8.9GF	FM filter FT901/2	£19.41	A
XF82HC	600Hz CW filter FT102	£15.32	A
XF455C	500Hz CW filter FT102	£22.50	A
XF455CN	270Hz CW filter FT102	£22.50	A
BHFRG7	FRG7 battery holder	£5.75	A
FC420	Remote ATU suitable for conversion for ham use	£99.00	D
NDH518	96 channel memory unit for NRD515	£159.00	D
FRA7700	Active antenna	£69.00	B
FRT7700	Antenna tuner/switch	£79.95	B
FRVWFM	Module for wideband FM	£5.00	A
DCRG8800	12v DC kit complete with DC lead	£4.00	A
MMB38	Mobile mount FT747GX	£15.00	B
MMB42	Metal cases FT747GX	£79.00	B
D3000216	RX mod kit FTONE	£3.00	A
D3000251	NB kit FTONE	£2.50	A
SET ONE	Extender board kit for FTONE	£34.00	A
D3000071	Counter unit FT301 (improved type)	£19.95	A
PA1	DC power adaptor FT207	£34.00	B
FBA1	Battery adaptor for PA1, NC1, NC3	£5.00	A
FBA3	Charging sleeve adapts NC1, PA1, NC3 to charge FT208, 708	£5.00	A
YM48A	DTMF mic 8 pin FT726	£35.50	A
FF5	Low pass filter 500kHz FRG7700	£10.00	A

TCVR £13.50
Handhelds/Mobiles by post £5
Next day £13.50

Carr A = £2.50 B = £5 (handies) C = £9.50 (mobiles) D = £13.50 (base stations) E = £16.50

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

SMC Ltd HQ Southampton: *S M House, School Close Chandlers Ford Ind Estate, Eastleigh, Hants SO5 3BY. Tel: (01703) 255111 Fax: (01703) 263507*

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 Ward & Co: *1 Western Parade, West Street, Axminster, Devon EX13 5NY. Tel. (01297) 34918 9.00am - 5.15pm Tues-Sat*

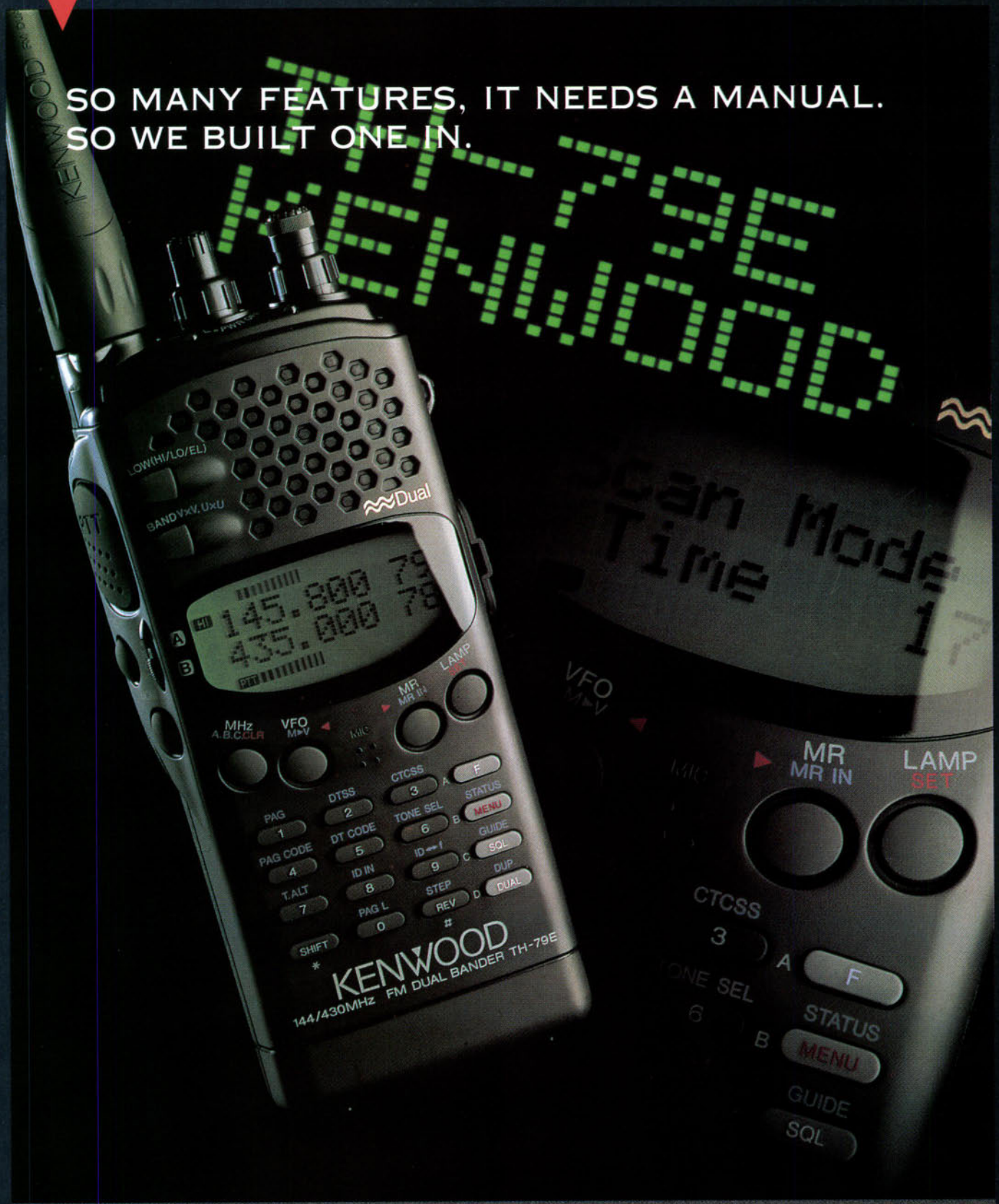
SMC (Northern): *Nowell Lane Ind. Estate, Nowell Lane Leeds. Tel. (0113) 235 0606 9.30am – 5.00pm Monday-Friday 9.00am - 1.00pm Saturday*

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*

THE THREE POINTS OF THE KENWOOD TRIANGLE REPRESENT ADVANCED TECHNOLOGY, QUALITY AND STYLE

SO MANY FEATURES, IT NEEDS A MANUAL. SO WE BUILT ONE IN.



Kenwood's TH-79E marks a new high in user-friendly handheld tranceivers. This slim-line FM dual-bander features a dot matrix LCD menu, which helps you to access the many class-leading features of this stylish unit.

Features that include an FET power module for longer battery life, 82 memory channels with ID, DTSS and pager functions, Automatic Band Change and DTMF memory function for auto-dial operation. Confused? You won't be. Just call up the menu. Or ring 0923 816444 for a full information pack.

KENWOOD

HOME AUDIO, CAR AUDIO, COMMUNICATIONS EQUIPMENT, TEST AND MEASURING INSTRUMENTS, TELECOMMUNICATIONS

EASTCOMM

Europe's Largest Amateur Radio Showroom

VISA
MASTER CARD
SWITCH
AMEX
DELTA
FINANCE

SEE YOU AT
STAFFORD
AUGUST 19th & 20th

"Mosley..... a better antenna !"

Choosing an H.F. Beam can be a difficult process. Mosley makes it so much easier.

Look at the trap assemblies for instance.
Mosley's advanced designs mean only 1 trap assembly for 2 bands. A 3 element Mosley beam for 10/15/20m only has 6 trap assemblies. Other makes have 12 ! A Mosley beam is therefore stronger, with less wind loading.

Mosley USA uses aircraft grade drawn aluminium. Others use extruded tube. Mosley's tubing is therefore closer tolerance, enabling pre-drilling and simple screw fixing. Others need hose clamps to take up the slack!

Mosley USA is the only manufacturer to offer a range of beams which include the WARC bands.

Wouldn't you rather have the MOSLEY edge?

SPECIAL OFFERS

	VERTICAL ANTENNAS	£
RV-4-C	10/15/20/40M	199.00
RV-6-C-WARC	10/12/15/17/20/40M	279.00
RV-7-C-WARC	10/12/15/17/20/30/40M	299.00
80M RV Upgrade	80M	129.00*
BEAMS		
JR Series		
TA-31-JR-N	10/15/20M 1 element	159.00
TA-32-JR-N	10/15/20M 2 element	229.00
TA-33-JR-N	10/15/20M 3 element	299.00
TA-33-JR-N-WARC	10/12/15/17/20 4 element	399.00
M Series		
TA-31-M #	10/15/20M 1 element	199.00
TA-32-M #	10/15/20M 2 element	299.00
TA-33-M #	10/15/20M 3 element	399.00
TA-33-M-WARC #	10/12/15/17/20M 4 element	549.00
TA-34-XL #	10/15/20M 4 element	649.00
TA-34-XL-WARC	10/12/15/17/20M 5 element	799.00
TA-53-M-WARC #	10/12/15/17/20M 4 element	699.00
Classic		
CL-33-M	10/15/20M 3 element	499.00
CL-33-M-WARC #	10/12/15/17/20M 4 element	649.00
CL-36-M	10/15/20M 6 element	699.00
Upgrades		
TA-30-KR	30M Upgrade: for # antennas only	149.00*
TA-40-KR	40M Upgrade: for # antennas only	149.00*
Pro Series		
PRO-57-B	10/12/15/17/20M 7 element	799.00
PRO-57-B-40 ***NEW!***	10/12/15/17/20/40M 7 element	949.00
PRO-67-B	10/12/15/17/20/40M 7 element	1049.00
PRO 67-C ***NEW!***	10/12/15/17/20/40M 7 element	1249.00
PRO-77-A	10/12/15/17/20/30/40M 7 element	1049.99
PRO 95	10/12/15/17/20M 9 element	1599.00
PRO-96	10/12/15/17/20/40M 9 element	2049.00
Warc Series		
TW-31	12/17/30M 1 element	249.00
TW-32	12/17/30M 2 element	449.00
TW-33	12/17/30M 3 element	599.00

PRICES MARKED * APPLY ONLY IF PURCHASED WITH MAIN ANTENNA

To find out more send a Stamped Self Addressed Envelope marked 'MOSLEY', for the new 30 page catalogue.

PW 8/95
R'COMM 10/94
REVIEWS
J CQ 8/94
QST 5/95

RF1 ANTENNA ANALYSER

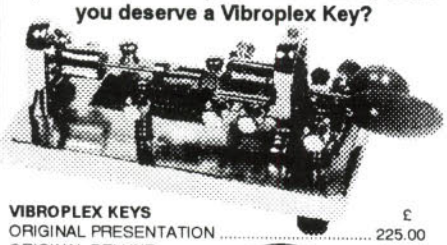
The pocket-sized RF Analyst has revolutionised antenna checking. Connected to any antenna it instantly reads out Impedance/SWR/Inductance/Capacitance from 1.2 to 35MHz.

£159.95

VIBROPLEX®

A Vibroplex Key is a beautifully crafted piece of history renowned world-wide for its design and engineering.

If you take pride in your morse code, don't you deserve a Vibroplex Key?



VIBROPLEX KEYS	£
ORIGINAL PRESENTATION	225.00
ORIGINAL DELUXE	145.00
ORIGINAL STANDARD	125.00
IAMBIC PRESENTATION	185.00
IAMBIC DELUXE	135.00
IAMBIC STANDARD	115.00
SINGLE PADDLE DELUXE	136.00
SINGLE PADDLE STANDARD	109.00
TWIN PADDLE WITH BUILT IN CURTIS KEYER	164.00
TWIN PADDLE	82.00
VIBROPLEX ACCESSORIES	
100TH ANNIVERSARY BOOK	23.00
100TH ANNIVERSARY BOOK - SIGNED	27.00
CORD & PLUG (SPECIFY KEY)	12.00
MUG	12.00
VIBROPLEX PARTS	
CLOSING SWITCH (Red or Black)	18.00
SPEEDWEIGHT ASSEMBLY (S/M/ or Large)	13.50
THUMB PIECE (Red or Black)	5.50
FINGER PIECE (Red or Black)	7.50
DASH CONTACT SLIDE ASSEMBLY	10.50
DOT CONTACT SLIDE ASSEMBLY	18.50

PW 6/95
REVIEWS
R'COMM 5/94

FULL VIBROPLEX REPAIR SERVICE AVAILABLE

01692-650077
ALL PRICES INCLUDE MAINLAND U.K. DELIVERY

DELTA Coax Switches

A New Standard in Lightning Surge Protection

REVIEWS
PW 8/95

● Arc Plug replaceable cartridge surge protection system - provides continuous protection of the active antenna circuit. Unused circuits are automatically grounded.

Delta 2 (2 Way, UHF connectors, 500MHz, 1.5kW) .. **£59.95**
Delta 2N (2 Way, N connectors, 1300MHz, 1.5kW) .. **£69.95**
Delta 4 (4 Way, UHF connectors, 500MHZ, 1.5kW) .. **£79.95**
Delta 4N (4 Way, N connectors, 1300MHz, 1.5kW) .. **£89.95**
Cartridge (replacement cartridge for all switches) **£8.95**

YAESU-ICOM-KENWOOD PHONE FOR BEST DEAL

OPEN: MON-FRI 9.00-5.30
SAT 9.00-4.00
(Closed 17-21 August)

PROFESSIONAL WIRE ANTENNAS

Σ SIGMA COMMUNICATION PRODUCTS

		£
BALUNS		
SPB-1	1:1 Voltage Type,3-35MHz,1kW	29.95
SPB-1C	1:1 Current Type,1.5-55MHz,3kW	32.95
SPB-4	4:1 Voltage Type,3-35MHz,1kW	32.95
TRAPS (2 needed for dipole,1 for sloper)		
ST-10	28MHz,600W	29.95
ST-12	24MHz,600W	29.95
ST-15	21MHz,600W	29.95
ST-17	18MHz,600W	29.95
ST-20	14MHz,600W	29.95
ST-30	10MHz,600W	31.95
ST-40	7MHz,600W	31.95
ST-80	3.5MHz,600W	31.95
SHORTENERS (2 needed for dipole,1 for sloper)		
SLC-40	40m (makes 38ft dipole)	19.95
SLC-80	80m (makes 69ft dipole)	21.95
SLC-160	160m (makes 100ft dipole)	21.95
MONO-BAND DIPOLES		
SMD-6	6m Dipole,10ft	20.95
SMD-10	10m Dipole,17ft	21.95
SMD-12	12m Dipole,20ft	22.95
SMD-15	15m Dipole,22ft	23.95
SMD-17	17m Dipole,28ft	23.95
SMD-20	20m Dipole,34ft	25.95
SMD-30	30m Dipole,46ft	27.95
SMD-40	40m Dipole,67ft	31.95
SMD-80	80m Dipole,134ft	45.95
SMD-160	160m Dipole,260ft	72.95
TRAP DIPOLES		
SD-32	20/15/(10)m,2 Trap,27ft	83.95
SD-42	40/20/(15/10)m,2 Trap,55ft	89.95
SD-52	80/40/(20/15/10)m,2 Trap,105ft	103.95
SD-162	160/80m,2 Trap,208ft	125.95
SD-34	20/15/10m,4 Trap,24ft	142.95
SD-44	40/20/15/(10)m,4 Trap,47ft	147.95
SD-54	80/40/20/(15/10)m,4 Trap,97ft	161.95
SD-56	80/40/20/15/(10)m,6 Trap,82ft	219.95
SD-68	160/80/40/20/15/(10)m,8 Trap,154ft	297.95
SD-610	160/80/40/20/15/10m,10 Trap,148ft	349.95
MULTIBAND AERIALS		
SA-10	160-10m,Balanced Line Feed,135ft	59.95
SAS-2	Shortened Version SA-10,70ft	89.95
G5RV-H	(40)/20/(15/10)m,51ft	24.95
G5RV-F	(80/40)/20/(15/10)m,102ft	39.95
OCF-H	Off Centre Fed,(40/20/10)m,68ft	50.95
OCF	Off Centre Fed,(80/40/20/17/12/10)m,135ft	65.95
SRD	Shortwave Receiving Dipole,46ft	49.95
SHORTENED DIPOLES		
SLS-40K	40m,38ft	66.95
SLS-80K	80m,69ft	77.95
SLS-160K	160m,100ft	83.95
TRAP VERTICAL SLOPERS		
SVS-31	20/15/(10)m,1 Trap,14ft	49.95
SVS-41	40/20/(15/10)m,1 Trap,28ft	52.95
SVS-51	80/40/(20/15/10)m,1 Trap,53ft	59.95
SVS-161	160/80m,1 Trap,105ft	70.95
SVS-32	20/15/10m,2 Trap,13ft	79.95
SVS-42	40/20/15/(10)m,2 Trap,24ft	81.95
SVS-52	80/40/20/(15/10)m,2 Trap,49ft	88.95
SVS-53	80/40/20/15/(10)m,3 Trap,42ft	118.95
SVS-64	160/80/40/20/15/(10)m,4 Trap,77ft	156.95
SVS-65	160/80/40/20/15/10m,5 Trap,73ft	189.95

For more information on the full range of Sigma aerials, send a Stamped Self Addressed Envelope marked 'SIGMA'

PW 8/95
REVIEWS
PW 8/95

PERSONALISED WORLD CLOCKS

A 9" dia. clock finished with **YOUR CALLSIGN** printed on the face. The map area is in three colours with blue sky effect background, showing countries with their true bearing, in degrees, a valuable aid to HF operators using rotary beams.

£39.95

INC. WORLD-WIDE DELIVERY

(PLEASE STATE CALLSIGN & AREA OF WORLD YOU OPERATE FROM)

PW 7/95
REVIEWS
J.CQ 12/94

Eastern Communications, Cavendish House, Happisburgh, Norfolk. NR12 0RU FAX 01692-650925

EDITOR'S Keylines

For the last few years, apart from the brief periods when I have had modern high-power transceivers to review, I have been busy on QRP c.w. using my Trio TS-120V. But recently, thanks to my newly-acquired KW2000B transceiver, I have re-discovered the delights and dangers of 'ragchewing' with friends old and new on h.f.

You may think I'm over-dramatising by using the word 'danger' but I think the behaviour I discovered poses a threat to our hobby. And in fact, I think the actions of the radio amateurs involved was certainly 'over the top'.

Unfortunately, it all started when I (quite innocently) got into QSO with a pirate operator using the callsign GW0JUJ. The illegal operator said he was in Anglesey and **seemed** to be a perfect gentleman, and then the trouble started!

I really began to wonder what I had stepped into when various stations broke in, talked over our QSO and generally made a nuisance of themselves calling (or so I thought at the time) both myself and the supposed GW0JUJ 'Pirates'. Quite frankly, I thought by **their** behaviour that **they** were the 'Pirates'!

Eventually, the illegal operator was forced to break off the QSO, but even then one persistent station kept breaking in, saying there were 'pirates about'. I can honestly say that I was more ashamed of the behaviour of these operators than I was of the illegal operator!

Finally, the **real GW0JUJ, Dave** from South Wales, came on the frequency (after being tipped off by telephone) and explained the situation. Shamefully I admit that I should have recognised his callsign, as Dave was featured in **Leighton Smart GW0LBI's** 'Three Watts From A Drainpipe' article in the April *PW*. If I had remembered, perhaps the incident would not have occurred!

In QSO with Dave, I mentioned how embarrassed I had been with the behaviour of the legitimate stations. I also made it clear over the air that, in my opinion, all they had to do, was to politely break into the QSO and wait their turn. Once in the QSO they could have informed me of the situation and I would have broken off the QSO immediately.

Dave GW0JUJ told me that the illegal operator had been making a nuisance of himself for quite a while, and seemed to pick on different callsigns at random. And, from personal experience I can tell you that's unfortunate. Several years ago, someone (using my callsign) was heard offering 'Free Subscriptions to *PW*' to anyone working G3XFD. Needless to say, it wasn't me!

So, you'll realise that I agree that 'pirating' a legitimate callsign is not just illegal, it's abhorrent behaviour. It could bring repercussions to the innocent radio amateur whose callsign is used.

But despite the actions of the illegal station, surely his behaviour does not warrant a child-like reaction from the legitimate amateur radio community? Personally, I don't think we should encourage any feedback at all to 'pirates' or the unfortunate individuals who often plague repeaters.

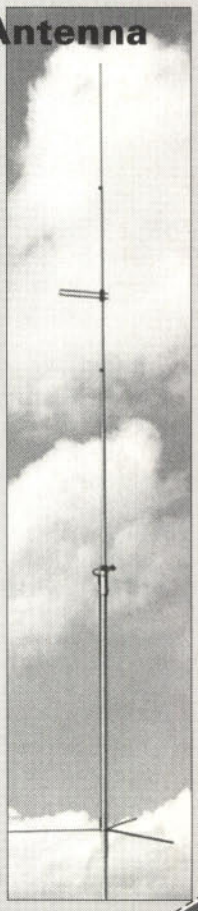
Our hobby is often considered by the media (quite wrongly in my opinion) to be inhabited by 'cranks'. If we react in an un-disciplined way to illegal operators or the 'funny voices' on repeaters (or other frequencies), **we could tarnish our public images ourselves.**

I can tell you that the unfortunate people providing 'funny noises and voices' will never be acknowledged over the air by me. I hope you do the same. Deprived of nourishment in the form of feedback, they'll drop off and disappear just like the parasitic Ticks we often find on our dogs and cats!

Rob Mannion G3XFD

SPECIAL PRIZE COMPETITION CORNER

Win A 144MHz Cushcraft Antenna



Wordsearch rules:
Twelve different words have been hidden in the letter grid. They have been printed across (forwards or backwards), up and down, diagonally, but they are always in a straight line without odd letters between. You can use the letters in the grid more than once for different words. Once you have found all 12 words, mark them on the grid and send it, along with your name and address (photocopies accepted with the corner flash) to our editorial address, marked 'Competition Corner' Wordsearch September 1995.

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

Words To Find:

ADI • ALINCO • ANTENNA • COMMUNICATIONS • ENDNOTES • MICROWAVE • MODIFICATIONS • OLYMPIC • PYE • QUAGI • UHF • VHF

Name.....

Callsign .....

Address.....

.....

..... Postcode .....

Send your entry (photocopies acceptable with corner flash) to: **Wordsearch Competition, September 1995, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.** Editor's decision on the winner is final and no correspondence will be entered into.

❑ SUBSCRIPTION ❑ VOUCHER

Entries to reach us by Friday 22 September 1995.

FIRST PRIZE: A Cushcraft AR-X2B 144MHz Vertical Antenna kindly donated by **Waters & Stanton Electronics** and a year's subscription to *Practical Wireless* or a £20 book voucher.

SECOND PRIZE: A six month subscription to *Practical Wireless* or a £10 book voucher.

COMPETITION CORNER SEPTEMBER 1995

RECEIVING You

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*.

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.

Amateur Radio Image

Dear Sir

Radio amateurs fight a constant battle protecting the image of the hobby and the good name of genuine enthusiasts. From time to time this involves denouncing illegal operation in our bands and convincing the press that people who listen into cellphone conversations are not true 'radio amateurs'.

For that reason, I was quite disappointed to see on sale at many recent rallies, including Bletchley Park, a rally with RSGB in its title - an abundance of 'pirate' cards and software for stealing satellite television programmes, such as the Adult Channel and Sky. Now it happens that stealing satellite signals is theft - full stop!

The law is clear on the subject and a judge will treat theft of television signals just as he would removing a mobile rig from an amateur's car. Whether we as individuals think this kind of theft is fair game is another matter entirely, but I believe that clubs, which organise rallies, should be seen to be acting within the law and not aiding and abetting any activity that could bring the name of amateurs into disrepute.

Just imagine if a Sunday newspaper journalist had been there.....the headlines would read 'Radio Amateurs tune into pirate porno TV'. Not very edifying is it?

It would be nice to have an unconditional assurance that from now on the RSGB and all other rally organisers will not countenance the sale of items intended for theft and that they will summarily eject any trader found to be offering these? If not, a clarification of which illegal activities these clubs consider acceptable would be helpful.

Andrew Emmerson G8PTH
Northampton

Editorial comment: As Andy Emmerson (our 'Focal Point' ATV author) has a valid point, we asked the RSGB to comment. Their reply, from Peter Kirby G0TWW the General Manager follows:

Dear Sir

The RSGB and RadioSport Ltd. co-sponsors of the Bletchley Park Mobile Rally were dismayed to find this type of material on sale at the rally. Neither organisation condones the sale of such items and steps have been taken to ensure that such items will not appear at future co-sponsored events.

Peter Kirby G0TWW
General Manager
RSGB

EMC Regulations & Kits

Dear Sir

The UK has several small firms supplying electronic kits for amateur radio uses. Despite most of these being run as part-time businesses, we are more active in this sector than anywhere else in Europe, and maybe also the USA. The many benefits which arise (technical education, exports, low cost of entry into the hobby, pleasure of operating home-built gear, etc.) may be completely lost if the EMC regulations governing all electronic products are implemented with vigour when they come into effect on 1 January 1996.

The problem is **NOT** technical - it is the bureaucratic burden that compliance with regulations will imply. Most of the kits involved probably meet the technical requirements, or could be made to do so relatively easily, but the burden of complying, even by the simplest self-certification procedure, will be greater than most of these businesses will be prepared to tolerate.

Most kits have a short life of about 2-3 years, sell in relatively small numbers, seldom remain unchanged for long periods and often are not even sold with cases! The selling price is often way below the true cost of development as all time is not costed properly.

The effort involved in getting a product registered, and maybe re-registered, will add much time and cost to their development which cannot be reclaimed in higher prices because they would become uncompetitive compared to mass produced gear. There are also potential problems with designed published in technical magazines, such as *PW*, *RadCom*, etc.

The situation is not confined to amateur radio kits. What is needed is a general exemption scheme for small quantity production run items - say under 200 off. Since this should not be viewed as an opportunity to flout the technical provisions, all suppliers should undertake and be required to clear up technical infringements, or refund the purchaser's money if it cannot be cured within six months of purchase; perhaps with the additional backing of some form of public liability insurance.

If this approach is adopted, there is hope that small electronics firms will still be able to start up in business and provide a service that is wanted by the public and most sections of Government. I hope you will be able to pursue such a scheme with the relevant officials and not be put off by talk of it being a requirement emanating from Brussels.

I have made similar proposals to the RSGB. In the meantime, I pray that somebody will recognise the significance of this problems before we all decide that we are not in business to push around yet more paper.

Tim Walford G3PCJ
Walford Electronics
Somerset

Editor's comment: For the sake of our hobby's future you can be assured I will try my best to get the EEC to take note of our concerns Tim. I also ask readers to contact their 'Euro MPs' to draw their attention to this important matter. If you are not sure who your 'local' representative is (they usually cover much larger areas than Westminster MPs) contact your local council. We must act together on this matter.

Theory & Construction

Dear Sir

Could you please write an article on synchronous a.m. detection, both theory and a constructional project?

Although I know the 'P' in *PW* stands for 'Practical', I would also be interested in more advanced radio theory, not avoiding mathematics. For subscribers also wishing to constantly enlarge their theoretical knowledge, *PW* may become less interesting when only the basic radio principles are repeatedly dealt with.

Peter Wessels
The Netherlands

Editor's reply: The content of *PW* reflects (as best as we can) what our readers ask for in surveys and when the Editorial team meet them at shows, rallies and club meetings. However, I know that Ian Poole G3YWX will be discussing your topic in 'Equipment Specifications'. The Editorial team would also like feed-back on the inclusion of more 'advanced' theory in the magazine, as Peter suggests.

July Antennas

Dear Sir
I am just writing to tell you how much I have enjoyed the July issue of *PW*. The articles on antennas are particularly interesting as I am grappling with the problems of a very small garden.

Anything for 3.5MHz is a real problem as my garden is very small and overlooked on three sides. The only clear take off I have is to the east.

So, I'm interested in ways of getting a good signal out in other directions. A future article on half-wave verticals would be most welcome, as these don't seem to need radials. Can you use a half-wave loaded vertical with a matching quarter-wave stub so that it can go high up on the back wall?

Another useful article would be a kind of comparison 'road test' for a number of different types of antenna for say 14MHz. It needs someone who can switch between say a quarter-wave vertical, a half-wave vertical, a half-wave dipole, trap dipole, trap vertical, quad loop, delta loop and beam, etc. on the same signal. By concentrating on one band, useful results could be obtained. I could imagine such an article taking a year to research.

How about sending an 'expert' to an ordinary QTH, like mine, to see what could be done with antennas, rather like gardening experts go to an ordinary suburban garden and turn it into a park!

There could then be a follow up article from the proud owner of the antenna after a year to see how it is performing. I do find it amusing that antenna articles often begin by saying that gardens these days are very small, but then go onto say that most people can put up 100ft of wire or something!

So, that's it. Thanks again for a great magazine. If you keep this standard up, I may have to take out a subscription!
Peter Halls G4CRY
York

Editor's comment: Some interesting ideas and suggestion there Peter, which will be passed on to our 'Antenna Workshop' author John Heys G3BDQ. Watch this space! The Editorial team are pleased you enjoyed the July antennas, and hope you enjoy the August 'Antenna Special' even more.

Magnetic Loop Antennas

Dear Sir,
You have now told us how to control a magnetic loop (*PW* August, page 26, 'Controlling That Magnetic Loop' by Gordon Lumley G3DJE), so how about telling us how to make one?
I have looked through back copies of *PW* but cannot find an article on magnetic loops.
Charles Morris
Cardiff

Editor's reply: Gordon Lumley G3DJE's article was aimed at helping the large numbers of readers who have already built 'magnetic loop' antennas. However, as there seems to be a great deal of interest, we hope to produce something suitable soon. Any other feed-back from readers on this subject would be appreciated.

★★★★ STAR LETTER ★★★★

Buying On A Budget

Dear Sir
Thank you for the article in the July issue 'Buying On A Budget' by Ben Nock G4BXD. I enjoyed it very much as I am on a **very** tight budget.

I have had a licence for two years but do not own my own rig. The problem is that I cannot afford, or really want, a 'black box' straight off the shelf. As I see it, there is nothing particularly 'amateur' about plugging in one of the latest rigs and chatting away.

I would welcome an article on ex-p.m.r. gear that can be converted for 70/144/430MHz. Where can it be bought (besides at rallies), where can the parts be found for conversion, how much, how is it done and so on. That is the reason that I took the exam, so that I could tinker about to my heart's content, without the worry of destroying hundreds of pounds of radio or invalidating a warranty.

This is what attracted me to the hobby and I don't think that I will ever be excited by the state-of-the-art plug-in and play wonders as I am by the likes of the Pye Cambridge and earlier models.

So, please lets have an article for the poorer v.h.f./u.h.f. fans amongst us, maybe then I could buy something to be tinkering with whilst I am at University this year!

Thanks for a great magazine, been reading you since 1981. Keep up the good work!
Chris Marsden G7RCI
Lancashire

Editor's reply: Articles on converting surplus equipment cause problems Chris. As soon as the article appears, the equipment sources dry up due to the demand! However, we occasionally publish a 'conversion' article (the 49 to 50MHz conversion we featured in 'The Handy From Tandy' in April seems to have been very popular) which gets over that problem. We hope you enjoy the p.m.r. conversion we're publishing this month.

Radio Amateurs in the Press

Dear Sir
The *Sunday Times* recently carried an article entitled 'Scramblers drive hackers off information superhighway encryption', from the 'Business Section', page 10, June 11 1995. It refers to 'any amateur radio ham' being able to intercept mobile 'phone calls. I have written to them complaining about it.

In my opinion, it should be illegal to possess radio scanners. At present it is just illegal to use them, which is totally un-enforceable. The second-hand market was flooded with cheap scanners when the police changed to a scrambled radio system. Nobody uses them legally.

I have a few other points I'd like to mention, now I've finally got round to writing. You sometimes refer to 'linear amplifiers' being used (illegally) on CB radio.

The amplifiers used on CB are in general, badly filtered, overated, Class C and totally non-linear. This includes the ones with 'linear amplifier a.m./s.s.b.' printed on the front.

Just listen to all the strong distorted s.s.b. signals on 27.4-27.5MHz. A better description would be 'power amplifier'.

In editorials, a few years ago, you moaned about radio amateurs not being allowed to convert illegal multi-mode CBs for legal 28MHz use. Your argument being that it would get them out of circulation. This does not hold water. These things are still being smuggled into the country, it would just increase the demand.
Adam Page
Tyne & Wear

Editor's comment: Our attempts to 'educate' the media on Amateur Radio continues. The widely read *UK Press Gazette* (journalism's own weekly 'trade' paper) recently published a letter from me appealing to journalists to contact the RSGB, the Radiocommunications Agency or *PW* to get accurate information, so as to avoid misrepresenting the Amateur Radio hobby. If you feel strongly on this topic, copies of my original letter to the *UKPG* are available (for individual readers to send to the local media) on request from the Broadstone office.

NEWS '95

Part Exchange Paddles

Gordon Crowhurst G4ZPY proprietor of G4ZPY Paddle Keys International has recently notified the 'Newsdesk' of a very special offer he is running for a trial period of one year, from September 1 this year.

With the exception of Morse keys that are sold as kits, G4ZPY will accept pump keys which have been purchased from them within the previous 12 months in part exchange for paddle keys. Following an inspection of your key G4ZPY will allow up to 40% off the purchase price paid for a pump key. This offer will enable customers to buy refurbished pump keys at lower prices than new models.

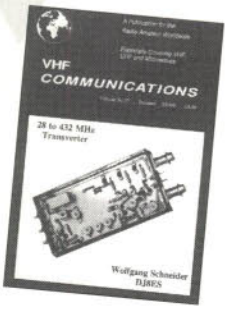
For more information contact **G4ZPY Paddle Keys International, 41 Mill Dam Lane, Burscough, Ormskirk, Lancshire L40 7TG. Tel/FAX: (01704) 894299.**

VHF Communications

VHF Communications is a quarterly amateur radio publication, edited by **Mike Wooding G6IQM**. It is aimed at the v.h.f., u.h.f. and microwave enthusiast and is based on a German publication called *UKW-Berichte*.

The latest edition (Summer 1995) of *VHF Communications* includes articles on A Sweep Tuner for a VCO, A Grid Dip Meter for v.h.f. and u.h.f., A 28/50MHz Transverter and a Big Wheel Antenna for the 70cm Band to name a few.

VHF Communications is only available on subscription. A year's subscription will cost you £15 or the national equivalent and all orders should be sent to **KM Publications, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF. Tel: (01788) 890365.** Individual copies and back numbers are available for £4 each. (Mike Wooding is a guest contributor in this issue of *PW*. See 'Woodings World').



Virtual Museum

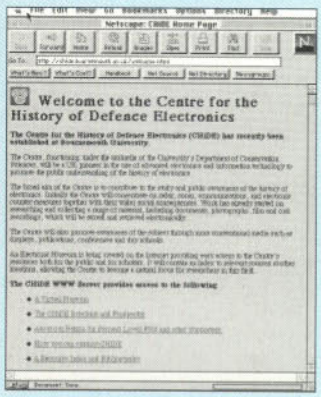
Bournemouth University's virtual museum on The Internet. Part of Bournemouth University's Conservation Sciences Department, the Centre For The History Of Defence Electronics (CHiDE) opened to the 'general public' with Internet access, from August 1.

Several 'museums' are to be found on The Internet. But Bournemouth University believe that their new project will be the first dealing with the history of defence electronics.

The official launch of the project was on June 26 1995, by the Chancellor, Baroness Caroline Cox of Queensbury and the Vice Chancellor Professor Gillian Slater. On a hot cloudless day they welcomed about 50 guests, many of whom were pioneers in the world of radar and electronics.

Sir Bernard Lovell FRS, their patron, was unable to attend on the day, but sent a message of support for the project. Using multimedia style sound, video, photographic and textual information, the virtual museum will allow 'visitors' to wander round the museum and research the history of defence electronics in this and other countries.

Although supported by the Imperial War Museum and its archives, the centre is looking for personal memories and recollections. These personal stories will be used to add depth and feeling to the history provided, giving a unique insight into the social impact radio and electronics of the industry over the period.

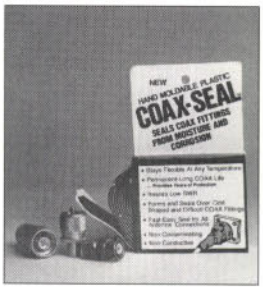


Initially the virtual museum will have only a skeleton set of pages to view, but it is hoped these will increase on a weekly basis. To wander around the 'museum' the Home Page address for those of you with internet access is: **http://chide.bournemouth.ac.uk/welcome.html**

If you would like to contribute to this worthwhile project, please contact **Dr John Beavis** (E-mail ***jbeavis@bournemouth.ac.uk***) or **Brian James** (E-mail ***bjames@bournemouth.ac.uk***) at **The Department Of Conservation Services. Bournemouth University, Poole, Doset BH12 5BB. Tel: (01202) 659169.**

(story by 'Tex' Swann G1TEX)

Flexible Putty



Due to recent press coverage of Coax-Seal, Waters & Stanton Electronics of Essex have decided to import this product direct from the USA.

Coax-Seal is a flexible putty type substance designed to be moulded around antenna connectors to give protection from corrosion and act as a waterproofing agent. The manufacturers describe it as "a hand moldable plastic which stays flexible at any temperature, is non-contaminating, non-conductive and helps to ensure low s.w.r." It can also be used on baluns, beam antenna parts, dipoles and connections to help prolong the life of your antenna.

Coax-Seal is supplied in a roll measuring 60in x 1/2in wide providing enough protection for nine coaxial fittings and costs **£3.95 plus 50p P&P.** More information can be obtained from **Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835/204965.**

Callsigns In Space

Would you like your name or callsign to fly on the Phase 3D (P3D) Spacecraft when it's launched in 1996? Well, owing to requests made by members of AMSAT worldwide, this has been made possible by the AMSAT-UK Phase 3D Project Team.

Anyone who donates £150 or more to the P3D fund will be able to have their name or callsign placed on the Spacecraft prior to its flight. This will be in the form of a small engraved plate, which will be photographed and then sent to the donor together with a small engraved certificate or plaque.

Commercial or trade organisations can also have their names 'flown' on P3D Spacecraft on receipt of a donation of £5000 or more. This is also open to government organisations and universities who would like to give cash instead of just supporting the hobby.

If you'd like to make a donation to the Phase 3D Spacecraft Fund all methods of payment and currency are accepted and should be sent to **Ron Broadbent G3AAJ, MBE, VP RSGB, 94 Herongate Road, Wanstead Park, London E12 5EQ, England. Tel: +44 0181-989 6741, FAX: +44 0181-989 34340.** Technical information sheets on the P3D Spacecraft are available from Ron G3AAJ on receipt of 3 IRCs.

Radio Amateurs Examination Courses

It's the time of year when all you budding Radio Amateurs should be thinking about enrolling on a RAE course, so to help you out here's a list of all the courses the *PW* Newsdesk has been informed about. If you can't find a course in our list in your area why not contact the **City & Guilds** of London on **0171-278 2468**?

Arnold & Carlton College of Further Education, Digby Avenue, Mapperley, Nottingham.

RAE course, 30 weeks, Wednesdays 6.30 - 9.15pm, **starts 20 September,** Tutor G4DVW. Enrolment by post or in person from **August 31.** Contact: **Alan Lake G4DVW** on **(0115) 938 2509.**

Intensive RAE course, 12 weeks, Thursdays 6.30 - 9.15pm, **starts 21 September**, Tutor G4DVW. Enrolment by post or in person from **August 31.** Contact: **Alan Lake G4DVW** on **(0115) 938 2509.**

Morse class suitable for beginners and for those wishing to brush up their speed, Wednesdays 7 - 9pm, **starts 20 September,** Tutor G4NZU. Enrolment by post or in person from **August 31**. Contact: **Alan Lake G4DVW** on **(0115) 938 2509.**

Avondale School, Stockport, Cheshire.

RAE course, weekly, **runs September to March.** Enrolment **early September**. Contact **Eric Chantler G0ORD** on **0161-427 1027**.

Blackpool & The Fylde College, Fleetwood Nautical Campus, Broadwater, Fleetwood, Lancashire FY7 8JZ .

RAE course, 30 weeks, **starts 12 September,** Tutor G3VDO. Fees: under 19 £3, over 19 £55**.** Contact: **(01253) 352352 Ex. 4021.**

City of Westminster College, 25 Paddington Green, London W2 1NB.

RAE course all levels catered for, starts **early September**. Contact: **Science & Humanities Dept, City of Westminster College** on **0171-723 8826.**

Glenrothes & District Amateur Radio Club, Balwearie High School, Kirkcaldy.

RAE course, Mondays 7 - 9pm, **starts late September.** Contact: **Ken Horne GM3YBQ** on **(01592) 265789 (evenings)** or **T. McGill** at **Balwearie High School on (01592) 640335 (mid September).**

Morse class, Tuesdays 7 - 9pm, **starts late September.** Contact: **Ken Horne GM3YBQ** on **(01592) 265789 (evenings)** or **T. McGill** at **Balwearie High School** on **(01592) 640335 (mid September).**

Hellesdon Adult Education Centre, Hellesdon High School, Middletons Lane, Hellesdon, Norwich NR6 5SB.

RAE course, Tuesdays 7 - 9.30pm, **starts week commencing 18 September.** Tutor G3IOR**.** Fees: £50 approx. Contact: **(01603) 41156.**

Hilderstone Radio Amateurs, Kent.

RAE course, Tuesdays 7.30pm, **starts 3 October.** Tutor Ken Smith G3JIX. Contact: **Ron Marchant G3TAJ** or **Ken G3JIX, QTHR** on **(01304) 812723**.

Hull College, Queens's Gardens, Hull HU1 3DG.

RAE course, 2 years (exam Dec 1996), Tuesdays 7 - 9pm (1st year), Mondays 7 - 9pm (2nd year), **starts 12 September (1st year), 11 September (2nd year)**. Fees: £2.50 registration plus £52 (1st year), £19 (2nd year). Enrolment by 'phone from mid-July or in person from 4 September. Contact: **Steve Brett G4COT** on **(01482) 329943**.

Morse class, Wednesdays 7 - 9pm, **starts September 13.** Fees: £2.50 registration plus £52. Contact: **Steve Brett G4COT** on **(01482) 329943**.

Newbury Technical College.

RAE course, Wednesdays 7 - 9pm, **starts 13 September**. Tutor G3NDS. Contact: **Newbury College** on **(01635) 35353** or **Ray Oliver G3NDS** on **(01672) 870892**.

Morse class, Fridays 6 - 7.30pm, **starts 15 September**. Contact: **Newbury College** on **(01635) 35353** or **Ray Oliver G3NDS** on **(01672) 870892**.

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

RAE Theory course, Monday evenings or Wednesday mornings.

Electronics Servicing/Construction course, Tuesday afternoons.

Computing course, Tuesdays mornings.

Morse class (beginners), Wednesday afternoons.

Enrolment September 4, 5th and 6th. Contact: **John Beaumont G3NGD** on **0161-872 3731 Ext. 347.**

Ormesby Middle School, North Road, Ormesby, Great Yarmouth, Norfolk.

RAE course, Thursdays 7 - 9.30pm, **starts week commencing 18 September.** Tutor G3IOR**.** Fees: £50 approx. Contact: **(01603) 35857.**

Rugeley Adult Education Centre, Taylors Lane, Rugeley.

RAE course, Tuesdays, **starts 20 September**. Tutor G4EQC. Contact: **Mr B. Golemboski** on **(01889) 578738.**

Sandwell Amateur Radio Club, The Broadway, Oldbury, Warley, West Midlands.

RAE course, Thursdays 7.30 - 9pm, **starts early September**. Tutor G0VLO. Fees: £1.50 per session inc. coffee, biscuits and club membership. Enrolment 7 September at 7.30pm. Contact: **Clive Binnell G0TVR** on **0121-429 6061, Archie Holyoake G40JJ** on **0121-552 4619** or **Martin Prestidge G2BXP** on **0121 552 4902.**

Novice RAE course running concurrently with above. Tutor: G2BXP. Contact: **Clive Binnell G0TVR** on **0121-429 6061, Archie Holyoake G40JJ** on **0121-552 4619** or **Martin Prestidge G2BXP** on **0121 552 4902.**

Sevenoaks Adult Education Centre, Bradbourne Road, Sevenoaks Kent TN13 3QN.

RAE course. Tutor G3OYU. Contact: **(01732) 451618.**

Swindon Technical College.

RAE course, Mondays 7 - 9pm, **starts 18 September**. Contact **Swindon College** on **(01793) 498300** or **Ray Oliver G3NDS** on **(01672) 870892**.

Thorpe Adult Education Centre, Thorpe St. Andrews School, Longfields Road, Thorpe St. Andrew, Norwich NRO 7NB.

RAE course, Wednesdays 7 - 9.30pm, **starts week commencing 18 September.** Tutor G3IOR**.** Fees: £50 approx. Contact: **(01603) 35857.**

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

RAE, Novice RAE & **Morse** courses. Contact: **Mike Dixon G4GHJ** on **(01203) 694200 Ext. 221.**

Twyford House, Shirehampton, Bristol.

RAE course, Mondays 7.15 - 9.15pm, **starts 18 September**. Tutor: G0LOJ. Fees: £5 registration plus £63.60. Contact **Liz** on **0117-968 3112 (office hours)** or **Chris** on **(01454) 616267 (evenings & weekends).**

Wombourne Youth & Community Centre, Church Road, Wombourne, Wolverhampton WV5 9EZ.

RAE course, Mondays 7 - 9pm, **starts 18 September**. Contact: **Brian Fereday** on **(01902) 820826.**

Morse class, Thursdays 7 - 9pm, starts 21 September. Contact: **Brian Fereday** on **(01902) 820826.**

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

RAE course, starts early October. Contact **Len Buck G0DLR** on **(01732) 823483.**

Mid-Warwickshire Open Day

The **Mid-Warwickshire Amateur Radio Society** is holding an Open Day on September 12 at their club house at the **St. John Ambulance HQ Building, 61 Emscote Road, Warwick.** The event will start at 6pm and run until 9pm.

During the event, the Mid-Warwickshire ARS will run on-air demonstrations, packet radio, home-brew and kit construction, a working short wave station, and a display showing the work of RAYNET. Everyone is welcome to attend the Open Day and are invited to ask questions about the club and learn more about amateur radio.

The Mid-Warwickshire ARS was founded in 1961 and now meets regularly at various locations throughout Warwick and Leamington Spa. Membership for the club is drawn from Leamington Spa, Warwick and Kenilworth with meetings being held on the second and fourth Thursday of each month. The club pride themselves on encouraging all members to get involved no matter what their level on knowledge, experience or expertise.

If you would like to find our more about the Mid-Warwickshire ARS activities or their Open Day please contact **Don** on **(01926) 424465**.

01702 206835 Waters & Stanton

Quote Visa or Access No.
For Immediate Despatch

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

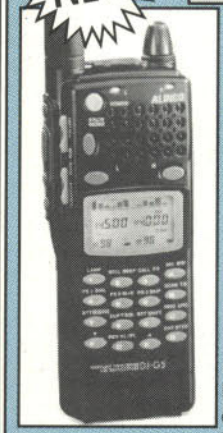
DX-70 HF + 6M Transceiver
100Watts HF 10 Watts 6m
SSB - CW - FM - AM
Narrow filters included
£1095

Great Part Exchange Deals

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 its electronic vol. / squelch controls. Send today for full details of tomorrow's handheld.

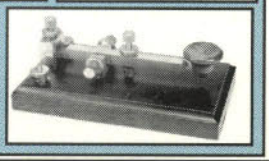
Watson Hand-made keys

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 lambic £49.95

Watson GMV Straight £44.95

Watson GMC Straight
£34.95



WATSON Mobile Aerials
Low cost - high spec.

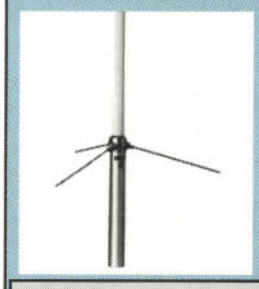
This new range of mobile aerials offering amazing value. Stainless steel whips, foldover bases and perfect matching. These are the best performers we have ever stocked! Resonated for European band and designed to take the higher powered rigs.

£24.95

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

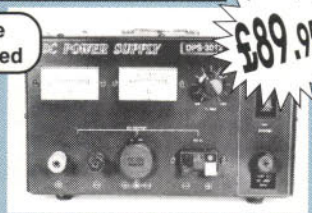
Brand new units with 1750Hz tone, 20 memories, direct 12V socket, 4 & 6 x AA cell boxes, carry strap, belt clip, antenna. Ni-cad packs £19.95 Chargers £9.95

£149 Post £8

Few Only!!

DPS-2012 22 Amp PSU

Fully variable
Fully Protected



£89.95

30 Amp model also available. Same design.
£119.95

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

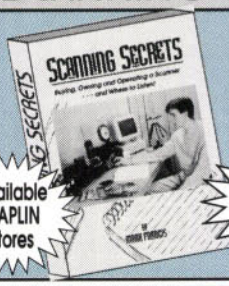
VSWR Meter Bargain!

£69.95

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

Add £4.40 p&p

"SCANNING SECRETS"

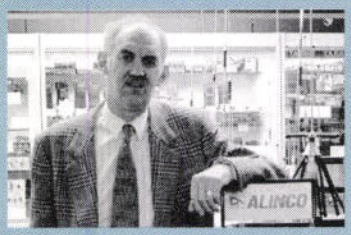


Exciting New Book!

Available MAPLIN Stores

£16.95

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.

Lack Space for 80 Metres?
WHF-80 Plus

66ft 50 Ohm end fed wire

Simple to erect. Can be squeezed into just 50ft of garden yet gives signal strengths similar to full size dipole! Send for data sheet. **Total cost £45**

New ICOM IC-775 DSP

Phone for a really super deal!

~~£339~~ £289

Alinco DJ-G1 2m FM

- * Spectrum Scope
- * WideRx AM/FM
- * 80 Memories
- * Ni-cad Pack
- * Charger

A chance to purchase this latest handheld at a really competitive price. Take advantage of our bulk purchase and order today.

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

Super Sale

Up to 20% Discount!

ALINCO DJ-S1E 2m FM

£199

Complete with ni-cad pack and AC charger

MFJ:		Usual	Sale
-722	Audio filter SSB/CW	£94.95	£69.00
492	Memory keyer	£119.95	£89.00
490	Memo Keyer + paddle	£189.95	£149.00
107B	Single 24h digital clock	£11.90	£9.95
1020A	Indoor sw active ant.	£89.95	£69.00
1272	TNC /mic. switch	£39.95	£32.00
704	Low pass filter	£46.95	£35.00
1701	6 way coax switch	£44.95	£35.00
912	Remote balunn	£49.95	£35.00
264	1.5KW dummy load	£79.95	£59.00
260	300W dummy load	£39.95	£29.00
203	160-10m dip meter	£119.95	£89.00
931	Artificial ground	£99.95	£75.00
5383	Computer interface	£59.95	£45.00
1278	Multimode data unit	£339.95	£249.00
1278BX	Multimode data unit	£339.95	£279.00
Optoelectronics:-			
2810	10Hz-2.4GHz counter	£199.95	£145.00
2600HA	1MHz-3GHz counter	£259.95	£175.00
Adonis:-			
AM708	Desk microphone	£179.95	£139.00
AM608	Desk microphone	£165.95	£125.00
AM308G	Base station mic.	£95.95	£75.00
AM508G	Base station mic.	£115.95	£89.00
HX7100	Gooseneck mic.	£119.95	£95.00
Diamond VSWR and Power Meters:			
SX 100	1.6-60MHz	£139.95	£109.00
SX 200	1.8-200MHz	£94.95	£75.00
SX 400	140-525MHz	£109.95	£89.00
SX 600	1.8-525MHz	£179.95	£139.00
SX 1000	1.8-1300MHz	£239.95	£189.00
SX 2000	Auto 1.8-200MHz	£149.95	£115.00
SX 9000	1.8-160/430-1300MHz	£279.95	£219.00

Watson Power Supplies

Fully Protected
13 Amp plugs

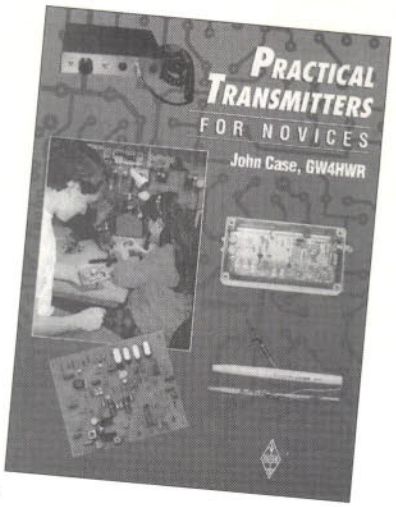
W-3A 3 Amp £19.95
W-5A 5 Amp £29.95
W-10 10 Amp £49.95
Also:
W-10AM meterd variable 10 Amp £59.95

Big Savings

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


The 59(9) DXReport
Your Weekly Source for Worldwide DX and Contest News
WELCOME TO THE 59(9) DX REPORT!

NOVICE Natter



For Radio Beginners of all Ages.

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

This month's 'natterings' from Elaine Richards G4LFM includes a look at readers' letters, news of a new book and 'First Steps' gives an insight into computing in radio.

New Newsletter

The *PW* Editorial Staff were very helpful on their recent trip to the Dayton Hamvention. They brought back the first copy of the new *59(9) DX Report* which is a newsletter for the contester or DX enthusiast.

The newsletter contains details of various DXpeditions (eight in this newsletter), the different exotic islands that are being activated (six of them) and various bits of DX news.

It's all very current stuff and the April edition I had only gave information until the end of May. They obviously haven't got the huge deadlines that magazine authors have and so can give you the latest changes and up-dates.

The author of the *59(9) DX Report* newsletter is **Bob Nadolny WB2YQH.** Bob is at the top of the Honor Roll in the USA - he reached that spot when he was just 22, the youngest person to get there! Apparently, he's been into contesting and DXing since he got his licence.

The other thing I thought was great for those who want to know where the unusual call-signs are possibly to be found, is 'The Listening Post' section. Other information available in the newsletter was QSL addresses and any news the author thinks other DXers ought to know. This newsletter comes out almost every week!

To subscribe to the *59(9) DX Report* here in the UK will cost you $30 for 25 issues or $53 for the full 50 issues. You can get more details on the *59(9) DX Report* from **PO Box 73, Spring Brook, NY 14140, USA. Tel: 716-677-2599** or if you have access to the ever more popular Internet, you can send your messages to **the599rpt@aol.com**

Readers' Letters

I've heard from **Eileen Mainwaring 2W1BPS** again recently. Despite looking after Wyn her husband, caring for an orphaned lamb and a clutch of chicks, she's managing to learn Welsh and get on the air once or twice!

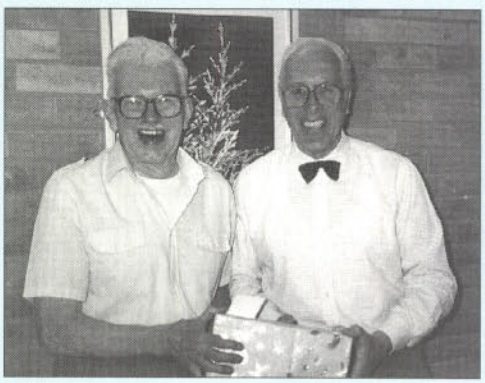
Eileen 2W1BPS was on the air during a recent contest on 50MHz. She reckons that most of the contest operators couldn't have come from the ranks of the Novice Licensees as their operating habits were much too bad. She did work one really expert operator, he had nearly 200 QSOs worked when he got his first Novice YL - Eileen. Other than that she's managed to go as far as Snowdon and Cornwall from her Llandeilo site.

She did have one moan and I expect it has affected others too. Novice students in her area who took their exam in March ended up by having their results late so anyone who needed to book a re-sit for the June sitting couldn't.

Sounds as if there could be some disgruntled Novices in Wales at the moment. Hopefully they can arrange a September exam and let's hope for a full pass this time.

Some while back, **John Percival G7DDU** wrote to nominate **Charles Austin G4MEW** for the 1995 Novice Natter *PW* Elmer Award. Well, recently he was honoured with the presentation of a decanter for his services to the Bedford Net.

You can see Charles on the left of the picture receiving the present from **John Bennet G3FWA**. Charles certainly runs an interesting meeting judging by the number of people who turn out.



Charles G4MEW being presented with a decanter by John Bennet G3FWA for his services to the Bedford Net.

Speaking of the Elmer Award, if you have someone to nominate for getting you interested in this hobby, then drop me a line as soon as you can. Hopefully next month, I'll be able to tell you what the prizes are - last year the first prize winner got a new v.h.f. hand-held, so get writing!

Everyone who nominates someone gets a log book so there's nothing to lose. Hope to hear from you soon.

Novice DIY

Having developed some constructional skills as part of the Novice course I'm sure many of you are looking for interesting projects to build. The answer may well be found in the latest RSGB book release called *Practical Transmitters For Novices.*

Practical Transmitters For Novices is written by **John Case GW4HWR** and is devoted to constructional projects for the Novice bands. The book starts with a quick overview of commonly used constructional techniques such as prototype board, Veroboard and the use of islands on copper laminate board. This provides a handy reminder that's particularly useful for the small add-on's or modifications to existing kit.

The next three chapters cover some of the basic circuitry that form the building blocks of the complete projects described later on. There were a few good basic projects in this section including an r.f. probe, absorption wavemeter (very useful to comply with your full licence) and a simple signal generator. All the projects included full constructional details, including the mechanics.

The first transmitter described in *Practical Transmitters For Novices* is a compact 1W unit designed for operation in the 3.5MHz band. The project was very well described and covered circuit operation, constructional notes, full mechanical details and a step-by-step test and alignment section. If you're not too sure about doing all the work yourself, all the components are available from Cirkit Distribution.

First Steps - Computing

If you look in the shack of most radio amateurs these days you will find a computer somewhere in the system. While some stations keep a computer just for occasional use others seem to be totally dependent with the computer controlling just about everything.

Maybe one day the computer will generate all the contacts, print and E-mail the QSL cards leaving the operator free to pop into the shack once a week to see what's been worked! Seriously though, there is a real place for computing in a modern shack, but where do you start?

For most the first problem is cost. With home computers costing anything upto £3000 how do you know what to buy?

The answer really depends on what you want to do with the computer. If you're looking for the ultimate computerised station and want to run all the latest software you will end-up spending a lot of money - but it doesn't have to be like that.

If, like many Novices and newcomers, you would like to experiment and build much of your own equipment, a computer can come in really handy. A classic example is antenna construction.

Building your own antennas is one of the cheapest and possibly most rewarding constructional areas, but you need to make quite a lot of calculations. This can be eased considerably with the aid of a very simple and cheap computer.

There have been lots of BASIC language programs produced that automate most of the calculations associated with antenna construction. These cover everything from simple dipoles through to all the spacing details for v.h.f. and u.h.f. multi-element arrays. One of the great things about the BASIC language is that these programs can usually be exported to any computer that runs Basic with only minor modifications.

Another area that's very popular with amateur constructors is filters. While r.f. filters often play a vital role in the elimination of interference, audio filters can be used to overcome some of the shortcomings of cheaper receivers. Whilst these filters are usually very easy to build the hard part is calculating the component values and then adjusting the result to use standard components.

The computer makes light work of this and can carry out many iterations of the calculations to give the best result with standard component values. As with the antenna design, most of these programs are available in BASIC language.

Electronic Logbook

After use for calculations, probably one of the most common uses of the computer is to provide an electronic logbook. By using an electronic logbook you are able to use the power of the computer to search for details of previous contacts.

With an electronic logbook facility all you have to do is type in the call and the computer will show whether or not you have worked the station before and if so it gives the operator's name and will list the details including equipment.

As you can see this is particularly useful facility that can really help sharpen up your operating technique. The very latest logbook programs include a wealth of facilities and can control your rig, provide beam headings and even operate packet stations to hear the latest DX news!

What To Buy?

All this is very well but you're still probably wondering what to buy and how much will it cost. If you're just looking for a computer to help with calculations and maybe run a logbook you should be able to get by with an older second-hand computer.

A good place to look is in the local free advertising papers that abound in most areas. looking through my local paper I've seen the following typical prices: Amiga 1200 (£200), Amiga 500 (£150), Atari ST (£60), BBC B + disk drives (£100), 286 PCs (£100), 386 PCs (£200-400), 486SX PCs (£500) and 486DX PCs (£600+). You will also need some form of printer and the popular dot matrix types seem to sell for around £30 each.

You could be forgiven for being confused about the IBM PC because there have been so many different processors used over the years. To help sort this out here's a simple listing starting with the slowest and oldest moving up to the fastest: 8086, 286, 386SX, 386DX, 486SX, 486DX, 486DX2, 486DX4 and Pentium. With the 386 and 486 machines you will usually find a second number quoted after the DX or SX this is the processor speed in MHz so the faster the better.

Before you go out and buy your computer I would suggest you find someone locally you can talk to about the pros and cons of the different systems, ideally you should try out the software yourself. There are bound to be several people at your local radio club who will be more than happy to make sure you don't waste your money.

Next month, in 'First Steps' I'll take a Novices look at the dreaded Internet - why has it got everyone so excited (at least until they see their 'phone bills!).

Following a brief reminder of modulation theory, the next projects were a double side-band transmitter for the 1.8MHz band and a 50MHz f.m. transmitter. As with the first project there were comprehensive details of all aspects of the construction.

The next area to be tackled was the 1.3 and 10GHz bands. This is the area where radio engineering and plumbing seem to come together! As with all the preceding sections the coverage was very thorough and included test equipment as well as a selection of transmitters.

The final sections of *Practical Transmitters For Novices* provided useful reference material plus a handy list of component suppliers. I was very impressed with the overall standard of the book and am sure it will prove invaluable for many new to the world of radio construction. *Practical Transmitters for Novices* is available from the *PW* Book Service for **£9** plus **£1 P&P UK**, **£1.75 P&P overseas**.

Until next month cheerio. Please keep sending me your suggestions for this column, I'm especially interested in hearing what you'd like featured in 'First Steps', so get writing.

Elaine G4LFM

THE BANDIT*

LOWE'S MAD SUMMER SALE OF ALL

For Example...

YAESU

FT-1000	RRP £3999	**Lowe price £2995**
FT-840	RRP £959	**Lowe price £725**
FT-900	RRP £1399	**Lowe price £1099**
FT-990	RRP £2399	**Lowe price £1895**
FT-2500M	RRP £399	**Lowe price £319**
FT-736R	RRP £1999	**Lowe price £1549**
FT-11R	RRP £324	**Lowe price £259**
FT-51R	RRP £529	**Lowe price £399**

Plus...

KENWOOD

TS-8505	RRP £1809	**Lowe price £1399**
TS-6905	RRP £1649	**Lowe price £1299**
TS-505	RRP £1059	**Lowe price £829**
TM-251E	RRP £419	**Lowe price £329**
TM-742E	RRP £879	**Lowe price £679**
TM-79E	RRP £479	**Lowe price £379**

Lowe are UK distributors for the exciting range of noise cancellation and audio filter products from **JPS COMMUNICATIONS** Just write, call or E-mail us for full details and prices. Ask for a copy of an independant review.

SPECIAL OFFER TO CLEAR

Base station dual-band antennas

Maldol HSWX1 only **£59.95**

Maldol HSWX2 only **£69.95**

PHONE FOR A COPY OF OUR GREAT WEEKLY SECOND-HAND LIST.

Vårgårda Radio AB

Call us on (01629) 580800 and we will send you full details of the top quality v.h.f. antennas from Vargarda of Sweden.

ADI 2m and 70cm hand-helds **IN STOCK NOW**

NEEDLESS TO SAY, ALL ITEMS ARE SOLD WITH THE FULL WARRANTY AND FAMOUS LOWE BACKUP. ALL PRICES INC VAT. NEXT DAY DELIVERY £10 EXTRA. VISA/MASTERCARD WELCOME. CASH EVEN WELCOMER! CHEQUES AS WELL.

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

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

***Who the heck , you may ask, is the Bandit?**
Just ask anybody who remembers vintage radios like the FT-101 and they will enlighten you!

LOWE

Lowe
Chesterfield Road, Matlock,

RIDES AGAIN

KENWOOD AND YAESU TRANSCEIVERS

BY THE TIME YOU READ THIS, THE **ICOM IC-706** MAY EVEN EXIST! SEE BOTH IT AND THE **ALINCO DX-70** AT YOUR LOCAL LOWE SHOP.

JUST IN!

The WEP300 is a really well styled clip-on earphone that goes round your ear - not in it!

ONLY £9.95.

Call us for a leaflet.

Lowe Electronics are sole UK distributor for Kantronics, the world leaders in packet equipment. See the Kantronics range on demo at your nearest Lowe shop.

SEE US AT THE STAFFORD SHOW – GREAT BARGAINS

Looking for good h.f. all band results?

We have sold many hundreds of the Chelcom CAHFV1 since we launched it last year. £119.00. Will bring you the best value in h.f. vertical antennas.

THE FAMOUS MANSON EP925 - BACK IN STOCK

Ring us for details.

* 3-15V d.c.
* 25A
* 30A peak
* Cooling fan
* Full metering

Buy the best - forget the rest!

All this for only **£99.95**

MAKE A NOTE IN YOUR DIARY - THE FAMOUS LOWE ELECTRONICS OPEN DAY AT MATLOCK WILL BE ON SATURDAY SEPTEMBER 16TH.

KENWOOD MAIN DEALER

ALINCO STAR DEALER

Master Dealer YAESU

YORKSHIRE
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

SEE US ON THE WEB!

orders@lowe.demon.co.uk
info@lowe.demon.co.uk
http://www.demon.co.uk/lowe/index.html

Electronics

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

CLUB Spotlight

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

Reactivation Of GX3JDY

East Riding RAF RS held a special VE Day event on Sunday 7 May 1995 and the callsign **GX3JDY** had its first appearance on the air. As Leconfield is now a combined base RAF and Army, security is top priority. The club did hope to receive permission to run a 24 hour station, but due to Leconfield being a 24 hour operational station, this was not possible.

With the valuable help and loan of three telescopic radio masts from the Royal Signals Station based at Leconfield, Warrant Officer **Gary Collier** and members very speedily erected a full-size G5RV h.f. antenna, Diamond 500 dual-band vertical v.h.f. and a 9-element Tona horizontal beam for s.s.b. 144MHz.

The club managed to work 215 stations during the ten hour period of operation, 155 on h.f. 3.5MHz and 60 on v.h.f./u.h.f. The furthest station on v.h.f. was F6HPP France and ON4BBW in Belgium in JO 10 SS square.

Unfortunately, in the afternoon a large Aurora Borealis created atmospheric conditions and blacked out the DX bands. But overall, the club did well, even though they did have difficulty in hearing all the stations who were trying to work them.

The triple mode station was operated by **G3UYV Les Navier 2629**, **Gordon Rutherford G7SCT 3830**, **James Bradley G1OSD 2845**, **Allan Wilson G4CZV 986**, **Jack Handley G0EAA 1646**, **David Boughton G7PER 3749**, **Jim Holbrook G6VWF 3737**, **Derek Green G7DKX 3439** and **Bernard Atkinson G0SWO 2912**.

The club also enjoyed the company of **Keith Ford G4ZKF 1817**, 51 Squadron Historian and **Bob Boyes**, ex 51 Squadron, who both served at Leconfield.

(L to R) Allan Wilson G4CZV, Jim Holbrook G6VWF, Les Navier G3UYV, David Boughton G7PER.

New PR Officer

Peter Brindley G0HEV has recently been appointed Public Relations Officer for the **Bury St Edmunds Amateur Radio Society**. Meetings are held at Culford School, 7.30 for 8pm on the third Tuesday of the month.

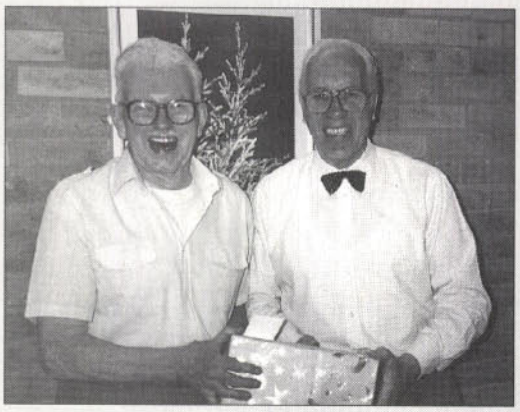
Further details can be obtained from **Kevin Waterson G1VGI, 20 Cadogan Road, Bury St. Edmunds, Suffolk IP33 3QJ** or Tel: **(01284) 764804**.

Follow-up Bedford Net

Some of the Bedford Net members at the 'breakfast' where the presentation was made.

Do you remember reading in the July *PW* about **Charles Austin G4MEW** and the Bedford Net? Well, just recently 'Club Spotlight' received a follow-up letter from **John Percival G7DDU** with some photos, where Charles G4MEW was presented with a decanter, suitably engraved for his service to the Bedford Net.

Charles Austin G4MEW (left) being presented with a decanter by John G3FWA.



Liverpool & District Amateur Radio Society

The **Liverpool & District Amateur Radio Society** meet at 8pm every Tuesday evening at the Churchill Club, Church Road, Wavertree, Liverpool. A couple of up and coming events are: August 15 - Projector Demonstration by G0MSO, 22nd - RAE Discussion, 29th - Surplus Sale, September 5 - Quiz and on the 12th the club is 'on the air'.

If you would like to know more about the Liverpool & DARS, you can reach **Ian Mant G4WWX** on **0151-722 1178** or write to him at **28 Welbourne Road, Childwall, Liverpool L16 6AJ**.

Clacton's Field Day

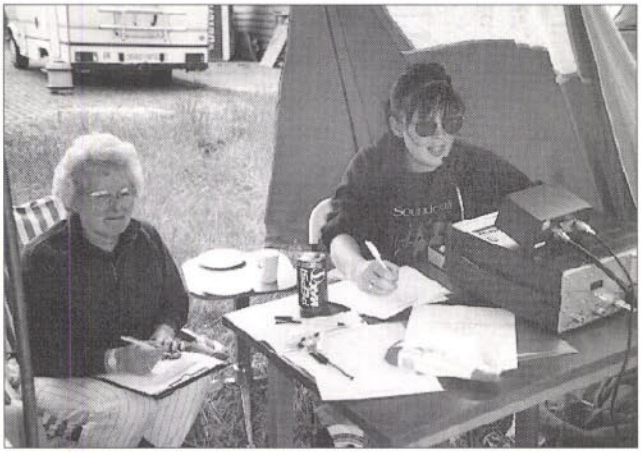
Back in May on the 6 and 7th the **Clacton Radio Club** held their annual field day from Saturday to Sunday where local amateurs had the chance to see most modes of transmission. The club's station was up and running, refreshments were available and a BBQ was also laid on.

Lots of equipment was used and a few DX stations were worked as well as local British stations on both h.f., v.h.f. s.s.b. and Digi modes. A total of 70 stations were worked, including 14 answers to a Packet CQ!

Clacton Radio Club is also involved in JOTA weekends, charity events and much more. For more details, contact **Michael G0SMJ** (Secretary) who will be happy to tell you more about the club.

Michael can be contacted on **(01255) 815207** or you can write to him at **44 Dulwich Road, Holland-on-Sea, Essex CO15 5NA**.

Leading Ladies



Pauline G7SPT at the microphone, with Jean G7SNH log keeping.

Pauline Moldon G7SPT talks about the **Crowborough Amateur Radio Society.**

Last year, the Crowborough ARS entered the *Practical Wireless* QRP Contest for the first time. We only decided two days prior to the contest to have a bash and as I was not licensed at the time, I was the log keeper.

I am now licensed and there are four ladies belonging to our club, three are already licensed and one is already on her way to taking the RAE. So, we all decided that we would take the men on at the their own game!

Unfortunately, the OM's FT-736R decided to pack up the previous Sunday, so we were all in a mad panic as to whether we would have a transceiver to use. Fortunately, another member of the club came to the rescue with his FT-726R. So, we now had a team with exactly the same equipment as the Crowborough Amateur Radio Society Boys Team, each of us using a 17-element Yagi.

The match was on! The boys were up at 7.30am putting up our antenna for us and so we were all ready to start at 9am. The boy's team G0CRW/P were our first contact, but we went onto work one GM (the boys never got one of these!), several GWs, ONs and PEs, and we even worked a French station.

Our final score was 85 contacts with 16 different locators with the boys only managing to scrape in 58 contacts with 12 different locators. The boys said we had an unfair advantage of being female, yet they tell us that every station they heard, they worked!

Unfortunately, that was not quite true of our station, as we did miss quite a few contacts, probably due to lack of experience (we don't get much chance to operate normally in contests). We won't come first by a long shot and we know we won't come last, but next year, now that we have some experience behind us, we will do better!

The day itself was once again ideal for such an event. The sun was extremely hot and we were fortunate to have a small tent to shade us.

The operators were myself, Pauline G7SPT, **May (Jenny) Clark 2E0ALR**, **Jean Hodgson G7SNH** and **Margaret Clark, s.w.l.** as the log keeper and our club mascot, my four month old daughter, **Georgina**.

Perhaps next year there will be a few more 'all ladies' teams, as quite a few we spoke to thought it was an excellent idea, as normally in contests we don't get a look in. If anyone would like to join in with us next year, we only have one entry rule - *You must be female!*

For further information on the Crowborough ARS, contact **Pauline G7SPT** on **(01892) 653782** or on **G7SPT@GB7ZZZ**.

Nottingham Experiment

Perhaps some of the spirit of the legendary Robin Hood, possibly one of the earliest supporters of equal opportunities, was still abroad in his adopted Nottingham in the Autumn of last year. This was when the senior novice instructor for that County was faced with the prospect of three totally blind students wanting to undertake the Novice RAE course, something which had never been attempted.

Julian Mayfield G0LXX did not throw up his arms in horror, as might have been expected. Instead, he set himself the task of discovering how this might be achieved, bearing in mind the firm emphasis on practical tasks in the course syllabus.

Julian confirmed that the policy of the RSGB was that as far as possible, persons should not be excluded from the course by virtue of disability. So, having received the blessing of the RSGB, Julian set about modifications to the course, so that it became tailor made for blind students.

As much as possible, the course became a 'hands on' experience. And, although the use of a soldering iron does not come highly recommended for blind students, it is possible to learn how to solder in theory and by the same method, what components, valves and layout are required to build, for example an audio amplifier.

Obviously a multimeter cannot be read, other than by sight. But knowledge of its functions and modes can be acquired without visually accessing the dial or read-out.

Special paper is available to blind students, whereby with the use of a stylus (or for that matter a ballpoint pen), lines can be raised on the paper, and this provided useful for circuit diagrams and symbols.

City & Guilds have, for some time, had special arrangements for blind students taking the RAE and the same facilities were made available for the Novice course.

Regrettably, two of the students were unable to complete the course, but one survived, and has since become **2E1EAE**, located near Leicester. The experience may be just the beginning, and only time will tell as with the RAE, whether the door will be opened elsewhere for blind students wanting to undertake the Novice course.

Operator 2E1EAE working Alex UA3RE, his first QSO on h.f. under the supervision of Julian G0LXX.

Town & County Festival

During the August bank holiday, (26-29th August) a special event station will be operating at the Town & County Festival, Stoneleigh, Warwickshire. The Town & County Festival is a hobbies and crafts fair, along with a motoring festival display, held every August bank holiday weekend. During the weekend, some 100,000 plus people visit the showground.

The callsign to listen out for is **GB4TCF**. Operation will be on the usual h.f. bands, 144MHz, possibly 430MHz 'phone, packet on 144/430MHz and there will be a RAYNET stand. All of these stations will be on display to the general public to promote amateur radio and show an open door for those who wish to participate.

If you wish to find out more, contact the organiser, **Mike Beaumont G4VCX**.

HAYDON COMMUNICATIONS

PRICE BUSTERS

KENWOOD TH-79E

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

£PHONE

We still have some at old prices

ALSO STOCKED

TH-22E	~~£254.95~~
TH-28E	~~£319.95~~
TH-42E	~~£289.95~~
TH-48E	~~£369.95~~

£UNBEATABLE

NEW MS-107K

Minature speaker microphone with P.T.T. suits all Kenwood handhelds.

Introductory offer **£14.95** *+ £1 P&P*

KENWOOD MOBILES

TM-733E

Dual band mobile with quick release remote head. Rx available 108-180/400-512/850-950MHz. ~~£729.95~~

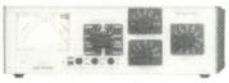
£PHONE

ALSO STOCKED

TM-251E	~~£419.95~~
TM-451E	~~£459.95~~
TM-255E	~~£949.95~~
TM-790E	~~£1959.95~~

£UNBEATABLE

ANTENNA TUNNING UNITS

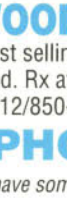


VC-300DLP

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



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 and charger • Rx available if required – 116-180/400-512/850-950MHz. Incls Nicads & Charger

Save £100

~~£329.95~~ *Limited stock* **£229.95**

OTHER ICOM SPECIALS

IC-706	With free PSU ~~£1199~~	£1099
IC-Z1E	Dual band handy ~~£529~~	£429.95
IC-738	HF transceiver ~~£1649~~	£1369

YAESU SUMMER SPECIALS

FT-840

We still have a few radio's left at old price.

So don't hesitate.

PHONE TODAY. ~~£950~~

OUR PRICE **£PHONE**

FT-11R	~~£329~~ Limited stock	£229.95
FT-51R	~~£529~~ Limited stock	£399.95

ALINCO PRICES SLASHED

DX-70

H.F. + 6m transceiver.

~~£1095~~

OUR PRICE **£PHONE**

OTHER SPECIALS

DJ-180E	+ FREE extra nicad worth £35	£229
DR-130	~~£369.95~~	our price £299.95
DR-150	~~£389.95~~	our price £329.95

EX-DEMO/SECOND-HAND EQUIPMENT

Full warranty

YAESU FT-990DC

Ex-demo

£1549.95

IC-761	As new	£1399.95
JRC-JST135	Immaculate	£999.95
FT-ONE	As new	£899.95
Icom IC-735	VGC	£749.95
FT-747 GXII	VGC	£549.95
TS-850SAT	Ex demo	£1569.95

KENWOOD TS-790E

Full warranty Ex-demo RRP **£1959.95**

£1589.95

FT-290RII	With linear	£469.95
Azden PCS-6000	VGC	£189.95
FT-211RH	VGC	£269.95
Icom IC-2000	Ex-demo	£329.95

YAESU FT-11R

2m Hand held. Immaculate

£199.95

TH-78E	As new	£349.95
IC-2SRE	2m Tx 25-1300Rx	£279.95
DJ-580E	Immaculate	£349.95
FT-727R	+ desk charger	£249.95
PK-232	VGC	£199.95
Mic mods trans	2 in 70 out	£69.95
ICF-2001D	VGC	£219.95
AR-3000	Immaculate	£699.95
FRG-9600	with HF converter	£349.95
MVT-7100	H/held scanner	£299.95
AR-3000A	As new	£849.95
TS-130S	(100w HF)	£399.95
TH-215E	As new	£199.95

THE SCANNER SPECIALIST

AOR The ultimate range

AR-8000

The most comprehensive scanner (hand-held) to date! Includes Nicads, charger, etc., ~~£449.95~~

OUR PRICE £389.95

AR-2700	~~£299~~	£269.95
AR-3000A	~~£909~~	£899.95
AR-3000A Plus	~~£1099~~	£999.95
SDU-5000	~~£799~~	£719.95
AR3030	~~£699~~	£639.95
Soft case for 8000/2700		£17.95

SCOUT REACTION TUNE NOW IN STOCK

Never before available! Connect the Scout to the AR-8000/2700 and the scanner will tune to any signal received on the Scout. A simple interface cable will connect you to a whole new dimension of scanning.

For further advise please call: **0181-951 5782**

OPTO-SCOUT

This new mini counter covers everything from 10MHz - 2GHz.

OUR PRICE **£399.95**

ALSO STOCKED OPTO 3300

The latest mini freqency finder from OPTOELECTRONICS. (Smaller than a pack of cigarettes). Inc Nicads/Charger, Antenna. 1MHz - 2.8GHz. RRP ~~£169.95~~

OUR PRICE **£139.95**

NB: ALL PRICES INCLUDE VAT

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

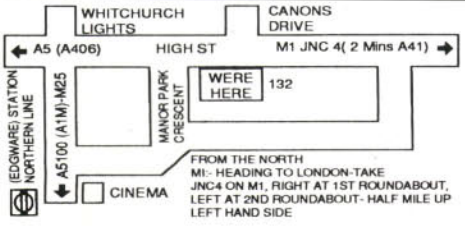
SALES PHONE - 0181-951 5781/2

132 High Street, Edgware, Middlesex HA8 7EL

Close to Edgware underground station (Northern Line). Close to M1, M25, A406.

VISA **Fax: 0181-951 5782** SWITCH ★ OPEN:- MON-FRI 10-6PM SAT 10-5PM ★

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



WE'LL BEAT ANY GENUINE ADVERTISED PRICE!

BY UP TO £25 PHONE FOR DETAILS

WHEN EVERYONE AROUND US ARE PUTTING PRICES UP, WE ARE PUTTING PRICES DOWN!

*Due to the vast quantity of antennas purchased by **YOU** from us, we have managed to negotiate a better deal from the factory. Unlike others – we are passing this saving on to you. Keep it up and we may get even better next year!!!*

TAIWAN SERENE BASE ANTENNAS

			OUR PRICE
TSB-3315	GF	144/70, 8.5/11dB (5.4m)	£129.95
TSB-3301	GF	144/70,6.5/9dB (3m)	£64.95
TSB-3302	GF	144/70, 4.5/7.2dB (1.7m)	£59.95
TSB-3303	GF	144/70, 3/6dB (1.1m)	£34.95
TSB-3002	AL	144MHz, 6.5dB (2.8m)	£34.95
TSB-3001	AL	144MHz, 3.4dB (1.4m)	£24.95
V-2000	GF	6m/2m/70cm, 2.1/6.2/8.4dB (2.5m)	£119.95

ACCESSORIES *P&P £1.00 on the following*

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

PRICES DOWN ON ALL ANTENNAS

HIGH QUALITY MOBILE ANTENNAS

DB-7900	144/70 cms, (5/7.6dB) 1.5m	£49.99
DB-770M	144/70 cms, (3/5.5dB) 1m	£22.95
DB-1304	144/70 cms, (2.15/3.8dB) .41cms	£19.95
DB-EL2E	144MHz, ⅞ths, 4.5dB (1.8m)	£29.95
DB-285	144MHz, ⅝ths, 3.4dB (1.3m)	£13.95

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

JUST ARRIVED

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

P-2512

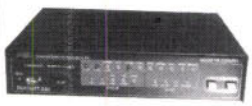
An incredible power supply! 25-30 amp cont. P.S.U., variable volts (3-15)
Dual meters (Vs and amps) **£89.95**
Over voltage protected

£89.95

P-3012 Also available 30 amp (fan cooled version of above)

OUR PRICE **£119.95**

AEA PRODUCTS



PK-232MBX .....our price **£299**
PK-900 Deluxe .....our price **£459**
PK-12 .....our price **£119**

AUDIO FILTERS

Timewave DSP9 Plus .....our price **£299.95**
Timewave DSP-59 Plus .....our price **£289.95**
Datong FL-3 ....our price **£139.95**
MFJ-784B.....our price **£239.95**

COAX SWITCHES

CX-401 4 WAY (SO239).....**£39.95**
CX-401N 4 WAY (N TYPE) ...**£49.95**
CX-201 2 WAY (SO239).....**£16.95**
CX-201N 2 WAY (N TYPE) ...**£21.95**
£2 P&P ON SWITCHES

NB-30W

2m H/held amp. 1½w input 30w output 13.8v

£2 P&P
OUR PRICE **£44.95**

TSA-6601

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

£1 P&P
OUR PRICE **£34.95**

NEW PRODUCTS — TSA-6602

VHF/UHF antenna matcher
£34.95 + £2 P&P
(up to 60w - Sep adjustment for VHF & UHF)

NEW PRODUCTS — TSA-6201

Super quality ext speaker with volume control
£14.99 + £1 P&P

NEW PRODUCTS — WATSON WEP-300

High quality earphone with 3.5mm mono jack fitted
£9.95 + £1 P&P
(Fits over the ear)

NEW PRODUCTS — MA-339

Mobile holder suitable for all h/helds

£9.95
+ £2 P&P

To take advantage of this offer just fill in the details on the order form on **page 70** of this issue. Alternatively call **Michael** on our **Credit Card Hotline on (01202) 659930** and **quote SCPW9** to place your order.

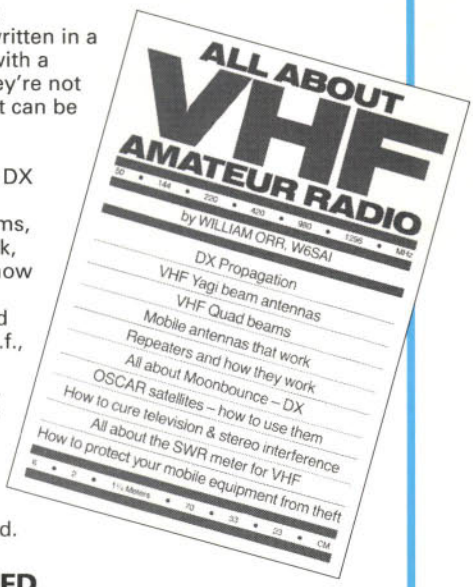
SUBS CLUB

"The book *All About VHF Amateur Radio* seems to be an ideal choice for our *PW* Subscribers' Club this month...so that's why I chose it for our 'VHF Special' issue"! says G3XFD.

Although it's by no means a new publication, there's something about William Orr W6SAI's book which has always appealed to me. I don't know whether it's Bill's approach to explaining complex subjects or his common sense ideas on 'getting over' difficult theories which helps me. But help me it does, and I feel sure that it could help you too!

All About VHF Amateur Radio may be thoroughly American in approach, and perhaps a little dated in some respects, but for anyone interested in the practical approach to v.h.f. and above...I suggest they start with this book. If I have trouble in preparing coaxial plugs and socket...I turn to my copy. And, if I'm at a loose end, I often find myself turning to any of W6SAI's books...because they're written in a very down-to-earth way with a sound practical basis (They're not many technical books that can be picked up and 'browsed' through!).

With subjects such as DX propagation, Yagi beam antennas, v.h.f. quad beams, mobile antennas that work, moonbounce, satellites (how to use them), curing interference problems and using s.w.r. meters on v.h.f., there's certainly a lot packed into its 172 pages. In my opinion the book is worth having just for the coaxial plug wiring and v.h.f. cubical quad antenna designs alone! Thoroughly recommended.

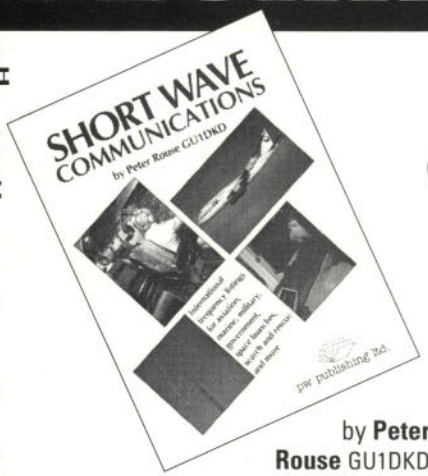


Rob Mannion G3XFD.

Offer open until 15 September 1995 (UK), 29 September 1995 (overseas)

By becoming a Subscriber, you can get your copy of *All About VHF Amateur Radio* for **£8 plus £1 P&P (UK), £8 plus £1.75 P&P (overseas)** (normal price £9.50 plus £1 P&P UK, £9.50 plus £1.75 P&P overseas) and get *PW* delivered right to your door!

SPECIAL BOOK OFFER



by **Peter Rouse** GU1DKD

SHORT WAVE COMMUNICATIONS

The 'SSB Utility Listening' column in our sister magazine *Short Wave Magazine* came out of the fertile mind of the late Peter Rouse. Peter had the knack of being able to write books and articles in such a way as to make them very readable and understandable. *Short Wave Communications* is such a book.

With the help of his book you should easily learn how to get the best out of your h.f. receiver. Complicated technological explanations have been purposely avoided and everything has been explained in layman's terms. Just enough information to let you listen in to what you want to hear and understand what you are listening to is provided.

Chapters cover such topics as in introduction to radio communications, operating your radio, antennas, international band plans, marine bands, civil aviation, military operations, amateur and Citizens Band radio, international callsigns, receivers past and present, accessories and supplies of equipment.

This book is highly recommended for your bookcase.

To order, use the form on **page 70** of this issue or call **Michael** on our **Credit Card Hotline** on **(01202) 659930** and quote **SWCPW9** to place your order.

HALF PRICE

NOW ONLY £4.50 + £1.00 P&P UK, £1.75 overseas.

SPECIAL BOOK OFFER

RADIO Diary

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

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 13:** Flight Refuelling ARS Hamfest '95 will take place at the Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. 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 in Scotland 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 26: A computer/rally/games fair is being held at Manchester University, Rectory Hall, Oxford Road, Manchester, next to Manchester museum and junction with Dover Street. Admission is £2 for adults and £1 for children/OAPs. Doors open 10am to 3pm. Free mag/CD and posters and free technical advice. **0161-627 2502**.

August 27: The Coleraine & District Amateur Radio Society are holding their annual rally at the Lodge Hotel, Coleraine. Doors open at 12 noon and admission is £1.50, which includes a draw. There will be a large number of traders in attendance and refreshments will be available. **Brian GI8LTB** on **(01265) 58664**.

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) 272008**.

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**.

September 3: The 18th Telford Radio Rally is being held at the usual venue, Telford Exhibition Centre, Telford. Free parking and easy access from M54. Flea market, Bring & Buy, trade stands, Novice feature, special interest groups and RSGB Morse tests. **John (01743) 249943** or **Dave (01952) 588878**.

***September 3:** The Bristol Radio Rally is being held at Brunel Centre, Temple Meads Station, Bristol. Doors open at 10.30am to 4pm (disabled 10.15am). Admission is £1 (accompanied children under 12 free). There is ample under cover parking, refreshments, large Bring & Buy and talk-in on S22. Further information from **Muriel Baker G4YZR, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG** or **(01275) 834282** (24hr answerphone).

September 10: The BARTG Rally is being held at Sandown Exhibition Centre, Sandown Racecourse, Esher, Surrey. Doors open 10.30am to 5pm. Admission fee for adults is £2, OAPs £1.50 and under 14s free, if accompanied by an adult. **Peter Nichol** on **0121-680 5963**.

***September 10:** The 14th Lincoln Hamfest will be held on the Lincolnshire Showground. Entry is £1.50. Morse tests available plus all the usual attractions. **Sue Middleton** (XYL G8VGF, QTHR). **(01522) 525760**.

September 12: The Mid-Warwickshire Amateur Radio Society are holding their Open Day from 6-9pm at the club's rooms in the St. John Ambulance HQ Building, 61 Emscote Road, Warwick. There will be amateur stations on the air together with displays of packet radio, home-brew, kit construction and lots more. All are welcome to come and see the club in action, ask questions and learn about amateur radio. **Don** on **(01926) 424465**.

September 17: Peterborough Radio & Electronics Society East of England Rally is to be held at the Peterborough Showground, easy access from A1, A605, A47. There will be trade stands, radio car boot and other local attractions. Full catering and bar. Acres of free parking. Doors open at 10.30am, 10am for disabled visitors. Admission is £1. Talk-in on S22 via G3DQW. General enquiries to **Ted G0REM** on **(01733) 66471**, QTHR.

September 17: The Central Lancaster Radio Rally is to be held at the Central Lancaster High School, Craig Road, Lancaster (five minutes from Jcn 34 M6). Doors open at 10.30am and the entrance fee is £1. There will be the usual traders, special interest groups, a Bring & Buy and refreshments. **Susan Griffin** on **(01524) 64239/(01384) 896199**.

September 23: A Radio Amateur Table Top Sale is to be held at St Mary's Hall, Reddish, Stockport. More details from **John G4ILA** on **0161-477 6702**.

September 24: The Droitwich Amateur Radio Club are holding their Three Counties Radio Rally at The Three Counties Showground, Malvern. For further details you can contact **Eddie G4PQZ** on **(01905) 773181**.

October 1: Blackwood & DARS rally is to be held at the Community College, Oakdale, near Blackwood, Gwent. Doors open at 10.30am. There will be traders, a Bring & Buy and a raffle. Talk-in on S22. Further details from **Norman GW0MAW** on **(01495) 227550**.

***October 1:** The Great Lumley Amateur Radio & Electronics Society will take place in the Community Centre, Gt. Lumley, Chester-le-Street. Doors open at 10.30am for disabled visitors and 11am for others. There will be trade stands, a Bring & Buy and much more. **Barry G1JDP** on **0191-3885936**.

October 15: The North Monaghan Hobby Radio & Computer Exhibition will be held at Cupids Nightclub and Restaurant, Smithborough, County Monaghan. Proceedings start at 11.30am and continue until 5.30pm. All the usual retailers will be in attendance along with a large display of computer equipment and a Bring & Buy. Refreshments will be available all day in the adjoining restaurant along with full facilities for QSLing via the brewery! Admission is £2 and half price for all under fourteen. Talk-in will be on S22 from 10.30am. Facilities will be provided for disabled access. **Stephen Hand GI7UIM (08) (013657) 51479** evenings or **Ken O'Reilly GI7UIP** on **(08) (013657) 38955** daytime.

***November 4-5:** The Eighth North Wales Radio & Electronics Show is being held at the Aberconwy Conference & The Bew Theatre, Llandudno. The show opens at 10am, both days. **B. Mee GW7EXH** on **(01745)591704**.

November 19: The Bishop Auckland Radio Amateurs' Club will be holding its annual radio rally at the Newton Aycliffe Leisure Centre. Doors open at 10.30am for disabled visitors and 11am for everyone else. Further info. from **Mike Shield. (01388) 766264**.

***November 26:** The Bridgend & District Amateur Radio Club are holding their radio rally at the Bridgend Recreation Centre, Bridgend. Further information from **Mike GW7NIS** on **(01656) 722199**.

December 3: The SDX Cluster Support Group will be holding a Radio, Electronics & Computer Rally in the Maryhill Community Centre, Glasgow, which is located just along from junction 17 of the M8 motorway and is located on major public transport routes. Doors open at 10.30am for disabled visitors and 11am to 4.15pm for everyone else. Entrance fee is £2 for disabled, UB40 holders and £2.50 for all other visitors (children under 14 accompanies by a parent free of charge). There will be many traders, club stands, lectures and demonstrations. Further information can be obtained from **John Dundas GM0OPS**, Rally Organiser, on **0141-638 7670**.

***December 3:** The Verulam Amateur Radio Club are holding their rally at the Watford Leisure Centre, which is located less than five minutes drive from the Junction of the M1 and M25 motorways. Trading will be from 10am to 4pm. **(01923) 222284**.

December 3: The Thames Valley Electronics Rally is being held at Kempton Park, Race Course, Sunbury-on-Thames, Middlesex. Doors open 10.30am to 4.30pm (10am free entry to the Bring & Buy stand). Major manufacturers and retailers, accessory supplies, antenna supplies, Bring & Buy stall, computers and component retailers and specialist groups. Admission for adults £1.50, OAPs £1 and children under 14yrs free. **(01494) 450504.**

DAVID BUTLER G4ASR

VHF REPORT

This month David Butler G4ASR takes a look at Sp-E propagation and recent openings on the 144MHz band..

Anyone active on the 50 and 144MHz bands (and 28MHz for that matter!) can hardly failed to have noticed that this summers Sporadic-E (Sp-E) season has been particularly strong. It usually starts in late April and continues through until early September with (sometimes) a brief winter peak between mid December and mid January.

Sporadic-E is quite a spectacular mode of propagation. And a previously 'dead' v.h.f. band can suddenly become alive with extremely strong signals.

With 50MHz the distances range from 500km to perhaps 8000km on occasions. On the 144MHz band contacts between 1000 to 3000km can often be made.

As a generalisation the more normal single-hop distance of around 1500 to 2000km is usually encountered on either band. Sporadic-E is very common on the 50 and 70MHz bands but fairly rare on 144MHz. This is because this band is approaching the highest frequency affected by Sp-E.

Some keen DXers have reported seeing TV signals, via Sp-E, on Band III around 190MHz. On a very few occasions contacts have even been made within the USA on the 220MHz band.

Investigation Probes

Investigation by ionosondes and other probes have shown that Sp-E layers contain a high concentration of ionised metals such as iron and magnesium (unlike the regular E and F layers which consists of atmospheric gases).

The Sp-E layers, about 1km thick, are generally accepted to form at heights of around 100-130km above the earth's surface. Quite often two or more thin layers will be present at particular heights.

It's important to note that the ionisation within the layers is not uniform. If you could look at the E-layer at a particular frequency you would see a number of discrete 'clouds'.

The 'clouds' will then appear to get smaller as the frequency is increased. So, by the time you reach the 144MHz band only the highest concentration of ionised material would be seen.

Unfortunately for the DXer the intense clouds are not stable and often move and disperse very rapidly. So, one moment you may be contacting a station in Hungary and the next second the band could be open to Romania.

The mechanism that produces the necessary ionisation is not clearly understood and several theories exist. Some people suggest that because the annual variation of sporadic meteor rate peaks during the same period as Sp-E, that there might be a connection between the two.

The correlation between meteor activity and incidence of Sp-E is very tenuous however. In the southern hemisphere, the Sp-E season is also in the summer but that period is also six months out of phase with the peak in the world-wide meteor rate.

Another Theory

Another theory states that openings are related to certain violent weather activity. Intense thunderstorm activity, for example, contains mechanisms that produce ionisation and strong electric charges which may influence the lower levels of the ionosphere.

Interestingly scientists at NASA's Marshall Space Flight Centre have recently been observing rare gamma ray flashes above thunderstorms. The high occurrence rate of these events suggests the presence of a little understood, but significant phenomenon, that could have an impact in many scientific fields.

It's suspected that the gamma ray flashes come from a rare type of powerful electrical discharge above large thunderstorm regions. However, whether these 'sprites' have any material effect on the formation of Sp-E remains to be seen.

One of the most popular theories at the present time is that Sp-E is caused by atmospheric wind shears. Charged ions, from meteoric material, can easily be carried along by winds at E-layer heights.

The charged ions can then be concentrated into irregular thin layers by a combination of high altitude wind shears and the earth's magnetic field. The mechanism seems to operate best under stable geomagnetic conditions and will get disrupted by auroral activity.

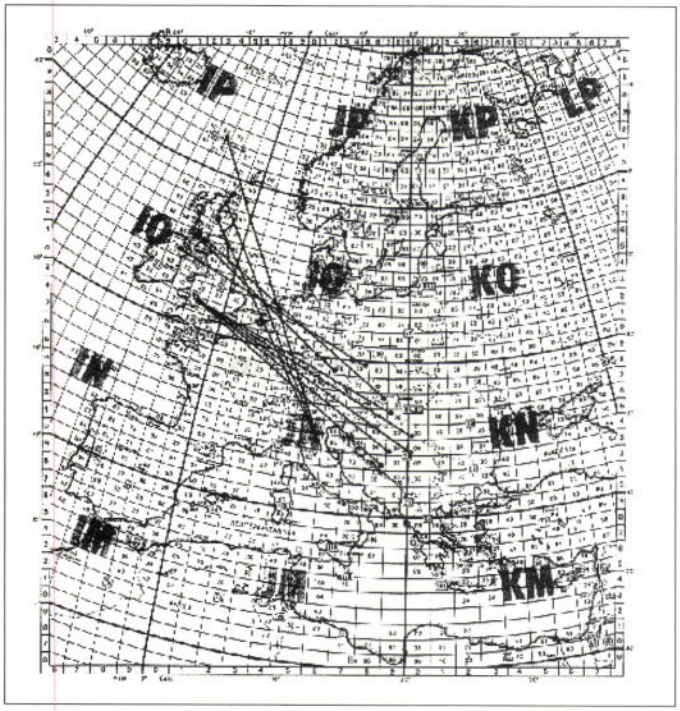


Fig. 1: Sporadic-E paths, 144MHz, on June 9 1995 (see text).

Making Contacts

Normally it's the keen v.h.f. DXer who specialises in making contacts via Sp-E. Generally speaking therefore most QSOs are made with s.s.b. or c.w. although f.m. works equally as well.

When an opening is in progress one-hop signals can be particularly strong. And it's actually possible to tune through a DX signal thinking it's a local station!

Certainly on the 50MHz band signals from Italy, for example, can be 'end stopping' on the S-meter. Unfortunately, the inexperienced operator will incorrectly think that all Italian stations run at least 2kW output!

The usual 'Tropo' signals on a 'normal' day are at the mercy of the prevailing weather and are therefore relatively weak. The Sp-E propagated signals on the other hand could almost be compared to a free-space path with little loss between stations. Although this isn't true it almost appears to be so at times.

Extreme Selectivity

Another characteristic of Sp-E is its extreme geographical selectivity. Because of this it's quite common to work stations with S9 signals all in one or two locator squares.

However, at the same time a local operator a few kilometres away may hear nothing at all. This can be extremely frustrating when the 50MHz band opens up to North America!

If all the Sp-E activity sounds like good news for everyone then I'm afraid you're wrong! To satellite and e.m.e. operators the onset of Sp-E propagation has a negative side.

To access a satellite (be it a man-made OSCAR or the Moon) your signal must get up through the ionosphere. Then on the return

journey your signal must again pass through the ionosphere.

At 29, 145 and, to a lesser extent, at 435MHz, Sp-E can make the ionospheric transit very difficult. At times it can even be impossible! Mode K satellites, such as RS12 using a 21MHz uplink and 28MHz downlink, can be completely lost if a Sp-E cloud is between you and the satellite.

Although the Sp-E clouds may only extend for a few tens of kilometres, the shadow they cast both on earth and in the orbital path of the satellite may extend to several hundred kilometres.

The 'moonbouncer' has similar problems especially when working on low elevation paths. The increased ionisation makes the E-layer less transparent much to the detriment of the transiting e.m.e. signal.

The effect is rather like that of fog! On a clear night the lights of a car are sharply focused. When fog is encountered the lights become broadened and diffused blurs. So, when you are listening for signals on the threshold of audibility Sp-E clouds are the last thing you want to encounter!

The Season

However, for many operators the onset of the Sp-E season is a godsend. Because received signals can be so strong it provides a great leveller of station equipment. Several watts and a dipole antenna will produce many good and interesting contacts on the 50MHz band.

On higher frequencies the geographical selectivity can help you. It can mean that your 3W and a 4-element Yagi may give better results than that 400W station with four 17-element Yagis on the other side of town!

As I mentioned earlier the process by which Sp-E is caused is not yet fully understood to enable accurate predictions to be made. However, in the June issue of *PW* I stated that the Tuesday after the first weekend in June almost always produces an opening on the 144MHz band.

Was I right this time? You bet I was! And not only that, I also predicted it would be a good day to work D44BS on the 50MHz band.

Elusive Openings

So when did those elusive openings occur on the 144MHz band during June? Well actually the first one occurred a little earlier on May 20. This was a brief event, between 0945-0955UTC extending into Italy and Sicily.

Only stations in south-eastern England (JO01) seemed to be working the DX. The best openings predictably came during the first few days in June. They took place on June 2, 5, 6, 9 and 12.

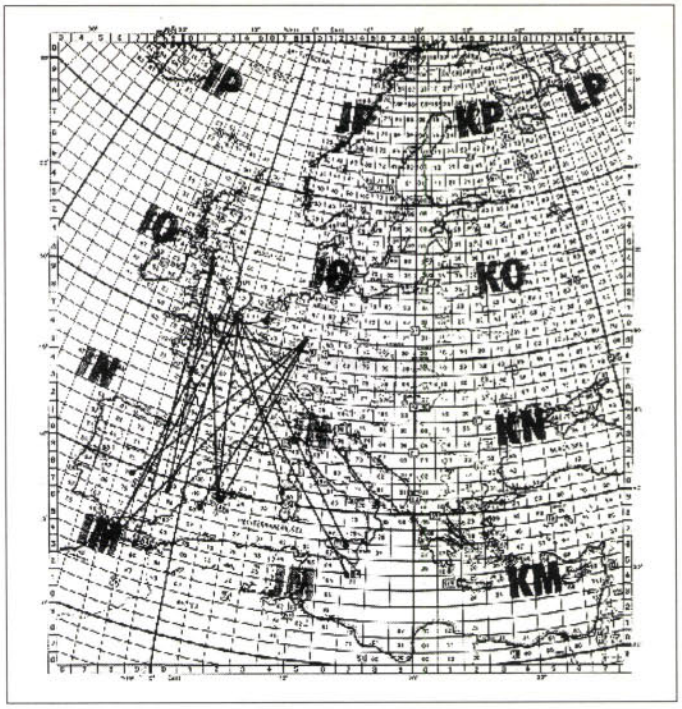


Fig. 2: Sporadic-E paths, 144MHz, on June 12 1995 (see text).

Another opening also occurred later in the month on June 25. So that's seven openings in the UK on the 144MHz band during the first half of this summer's Sp-E season.

Now I'll take a closer look at those 144MHz openings during June. And the first one, on June 2, actually consisted of two openings.

The first brief event at 1230UTC was to the islands of Greece. Propagation from SV was mainly to central and northern France.

A small extension allowed a few favourably sited stations in south-east England to work SV1BTR (KM17). The station of **Kintzonidis Spiros SV2BXC** (KN10) was also active at this time.

In his report SV2BXC mentions having a local chat with SV2CWW on 145.525MHz when French stations suddenly broke in. A number of stations in France and Switzerland were contacted on f.m., the signals being so strong he could hear them on his hand-held transceiver.

The second opening on June 2 was a much bigger event lasting nearly two hours. Commencing around 1415UTC stations in LZ, YO and YU were worked from many areas of the UK. By 1450UTC the propagation had moved further south enabling stations in G, GI, GM and GW to work into Italy and Sicily.

Three days later on June 5 the next opening on the 144MHz band took place. This time the propagation path from the UK was to the Mediterranean area, Spain and Portugal.

The event was quite lengthy, starting around 1450UTC and continuing through to 1820. Many operators in G, GW and GM reported making contacts with stations in CT, EA, IS0, IT9 and 9H. The Balearic Islands were well represented with EA6FB, EA6SA, EA6XQ, EB6YY and EA6/DF5JJ appearing in many logs.

The Prediction

And now to the day of my prediction, Tuesday June 6! And one of the first DX signals heard was at 1014UTC when G4FUF spotted the Maltese station 9H5L.

The main event really got going though from 1120UTC and continued through to 1255. Stations in southern, eastern and central England, Wales and Scotland made QSOs into CT, EA, EA6 and I. The station of EA9AI (IM75) in Ceuta, North Africa was reported by G4FUF (JO01), G4VPD (IO92), G7HUD (IO83) and GM4CXM (IO75).

For the majority of operators who miss most daytime events because of work commitments the opening on June 9 was a bonus. This Sp-E event started at 1620UTC lasted for over two hours.

It should be noted of course that the start and finish times depend very much upon your geographical location. The locator map, **Fig. 1**, shows some of the propagation paths available.

At my QTH (IO81) the 144MHz band was open from 1624-1639UTC. Contacts on s.s.b. were made with stations in DL, HA, I, OE, YU, S5 (Slovenia), T9 (Bosnia) and 9A (Croatia). My best DX was with YZ7MON (KN04) at 1952km.

Noel Moore GI7CMC (IO74) reports that the band was open with him between 1630-1850UTC. He made contacts into DL, SP, OE, OK and OM with the best DX being at 1842 km.

Nick Gregory G0HIK (IO84) mentions that in Cumbria the band stayed open until 1840UTC. He worked OK2VWB and SP9DHQ using a Yaesu FT-221 with replacement muTek front-end, a muTek mast-head l.n.a., and 70W into a 10-element Yagi.

Best Of Month

What was probably the best opening of the month occurred on June 12 and I've shown some of the paths on the locator map, **Fig. 2**. During the day a number of separate events were recorded.

The first started around 0840UTC when **G7LIJ** (JO01) heard 9H1GB (JM75). At 0910UTC the band opened up again allowing contacts to be made with stations in CT, EA, EA6, EA9, I, IS0, IT9, 9H.

It was particularly pleasing to note that three African stations, EA9AI, EA9IB and EA9MH were being worked by many UK operators. This opening was very intense and lasted well over two hours. Between 1415-1445UTC a shorter but no less interesting opening occurred to CT and EA.

Ralph Sachs G2CZS (JO01) caught the main event working EA6XQ, EA9AI and a number of mainland Spanish stations between 1000-1230UTC. He also mentions hearing ER5AA in Moldavia during the Sp-E opening on June 2. Unfortunately signals were in and out too quickly to make a QSO.

Finally from the sunny island of Malta GC comes a report from **Marco 9H5SN**. Marco uses a Yaesu FT-221R, 100W and a 16-element Yagi. He worked a number of G stations in the opening between 0833-1039UTC.

The last opening was a very patchy event on June 25 between 1630-1715UTC. Best propagation was between DL and CT, EA and IT9 and **GW1YQM** (IO82) reports hearing IT9IPQ (JM78) and **G4CLA** (IO92) heard SV3KH.

Deadline Time

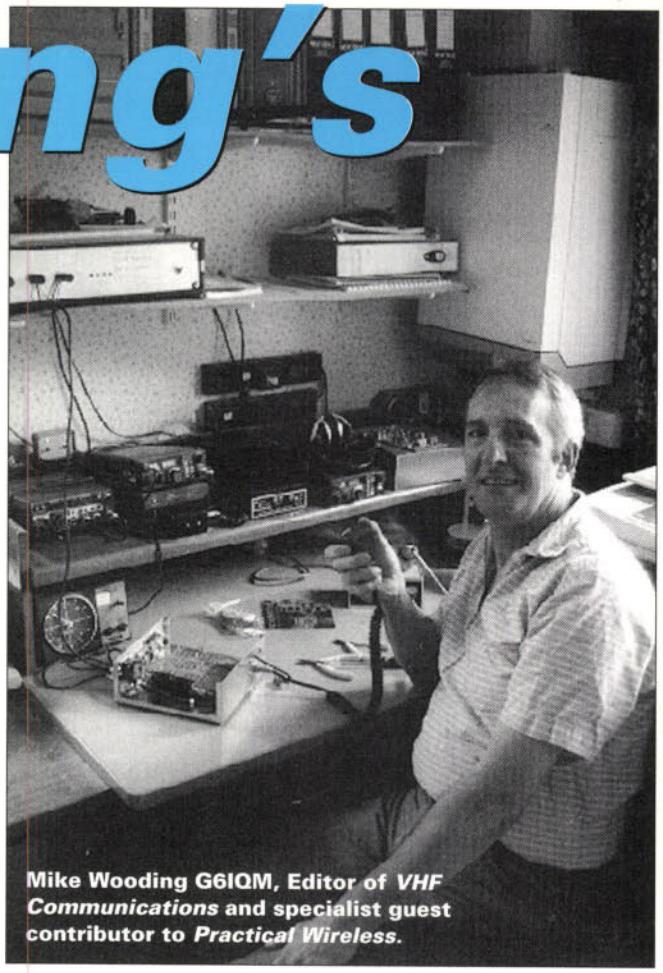
It's deadline time again! Sorry there's no room to give you details of activity on the 50MHz band or of the seven transatlantic openings during June. I plan to cover these and further 144MHz Sp-E openings next month.

In the meantime if you've made an interesting QSO or just wish to pass on any news 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

Wooding's World

Mike Wooding G6IQM, the Editor of VHF Communications magazine provides an insight to his approach to the fascinating world of v.h.f. Mike invites you to join him and the other dedicated 'VHFers' as they explore ever higher frequency bands.



Mike Wooding G6IQM, Editor of *VHF Communications* and specialist guest contributor to *Practical Wireless*.

Some pioneering microwave operators, such as Bill James G6XM (who has been active for well over 60 years) led the way for many others with their specialist work. Pictured (left) here is the station of G6XM/P, who was working from a favourite hill top site in Somerset in 1983. The 3cm transmitter and receiver was wideband and used 144MHz for 'talk back'.

There are as many proponents of v.h.f.-and-up as there are those operating the 'd.c. bands'. There's also much to be said for both areas of amateur radio, h.f. and v.h.f.

Many a heated argument can be heard about whether or not h.f. or v.h.f. is better and who is the 'proper' amateur. Especially if the v.h.f. enthusiasts is 'only' a class B!

I intend to enter neither argument. However, I hope to instil you with a little of my enthusiasm for operating in the v.h.f., u.h.f., s.h.f. and microwave areas.

I have always maintained that there's still much experimenting to be done in the various fields of radio communication. But not being an expert in h.f. modes of communication, I cannot say if there is much yet to be done there.

However, in the milli and micro-metric bands there is a great deal yet to be explored. Whether you are into construction, specialist modes, or just simply operating, then the multivarious areas of v.h.f.-and-up can offer a great deal of instruction, satisfaction and pleasure.

Many people look at 144MHz and some of its attendant problems and consider that this band **is** v.h.f'. But in my opinion that's not the case! Those of us who attempt more serious work and experimentation on the upper bands are more often found using 430MHz (70cm) as the base 'natter band'.

The higher bands, 1296MHz (23cm) , 2.4GHz (13cm) and 10GHz (3cm), etc., are where the real experimentation and construction takes place. It must also be said that there are a few amateurs dabbling with the bands much higher than these.

The Requirements

The requirements of a good v.h.f. station are essentially the same as for h.f. But perhaps greater attention must be given to detail.

I've found from my own experiences that many amateurs are not initially aware of the implications of poor antenna feeder connections, for example. I also feel that far too much attention is given to getting the v.s.w.r. down to virtually 1:1.

Too much concern with the v.s.w.r. is something of a nonsense. This becomes obvious when you're operating the higher bands, as antennas and feeders are expected to work over much greater bandwidths in many cases than on h.f.

The greater bandwidth means that the v.s.w.r. may vary over quite a large amount over the band. Consequently, a compromise is the only solution.

Important Antennas

As with all radio communications, one of the most important aspects of a v.h.f. station is the antenna. Incidentally, I hate the word antenna when applied to aerials! And as I often say on our local repeater, GB3WK, **insects** use antennas, **we** use aerials!

However, the worthy Editor of *PW* says it's antenna in the magazine. So antenna it shall be! (*Thank you Mike!* ***Editor***.)

The most common type of antenna for v.h.f. and u.h.f. is the Yagi-Uda, commonly known as the Yagi. These antennas are generally tuned by manufacturers and further tuning is not possible by the user. Although some versions utilise Gamma tuning stubs, which allow you to fine tune the antenna match to suit the frequency slot in the band where you operate most.

Higher Bands

The higher bands, 23 and 13cm, require antenna systems with high gains. And although the Yagi can be constructed with gains in the region of 10 to 15dBi without much difficulty, they tend to become somewhat narrow-band.

A variation of the basic Yagi design is the quad loop Yagi. This type of antenna employs loops instead of straight elements.

The loops are of specific diameter for the frequency band required. And, as with straight Yagis, the gain is increased with more loops.

Gains of the order of 18 to 22dBi are not uncommon with the quad loop type of antenna. Gains such as this can be achieved with straight Yagis, but at the expense of bandwidth and size.

Straight Yagis of high gain are generally long Yagis, with wide element spacings. They can easily be anything up to (and over) 10m long!

The quad loop Yagis with similar performance on the other hand are not so daunting. They tend to be around a mere 3 to 4m boom length.

Broad Band

Another advantage of the quad loop Yagi is, that by comparison to the straight Yagi, it's very much more broad-band. Take the 23cm band as an example, where in order to cover the entire band from 1240 to 1320MHz (as ATVers need to do) with straight Yagis, two antennas are required to maintain a reasonable gain across the band .

However, if a quad Loop Yagi antenna is used, then only one antenna is required to cover the whole 23cm band, with less than a couple of dB variation across the band. But one disadvantage with the quad loop Yagi is that it has a wider beam width than the straight variety.

In some instances the wider beam width can be more useful, but for the avid DXer, the requirement is to concentrate all the forward gain into as tight a beam as possible. My personal choice is the quad Loop, and for 23cm I currently run a 48-element JVL for receive and a 28-element MicroMax for transmit.

A point to note here is that I use two separate antennas, one for transmit and one for receive. This is the recommendation of many stations and one that I fully endorse.

Separate Antennas

The practicalities of separate antennas for transmitting and receiving is that lossy and expensive antenna changeover relay systems are not required. This may not be a problem if you are using proprietary equipment, but the majority of us on these bands use home-brewed systems, and so this is a very important consideration.

Another financial consideration is that on the higher bands it is almost mandatory to use mast-head preamplifiers. This means that not only does the transceiver need an antenna changeover system, but so does the pre-amp, thus doubling the loss and expense. However, there can be a trade off!

If, for example, you're using quite high transmitting powers, and a twin antenna system, you'll have to give some consideration to the signal strength available at the receive antenna and consequently at the input of the pre-amplifier or receiver.

But all is not lost! This is because there are ways to protect for these conditions, and most modern circuit designs allow for high signal condition handling without disaster.

Keen Constructor

As I said earlier, I'm an avid constructor. In fact it should be said that of the time I have available for the hobby, I spend more time wielding the soldering iron than the microphone!

Once a unit has been built, aligned, tested and proved on air, I just seem to move onto the next one. Currently I am working on a new 13cm transverter.

There are commercial transceivers around today that operate multi-mode on 23cm. However, I am not aware of anything commercially available for the amateur on the bands above 23cm.

So, most operators on the higher v.h.f. bands build their own equipment. But don't worry, this is not as daunting as it sounds although you **do** need to be fairly proficient in the use of basic hand tools. You also need a good soldering station, preferably temperature controllable and with a variety of bit sizes.

It has to be said that as the frequency gets higher then the components get smaller. But this does not particularly require any specialist skills or tools.

Good eyesight is a definite advantage though, as we are now into the realms of surface-mount devices. They are not at all difficult to solder into place, but they can sometimes be well nigh impossible to see!

So, having said that most equipment used on the upper bands is home built, where does the v.h.f. enthusiast get the necessary circuit designs, printed circuit boards, components, etc., from? Fortunately, there are a few excellent component suppliers, some of whom also supply p.c.b.s and complete kits for receivers, transmitters, transceivers and more usually transverters.

Transverters

Just in case you're not fully conversant with what a transverter is, it's in fact simply a transmitter or receiver without an exciter stage. In other words, a transverter needs a radio to 'drive it'.

Actually, to be really exact, a transverter is a transmit-converter, hence its name. But in practice, radio amateurs usually use the name to refer to transceivers as well as just transmit only units. Conversely, receive only converters are usually called just that.

The microwave bands are put to many uses, and eventually even BBC equipment like this is available surplus. But Mike Wooding G6IQM recommends if you need help or advice in setting up a station, talk to an established operator - they'll be pleased to help.

Most transverter designs for the upper bands transvert from 144MHz, or occasionally 430MHz, although designs are to be found which transmit from 10m for example. This means that your shack 144 or 430MHz multi-mode transceiver can be used to work 23 and 13cm.

I have also seen details of a soon-to-be-available transverter for 3cm that uses 144MHz as the driver. However, when it comes to 3cm, there are some very good designs already available for complete units that do not transvert but have their own exciters. In fact 3cm is often used as the base for transverting to even higher bands.

Building a transverter should not be regarded as a task only for the expert. Although as I said earlier, the higher the frequency then often the smaller the components, meaning large populations of surface mount devices (s.m.d.s).

But actually fitting surface mount devices need not be considered difficult. Essentially, the main points to consider are as follows.

1: Careful handling, as s.m.d.s are usually more fragile than discrete types.

2: Awareness of static protection, connecting yourself, your soldering iron and the p.c.b. being worked on together to a common earth point.

3: Careful soldering and paying particular attention to the temperature of the soldering bit.

If these simple points are followed then successful use of surface mount components can be achieved.

Test Gear

Another question that's often asked is, how can I build equipment for the very high frequencies when I haven't got loads of test gear? Fear not, many designs for transverters for microwave applications are so designed that no test equipment other than a simple multimeter is required.

Without going into specifics, the utilisation of on-board stripline filters, rat-race mixers, fixed frequency multiplication stages and Microwave Monolithic Integrated Circuit (MMIC) 50Ω building blocks, means that virtually no tuning-up is required. Even a frequency counter may not be required, as the setting of the local oscillator can be achieved by using a 144 or 430MHz receiver to monitor the harmonics.

I hope you can see now that home-brewing equipment for v.h.f., u.h.f. and microwaves is not a totally black art!

Also, as with all aspects of amateur radio, there's always a friendly, knowledgeable station. They will help you out with advice and practical help, both over the air and in the shack.

Never be afraid to ask! We all are still learning, even those of us who are supposed to know what we are talking about!

Also, just because you haven't got a 400W 23cm transmit capability do not be discouraged. I came back to 23cm narrow-band working last year using a home-built Down East Microwave transverter with 10mW of r.f. output, and managed to work (quite successfully) **Gil G0GIL** and **George G8AIM**, both stations approximately 30km away from me and neither of them direct line-of-site paths.

Also, during the good conditions prevalent during last autumn, quite a few stations worked into Europe using very small powers. Yes, QRO is nice, but often QRP is more exciting and satisfying!

Working The Bands

There's no special technique for working the higher bands, any more than there is for the h.f. bands. Everyone has their own particular idiosyncrasies when it comes to radio, and in some ways I may be more idiosyncratic (or just plain idiotic - my callsign is **G6 I**'m **Q**uite **M**ad) than most!

The main thing that comes to mind is the need for patience. Whatever mode you are attempting on these bands that nasty old thing called propagation probably has a much greater say in your success than on the lower bands.

Propagation modes such as Ducting, Sporadic-E, etc., can make or break a contact, within seconds. However, these modes of propagation enhancement can also give great excitement, especially when your few watts of 'giglytbits' CQ call results in a DKxxxx or whoever to reply.

I hear you say "Okay so what, with a few watts on h.f. I can talk around the world". Yes I agree, you probably can, but it's all relative.

The higher bands are essentially for line-of-site communication over relatively short paths. So, when you make a contact over many hundreds of kilometres, then that's as much an achievement (more so for me) than contacting VKxxxx or wherever on h.f. Mind you, having said that, I do have a partially completed 50MHz transverter, which I shortly hope to get serviceable, so I can talk to the USA!

Need For Patience

Anyway, back to the need for patience. The higher the frequency then certainly the more difficult is going to be the contact. Therefore, many hours may be spent in trying to establish paths and making contacts.

Much experimentation is actually carried out over the air. You will often hear two or three stations in a net actually testing and setting gear up over the air, using each other's stations to calibrate their equipment. It's quite probably likely that more air time is spent doing this than just making contacts for a natter.

Another point that is worth mentioning is that the upper bands are quiet. Not necessarily electrically quiet, but often totally devoid of human 'occupation'.

I have spent a lot of time calling on the various bands above (and sometimes including) 430MHz to no avail. However, the temptation to rip your gear apart should be resisted!

The problem is two-fold. Firstly, as I said above, propagation is such that your wonderful signal, having traversed your feeder and launched much of itself successfully from the antenna, simply nose dives into the ground at the end of the street. Nothing you can do about that!

Secondly, the higher bands are far less occupied than 144MHz and those below. It's not unusual for stations to ring other active stations just to ascertain that they are both on the band and beaming at each other! Keep trying and your attempts will be rewarded.

Equipment

I've already mentioned one or two pieces of equipment that I use and/or recommend. And although there are other sources of equipment and components, the following are those that I use and have found to be helpful and usually able to satisfy my requirements.

I'll start off with antennas:

The JVL range of antennas for 23cm and 13cm are available from **Mike Walters G3JVL, 26 Fernhurst Close, Hayling Island, Hampshire PO11 0DT**.

Unfortunately MicroMax antennas are no longer available.

Next, transverter kits/p.c.b.s: Available from **Mainline Electronics, PO Box 235, Leicester LE2 9SH**.

Specialist (Subscription only) magazines: ***VHF Communications Magazine*, 5 Ware Orchard, Barby, Near Rugby, Warwickshire CV23 8UF**.

Components: **Mainline Electronics, PO Box 235, Leicester LE2 9SH**

JAB Electronic Components, The Industrial Estate, Rear of Queslett Motors, 1180 Aldridge Road, Great Barr, Birmingham, B44 8PB

Express Components, PO Box 517, Hove, East Sussex BN3 5QZ

Piper Communications, 4 Severn Road, Chilton, Didcot, Oxfordshire OX11 0PW

Circuits And Projects

Sources of circuits and project designs for v.h.f., u.h.f. and Microwave equipment are readily available in two specialist publications:

Dubus, which is available through the UK Agent, **Roger Blackwell G4PMK at 57 Station Road, Scholes, Leeds LS15 4BY**.

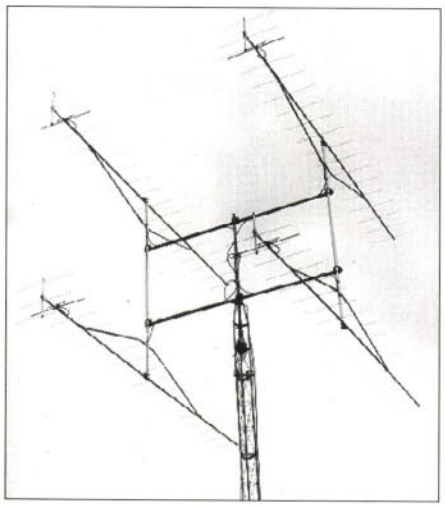
And of course, there's *VHF Communications*, published by **KM Publications, 5 Ware Orchard, Barby, Near Rugby CV23 8UF**. It's a good source of ideas, and of course I should think that way because I happen to be the Editor!

Both publications I've mentioned are available by subscription or at some of the various rallies around the country. The *VHF Communications* is a commercial magazine aimed at both amateurs and professional engineers alike, and offers a p.c.b. service for most of the featured designs and full or partial kits for many.

The *Dubus* magazine is more of a forum for radio experimenters, who often offer p.c.b.s for their designs. Many other publications, such as of course *PW*, occasionally run projects for the upper bands, but their remit is a much broader one than *VHF Communications* or *Dubus*. My advice is that you buy all three, but then I am a little biased!

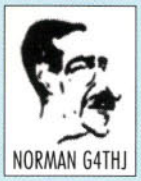
I hope that this short article on my approach to operation on the v.h.f., u.h.f. and microwave bands has given a little of an insight into this exciting area of amateur radio. It's very much my approach and not necessarily the best way - but I enjoy it and I hope you will!

PW



If you have the space, DX hunting is made easier with arrays such as this. However, G6IQM says that QRP is often an enjoyable challenge on the 'v.h.f. and above' amateur bands.

ARE COMMUNICATIONS



ALL MAJOR BRANDS OF EQUIPMENT AVAILABLE, MOST AT THE LOWEST PRICES IN THE UK + 24 MONTH WARRANTY ON KENWOOD ICOM & YAESU TRANSCEIVERS

THIS MONTH'S SPECIAL
KENWOOD TS–850S

Only £1495.95
Save £350 while stocks last
Also TS–850 SAT £1589.95 SAVE £370

Wanted - Good Used Equipment

Top prices paid for clean rigs

cushcraft CORPORATION

Make the most of the summer get busy fitting those new antennas now!

Cushcraft HF		
R5	vertical 5 band	£279
R7	vertical 7 band	£369
A3S	3 ele beam	£349
A4S	4 ele beam	£425
A3WS	12/17m Yagi	£275
D4	4 band dipole	£229
D3W	10,17,30m dipole	£169

Cushcraft VHF		
AR6	6m vertical	£52.00
148-10S	2m 10 ele yagi	£62.00
13B2	2m 13 ele yagi	£99.95
17B2	2m 17 ele yagi	£169
A50-3S	6m 3 ele yagi	£75.95
2m	22 ele oscar yagi	£199
70cm	38 ele oscar yagi	£189

BASE ANTENNAS

WX1/N	2m/70cm colinear 5.8'	£89
WX2/N	2m/70cm colinear 9'	£115
WX4/N	2m/70cm colinear 14'	£149
GP9N	2m/70cm colinear 17.5'	£135
GP95	2m/70/23cm colinear 10'	£109
CA350DB	6m/10m colinear 22.7'	£149

ANTENNA ACCESSORIES

DX10N	2m/70cm Duplexer	£22.50
TSA6001C	2m/70cm Duplexer	£25
CFX314	6m/2m/70cm Triplexer	£49
CFX431	2m/70/23cm Triplexer	£49

MOBILE WHIP ANTENNAS

EX104B	2m/70cm mini	£22.50
HS727SS	2m/70cm mini	£17
TSM1316	2m/70cm mini	£18
SB2	2m/70cm mini	£17.50
SB7	2m/70cm 1.4m	£41
Z740	2m/70cm lock fixing	£35
HR50	6m 1/2 wave 2.13m	£46
DB144	2m 5/8 F/G 1.25m	£14.95
VM144HP	2m 7/8 1.79m	£38
TSM1312	2m/70cm 0.89m	£23
TSM1309	2m/70cm 0.93m	£25
TSM1339	2m/70cm 0.89m	£22.50

SUMMER ROTATOR SPECIAL SEPTEMBER ONLY
Yaesu G–400 and G–400RC

Only £165 SAVE £34

Only £195 SAVE £44

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
FT102	Yaesu	Fair	HF Transceiver PA - 3 x 6416B's	£475.00
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
TS430S	Kenwood	Mint	HF TX/RX FM, CW filter	£650.00
FT890AT	Yaesu	Mint	HF Transceiver with ATU	£1,199.00
TS50S	Kenwood	Good	HF 100watt Mobile TX/RX	£725.00

VHF/UHF TRANSCEIVERS

C500	Standard	Good	Dual Band Hand Held	£225.00
IC-P2ET	Icom	Mint	2m Handheld Keypad entry	£189.00
TS60S	Kenwood	V.Good	6m 100w mobile	£750.00
IC2ZE	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
FT290R11	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 Handie + charger + mic	£285.00
TH78E	Kenwood	Pristine	2m / 70 cm Handie as new	£325.00
IC125	Icom	Good	Commercial Radio	£80.00
C844	Stand	Fair	Handheld	£50.00
IC02E	Icom	V.Good	2m handheld + Bits	£150.00
FT728	Yaesu	V/Good	Transceiver	£299.00
M40FM	HRC	Good	Transceiver	£45.00
TEMPO		Good	2m handheld	£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	£154.99

MISCELLANEOUS

AT230	Kenwood	Fair	ATU	£160.00
FAS14R	Yaesu	Good	Remote Antenna Switch	£70.00
PG1	Datong	Good	HF Converter	£65.00
LPM144/10	BNOS	Good	2m Linear Amp 10w in 100w out	£149.00
AT230	Kenwood	Mint	Antenna Tuner	£189.00
FC757AT	Yaesu	Good	Automatic ATU	£225.00
AL811X	Ameri	Mint	HF Amp 700watts	£550.00
KG2	Kurani		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	£75.00
UC-1	Daton		Convertor	£69.00
VLF	Daton	Good	VLF convertor	£30.00
FL2025	Yaesu	Unused	25 Watt Amp for FT290R11	£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

R5000	Kenwood	Good	HF Receiver + Internal converter	£825.00
AIR7	Sony	V.Good	Airband Scanner	£169.00
R537	Signal	V.Good	Airband Receiver Hand Held	£55.00
ICF PRO80	Sony	Good	Hand Held Shortwave RX	£179.00
ICF2001D	Sony	Good	S/wave receiver	£169.00
FRG7	Yaesu	V.Good	HF Gen Coverage RX	£165.00
AR1500EX	AOR	Good	Hand Scanner + SSB	£225.00
RF3100	Panas	V.Good	Receiver	£199.00

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

FULL EXPORT FACILITY – MARINE & COMMERCIAL EQUIPMENT ALSO AVAILABLE

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 VISA
Fax: 0181 891 2565 Mon-Fri 9.30-5.30 Sat 9.30-1pm

ARE

Olympics On Six

Ken Ginn G8NDL describes his modifications to 'P' Band Pye Olympic p.m.r. transceivers enabling them to work on 50MHz.

As I had already modified a number of surplus 'P' Band Pye Olympic transceivers to work on 70MHz, the question was later posed to me about converting the same rig to 50MHz. However, at first I was very reluctant to take on such a task, knowing the initial problems when I undertook the 70MHz modifications!

I thought that the 50MHz conversion would be a harder project to perform...and I was proved right. The job should only be undertaken by the experienced!

Whereas the 'P' band Olympic needed only a relatively small deviation from the original operating frequency, the 50MHz modification needed an extra 20MHz squeezed out of the rig. It would end up operating some 18MHz out of its original operating frequency band.

Much the same modifications are performed on the 50MHz rig, as were undertaken in the 70MHz conversion. However, there are a few additions which I'll explain section-by-section, and to help I've provided a block diagram, **Fig. 1**.

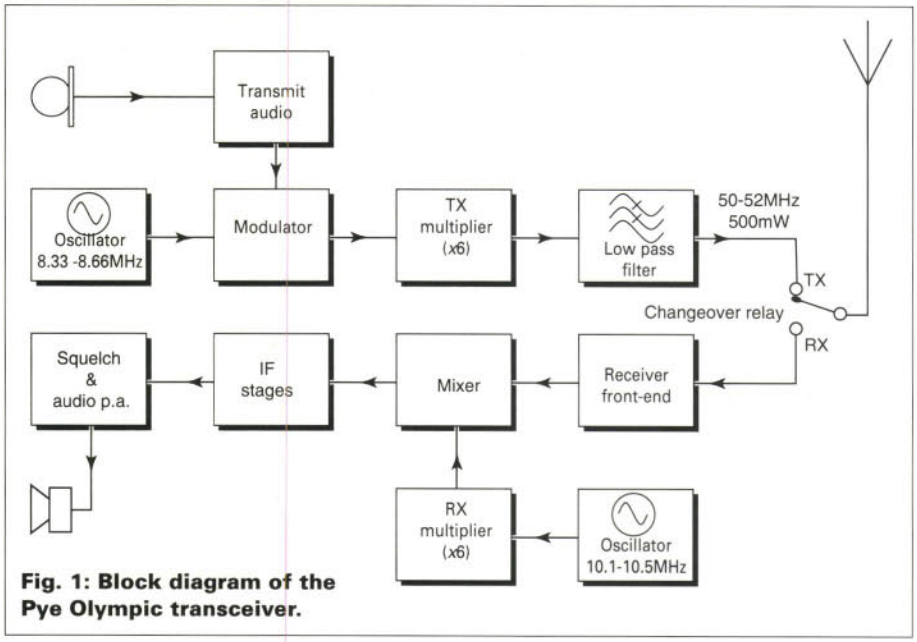


Fig. 1: Block diagram of the Pye Olympic transceiver.

The Transmitter

Considering the parts, which needed modification, I'll look at each part separately and will start with the transmitter. So, by looking at **Fig. 1,** you'll see that the oscillator is a design which will work from 6 to 14MHz quite comfortably.

The broadband oscillator is common for A through to E band models. This is quite fortunate, as the oscillator transmit frequency adopted in this rig is now of the order of 8.4MHz.

The transmit multiplier stages in the original transceiver have multiplication ratios of x2, x3 and lastly x2 (total x12). This provides an output frequency at the 84MHz for a crystal frequency of 7MHz.

In the 50MHz design, the multiplier stages are adjusted to give a different overall multiplication ratio of x6. This is mainly accomplished with the first stage now having a ratio of x3, the second x2 and the third x1. This gives a healthy output to drive the p.a. to about 500mW at 50MHz.

The p.a. 'brick' in the 'P' band model (BGY32) is designed to run from 68 to 88MHz at an output power of 17W for an input power of 100mW. And as I ended up running this broadband module some 18MHz lower than specified, I expected that the transmitted r.f. power out was going to be less, and it turned out to be only 3W.

The drop in power prompted me to buy a Pye A200 70MHz p.a. It was ripe for modification and would provide a little more power, approximately 15W. Unfortunately, to replace the 'brick' with another was found to be an expensive exercise, so I thought it was best to obtain the A200 p.a. to keep the cost down.

During the conversion, the low pass filter (l.p.f.) in the final module will need some adjustment. To do this all the capacitors and inductors are removed and replaced to adjust the filter's response to attenuate the second and third harmonics, as these may be present at 100 and 150MHz.

The Receiver

In the 50MHz conversion, the receiver is modified in the same way as the 70MHz Olympic, to bring the operating frequency down to below specification of the original design. The local oscillator injection will be running at 61MHz into the front-end module's mixer.

The receive crystal oscillator will then be

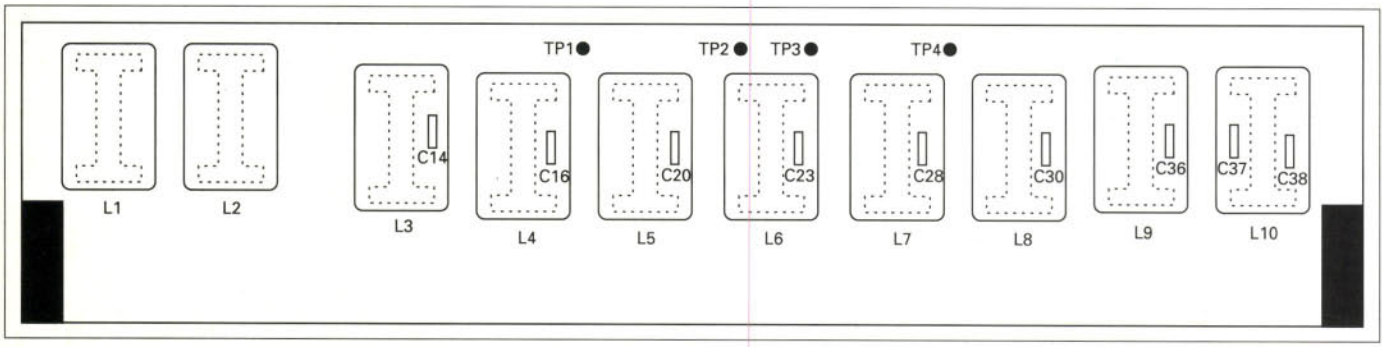


Fig. 2: Diagram showing the transmitter multiplier chain with notations indicating the components requiring modification (see text).

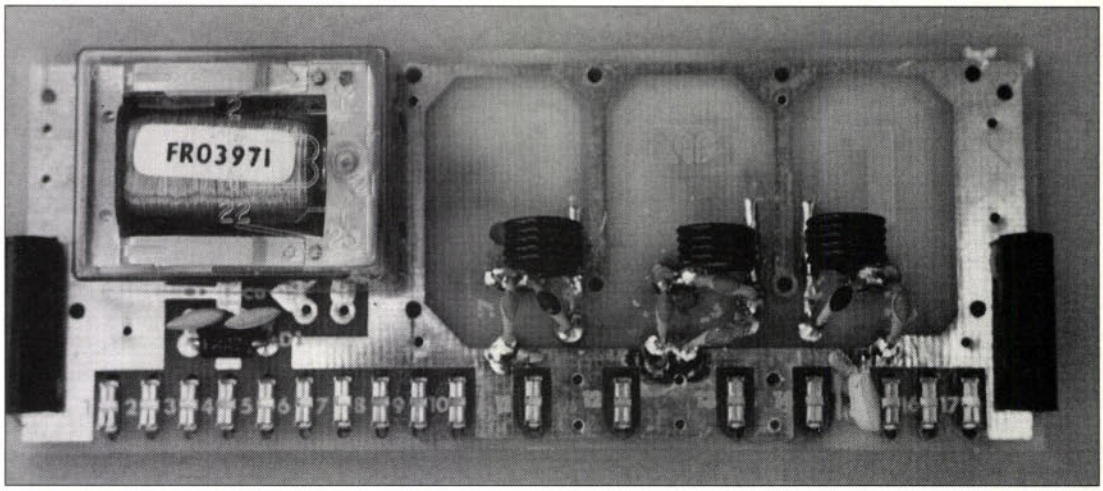


Fig. 3: Photograph showing low pass filter (l.p.f.) unit which has to be modified (see text). The photograph shows the new coils which replace the original printed circuit inductors.

at 10.3MHz and into the following multiplier stage, which runs at x 2 and x 3 (total x 6). The last stage has a multiplication ratio of x 1, i.e. tuned at 61MHz.

A considerable amount of work is required on the front-end module. Some of this work is borrowed from the modification to the 70MHz module.

Most of the coils have to be rewound. And some of the capacitors have to be replaced to make the circuit run efficiently at the new frequency.

Multiplier Stages

As I've mentioned above, the multiplication ratios of all the multiplier stages have changed, and they are now:

Transmit crystal frequency = TX freq/6MHz
Receive crystal frequency = (RX freq +10.7) /6MHz

Both transmitter and receiver crystals are to the Pye specifications T54JO. All crystal manufacturers will be aware of this specification and will produce them to your order.

Transmitter Modification

It's time to tackle the transmitter multiplier modification, see **Fig. 2**. And the first line of attack is to remove the screening cans for L3, 4, 5 and 6.

Next, remove the following ceramic capacitors that are adjacent to those coils, namely: C14 (adjacent to L3), C16 (adjacent to L4), C20 (adjacent to L5) and C23 (adjacent to L6).

Replace the listed capacitors with individual 56pF ceramic types. This can be either in the original hole mounting for the capacitors or on the bottom of the board. Then replace the screening cans onto the board.

Now add the following capacitors across the board, associated with the following coils, L5, L6, L7, L8, L9 and L10. Connect the following capacitors in parallel with: 56pF across ceramic C28, 33pF across ceramic C30, 10pF across ceramic C36, 56pF across ceramic C37, and 22pF across ceramic C38.

This concludes the modification of the transmitter multiplier stage prior to alignment.

Low Pass Filter

Next, it's time to carry out the l.p.f. modifications. Incidentally, the original coils (on the un-modified transceiver) are in the form of **printed circuit inductors.** See **Fig. 3** for guidance, and to start, the screening can which is soldered to the top of the p.c.b. has to be removed.

Some care is needed when carrying out the modifications. There are a number of tags which are soldered through to the bottom of the board and these have to be eased gently to ensure the board is not damaged in any way.

Once the screening can is removed, the removal of all the components of the l.p.f. section follows. This means all the associated capacitors and the printed circuit inductors. These are removed as shown in the photograph.

Firstly the track is cut with a sharp knife. A tinned soldering iron is then applied to the track side, (which needs lifting) and this will weaken the joint between the track and the board, the track will then start to lift.

At this point, the track can be removed with the aid of the sharp knife. It's then just pulled away to a point indicated in the photograph in **Fig. 3**.

The same procedure is adopted for the remaining coils. The remaining tracks now make adequate points to which the three new coils can be mounted to the board.

The three coils, **Fig. 4**, are all air wound on a 5.5mm former with 20s.w.g. enamelled copper wire, and they're closely wound and formed to fit on the board. Finally, they are then soldered onto the top track side of the board.

The first coil (L1), has five complete turns, the second (L2), has four turns and the third (L3), also has five turns. **Coils L2 and L3 are both wound clockwise and L1 is wound anti-clockwise** (this facilitates the mounting of the coils to the p.c.b. better). Refer to **Fig. 3,** the l.p.f. section for more detail.

When finished, the poles of the second and third harmonics of the new circuit should be in the region of 100 and 150MHz and have 45 and 25dB attenuation respectively. This provides adequate attenuation of any spurious generated from the transmitter side.

This stage concludes the modification to the transmitter side. However, the following section is rather more involved and is by far the most difficult of the modification to perform!

Receiver Modifications

To start the next stage, remove the receiver front-end, **Fig. 5**, and its multiplier modules from the transceiver. Next, you should pay attention to the front-end, where the lid of the screening can is removed by unscrewing the four self-tapping screws.

There are six air wound coils in the module and **ALL** six are to be removed (that's L1 through to L6). The remaining coils are to stay. Clear all the holes of any excess solder, including those for the coil taps, if any, as this will make the re-assembly easier.

Now remove the following capacitors from the front-end module: C2 (associated with L1) and replace with a 5.6pF ceramic, C4 and C6 (associated with L2) and replace C4 with a 5.6pF ceramic and replace C6 with a 2.2nF ceramic.

Next, remove C8 and C10 (associated with L3) and replace C8 with a 2.2nF ceramic and replace C10 with a 5.6pF ceramic, C12 and C14 (associated with L4) and replace C14 with a 2.2nF ceramic, **note that** C12 is no longer required

Continue, by removing C16 and C18 (associated with L5) and replace C16 with a 2.2nF ceramic and replace C18 with a 15pF ceramic. Then remove C20 (associated with L6) and replace C20 with a 5.6pF ceramic type. You should now add a 33pF ceramic across C23 on the track side of the p.c.b.

Winding the major front-end coils now follows. These are all wound using 0.56mm diameter enamelled copper wire wound around a 6mm former. The coils are finished close air wound and completed with epoxy resin adhesive (Araldite is suitable) coated on the inside of the coil to make the coil more rigid.

The coils are made as follows overleaf:

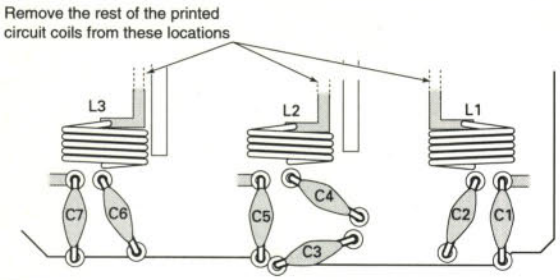


Fig. 4: Detailed view of new l.p.f. components. The original inductors are printed circuit types on the p.c.b. and have to be removed (see text).

L1 is 12 turns tapped at 2 turns near earthy end
L2 is 12 turns tapped at 3.75 turns near earthy end
L3 is 10 turns
L4 is 12 turns tapped at 2.5 turns near earth end
L5 is 10 turns
L6 is 12 turns tapped at 3.25 turns near earthy end

Because of the way in which the connection to the taps are positioned on the p.c.b., some coils have to be wound clockwise and others anti-clockwise as I've already warned you about!

Those coils wound clockwise are: L2, L3, L5 and L6 right-hand thread from an earthy end. Those remaining, L1 and L4 are wound anti-clockwise, left-hand thread from the earth end.

Receiver Multiplier

The receiver multiplier board, **Fig. 6**, is probably the easiest of the four boards to modify. It requires all the screening cans to be removed from all the coils, L3, L4, L6, L7 and L9 inclusive.

Next, remove the following capacitors from the board: C9 (associated with L3), and change for a 100pF ceramic, C7 (associated with L4) and change for a 100pF ceramic, C19 (associated with L6) and change for a 39pF ceramic, C17 (associated with L7), **no capacitor added**, C27 (associated with L9) and change for a 47pF ceramic, and add a 4p7 ceramic on the bottom of the board.

Transmitter Tuning

You should now be ready to set up the transmitter tuning. This is carried out by adjusting the tuned circuits and watching the resulting points of resonance on the test points on the board.

Before you start though, make sure that there is a crystal in the correct socket! You'll also need a dummy load and some form of power indicator on the antenna socket and a 13.8V 4A power supply.

When you're ready, set the rig to transmit, but be careful as some microphones have a 40 second timer in the casing. (The 'shaver' shaped microphone does, and this will tend to make the tuning up a little difficult, having to de-key and key-up again throughout the tune up procedure).

Then (while referring to the lay-out drawing, **Fig. 2**), keep the transmitter keyed during the whole transmitter alignment. Next, while looking at the transmitter multiplier, connect the multimeter positive lead to TP1, adjust L1 and L2 for a minimum, then adjust L3 for a maximum of around 8V.

Then transfer the multimeter probe to TP2 and adjust L4 for a minimum. Now re-tune L3 for a minimum and lastly adjust L5 for a maximum of about 9V.

Next, transfer the probe to TP3 and adjust L6 for a minimum. Re-tune L5 for a minimum. Adjust L7 for a maximum of about 8V.

Transfer the probe to TP4 and adjust L8 and L7 for a minimum. Then adjust L9 for a maximum of about 12V.

Connect an ammeter in series with the power supply (10A range). Re-tune L9 for maximum supply current. Adjust L10 for maximum supply current, which is approximately 3A. Now Check (if possible) the output power and this should be over 2.5W, with about 3A being drawn from the power supply at 13.8V.

The maximum deviation level is set with the preset on the transmit board by adjusting the preset control RV1. It should be set at about 3kHz.

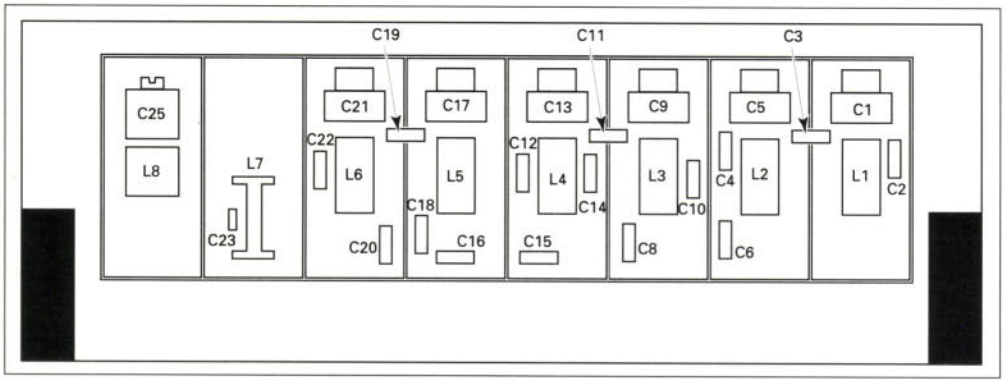
Receiver Alignment

The next procedure is to carry out the receiver alignment. This is accomplished in the usual way with the typical set-up using a signal generator and a means of reading SINAD if possible.

However, carrying out the alignment 'by ear' can work almost as well as listening with a modulated carrier and continuous tone of 1.0kHz with a speaker!

To start (while refrring to the lay-out diagram, **Fig. 6**), set the transceiver up with a crystal in the appropriate channel and select that channel. Measure the voltage on TP1 (on the receiver multiplier board) with the aid of a multimeter (negative on the multimeter to the

Continued on page 36



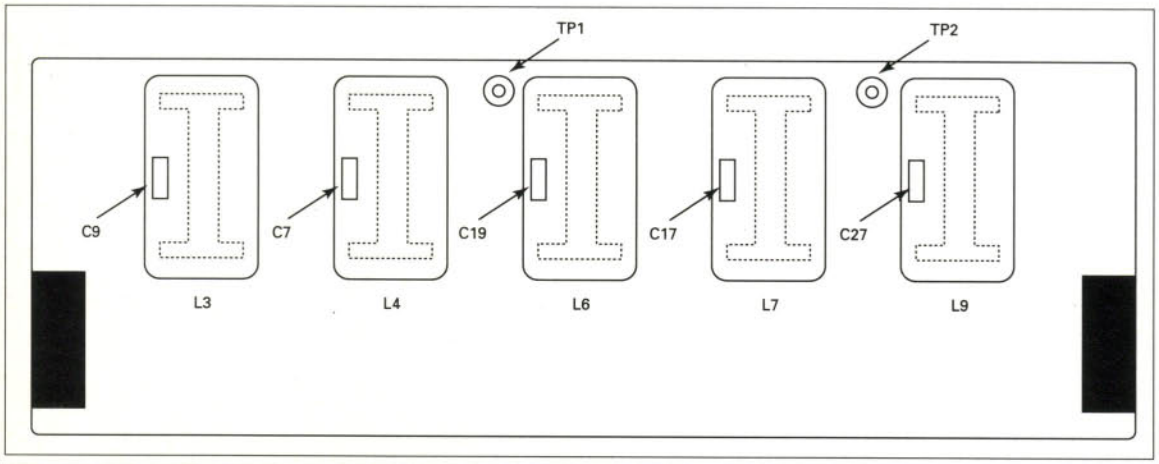


Fig. 5: The receiver front-end module with component identification (see text).

Fig. 6: Receiver multiplier unit with components indicated (see text).

A Quick Quagi

Keen antenna constructor Kevin James G6VNT has come up with another quick and simple idea. This time it's a combined 5-element quad and Yagi which he's named the 'Quagi'.

This time I've been experimenting with a high gain quagi beam design for the 144MHz band. But strictly speaking, the antenna is not a true quagi, but a mixture of a quad, a slot and a single Yagi!

My antenna has the driven element of a quad, the rear reflectors of a slot and the front-end of a Yagi! And having an overall length of only 1.4m, it's quite small when hoisted aloft and an impressive gain normally only achieved with much larger antennas.

The theoretical gain of an array such as the 'Quagi', is around 11dB. But you never attain this figure in actual practice, due to losses in the feeder and matching arrangements.

Circular Element

As you can see from **Fig. 1**, the antenna has a circular driven element. In theory, this shape has the greatest gain and capture area of all the various loop shapes, i.e. squares, rectangles and triangles, etc.

A loop has a gain of 1.4dB over a straight half wave dipole. This is backed up with a twin reflector arrangement, with elements, spaced vertically, at approximately quarter of a wavelength.

A couple of directors added to the front-end adds approximately another 3dB. By careful spacing of the parasitic elements from the driven element, a 50Ω 1:2 match is achieved into the feeder.

Because the loop is balanced, it's necessary to add a balun to match it properly into the unbalanced feeder. I achieved this by simply making a two-turn tapped coil of 50mm inside diameter out of the coaxial cable, just before it connects to the loop, as in **Fig. 1**.

Mechanical Details

The mechanical details are straightforward, as the boom consists of 15mm square tube. This is typical as that used on TV antennas, and the reflectors, were made of 8mm tube.

The driven element was made of 8s.w.g. galvanised wire bent into a loop. The diagram in **Fig. 1**, shows that the ends bent up into a contact or terminal block.

The wire is typical of that used for threading through concrete posts for fencing around modern houses (but I suggest you go and buy some rather than 'borrow' it!). I did try to use 10s.w.g., but it was not really rigid enough.

The RG58 coaxial cable had its screen and centre core tinned before insertion into the contact block and tightening the screws. When you do this, make sure that you weatherproof the connections well before hoisting the antenna aloft. I use bathroom silicon sealant to keep the water out.

The coaxial cable leaves the contact block vertically, going into the two turn taped coaxial loop balun as already mentioned. The coaxial then goes up to the boom where it's taped in position and finally down the mast. I use the commonly used electrician's type black plastic insulating tape, as it seems to do the job satisfactorily.

Wooden Batten

A 670mm length of 20 x 10mm cross section wooden batten is mounted inside the loop. This holds the loop open and in shape with the complete assembly being bolted in place at the centre of the boom.

A small 15mm wide x 10mm deep notch cut out in the wooden batten, stops the loop

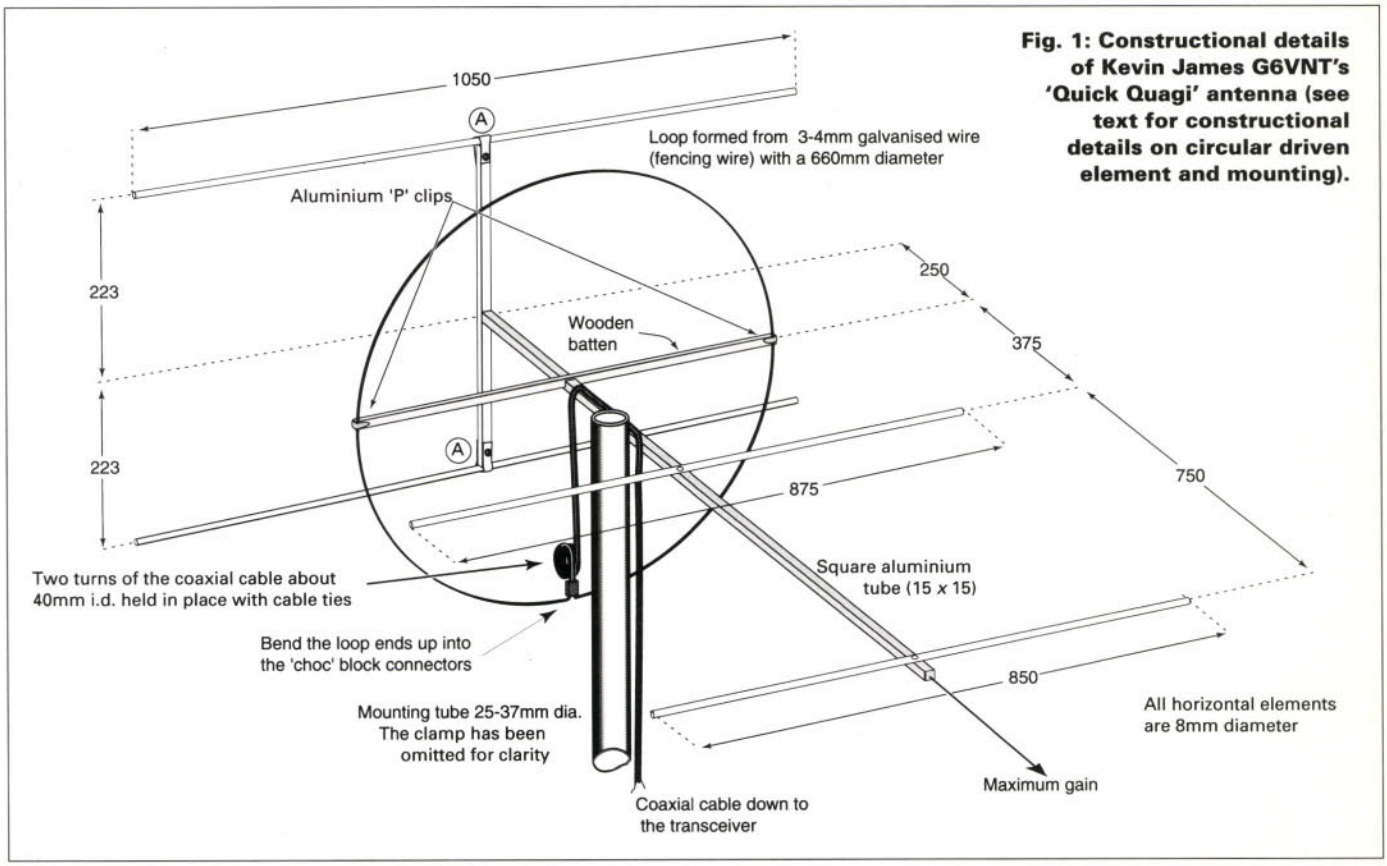


Fig. 1: Constructional details of Kevin James G6VNT's 'Quick Quagi' antenna (see text for constructional details on circular driven element and mounting).

support moving out of alignment when it's mounted on the boom. Small aluminium clamps at each end of the wooden batten, holds the galvanised wire loop in position.

At the rear of the antenna, a T-piece holds a vertical section of 15mm square tube to the end of the boom. At each end of this bar is bolted a 8mm diameter x 1050mm tube reflector element.

Two directors are mounted in front of the loop driven element. One director 875mm long is mounted 375mm in front of the driven element. A second (shorter) 850mm long director is mounted some 750mm in front of the first director (1.125m from driven element).

A standard right angle clamp, holds the boom to the mast. The bracket I chose allowed a wide variation in mast sizes to be used.

Finally, make sure you paint the wooden loop support with a coat of yacht varnish (particularly the ends) to stop water absorption into the wood when it's exposed to the weather.

Shopping List

You will need a the following lengths of 15mm square aluminium tube: One of 1.4m long, and one 450mm long.

Also required are the following lengths of 8mm diameter tube: Two 1.05m lengths, one of 875mm and one of 850mm. Also needed is one 670mm length of 20x10mm wooden batten.

For the loop a single 2.1m length of galvanised fencing wire or copper wire (note that if copper wire is used, the v.s.w.r. is likely to change) about three to four millimetres on diameter, various narrow strips of aluminium to make clips for driven element loop securing. Also needed is one two-hole piece of 'chocolate-block' electrical connector and a 25-37mm diameter mast and mounting clamps.

Impressive Performance

During testing, the 'Quick Quagi' proved itself and gave an impressive performance. For example, using my standard HB9CV antenna, giving an S3 signal on the front from a constant signal source at 10m, switching over to the Quagi provided an S5 signal. Received measurement readings were taken on the my Kenwood 751E.

I achieved a 1:2 v.s.w.r. with the prototype. A small lobe was present at the back of the antenna, but I considered it nothing to worry about.

With an S9 signal on the front, rotating the antenna 180° gave an S2 on the rear. I estimated that a gain of around 9.5dB should be achieved - not bad for an antenna only 1.4m long!

Although I haven't tried my prototype on high power, there seems no logical reason why high power should not be employed. So, have a go yourself, build a 'Quick Quagi' and see what it can do! **PW**

Olympics On Six

Continued from page 34

negative supply to the rig and the positive on the meter to the various test points) and adjust L3 and L4 for a maximum reading of around 100mV d.c.

Now, with the multiplier probe to TP2, adjust L6 and L7 for a peak. Now re-tune L3 and L4 for a maximum reading on the meter, around 500mV with the probe still connected to TP2.

Next, by using an r.f. signal generator (set to give some 10mV of r.f.) connect it to the antenna socket on the rig at the test frequency. And with the modulation set at a 1kHz tone at 2/3 system deviation (3kHz for a 5kHz system, 1.6kHz for a 2.5kHz system), tune L9 on the receiver multiplier for best SINAD (if test equipment is available. If you don't have test equipment, adjust for best 'quieting' while progressively reducing the signal.

You should now (while referring to the lay-out drawing, **Fig. 5**) adjust C1, C5, C9, C13, C17, C21, C25 and L7 on the front-end module for best quieting. The presets on **this** module can be adjusted with a screwdriver.

The coil **L7** however, **needs a non-metallic tool** to make the adjustments. A small knitting needle filed to the appropriate shape for the slug's slot. (It's the best alternative for the job if a plastic tool is not available).

Be careful with L7 as it's very fragile, and the trimmer C26 also has quite an effect on the overall performance of the receiver.

Should this slug, or any other for that matter, be stiff, then the application of a little localised heat will help to free it. But a word of warning....not too much heat!

Finally, it's worth mentioning the results I've achieved with the three Olympics I converted to 50MHz. The procedure outlined has provided a sensitivity around 0.2µV for 12dB SINAD.

Output Power

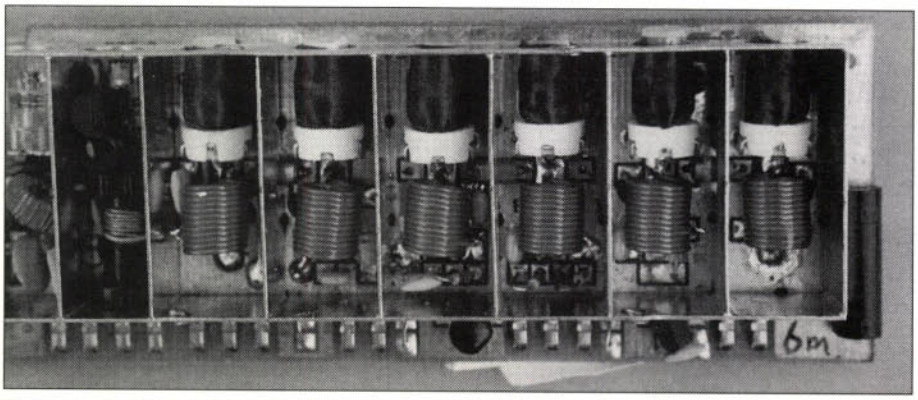
The major problem with the conversion is the fact that the output power is a little on the low side, at only 2.5W. This is due to the fact that the BGY32 is designed to run within a limited band and does not work efficiently outside its bandwidth.

The p.a. module can actually be put to one side and replaced with another unit. Alternatively, an adequate module can be placed externally to the radio to bring the output power up to a respectable 15W from the 500mW drive from the transmitter multiplier board. (One such module is available from **Garex Electronics, Tel: (01364) 72770** at a very reasonable price).

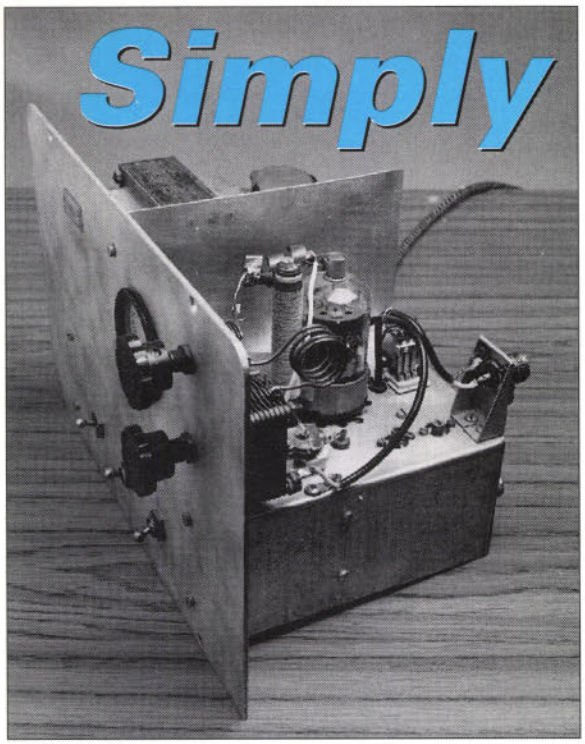
Another alternative would be to make a small p.a. module to replace the original unit in the radio (*There's a suitable project in this issue. Editor*). Or you could convert any one of a number of surplus boards on the second-hand market to use as an external p.a.

So, get busy...first find your Olympic and then carry out the conversion. I'm looking forward to meeting you on 'Six f.m.'!

PW



Photograph taken by Ken Ginn G8NDL, showing close-up view of the modified Pye Olympic 'P' band transceiver receiver front-end with newly wound coils in place (see text).



Simply Linear On 6

Derek Holmes GW3JSV shows you how to get a 'bit more grunt' on 50MHz, using only items from the junkbox.

To try out 50MHz, I bought an FT-690. It's an interesting little rig, and the day it arrived coincided with a very good tropo opening. I heard Ws and VEs just like I was on 14MHz and I was only using a dipole about three metres off the ground.

The DX, of course, whetted my appetite, so a beam was constructed and mounted on my little tower at about 12m high. I had some very satisfying results, but then wanted better!

The obvious answer was to construct some form of linear amplifier. So, my 'junk box' 'store cupboard' seemed the best place to start.

I had no solid state device to hand, so I turned towards the valves that were available. The circuit, shown in **Fig. 1**, follows conventional techniques and it's pretty basic.

Out of the 'bottles' to hand, I chose the trusted 6146B. A check with the *ARRL Handbook* showed that this valve works to 60MHz at full ratings.

Further examination showed that in class AB1, the drive power was minimal. So the 6146B seemed the perfect choice.

The junk box produced a suitable power transformer, capacitors and other bits to complete the job. The workshop yielded up an aluminium chassis, a front panel and - a case.

Words Of Caution

A cautionary word of warning for those bought up on solid state amplifiers. You will be dealing with elevated voltages (several hundred volts) and if you integrate the power supply on the same chassis, you'll have mains under your hands. **Please take the necessary precautions**.

When constructing an amplifier of this sort, the wiring associated with the r.f. circuits should be as short and direct as possible. Also these connections should be made from using a heavy gauge wire. I use a minimum of 1.2mm (16s.w.g.), silver plated or tinned copper. This allows good sturdy point to point wiring of good mechanical strength.

The d.c. circuits should be adequately r.f. decoupled close as possible to the point of common connection. The d.c. wiring should be routed well away from the signal wiring and be of suitably insulated wire for the circuit voltage.

To minimise hum pick-up from heater wiring, run these circuits in 'twisted pair' kept as near as possible at right angles to any signal wiring. It's handy to devise a colour code for this type of wiring because it allows you to trace through the circuits visually without resource to a continuity check.

Last but not least, every effort should be made to prevent the grid circuit from 'seeing' the anode circuit except via the electron stream inside the valve. This requirement can result in a lot of mechanical engineering to provide adequate screening. Therefore, it pays to take time in laying out the various

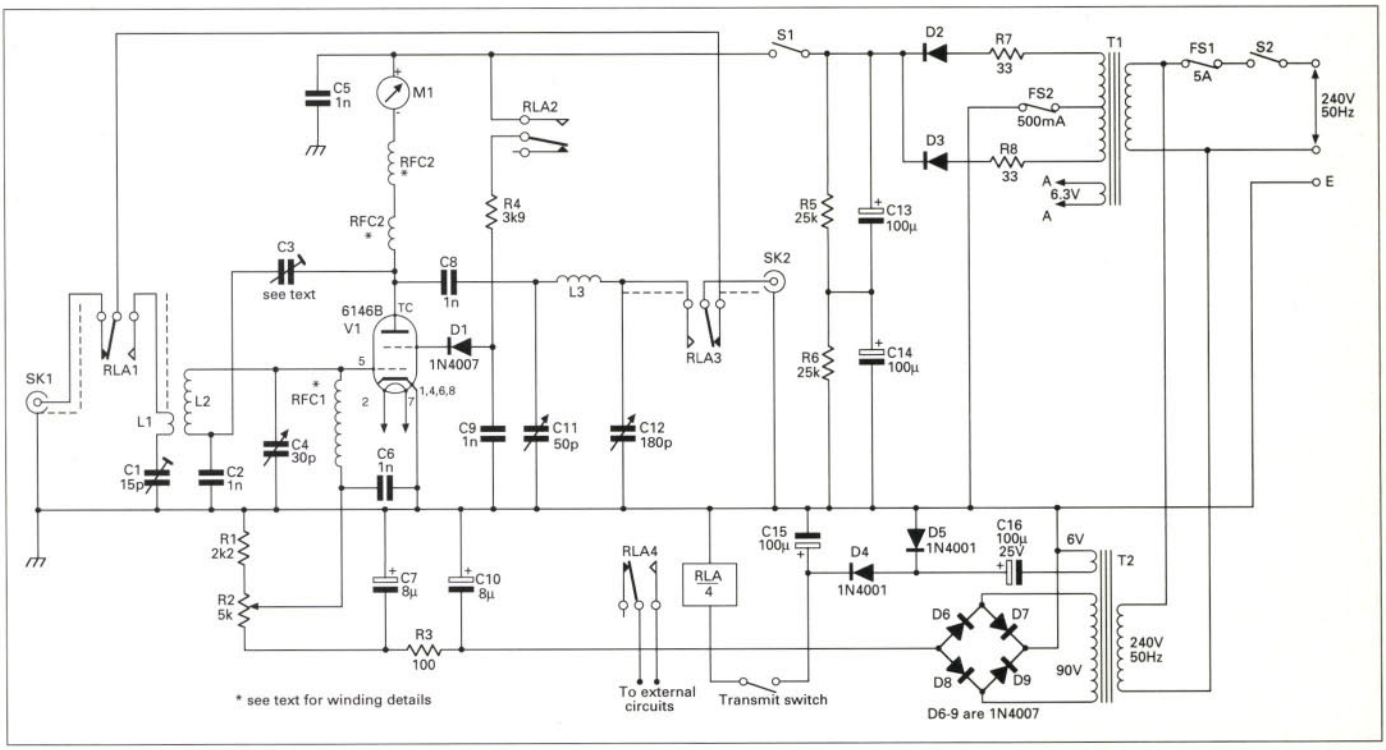


Fig. 1: The circuit of the simple p.a. uses only one valve to give about 10dB gain on 50MHz.

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

0181 - 566 1120

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

OPENING HOURS **MON-SAT 9.30 - 6.00** Late night Thursday by appointment

THE IC-706

Just to prove a point, here's a little photo of the VERY FIRST IC-706 in the U.K. - at MARTIN LYNCH, along side the hot contenders, TS-50 and the new DX-70 from Alinco.

In case you've been on Mars for the last three months and haven't heard about the new IC-706, ICOM thought it was about time they showed the other manufacturers what "innovation" is all about!

Here are some reasons as to why your shack isn't a shack without the new IC-706.

a. *It takes no more room than a small 2m multimode*
b. *It produces 100 watts on HF*
c. *It produces 100 watts on 6m*
d. *It produces 10 watts on 2m*
e. *It has all modes as standard (including wide band FM RX)*
f. *It has GenCov. RX, 30KHz-200MHz*
g. *It has 101 memories (including AlphaTag)*
h. *It employs a Spectrum Scope*
i. *It tunes in 1Hz tuning steps*
j. *It has a quick release front panel.*

The question is, does it transmit on FOUR METRES as well? The answer is probably YES, but wait and see!

To order your IC-706 call the sales desk today - your trade-ins are very welcome! DIAL 0181 566 1120, NOW!

AEA PRODUCTS

PK-12 *Low cost budget VHF TNC now with FREE software* **£115.95**

PK-96 *The easy way to get on 9k6 baud packet* **£179.95**

PK-232MBX *All mode Data controller - the bench mark* **£289.95**

PK-900 *The best selling commercial grade controller* **£439.95**

p&p on all items, next day delivery - £10

AEA PRICES HAVE NEVER BEEN SO LOW

SAVE £200

ON A NEW DUAL BANDER!

£529 for 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.*

THE IC-775DSP

If you haven't actually used a new IC-775DSP, and you are interested in owning the very best in HF engineering, then pop in to the LYNCH shop for a test drive.

It's very big, (about the same size and weight as the competitors), has 200 watts of power output, houses its own heavy duty power supply and auto ATU. It has excellent SSB transmit signals, that analog methods can't compete with, are produced through control of signals at the modulation stage; noise reduction at the demodulation stage results in crystal clear signals - revolutionary DSP technology at work for the serious DX'er. In short it is the most beautifully built technically advanced HF transceiver to come out of Japan - BAR NONE. To find out more, call Martin Lynch personally on 0181 566 1120.

Trade in's are very welcome and a free finance option is available. (subject to status).

THE IC-765

With the introduction of Icom's new flagship, we have a limited selection of it's predecessor, the brilliant IC-765 as "trade-ins".

Like the IC-775, the IC-765 has its own built in power supply, sports a very clever auto tuner and it still has one of the best ergonomically laid out front panel lay-outs of a modern HF Transceiver. Talking of front panels, the IC-765 is a pure solid aluminium construction, (not plastic like so many modern designs), and like the rest of the design - is built to last. Price? the last release from Icom was £2995.00. We have three only at a very healthy saving of £1495.00. Deposits of only £195 and your own trade-ins welcome. Phone the sales team today. 0181 566 1120
One only FT-1000 and TS950SD at £2295 Each!

Both used, as new in origional boxes, with all packing and full warranty of TWELVE MONTHS. FREE FINANCE IS ALSO AVAILABLE!

THE ALINCO DRM-06

Are you ready for the activity om SIX METRE FM yet? I have a limited number of 10 watt ALINCO transceivers at special giveaway prices

- but hurry - they are going fast

THE ALINCO DX-70

We had ten from the importers and sold the lot within a week. Why? Because in one hit, Alinco have designed and produced a first class MINI HF transceiver with 6 metres that must have the other manufacturers quivering in their boots! The audio is very crisp and clear, its a doddle to use thanks to the super user friendliness and as always with Alinco its priced to sell. £1095.00

£105 deposit and 12 payments of only £82.50, FREE FINANCE!

Digital Filters

KNOCK OUT THE NOISE WITH A DIGITAL SIGNAL PROCESSOR

TIMEWAVE DSP9+ **£229.00**
TIMEWAVE DSP59 ..... **£279.00**
MFJ 784 ..... **£239.00**

NEW

MyDEL POWER BOX
13.8 Volt DC at 20-25 AMPS

Fed up with non protected power supplies that can go high volts and blow your rig to bits? So are we! Most of the super cheap 20/25 amp power supplies on sale have no OVER VOLTS protection, let alone short circuit protection.
Ideal for your FT900, FT840 or any other 100 watt SSB transceiver, the new MyDEL "POWER BOX" is the most cost effective way of supplying enough power for your shack. It employs twin rectifiers on a seperate heat sink and is housed in an attractive metal screened cabinet for maximum RF screening.

ONLY £79.95 - beating any other price for power supplies by a mile!

(p&p £10.00)

RSGB SWITCH

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

Call 0181-566 1120 for details of my MA

END OF SUMMER Sale

"Never knowingly made a profit on new Icom, Kenwood, Yaesu, Alinco & more...they're all at knock-down prices"

ANTENNAS

TONNA ANTENNAS *LOWEST PRICES!*

2 METRES

20804	4 ELE FIXED	£36.95
20809	9 ELE PORTABLE	£44.95
20089	9 ELE FIXED	£41.95
20818	11 ELE FIXED	£68.95
20811	9 ELE CROSSED	£72.95
20817	17 ELE FIXED	£79.95

70CM

20909	9 ELE FIXED	£39.95
20919	19 ELE FIXED	£45.95
20438	19 ELE CROSSED	£53.95
20921	21 ELE FIXED	£59.95

6M

20505	5 ELE FIXED	£62.95

23CM

20623	23 ELE FIXED	£42.95
20635	25 ELE FIXED	£50.95

CUSHCRAFT ANTENNAS

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

TS SERENE ANTENNAS

BASE *THE LOWEST PRICES, HIGHEST QUALITY*

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

MOBILE

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

AS FEATURED IN RADCOM

PHF-160 Enormous 160M Centre Loaded Whip	£54.95
PHF-80 Almost as big 80m Centre Loaded Whip	£24.95
PHF-40 The mutts nuts on 40m, at a mere	£22.95
PHF-20 The way to DX, (safely) on 20m	£19.95
PHF-15 You guessed it, the same but on 15m	£19.95
PHF-10 I'll give you one guess	£19.95
AB-5 5 bander 10-80 in one antenna. It works!	£89.95
BB-2 Massive Spring mount for L.F. Whips	£49.95
116-NP gutter mount with 3/8 thread	£6.95
142-ADP Body mount with 3/8 to SO239	£9.95

Heil Sound

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-I/K/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

USED EQUIPMENT SPECIALS

Call or Fax for your FREE copy of the full listing

Nobody can offer 1 year warranty on used!!!

5 years ago, MARTIN LYNCH introduced the largest selection of USED equipment to the U.K. The list is so large that it would take 6 pages of condensed text to reproduce it. Here's a sample (we have at least two or three of each item listed in stock) but please check before ordering.

AEA	PK232MBX	TNC	£195.00
AEA	PK88	TNC	£99.00
ALINCO	DJ180	2M HANDIE	£129.00
AOR	AR1500E	SCANNER	£199.00
AOR	AR3000	SCANNER	£579.00
AOR	AR3030	RECEIVER	£499.00
AOR	AR8000	SCANNER	£349.00
BNOS	LPM144/3/50	2M 50W AMP	£89.00
BNOS	LPM432/3/50	70CM 50W AMP	£129.00
BNOS	LPM50/10/100	6M 100W AMP	£159.00
DRAKE	TR7+PSU	HF TCV'R	£499.00
ICOM	IC28E	2M 25W TCV'R	£169.00
ICOM	IC2E	2M HANDIE	£99.00
ICOM	IC785	HF TCV'R	£695.00
ICOM	IC736	HF+6M TCV'R	£1495.00
ICOM	IC765	HF TCV'R	£1495.00
ICOM	IC901E	2/70 FM MOB	£425.00
ICOM	ICR7000	BASE SCANNER	£749.00
ICOM	ICR7100	BASE SCANNER	£1100.00
ICOM	ICW21E	DUALBAND H/H	£395.00
ICOM	ICPS55	25 AMP PSU	£129.00
ICOM	ICRM3	CONTROLLER	£45.00
KENWOOD	TS130V	10W QRP HF	£349.00
KENWOOD	TS140S	HF TCV'R	£649.00
KENWOOD	TS680S	HF TCV'R	£695.00
KENWOOD	TS940S	HF TCV'R	£1100.00
KENWOOD	TS530S	HF TCV'R	£495.00
KENWOOD	TS830S	HF TCV'R	£525.00
KENWOOD	TS950SD	HF TCV'R	31995.00
KENWOOD	TL922	2KW HF AMP	£1150.00
LOWE	HF150	SW RECEIVER	£325.00
LOWE	HF225	SW RECEIVER	£349.00
STANDARD	C500	DUALBAND H/H	£225.00
STANDARD	C528	DUALBAND H/H	£249.00
YAESU	FRG100	SW RECEIVER	£399.00
YAESU	FT1000	TOP HF TCV'R	£2295.00
YAESU	FT101ZD	HF TCV'R	£395.00
YAESU	FT107M	HF TCV'R	£399.00
YAESU	FT2200	2M 50W FM	£249.00
YAESU	FT221R	2M M/M BASE	£295.00
YAESU	FT225RD	2M M/M BASE	£525.00
YAESU	FT290RMK1	2M M.5W M/M	£269.00
YAESU	FT290RMK2	2M 2.5W M/M	£399.00
YAESU	FT41	70CM H/H	£239.00
YAESU	FT840	2M 10W M/M	£349.00
YAESU	FT780R	70CM 10W M/M	£395.00
YAESU	FT530R	DUALBAND H/H	£369.00
YAESU	FT707	HF TCV'R	£295
YAESU	FT790RMK1	1W 70CM M/M	£295.00
YAESU	FT736R	QUADBANDM/M	£1100.00
YAESU	FT23R	2M HANDIE	£125.00
YAESU	FT73R	70CM HANDIE	£145.00
YAESU	FT747GX	HF TCV'R	£549.00
YAESU	FT757GX	HF TCV'R	£549.00
YAESU	FT767GX	HF TCV'R	£895.00
YAESU	FT840	HF TCV'R	£675.00
YAESU	FT990DC	HF TCV'R	£1395.00

AR-8000 + SCOUT = REACTION TUNE

What is Reaction Tune? Simple. Connect a suitably modified AOR-8000 (or AR-2700), to the latest Optoelectronics SCOUT and when the counter "sniffs" a transmission out of the air it INSTANTLY puts the scanner to that frequency! The AR8000/SCOUT combo instantly removes the frustration of seeing Two-Way communications happening before your eyes and wondering which frequency they're on!
The SCOUT will also allow you to capture up to 400 frequencies and 255 hits per frequency. The SCOUT's Memory Tune captures frequencies, will then log into memory and tune your AR-8000 at a later time. In addition, the SCOUT frequencies can be downloaded to a PC with the Scout Utility Disk for reference and building your own database.

The SCOUT will also REACTION TUNE the ICR7100, ICR9000, ICR7000, AR2700 & PRO2005/6.

This months package deal:

Package 1 New AR-8000 Scanner + Scout + Interface = £873.95
Deposit £73.95 and 12 payments of only £66.66, ZERO APR

Package 2 New AR-2700 Scanner + Scout + Interface = £723.95
Deposit £69.95 and 12 payments of only £54.95, ZERO APR

Package 3 Your existing AR8000 + New Scout + I/F = £424.95
Deposit £44.95 and 12 payments of only £31.66, ZERO APR

Package 4 A new Scout complete with Nicads Charger & Antenna £399.95
Deposit £39.95 and 12 payments of only £30.00, ZERO APR

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&OE. £10 p&p on all major items.
Martin Lynch is a licensed credit broker. Full written details are available on request.

Linear Amp UK

As used by the award winning contest group, GWORDI on the recent RSGB 6M Trophy.

Peter Rodmell has been busy refining his excellent range of high power LINEAR AMPLIFIERS. Please call for full details.

1 *Explorer 1000. 1kW out, 160-10m dual Eimac 3-500Z* **£1450.00**
£250 deposit, 12 payments of £100.00 INTEREST FREE

2 *Hunter 6000. 600W out, 80-10m single Eimac 3-500Z* **£995.00**
£95 deposit, 12 payments of £75.00 INTEREST FREE

3 *2m Discovery. 800W out, single Eimac 3CX800A7* **£1295.00**
£191 deposit, 12 payments of £92.00 INTEREST FREE

4 *6m Discovery. 800W out, with relays fitted.* **£1295.00**
£191 deposit, 12 payments of £92 INTEREST FREE

5 *70cm Discovery. Minimum 600W out, using Eimac 8874* **£1450.00**
£250 deposit, 12 payments of £100.00 INTEREST FREE

MICROWAVE MODULES

MICROWAVE MODULES ARE BACK! FIRST - FROM MARTIN LYNCH

MML432-30LS	25-30W 70CM LINEAR WITH PREAMP, 1/3 DRIVE	£169.95
MML432-50S	50W 70CM LINEAR WITH PREAMP, 10-15W DRIVE	£169.95
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	200W 2M LINEAR WITH PREAMP, 10W DRIVE	£289.95
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

THEIR TWO, FOUR & 70CM TRANSVERTERS ARE ALSO STILL AVAILABLE.

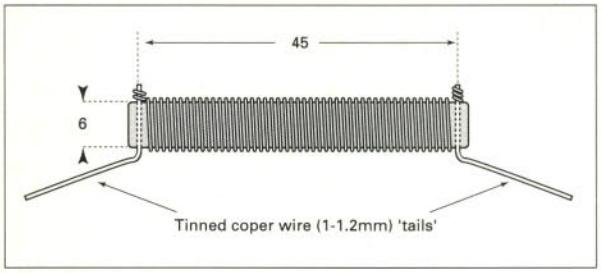


Fig. 2: (Left) The coil RFC1 is made by winding about 80-100 turns of 0.3mm e.c.w. on a wooden mandrel former.

Fig. 3: (Below) The coil RFC2 is made by winding double silk covered 22s.w.g (0.75mm) copper wire on a 15mm ceramic former. If using enamelled copper wire space each turn so as not to touch its neighbour (60-65t).

Fig. 4: (Below)The choke RFC3 is made from three turns of brass strip about 4-6mm wide wound around a 6mm internal diameter. Keep the ends as short as possible.

components on paper, before cutting and drilling metal chassis.

Grid Circuit

It's also a good idea to contain the input or grid circuit components in a screened compartment, so components around the input socket are in a metal box. In this case, I found it was unnecessary to include the grid connection of the valve base in the screened area, so a feed through bushing (a simple rubber grommet) was provided. **Do not** use a feedthrough capacitor as signal feedthoughs. No signals would get through.

By loosening the coupling between L1 and L2 and with C2 adjustable, the grid drive could be peaked across the band. But as my 50MHz activity is all in the bottom 500kHz portion of the band the input circuit is adequate when centred on 50.150MHz.

Having dealt with the r.f. side of the grid circuit, let's turn to the d.c. biasing. Because the 6146 is being operated in class AB_1, a stable grid bias supply will be required.

The bias voltage for a 6146 operating in linear mode is -50V (referred to the cathode). This voltage is obtained from a dedicated power supply integral with the amplifier.

The coil RFC1 was straight from the junk box. It has an inductance of approximately 5.6µH and can be made by winding some 30s.w.g. enamelled wire onto a 6mm dia insulated rod to give a winding length of 30mm close wound.

The ends of the winding can be made off onto tinned copper wires of about 1mm (18s.w.g.). Have a look at **Fig. 2** to see what the finished choke should look like.

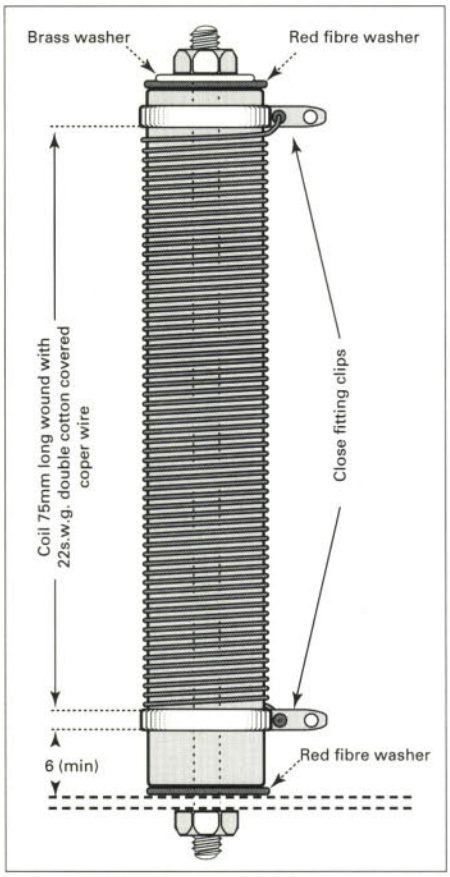
The bias potentiometer, R2, is a wire wound type and should be of generous rating. Don't stint this component and its associated series resistor, R1.

Both components dissipate a fair power and get quite warm. Because of this I chose a 5W rating for both of these components.

Anode Circuit

The anode circuit is a conventional Pi output stage. The anode choke RFC2 needs a special mention. The choke is made by winding a 75mm long coil onto a 15mm dia, ceramic former. It was once a mains dropper resistor former, see **Fig. 3** for the mechanical details. The wire used is 22s.w.g. double cotton covered.

The main essential is that the self resonance of RFC2 must be well removed from the operating frequency. To check this, short the



ends of the winding with a stout piece of wire and check for resonance with a dip meter (g.d.o.).

Any spurious resonances (dips) should be at least at least 10MHz away from the operating frequency, i. e. none between 40 and 60MHz. The choke RFC3 may or may not be required. I tried a six turn coil of 16s.w.g. wire about 3mm dia shunted by a low value resistor.

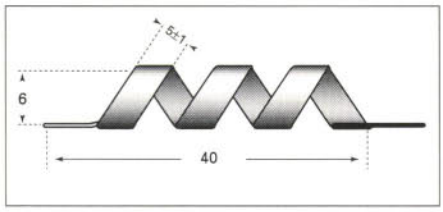
My arrangement for the the choke was not good, the resistor became very hot, so I decided to use a very low value inductance and dispense with the resistor.

The inductor I made, shown in **Fig. 4,** is made from a 4-6mm wide strip of thin, about 0.5mm brass. I wound this into a coil on a drill bit as a mandrel.

Once the winding is taken off the mandrel, the turns will naturally open out to provide adequate spacing, but in any case, the turns should not need touching.

In my amplifier, I've had no problems with parasitic instability, although the the screen grid is fed from the high voltage rail through a 10kΩ dropper resistor (the screen grid voltage needs to be stable at 245V).

The diode, D1, inhibits secondary emissions that can shorten the life of high gain valves such as the 6146. The diode used should



have a peak inverse rating (p. i. v.) of at least 800V.

Output Circuit

The output circuit is a conventional Pi tank type. The anode load resistance of a 6146 operating under these conditions is of the order of 1400Ω and the Pi tank circuit has to transform this to the 50 or 75Ω level required for the antenna system.

The components values for the Pi network in the diagram meet the general rule of thumb calculation set out in the 'HF Transmitters' chapter in the 5th edition of *Radio Communications Handbook*, published by the RSGB.

The measured output into a 50Ω load is the order of 15W on s.s.b. and about 20W on c.w. This gives a gain figure for my installation of 10dB, adequate for my needs.

On-air reports of voice transmissions (s.s.b. and f.m.) have indicated that the 'spectral' quality is very good. Similarly, on c.w. reports have been very encouraging, where I had T9 reports under the varying local and DX conditions.

The Power Supply

The power supply is on the same chassis as the amplifier. The chassis measures 230mm x 165mm x 75mm deep and the various components are laid out as indicated in **Fig. 4**. I think I was lucky in having a power transformer of a size which fitted in very well. Anybody building this unit will have to experiment with what they have to hand.

I've used a 350-0-350V transformer with a bi-phase rectifier and capacitor filter as shown, this gives an anode voltage of 380V at current of 130mA peak. The filter capacitors are arranged in series because I intend uprating of the power supply to 800V. The capacitors are each 100µF 450V working and shunted by high power equalising resistors.

Control

The control of both the amplifier and the exciter is effected from a switch located on the

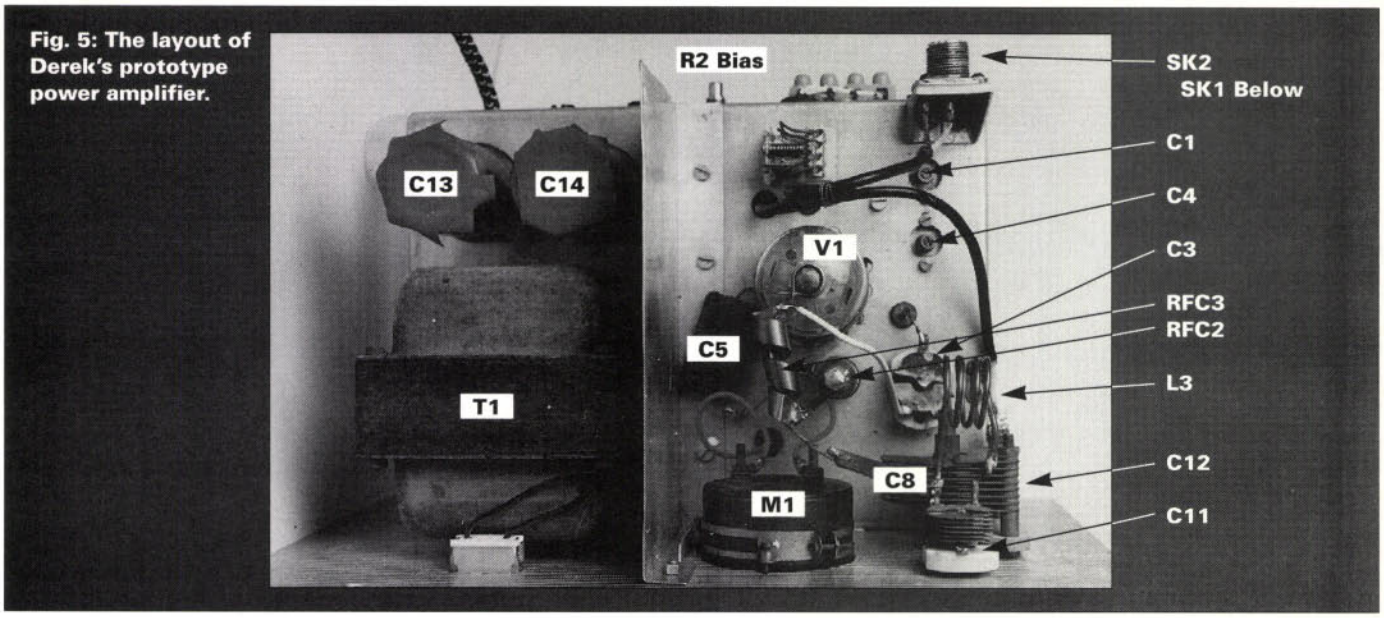


Fig. 5: The layout of Derek's prototype power amplifier.

operating desk console. A change over relay is incorporated within the amplifier, which performs all of the transmit/receive change over functions.

The relay has a 12 volt operating coil. It takes its power from a six volt winding through a voltage doubler circuit.

The FT-690 provides a d.c. voltage at the antenna socket. This voltage can be used, via a transistor switch to a control relay, retaining the full p. t. t. facility of the FT-690.

A suitable control circuit was published in *PW* in February 1991, page 32. This appeared in the review of a solid state 50MHz p.a. stage.

Neutralising

Neutralising an amplifier is an unloved subject, and luckily in the original model, it proved to be unnecessary. Other amplifiers may not behave as well. The system shown is well tried and tested in this circuit configuration and is easy to adjust.

The requirement is to balance the the valve's internal capacitances with an external capacitance. The capacitor, C3, is a 5pF preset type with wide spaced plates. This is to withstand the full h. t. voltages. I modified a preset capacitor to two vanes (one fixed and one moving) making sure I had a spacing between the vanes of at least 1.5mm.

To adjust the neutralising capacitor, apply h.t. and grid drive. Resonate the anode circuit and observe the output into a dummy load on a wattmeter. Adjust C3 while keeping the anode circuit at resonance until maximum output occurs at minimum anode current.

Once set-up, it should never require attention unless you change the valve or replace some circuit component. **Do be careful when carrying out this adjustment**.

I know designers all say "since I built this, I've had no end of fun. " Well, I have. This little amplifier has put my signal into nearly 100 countries.

One day I might get the cards to prove it. This linear didn't cost me anything, and that has to be a plus! **PW**

Shopping List

Resistors

2.5W wirewound 5%		
33Ω	2	R7, 8
100	1	R3
5W wirewound 5%		
2. 2kΩ	1	R1
3. 9kΩ	1	R4
25kΩ	2	R5, 6
Rotary 3W (minimum power rating)		
5kΩ	1	R2

Capacitors

High voltage disc ceramic 500V working (minimum)		
1nF	4	C2, 5, 6, 9
High voltage disc ceramic 1kV working (minimum)		
1nF	1	C8
Electrolytic 425V working		
100µF		C15, 16
Electrolytic 450V working		
8µF	2	C7, 10
100µF	2	C13, 14
Variable (high voltage)		
5pF	1	C3 (see text)
15pF	1	C1
50pF	1	C11
180pF	1	C12 (or a 200-250pF air spaced type)

Valve

6146B	1	V1

Semiconductors

1N4001	2	D4, 5
1N4007	7	D1, 2, 3, 6-9

Inductors

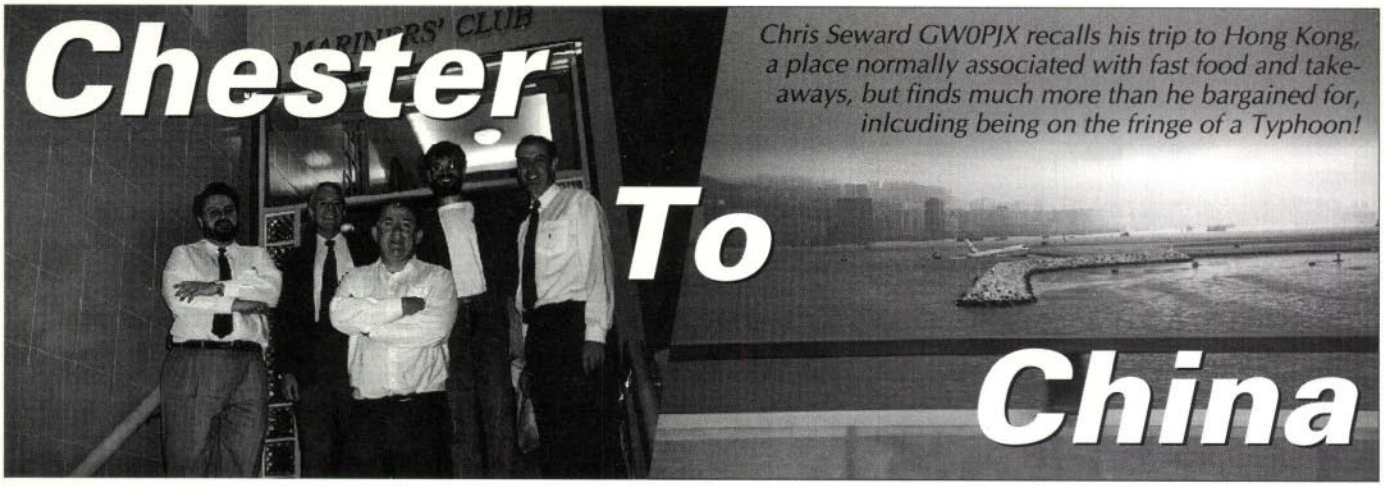
L1	1turn 1mm enamelled copper wire (e.c.w.) over the 'earthy' end of L2
L2	6 turns 0.8mm e.c.w. 15mm diameter 20mm long
L3	4 turns 2mm e.c.w. 25mm diameter 20mm long
RFC1	5.6µH (approx) See **Fig 2** for details
RFC2	See **Fig. 3** for details
RFC3	See **Fig. 4** for details

Miscellaneous

Metal chassis for the unit, one 350-0-350 150mA transformer, one 90V (100mA) + 6. 3V (2.5A) transformer, one 200-250mA f. s. d. current meter, two s.p. switches, one 4-pole changeover relay, plugs sockets, coaxial cable, interconnecting wire.

Chester To China

Chris Seward GW0PJX recalls his trip to Hong Kong, a place normally associated with fast food and take-aways, but finds much more than he bargained for, inlcuding being on the fringe of a Typhoon!



Above Left: **(from L to R) Bob VS6EY (beard), Phil VS6CT (Jacket), Chris Seward GW0PJX, Bret VS6BG (beard) and Bill VR2BG, outside Hong Kong Mariners Club - Kowloon.** ***Above Right:*** **China Airlines 747 in the water!**

When my employers informed me that I would have to work in VS6 during the first two weeks of November, my main reactions were, well somebody has to do it and two weeks without amateur radio could give me severe withdrawal symptoms. But the former had to be borne with fortitude the latter had to be addressed!

The nature of my work meant that the evenings and weekends were my own time and as such, could be devoted to sightseeing and imbibing the local ale! The remaining free time could be devoted to general short wave listening with an emphasis on eavesdropping on the local amateur bands.

Borrowing Equipment

My home station does not lend itself to transportation by air over a distance of 6000 miles. So, I set about borrowing a good quality short wave receiver that met the following criteria: robust, small, ran off its own power supply, good selectivity and provided most modes.

As a member of the Chester Amateur Radio Club, I had attended a lecture given by **John Wilson** of **Lowe Electronics**, so, it was natural that my thoughts should turn to borrowing a Lowe HF-150. A quick telephone call to John brought an offer of the loan of an HF-150 with all appropriate accessories.

The HF-150 arrived shortly in its own carrying bag and became part of my personal hand luggage. I also packed a couple of random lengths of wire to act as temporary antennas and the *Passport To World Band Radio 1993*.

Packet Message

In anticipation of my visit, I sent a packet message to the local VS6XMT BBS asking for details of local radio club activities. Sure enough, in a couple of days, replies were received from two amateurs.

The Sysop *VS6XMT Charlie* and **VS6XPL John** both gave me details of the local clubs available. The club that met whilst I intended to be in VS6 was the Hong Kong Amateur Radio Transmitting Society, (HARTS) and I made a note in my diary to visit.

Temporary Home

Having arrived at Kia Tak airport, temperature 29° Centigrade, I was escorted to what would be my temporary home for two weeks, a very nice building currently in use by Her Majesties Forces, next to the Star Ferry on Hong Kong Island. The views over the harbour were magnificent and I soon settled in.

I did reflect, however, that I was very wise not to bring a transmitter, as any unauthorised signals from my temporary QTH would no doubt bring a most unwelcome response from my hosts! After unpacking my toothbrush, I set-up the temporary random wire antenna within my room that was on the 21st floor.

Local Amateur

Tuning into 3.5MHz band brought a 59 signal from a local amateur **VS6WO**. This was my first and last signal heard on this band during my stay. I soon found out that '80' was under used by the local amateurs.

However, broadcast and amateur stations, both local and DX, were easily copied by the HF-150 on all bands and there appeared to be no difference between the wire antenna and the whip supplied by Lowes. I kept a log during my stay and the following is a brief extract.

Broadcast	BBC on 11945, Radio Japan 9750, Moscow 6190 & 9845, Deutsche Welle 9765, Swiss 7480, China 15400,
Beacon	CW 8542
Amateur c.w.	JE5UOW - 7MHz, JA4WFO - 18MHz, JS0BQX - 21MHz
Amateur s.s.b.	VS6WO - 3.5MHz, DU9RG, VS6WO, OI5AY, JH5ZJS, JA1YXJ, JM1XCW - 7MHz HS1BV, DU9RG, US6WO, VS6WV, BV2KI, VS6WQ - 14MHz VS6CT, JM6ETO, VSK4ZQ, EA3CVA, DU9RG - 21MHz VS6WO - 28MHz

Made Welcome

On November 9 1993 I attended the meeting of the HARTS at the Hong Kong Mariners Club, Kowloon, a short ferry ride away and I was made welcome by **Bret VS6BG**, President, **Bob VS6EY**, **IARU**, **VR2BG Bill**, (Treasurer) and **Phil VS6CT**, (Members' Communications).

The club represents amateur radio interests with the local Authorities and international bodies. The subjects discussed ranged from repeater abuse (heard that before somewhere!), grants to DXpeditions, AMSAT and licensing matters.

The meeting was conducted in a bilingual format, translations between English and Cantonese following speaker's comments. After the meeting, I joined the President and his colleagues for a most enjoyable dinner. Phil kindly invited me to his station, but due to pressure of work I was unable to make it.

Typhoon Fringe

During my stay, the Colony endured the fringe of a Typhoon. Typhoons, I was assured by locals, never happen in November!

Whilst the rain was lashing down and the wind was blowing, a China Airlines Boeing 747 overshot the runway at Kia Tak. It gave a rather poor impression of a Shorts Sunderland flying boat that had forgotton how to float!

Fortunately all were rescued. The plane could be clearly seen from where I was staying, becoming a local attraction for those tourists undertaking a harbour cruise.

Farewell Feelings

It was, therefore, with mixed feelings that I boarded the aircraft to leave VS6. Sad that I was leaving a lot of new friends, glad I was going home to my family and anxious that our pilot knew the overall stopping distance of a 747!

My thanks go to the Members of HARTS for their welcome and John Wilson of Lowe Electronics for the loan of the HF-150.

PW

UNIQUE PACKAGE DEAL! ONLY AT COASTAL!

IC-706 + 2m 100w AMP!

for only

£1195 CASH CHEQUE CREDIT CARD

"Yes — 3 into 1 does go!" says Coastal

ICOM have hit the amateur market with a real bombshell! They have come up with a unique base station/mobile rig that is low in cost, high on specification, will sit on your palm AND can pour out a full 100 watts on all HF bands and on six metres. Wow! No wonder the orders are streaming in! With our generous part exchange on your present shack full of rigs, you could be looking at a fantastically low residual price to pay. This ICOM has got to be the 'Rig of the Year'!

Of course, we amateurs are never satisfied! "Why doesn't it have 100 watts on 2?" we hear you say. As always Coastal try to rise to the occasion. For a limited period only, you will receive FREE OF CHARGE and fully guaranteed, an MM 100 watt linear for 2m when you buy your IC-706 from Coastal, paying only the normal RRP! Call us immediately to reserve your new ICOM-706.

100 WATTS HF ALL BAND + 100 WATTS 50 MHZ + 100 WATTS 144 MHZ

AND ... Full general coverage on receive!

FREE MICROWAVE MODULES MODEL 144-100S 2 METRES 100W OUTPUT 12db PREAMP

Available free only with the above package but in stock at £179.95 RRP

SPECIFICATIONS

■ GENERAL

- Frequency coverage : Receive 30 kHz–200.000 MHz
  Guaranteed range: 500 kHz–29.995 MHz
  50.000–54.000 MHz
  144.000–148.000 MHz
  Transmit 1.800–1.99999 MHz*
  3.500–4.000 MHz*
  7.000–7.300 MHz*
  10.100–10.150 MHz
  14.000–14.350 MHz
  18.068–18.168 MHz
  21.000–21.450 MHz
  24.890–24.990 MHz
  28.000–29.700 MHz
  50.000–54.000 MHz*
  144.000–148.000 MHz*
  *Varies with version.
- Mode : LSB/USB, CW, RTTY (FSK), AM, FM and WFM (receive only)
- Number of memory channels : 101 (99 regular and 2 scan edges)
- Power supply requirements : 13.8 V DC ± 15%, 20 A
- Usable temperature range : –10°C to +60°C (+14°F to +140°F)
- Frequency stability : Less than ± 200 Hz from 1 min. to 60 min. after power ON. (After that, rate of stability change is less than ± 30 Hz/hr. at +25°C; +77°F).
- Current drain (at 13.8 V DC) : Receive squelched 1.5 A
  max. audio output 2.5 A
  Transmit 20 A
- Dimensions (projections not included) : 167(W) x 58(H) x 200(D) mm
  6 9/16(W) x 2 9/32(H) x 7 7/8(D) in
- Weight : Approx. 2.5 kg (5 lb 8 oz)

■ TRANSMITTER

- Output power

	1.8 to 50 MHz bands	144 MHz band
SSB/CW/RTTY/FM	5 to 100 W	0.5 to 10 W
AM	2 to 40 W	0.2 to 4 W

- Spurious emissions : Less than –50 dB (1.8–28 MHz)
  Less than –60 dB (50–144 MHz)
- Carrier suppression : Less than –40 dB
- Unwanted sideband : Less than –50 dB

■ RECEIVER

- Receive system :
  SSB, CW, RTTY, AM, WFM Double conversion superheterodyne
  FM Triple conversion superheterodyne
- Sensitivity (pre-amp ON) :

	0.5–1.8 MHz	1.8–29.995 MHz	50–54 MHz	144–148 MHz
SSB/CW/RTTY (10 dB S/N)	—	0.16 µV	0.16 µV	0.16 µV
AM (10 dB S/N)	13 µV	2.0 µV	2.0 µV	2.0 µV
FM (12 dB SINAD)	—	0.5 µV (28–29.7 MHz)	0.5 µV	0.25 µV

- Selectivity (normal) :
  SSB, CW, RTTY More than 2.3 kHz/–6 dB
  Less than 4.0 kHz/–60 dB
  AM More than 6.0 kHz/–6 dB
  Less than 20.0 kHz/–40 dB
  FM More than 15.0 kHz/–6 dB
  Less than 30.0 kHz/–50 dB
- Spurious and image rejection : More than 70 dB (HF bands)
- Audio output power : More than 2.0 W (with an 8 Ω load)

See also Icom's display on the inside back cover.

OPTIONS

AH-2b ANTENNA ELEMENT (for use with the AH-3)
AH-3 HF AUTOMATIC ANTENNA TUNER
AT-180 HF + 50 MHz AUTOMATIC ANTENNA TUNER
CR-502 HIGH-STABILITY CRYSTAL UNIT
CT-16 SATELLITE INTERFACE UNIT
CT-17 CI-V LEVEL CONVERTER
EX-627 HF AUTOMATIC ANTENNA SELECTOR*1
FL-100 CW NARROW FILTER (500 Hz/–6 dB)
FL-101 CW NARROW FILTER (250 Hz/–6 dB)
FL-103 SSB WIDE FILTER (2.8 kHz/–6 dB)
FL-223 SSB NARROW FILTER (1.9 kHz/–6 dB)
HM-103 HAND MICROPHONE
IC-4KL 1 kW HF LINEAR AMPLIFIER*1
MB-62 MOBILE MOUNTING BRACKET (for main unit)
MB-63 MOBILE MOUNTING BRACKET (for detachable front pahel)
OPC-581 SEPARATION CABLE (3.5 m)
OPC-587 SEPARATION CABLE (7 m)
OPC-589 ADAPTER CABLE (modular mic con. → 8-pin mic con.)
OPC-598 ACC EXTENSION CABLE (7 m for the AT-180)
OPC-599 ADAPTER CABLE (13-pin ACC con. → 7+8 pin ACC con.)
IC-PS30 DC POWER SUPPLY (13.8 V, 25 A)
PS-85 DC POWER SUPPLY (13.8 V, 20 A)
SM-8 DESKTOP MICROPHONE*2
SM-20 DESKTOP MICROPHONE*2
SP-7 EXTERNAL SPEAKER (for base station use)
SP-10 EXTERNAL SPEAKER (for mobile use)
SP-12 EXTERNAL SPEAKER (for mobile use)
UT-102 VOICE SYNTHESIZER UNIT

*1 An optional OPC-599 is required.
*2 An optional OPC-589 is required.

All stated specifications are subject to change without notice or obligtation.

COASTAL COMMUNICATIONS

AMATEUR RADIO FOR THE RADIO AMATEUR

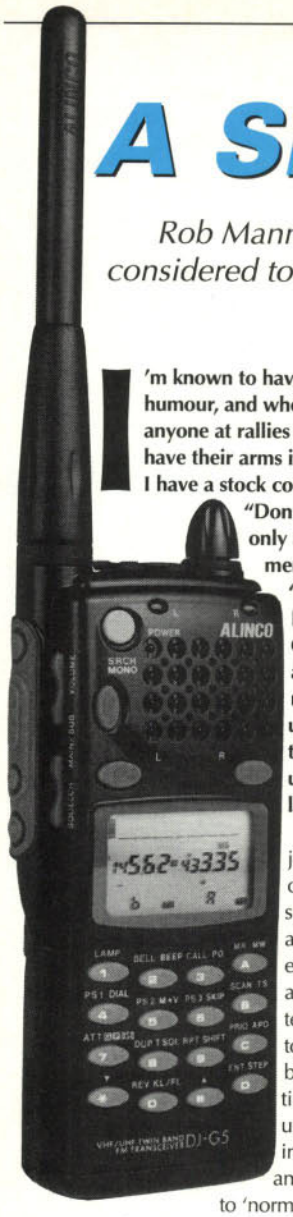
19 Cambridge Road, Clacton-on-Sea, Essex CO15 3QJ

VISA, ACCESS, AMEX, RSGB, DELTA, SWITCH, Licensed Credit Brokers

MON-SAT 9-5pm
WED 9-2pm
01255 474292

A Single-Handed Review

Rob Mannion G3XFD seemed very well qualified to try a dual-band hand-held that's considered to be easier to use with one hand. So, our 'digitally-deprived' Editor tried out the Alinco DJ-G5 on behalf of other operators in the same boat!



I'm known to have a sense of humour, and whenever I meet anyone at rallies and shows who have their arms in a plaster-cast, I have a stock comment. It's: "Don't worry, you're only a part time member of the 'One Armed Bandit's Club....but I'm a full-time member". It usually breaks the ice and we usually have a laugh!

Actually, joking apart, I can really sympathise with anyone who is effectively 'one armed' temporarily due to their injury because by the time they've got used to it, the injury's healed and they're back to 'normal'.

However, there are a great number of radio enthusiasts who like me, cope with every day life permanently with less than the usual ten digits. And in fact I've got a few friends who manage extremely well with none at all!

But, this review is aimed at helping those who may have lost an arm, have limited use of one arm because of arthritis or from a 'stroke' or other problem. I was asked, as I seemed to be the ideal candidate to try out the DJ-G5.

I've also no doubt at all that those of you with the full complement of 'digits' will find the review of interest. After all, there's many a situation where you'll have your other hand fully occupied!

Complex Problems

As modern miniature hand-held transceivers get even smaller and complex, anyone with less manual dexterity has got problems! And, when you bear in mind how the individual manufacturers vie with each in miniaturising equipment, it's bound to get worse!

So, when Jeff Stanton of Waters & Stanton Electronics asked if I'd like to try a hand-held transceiver which (in his opinion) could help people 'in the same' boat as me, I readily agreed. In doing so the Editorial team broke the rule "the Editor shalt not review hand-helds", but as I've mentioned....there are special reasons.

Small And Neat

The Alinco DJ-G5 is relatively small and neat, but it's certainly not the smallest dual-band hand-held I've seen. However, when the package arrived in the *PW* office I quickly realised that Jeff Stanton had a good point...it **was** easy for me to handle with one hand.

I was immediately impressed by the way I could operate all the controls (including the top-mounted rotary switch) with little effort with my left hand. In fact, it seemed perfect for someone who only has the use of their **left** hand.

It was difficult for me to imagine (after almost 35 years of single-handed operation!) what the transceiver would handle like in the grip of someone using their right hand only. So, to help, I wandered into **Dick Ganderton G8VFH's** office (Editor *Short Wave Magazine*) and asked him to try the transceiver, using only his right hand.

Dick handled it and after a little experimentation adopted a technique he recalled from his chemistry days at school (where he had to hold and adjust something in one hand, while holding a test-tube in the other. However, the technique made him look uncomfortable using and operating it one-handed.

To be as fair as possible, I also asked **Tex Swann G1TEX,** the *PW* Technical Projects Sub-editor to try the rig, using the same one-handed approach employing the right hand. Tex, who admits to being a 'forced right-hander' (from the dreadful days when left-handers were literally forced to use their right hands when they first went to school) seemed to be less than comfortable holding the transceiver.

However, on the other hand (sorry about the pun!) **Kevin Nice G7TZC** the Assistant Editor of *Short Wave Magazine*, tried the transceiver using only his right hand. He looked perfectly comfortable and said it felt well balanced, and promptly operated the rig very effectively. His opinion "very well balanced" and he also said he'd be perfectly happy using the transceiver using only the right hand.

On The Air

So, having got the opinion of other amateur radio operators to get a 'right' view, I'll now report on how the transceiver worked on the air. And to start off, I've got to say I have good and critical comments in this area!

I don't often work on 430MHz and it was good to join the 'Gentleman's Band' as Dick G8VFH calls it. On '70' this rig performed well and seems to be very sensitive indeed. The reported audio (from the tiny microphone tucked down right at the bottom of the transceiver) was surprisingly good.

All my QSOs on 430MHz were via repeaters, as I didn't hear anyone on the simplex channels using the 'rubber duck' antenna. (I don't have any u.h.f. antennas at my home). But, despite this I enjoyed using the transceiver on the band, finding it to be very easy to handle and operate from my left handed point of view.

On 144MHz my time on air coincided with the spell of very hot and sunny weather we experienced in early July. The rig provided me with plenty of simplex and repeater QSOs and I heard quite a bit of DX.

Unfortunately though, as the weather and tropo conditions were so good for v.h.f. activity, the band was very busy. This showed up some shortcomings in the DJ-G5's 'front-end'.

I took the rig out to a local hilly spot and found that with the 144MHz band being so busy (it was on a weekend) the DJ-G5T's front-end selectivity was being pushed to the limit. I felt that if I had connected the rig to a portable beam antenna, an approach which provides many enjoyable QSOs for hand-held users, the various other QSOs on adjacent channels would have caused real problems.

But, having criticised the selectivity on the hand-held, I must praise its sensitivity (which is excellent). And, bearing in mind the 'wide band' techniques used by manufacturers providing dual-band transceivers (also incorporating the non-amateur radio coverage which is so often widely promoted nowadays) I should not be so surprised that the receiver front end is a little 'wider' than perhaps it should be.

While on the subject of selectivity, Tex G1TEX commented on the DJ-G5's performance when he had it at his photographic studio. Tex noticed that the transceiver responded to 'wide area paging' transmissions, which could pose problems to anyone living close to a transmitter.

The transceiver with associated NiCad recharging unit.

Rob Mannion G3XFD found that 'single handed' operation of the DJ-G5 was easy and comfortable.

Display & Controls

Personally, I found that the DJ-G5T handled extremely well, the display and controls were excellent and it was generally speaking, a delight to use. I've also got to say that it's the first modern hand-held which I've truly been 'at home with'.

In use, the clear l.c.d. enunciators and the neat (but very easy to operate) general controls were a pleasure to use as was the backlit (useful in the dark) keypad. I never had to fumble once!

In particular, I should mention the main rotary tuning control (top right hand of the transceiver) which I found (as a left-handed person of course) exceptionally easy to use. It proved to be so good that if I were to be looking for a dual-band hand-held transceiver, the DJ-G5 would be foremost in my thoughts.

Everything on the transceiver's control panel seemed to be laid out just right for me. And (for someone who rarely tries the 'frilly bits') I found myself using the 'scan' facility on both v.h.f. and u.h.f.

The Alinco DJ-G5 is also provided with the now familiar 'Channelscope' facility (11 channels in this model). It's also fitted with CTCSS tone encode and decode as standard.

Not being a regular dual-band tranceiver user, I was a little confused by the 'squelching' at first. However, I soon got the hang of the control panel and ensured I was adjusting the squelch level and the volume on the band I needed!

To have the DJ-G5 scanning both 144 and 430MHz was fascinating. It's the first time I've really found the facility to be useful on a hand-held and it gave an indication of the activity levels on both bands. Also (bearing in mind I'm not the most mentally agile of people!) I found the screen prompts to be helpful and surprisingly clear (for such a small display) even for someone wearing bifocal spectacles.

I was asked if I would try the transceiver out mainly for the purpose of evaluating it for 'one-handed' operation. So, hopefully you'll forgive me for not delving deeper into memory functions and the host of other facilities available on the rig. They are comprehensive indeed!

In any case, I think this rig will appeal to many operators, particularly those who either have, or perceive themselves likely to have problems in operating a modern small hand-held.

To quote Kevin G7TZC once again "It's very well balanced". And for my part I think that the DJ-G5 dual-band transceiver **is** well balanced and felt very comfortable to use.

I suggest that if you're in the 'same boat' as I'm in, you try a DJ-G5 for yourself so you too can discover the freedom of operating a hand-held. And once you've made the decision that it could be feasible for you, the host of other facilities that come in the same package can be yours too!

My thanks for the loan of the DJ-G5 go to Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX: (01702) 205843, who can supply it for £479. **PW**

Manufacturer's Specifications

General	
Frequency range:	144 to 145.995MHz and 430 to 439.995 (plus non-amateur radio coverage)
Modulation type	F3
Microphone input impedance	2kΩ
Speaker impedance	8Ω
Operating voltage range	4.5 to 16V d.c.
Nominal input voltage	7.2V
Current consumption transmit at 13.8V d.c.	(Hi) approx. 1.4A (v.h.f.) 1.5A (u.h.f.) (Mid) approx.
Current consumption at 7.2V	(Hi) approx. 650mA for 2W (Mid) approx. 650mA for 2W
Current consumption	(Low) 13.8/7.2V approx. 350mA for 350mW
Standby (both bands)	approx. 85mA
Standby (one band)	approx. 50mA
Battery save	approx. 25mA
Auto power off	approx. 5mA
Dimensions	57 x 138 x 27.5 (Without power pack and protrusion) 63 x 155 x 31.5mm (with power pack)
Weight	350g (with power pack, antenna and belt clip)
Operating temperature	-10 to +55°C
Ground	Negative ground
Receiver	
Circuitry design	Double conversion superhet
Intermediate frequencies	1st 38.9MHz, 2nd 455kHz (v.h.f.) 1st 45.1MHz, 2nd 455kHz (u.h.f.)
Sensitivity	
Low band (144 to 146MHz)	Better than -16dBμ
High band (430 to 439.995MHz)	Better than -15dBμ
Signal to noise ratio	30dB or better for 1μV
Squelch sensitivity	Better than 0.1μV
Audio output power	100mW @ 10% distortion into 8Ω
Transmitter	
Frequency coverage	144 to 145.995MHz & 430 to 439.995
Power output	
Using 13.8V d.c. (external)	Approx. 5W v.h.f./u.h.f.
Using 9.6V d.c. (internal NiCad)	Approx. 4.5W v.h.f./u.h.f.
Using 7.2V d.c. (internal NiCad)	Approx 3.5 v.h.f., and 3W u.h.f
Using 4.8V d.c. (internal NiCad)	Approx. 1.5 v.h.f., and 1W u.h.f
Modulation	Variable reactance
Maximum deviation	±5kHz
Spurious signal ratio	not more than -60dB

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

Thanks for letting me see a copy of Rob Mannion's review on the DJ-G5 transceiver and providing the opportunity to comment. I'm pleased he liked it overall, and I FAXed the factory in Japan about the criticism of the front-end selectivity. They pointed out that the rig tested was a pre-production sample displayed at the Friedrichshafen Hamfest and production models would have narrower selectivity to give an improvement.

I would also like to mention the wideband receive facilities between 108 and 137MHz for Airband, and 130 to 174MHz n.b.f.m. and 420 to 470MHz n.b.f.m. **G6XYU**

It's Ray Fautley G3ASG's turn in the workshop this month and he says it's possible to get two 3-element h.f. beams in the attic!.

Antenn

You don't really mean two beams in the attic?" Yes, I do! But no, you can't rotate them because they're fixed wire beams.

However, they're still 3-element beam antennas. So, how can this be possible?

Let's start by defining the classic 3-element beam antenna. It has a driven element, a reflector and a director with a spacing of between 0.1 and 0.3 wavelength between the elements.

The most critical dimension is 9m. If you can get 9m in one direction, that is to accommodate the antennas with 0.1 wavelength spacing, you're there!

The various elements can be bent so their ends drop vertically without much loss if you can't get the whole element in a straight line. The important bit is to get the centre of all the elements on the centre line of the attic space.

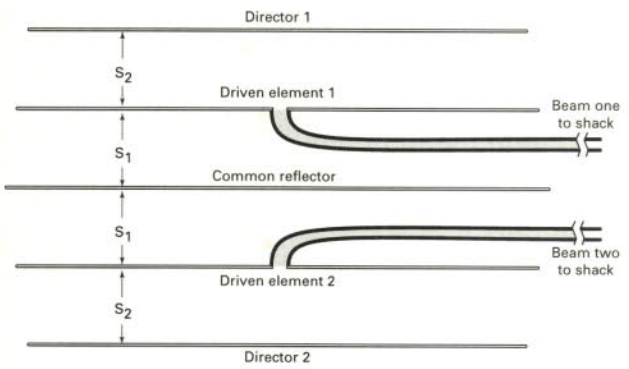


Fig. 1: Two beams, 'firing' in opposite directions can be arranged to fit in the roofspace.

Probably the most popular types have a spacing of 0.1 wavelength between the driven element and the director, and a spacing of 0.15 wavelength between driven element and reflector. This means that for 14MHz, elements about 10 metres long are needed.

If the spacing used is 0.1 wavelength for both director and reflector, the director-to-reflector distance will be about 4.25m. So, have you got an area in your attic space of 12x4.5m?

If you have an area of 12x4.5m available, you can fit one beam. Depending on the band chosen, for two beams you might need about 12x9m.

The general layout is shown in **Fig. 1**. You may think that the antenna measurements might be a bit bigger than the average loft space. But fear not!

Full Area

I'll assume, for simplicity of design, that you have the full area of 12x9m available. But if, for instance you can get the width of the elements in the attic space, but the front-to-back distance is a little short, then just space the elements as shown in **Fig. 2** .

In the diagram of **Fig. 2** the maximum front-to-back distance is x metres. As a compromise the element spacing is x/4. While not ideal it will allow a fair amount of signal out and back in again.

The one drawback of the whole scheme may well be that as the orientation of the attic is fixed (unless you are able to rotate the building!). So also are the direction of maximum radiation of the two antennas. Another limitation is that the antennas must point in exactly opposite directions.

That's the gloomy bit over! And if the limitations haven't put you off, I'll get on with the description of the whole set-up.

The method used to reduce space is to use a common reflector for both beams, as in Fig. 1. Folded dipoles made from 300Ω twin feeder are used for the two driven elements as shown in **Fig. 3**.

Cutting one of the two wires in the exact centre of the twin feeder element allows connection of the random length feeder to the shack. This feeder should ideally also be 300Ω twin. I've shown an enlargement of the centre connection in **Fig. 4.**

Practically any type of copper wire, single, stranded, bare, enamelled or insulated can be used for the common reflector and the two directors. A suitable source of copper wire is that rescued from flat cable designed for mains wiring.

The wire elements are simply stretched taught across the attic space, and fixed to the roof supporting timbers. I find furniture staples or even drawing pins convenient for pinning the elements up. Find the exact centre of all the element lengths and ensure that they are on the line of the attic.

Your attic may not be wide enough to accommodate the whole length of the elements,. This is no real problem, just let the free ends dangle vertically downwards.

But do try to keep them as far away from other objects as possible. Especially if that object is made of metal.

Construction stages

To help, I'll list the construction details in stages below:

1. Measure the attic area available where roof timbers could be used to support the antennas. Remember that **all** the elements must be in the same horizontal plane.

2. On a piece of paper, draw this rectangular area. This will be the plane for the elements of the two beams.

3. Draw a nominal centre line in each direction of the rectangle.

4. Whatever dimension 'X' happens to be (as long as it's not too much shorter than 9m) divide it into four and draw in the five elements.

'5. Cut two 10.01m lengths of copper wire for the two directors and mark (with tape) the centre of each.

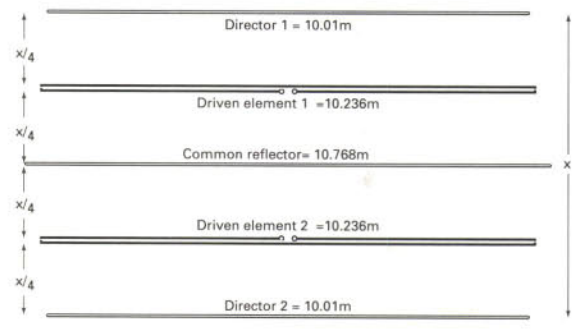


Fig. 2: Each driven element takes this general layout. See Fig. 4 for details of the centre

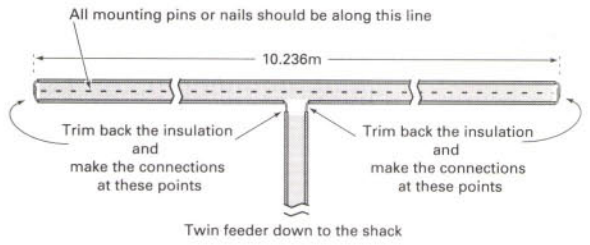


Fig. 3: If you have enough space for the width, but not the front-to-back dimension, just divide the distance (x) by four.

6. Fix the two directors along roof timbers (if available) at the attic ends, ensuring that the centre of each director, is on the attic centre line . If there are no timbers available just where you want them, fix the centre of one wire to the centre of the wall or whatever is available. Stretch each side from the centre and fix the two ends. Don't worry about insulating from the wall or from timbers, as if it's dry (and it ought to be in the attic!) there should be no problems. Repeat for the other end of the attic with the second directors.

7. Cut two 10.236m lengths of 300Ω twin feeder for the two driven elements.

8. Bare the wires at the ends of each of the driven element lengths as in **Fig. 3**, twist them together and solder.

9. At the centre of the driven element cut through one wire only and strip off the polythene from each exposed end for 6mm, as in **Fig. 4**.

10. Repeat 8 and 9 for the other driven element.

11. Fix the two driven elements to the timbers where possible, using small nails or pins described (see **Fig. 3** for the position of any nails or pins). If the timber supports are beyond the element ends, simply tie string to the loops formed at the ends by the twisted and soldered wires to extend the physical lengths as required.

12. Again using 300Ω twin feeder, cut two lengths long enough to reach from each of the driven elements well into the shack.

13. At one end of one of the feeders, strip off the polythene insulation from both wires for about 10mm.

14. Twist one of the bare ends to one of the centre connections of the driven element, and solder.

15. Twist the other bare end of the feeder to the other centre connection, and solder.

16. Repeat 13, 14 and 15 to connect the other feeder to the centre of the other driven element.

17. Position the two antenna feeders in the attic so that they can be taken together into the shack.

18. That, completes the attic part of the job, so you can put the ladder back and shut the trap door.

19. The directions that my antennas fire are to north west and ' to the south east, but you will have to note your own for your particular orientation.

20. Finally connect one of the feeders to the balanced output of your a.t.u. (you've just got to have an a.t.u. to ensure that the impedance at the end of the feeder is transformed to a resistive 50Ω load for your transmitter) and then tune and match for zero reflected power. That's all!

To transmit to the opposite direction, just remove the feeder from the a.t.u. and replace by the other one. A refinement, and it's a useful tip, is to wire in a two pole changeover switch between the two feeders and the a.t.u. The general idea is shown in **Fig. 5**.

You can label the two switch positions with the directions (of hopefully!) maximum radiation. It is important to remember that either high voltage or high current can appear at the switch contracts, therefore only the large ceramic transmitting type switches should be used for this purpose.

Finally, if you're a tinkerer, you can adjust the lengths of the reflector and directors by using a field strength meter. With help from fellow enthusiasts you'll be able to get forward gain and front-to-back ratio to maximized for the two beams.

I've been using two such indoor beams for some eight years now with excellent results, particularly to North America (firing NW) and to the middle east (SE). With loss of directivity, they are usable on 18, 21, 24 and 28MHz providing an a.t.u. is used!

Even 7MHz operation is possible, although it's not at its best on this band. Of course, the same principle can be used to optimise operation on any of the other bands, providing the element lengths and spacings are scaled accordingly. And don't forget, you should always use an a.t.u. to get reasonable results!

PW

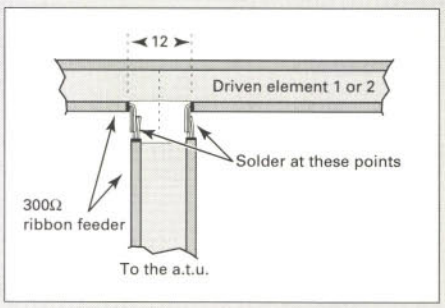


Fig. 4: Details of the connection of the feeder to the centre of each driven element.

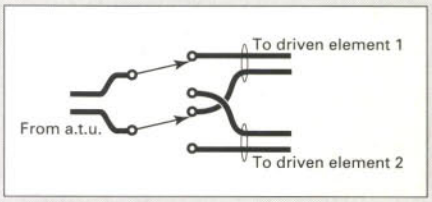


Fig. 5: Using this simple switch arrangement allows easy choice of transmitting direction. The switch used must be a good quality type though because of high r.f. voltages.

Seeing Double

Reviewing the ADI AT-200/400 144/430MHz Hand-Held Transceivers

Newly licensed Donna Vincent G7TZB shares her experiences of first-time operating and tells you what she thinks of the ADI AT-200/400 144/430MHz hand-held transceivers.

After finally passing my RAE I was keen to get on the air using G7TZB. However, I wanted to make my first QSOs using a radio that was uncomplicated and friendly towards the beginner like myself.

So, when I was offered the chance of taking a look at a pair of budget priced hand-helds in the shape of the ADI AT-200/400 transceivers, I jumped at the chance. The AT-200 is the 144MHz version with the AT-400 covering the 430MHz band.

After unpacking the AT-200 the first thing that struck me was its size. Many of the hand-helds that pass through the *PW* offices are incredibly small and although not exactly huge in size the AT-200 to me seemed larger than most. It measures 83.5 x 55 x 31mm, fits comfortably in the hand, is very robust in appearance and weighs in at 185g.

The AT-200 is supplied with dry cell battery case, belt clip, hand strap, antenna and an A5 sized 57-page user manual. A NiCad battery pack, charger and speaker microphone are offered as optional accessories and for the purpose of this review I was loaned them as well.

Positioning Of Controls

Before I tell you how I got on as a 'novice' putting the AT-200 through its paces let me firstly run through the positioning of the controls.

The top panel consists of the **Power/volume** switch, **Squelch** control and the **Rotary channel selector.** Also situated on the top are the **External Speaker Jack 'S,'** which is designed for connnection of a microphone/speaker or a head set with a push-to-talk (p.t.t.).

There's also an **External Microphone Jack 'M'** for connecting a microphone speaker head set with p.t.t. Finally, there's the all important antenna jack and the transmission/battery indicator light.

The front panel houses the function controls in the form of a 16 push-button keypad. Each of the buttons are dual function and can be operated in conjunction with using the **Function** button which is situated on the left-hand side panel of the unit.

Also on the front panel are the **Lamp**, **Call** and **Squelch** defeat controls. These are placed to the left of the display panel and the built-in condenser microphone.

Once I had familiarised myself with the basic functions, charged the NiCad pack and installed the antenna, it was time to attempt my first QSO.

Limited Experience

As I had a limited experience of QSOs being conducted, I was fairly nervous and apprehensive about putting out my first CQ call. I'd already had a 'staged' contact with **Kevin G7TZC** in the *PW* Office car park upon receiving the AT-200. However, this was really just to make sure that I didn't 'chicken-out' and to ensure that I had at least one entry in my logbook!

Prior to taking G7TZB on air I spent some time listening to other amateurs in order to familiarise myself on the correct operating procedures. It's all very well reading about how to do it, but actually going on air is another thing.

I'd been advised to make my initial contacts using either the local repeater, in my case GB3SC, or if that failed the calling channel, 145.50MHz. This I was told was a guaranteed way of ensuring I'd make a contact, thus enabling me to then move onto a full QSO.

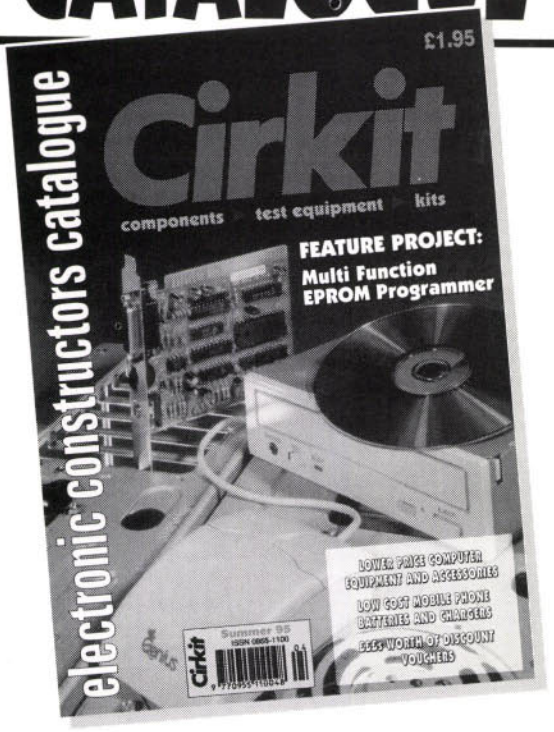
The **Call** button when depressed displays the calling channel frequency. When supplied, the AT-200 has the calling channel set to a factory default, so before I could continue I had to re-program this.

Changing the stored frequency in the call memory is easily done by carrying out four simple steps. First you need to change the displayed frequency to the desired one, in this case 145.50MHz, using either the numeral buttons on the keypad or the **Rotary channel selector**.

Next press the ***/MR/ENT** button while pressing the **Function** button, you'll see 'M' in the display window, now press the **Call** button and you'll hear a long beep which indicates that the stored call frequency has been changed. Finally press the ***/MR/ENT** button again to return to the dial frequency mode.

In order to be ready for repeater operation I wanted to have the frequency of GB3SC stored in the memory of the AT-200. The procedure for doing this was slightly more complicated than

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

£1.95 + 30p p&p

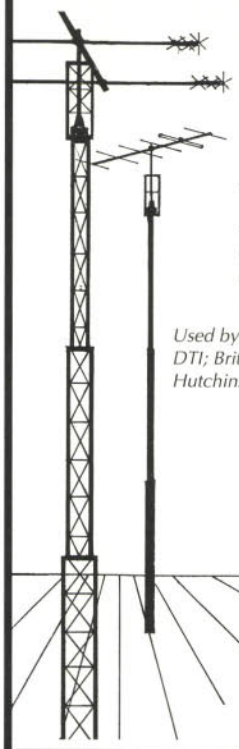
- Feature project for an EPROM programmer
- New 20MHz 'scope from Leader, training systems from Flight and an extended range of mobile phone batteries and accessories from Uniross
- Latest addition from Velleman kits including a video digitiser card
- 280 pages, 26 sections, over 4000 products from some of the worlds finest manufactures and suppliers
- Available at most large newsagents, from 13th April, or directly from Cirkit
- **Send for your copy today!**

Cirkit

Access VISA

Cirkit Distribution Ltd
Park Lane · Broxbourne · Hertfordshire · EN10 7NQ
Telephone: 01992 448899 · Fax: 01992 471314

ALTRON TOWERS AND MASTS QUALITY AT A GOOD PRICE



- ★ Telescopic, tiltover
- ★ Fixed
- ★ Static, mobile
- ★ 4.5m and 3m section modules for low retracted height
- ★ Fully galvanised to BS729

Over 50 models available from 3m – 30m telescopic and 60m fixed including the popular and proven SM30 and CM35 masts. Design windloads based on CP3 CHAP V pt 11 1972 (38 m/s minimum 85 mph) and BS8100 1986.

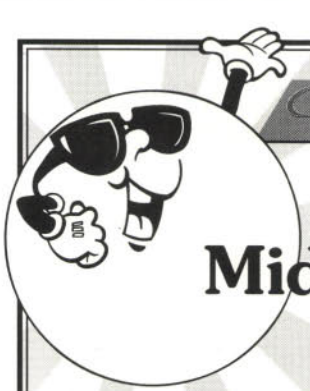
Used by such professional bodies as: BT; Home Office; DTI; British Aerospace; British Gas; the Police; Hutchinson Telecommunication; Motorolla and Marconi.

Also available are the highly anti-corrosive, precision manufactured strong, portable ALI masts and towers.

AQ6-20 'SPACE SAVER'
compact 4 bander with 2, 3 or 4 elements. 6, 10, 15 & 20m.
• Unique fully sealed coils • Hi 'Q' close coupled capacity hat loaded yagi with optimised performance • Ideal for small spaces • Full specification sheet available.
• 2 Ele **£161** • 3 Ele **£236**
• 4 Ele **£310**

Send large SAE for full details or phone for quote.

ALTRON COMMUNICATIONS EQUIPMENT LTD
UNIT 1, PLOT 20, CROSS HANDS BUSINESS PARK, CROSS HANDS DYFED, S. WALES, SA14 6RE
Tel. 0269 831431 Fax 0269 845348



Cricklewood Electronics

Mid-Summer Madness

Our catalogue WAS ~~£2.50~~

NOW FREE only the cost of a stamp or a phone call

LARGE RANGE OF COMPONENTS AND ACCESSORIES FROM THE FAR EAST TO THE WESTERN HEMISPHERE INCLUDING TRANSISTORS, SPEAKERS, TOOLS, TEST EQUIPMENT AND MUCH, MUCH MORE

INC. £30 WORTH OF VOUCHERS

THINK COMPONENTS - THINK CRICKLEWOOD

Please send me a copy of the 1995 Cricklewood Catalogue.
Name.....
Address.....
.....
..... PW

Cricklewood Electronics Ltd, 40-42 Cricklewood Broadway, London NW2 3ET. Tel: 0181-450 0995 Fax: 0181-208 1441

setting the call frequency as you have to remember to set the repeater shift direction of the transmit frequency. However, after several attempts of reading and re-reading the manual I managed it.

Initial Problems

With all the preparations done I was now truly ready to call CQ. I did and.... nothing happened! Not one to be disheartened I tried again and again but still nobody came back to me.

I sought advice and the verdict I got was that either the supplied antenna was not very effective and could in fact be 'deaf' on transmit or that the location of my QTH could be the problem. This was puzzling to me as certain signals I'd been listening to were very strong indeed, according to the AT-200's built-in S-meter and r.f. output indicator.

Tex G1TEX came to my rescue and kindly built me an end-fed 1/2 wave antenna to try out. With my new antenna installed I arranged a QSO with G7TZC on the calling channel to see if I could now make a contact.

I tried numerous times to return G7TZC's calls without success. Again I sought help and without too much difficulty the problem was soon identified.

I had inadvertently set a shift direction on the calling channel which meant that every time I pressed the p.t.t. I was transmitting to a beacon (luckily not outside my licence conditions). It was no wonder none of my CQ calls were being answered. With the problem identified it wasn't long before I was up and running and on the air.

To The Test

With the initial problems solved I was now in a position to really put the AT-200 to the test. So I did!

The AT-200 is capable of operating at three different power levels. These are defined as low, middle and high. Low power gives the user an output of 350mW, middle 2.5W and high 5W. Selecting the power level required is easy and the level selected is indicated by a L, M or H on the display.

During the time that I was using the AT-200 I found that I received the best signal reports when operating in high power. Anything less and I was being told that I was very faint.

However, on several occasions I was being told that my signal was not very readable and that a considerable amount of noise was being heard often wiping my voice out completely. I was asked during several QSOs if I was using a speaker microphone to which the answer was yes. Waters & Stanton had loaned me a CMP145 speaker microphone to use with the AT-200 and this it seemed was causing the noise problem.

The CMP145 microphone was swapped for a different model, the QSO110 which improved things considerably. The only complaint I was getting now was that I needed to shout into microphone a bit more as I was still 'distant'.

Memory Banks

The ADI-200 boasts 20 memory channels which are split into two banks of ten. These can be used to store frequencies of your choice.

I decided to store, in addition to the GB3SC frequency previously mentioned, the f.m. simplex channel frequencies. The procedure for programming frequencies into memory is fairly straightforward as the manual illustrates the procedure with diagrams, which I found to be very helpful.

My reason for storing the simplex frequencies was simple. I had soon discovered it was easier to go direct to the stored frequency memory channel when moving from repeater operation to simplex working than it was to dial or direct entry the new frequency. However, doing this did mean that I had to remember which frequencies were in which memory channels!

The scanning facility on the AT-200 has two purposes. The first is to scan the whole frequency range and this is done by simply pressing the **C/VSCAN** button. You can alter the direction of scanning by pressing either the **8/REV/t** button or the **9/SHIFT/s** button.

One thing to watch out for when using the AT-200 in scanning mode is that once the rig reaches the bottom end of the frequency range the display starts to flash. This caught me out the first time and was a little unnerving, as I had seen no mention of it anywhere in the manual.

It's also possible to instruct the rig to pause during the scanning procedure. This means that when a signal is received scanning will stop for five seconds or until the signal disappears, whichever happens first.

There's also a busy scan function which means scanning stops when a signal is received but resumes four or five seconds after the signal disappears. To use these functions you should press the **7/+/-/BS** button on the keypad.

The second way of scanning frequencies with the AT-200 is to scan through the memory channels. This is done using the **D/MSCAN** button.

Other Functions

As well as the normal functions of being able to change channel step size, battery save functions, muting the buzzer, p.t.t. lock, etc., the AT-200 has some other interesting features. These include dual-watch operation, optional tone squelch control and pager and code squelch.

The dual-watch operation enables the user to monitor two different frequencies and the AT-200 is capable of three types of dual-watch. The function works by switching between the two previously selected frequencies every three seconds.

I found the dual-watch function to be particularly useful once I'd worked out which frequencies were the most occupied. It turned out on several occasions that these were usually the repeater channel and the calling channel. By setting the dual-watch for these it meant that I very rarely missed a chance of hearing a CQ call and thus having a QSO.

The tone squelch operation is not available as standard on the AT-200 but can be installed should you wish to use the unit in this way. Although I didn't actually use the pager and code squelch feature after reading the description of how to use it in the manual I can see that it could prove be very useful. The pager and code squelch feature is designed to be used to either page one specific station or to page several stations in a group.

The AT-400

By now you're probably wondering when the AT-400 is to get a mention in this article, well here it is! The AT-400 is identical to the AT-200 in every way other than the model number printed on the front and of course the fact that the AT-400 covers the 430MHz band.

As I had spent a considerable length of time using the AT-200 it was less daunting for me when I ventured into operation on the 430MHz band with the AT-400. Owing to the fact that I had experienced initial problems with the antenna and with making contacts using the AT-200 I was very surprised when I managed to raise my local 430MHz repeater and hold a successful QSO on my first attempt with no problems at all!

Upon talking to fellow amateurs it transpired that although my QTH may not be in the best location for amateur operation, the 430MHz repeater close to me is often easier to work through and gives good results. This could explain why when using the AT-400 making contacts was easier.

The only problem I experienced when using the AT-400 was that because it's identical in appearance to the AT-200 when I had both transceivers scanning for signals at the same time it became difficult to determine which radio was receiving which signals. I guess that's the price you pay for being over enthusiastic and trying to listen to two things at once!

Three Criticisms

There are only three criticisms that I have of the AT-200/400 and these are as follows. Firstly I thought that the display window was a bit on small side and very dark.

In fact I found that unless I was using the radio in extremely good lighting conditions I was forever having to switch the lamp on. And actually at one stage I had the lamp switched on permanently. (I found out how to do this by accident, you need to depress the **Function** button whilst pressing the **Lamp** button!).

Secondly I found that in several areas the manual supplied was not clear in its approach. I think this maybe is a result of the difficulties of the translation into English from Taiwanese.

As I've already mentioned, I experienced problems in programming the repeater shifts and reading the manual got me even more confused. However, my confusion may have been caused by my limited experience and in defence of the manual, the diagrams when used did help a lot.

And finally the third criticism I have is about the fact that both the AT-200 and 400 come without a NiCad battery pack and charger

supplied as standard. Personally I think this is wrong when you consider that both are advertised as being budget priced transceivers and a NiCad charger eliminates the need to continually buy batteries which could work out very expensive if you're an enthusiastic operator.

Overall Impressions

Overall I was very impressed with the AT-200/400. As a newly licensed amateur I felt that it suited my needs very well and I thoroughly enjoyed operating with it.

Once I got to grips with the AT-200/400 and all the various functions it was very easy to use and I could see that over a period of time as I became a more experienced operator it would still suit my needs.

You could say it would grow with me. The AT-400 would I think be very appealing and good investment for a Novice licensee to consider, mainly due to its simplicity.

I think that the fact that the AT-200/400 are priced at £179 and £199 respectively is very favourable. I am sure that for a beginner these prices are very reasonable making the transceivers well within reach.

Certainly, I would consider paying the prices for the rigs. The only thing that does concern me about the cost is the fact that the NiCad pack is an extra £19.95, the NiCad charger an extra £9.95 and the speaker microphones an extra £12 - £15.

I would like to see ADI launch a dual-band budget hand-held transceiver based on the same lines as the AT-200 and 400. This is because it could get expensive if you're keen to operator on both the 144 and 430MHz bands.

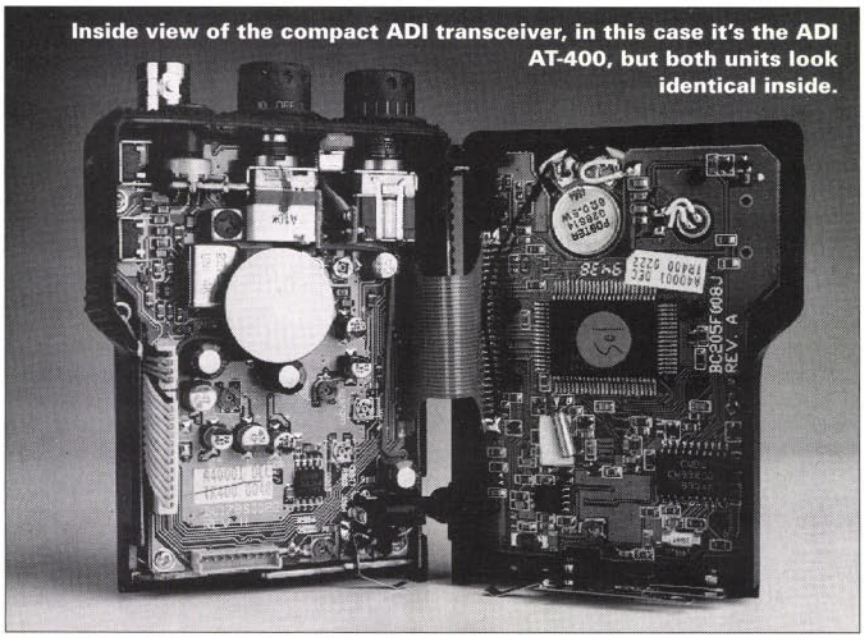
My thanks go to **Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, FAX: (01702) 205843** for the loan of the radios and to all those who helped me get on the air and into the fascinating world of amateur radio.

The only regret I have now is that I have to give the transceivers back just as I've got used to using them! **PW**

Manufacturer's Specifications

Specifications For AT-200 and AT-400. (AT-400 specifications listed separately in brackets only when different from AT-200).

AT-200 & AT-400	
General	
Frequency range:	144 to 145.995MHz (AT-400 430 to 439.995MHz)
Modulation type	F3
Microphone input impedance	600Ω
Speaker impedance	8Ω
Operating voltage range	5 to 16V d.c.
Nominal input voltage	7.2V
Current consumption transmit at 13.8V	High approx. 950mA for 5W (AT-400 aprox. 1.3A for 5W) Mid approx. 650mA for 2.5W (AT-400 approx. 950mA for 2.5W)
Current consumption at 7.2V	Hi approx. 650mA for 2W (AT-400 approx. 900mA for 2W) (Mid) approx. 650mA for 2W
Current consumption	(Low)13.8/7.2V approx. 350mA for 350mW (AT-400 approx 480mA for 350mW)
Standby	approx. 35mA (AT-400 38mA)
Battery save	approx. 13mA (AT-400 approx. 14mA)
Auto power off	approx. 5mA
Dimensions	83.5 x 55 x 31 (Without power pack and protrusion)
Weight	185g (without power pack and antenna)
Operating temperature	-10 to +55°C
Receiver	
Circuitry design	Double conversion superhet
Intermediate frequencies	1st 21.8MHz, 2nd 455kHz (AT-400 1st 23.05MHz, 2nd 455kHz)
Sensitivity	-10dBμ (For 12dB SINAD)
Signal to noise ratio	30dB or better for 1μV
Squelch sensitivity	0.1μV
Audio output power	250mW @ 10% distortion into 8Ω
Transmitter	
Frequency coverage	144 to 145.995MHz (AT-400 430 to 439.995MHz)
Output power	High 1W with CBC145 (AT-400 800mW) 2.5W with SBC145 (AT-400 2W with SBC145) 2W with RBP072/RPB120 5W with RBP120 (Mid) 2.5W with RBP072 Low 350mW
Modulation	Reactance
Maximum deviation	±5kHz
Spurious signal ratio	better than -60dB



Inside view of the compact ADI transceiver, in this case it's the ADI AT-400, but both units look identical inside.

After seeing a copy of the G7TZB review, Jeff Stanton G6XYU of Waters & Stanton Electronics sent us the following comments:

Thank you for letting me see a copy of G7TZB's review. It looks fine to me, I think Donna's produced an interesting article. Her criticisms are fair and of course some difficulties she had stem from her first experiences getting on the air. These all add to the interest.

Regarding prices, these are just about the only rigs for either band available new below £200. This is important to many amateurs on limited budgets. Purchasers can add NiCad packs and chargers later as finances allow.

Please note that the extended receive coverage of the AT200 is 130-170MHz and the AT400 420-465MHz.

Could *PW* invite comments back from new users of these transceivers or any other reviewed recently? Especially beginners.

What about recommendations of favourite rigs from readers either new or second-hand?

G6KYU

Gaining Power

Patrick Allely GW3KJW wrote this article before the radiated power restrictions on 50MHz were removed. But it still gives an insight into the enormous e.r.p. you may be unknowingly creating. Your results may suprise you!

The UK amateur licence no longer imposes any conditions concerning effective radiated power (e.r.p.) within the 50MHz band. This article was written when restrictions were in force, but I hope to show that your e.r.p. may be much higher than you think.

Very often, whilst talking to fellow amateurs on 144MHz, the question of 50MHz arose. Unfortunately I have no equipment to operate on 50MHz, but I am always interested in what happens on all amateur bands. This interest invariably led to the discussion of the pros and cons of 50MHz.

Back in the days of effective radiated power limitations, I was often told 'Oh I run about 25W to a four element beam. It works out quite well, it's surprising what can be done with low power.'

After a little mental arithmetic I might have asked 'Don't you think that is a little more than the permitted 100W e.r.p.?' The answer was always, 'No, I have very lossy coaxial feed.'

At this point I'd usually drop the subject, but I wouldn't recommend buying his 50MHz station. With his poor coaxial cable his voltage standing wave ratio (v.s.w.r.) must be horrible and his p.a. stage (transistor or valve) must be suspect.

There is a problem with many enthusiasts, in that they do not understand the concepts of e.r.p. peak envelope power (p.e.p.) and in deciBel form (dBW). These are terms so beloved by the Radiocommunications Agency in the Radio Amateurs licence, and used so nonchalantly and often inaccurately on the air.

Another requirement of our licence, is that our power is recorded in dB relative to 1W. But many amateurs I know still show their power in Watts effective, being unable to convert one system of measurement to another.

In truth it's not easy to comprehend initially that 10W output is roughly equivalent to 10dBW but 20W out is just over 13dBW, or that 1W out is 0dBW. How can 1 = 0, or that 100W of carrier power be capable of producing 400W p.e.p. or 26dBW?

Again confusion arises when calculating effective radiated power. Here the gain of the antenna, the loss in the feeder and connectors, together with the p.e.p. must all be worked out and calculated before some reasonably accurate assumption can be derived.

The procedure may seem a little complicated, but the mathematics involved are relatively simple, especially if you have access to a cheap scientific calculator. It helps your case to be able to state with confidence, your estimated e.r.p. should the gentlemen from the Radio Investigation Service come around.

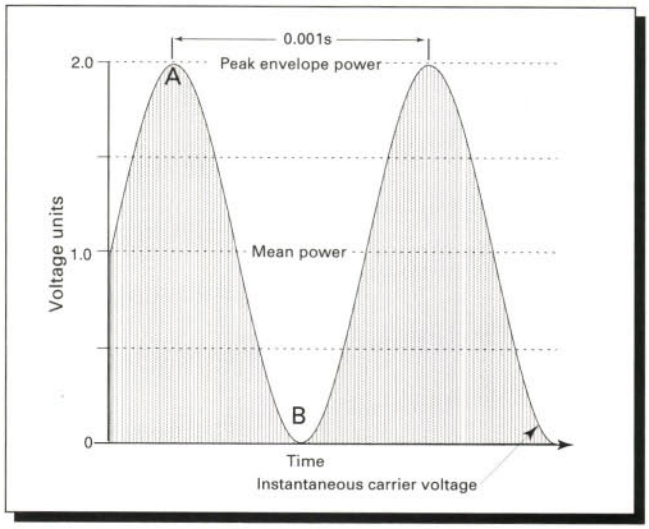


Fig. 1: The instantaneous power on a 100% modulated r.f. waveform. Peak power (four times 'mean' power) occurs at twice the voltage level of the mean or carrier level.

Down To Basics

Now, let's get down to basics and do a bit of measuring. Assume a transmitter has a carrier output of 100W and is 100% modulated by a steady tone of 1000Hz. This results in a modulation envelope such as shown in **Fig. 1**.

At one instant (at A) in the cycle the total voltage is two units corresponding to 2*2*100W (400 watts). A short time later (at B) the total voltage is 0 and so the power is 0. The transmitter is capable of delivering four times its carrier power, this is known as p.e.p. and in s.s.b. mode is being transmitted on one sideband only.

The output power can be measured on an oscilloscope. Feed a two-tone frequency oscillator into a transmitter with the output of the transmitter set to produce some known power into a dummy load.

The load power should be measured by a thermo-couple meter giving an accurate mean power reading. A portion of the r.f. signal should be fed to the vertical plates of an oscilloscope, producing a pattern. The limits of the deflection should be noted.

The mean power produced is equivalent to a voltage of half the p.e.p. value. So, if you are measuring 25W into the dummy load, the p.e.p. is 100W. Remove the two-tone oscillator and replace it with a microphone and speak normally.

The patterns displayed on the oscilloscope will change with the speech, but the peaks should not be allowed to exceed the maximum deflection of the two-tone oscillator. Exceeding this will result in 'flat topping' and distortion. Now that we know the p.e.p., it's time to convert this into the dreaded decibels (dBW).

Basic Unit

The decibel (dB) is the basic unit for measuring the difference between two sound or power levels. It's a non-linear measurement based on logarithms to the base 10. It compares with human hearing which cannot measure absolute sound levels but can detect differences in level.

Since there is no such thing as zero signal level (despite having been given reports of 5 and 0), measurement is made compared with a known power. The power level of 1W is used as the reference. Any increase (or decrease) in power measured in dBW is relative to 1W, with 1W output being 0dBW. See **Table 1** for a list of useful powers and their dBW figures.

Each time the power output is doubled, the dBW figure increases by three. So 100W corresponds to 20dBW, then 200W is 23dBW and 400W is 26dBW. It's actually

Table 1

p.e.p.	dBW	p.e.p.	dBW	p.e.p.	dBW
1	0.000	10	10.000	100	20.000
2	3.010	20	13.01	150	21.761
3	4.771	30	14.771	200	23.010
4	6.021	40	16.021	250	23.979
5	6.990	50	16.990	300	24.771
6	7.782	60	17.782	350	25.441
7	8.451	70	18.451	400	26.021
8	9.031	80	19.031		
9	9.542	90	19.543		

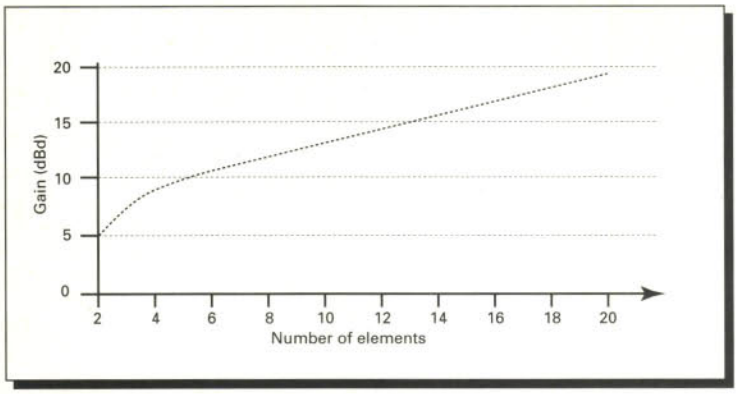


Fig. 2: The theoretical gains of Yagi antennas with various numbers of elements. In practice the gains will be a little lower than those shown here.

26.0206dBW, but who's arguing.

Working with powers below 1W gives negative, but just as valid (-dBW) readings: i.e. 0.5W is half the reference and is therefore 3dBW **down**. If you are using 0.5W p.e.p. the log book should record the power at -3dBW.

Using 100mW p.e.p. is ten times lower than the reference point and should be shown as -10dBW. It looks odd to see negative power levels, but it's just unfamiliarity with the system that causes alarm.

Using this dBW output values can make deciding which amplifier to buy easier. What are the merits of buying a 100W amplifier, or spending a lot more money to buy a 160W amplifier?

The relative difference between a 160W amplifier and a 100W one is just over 2dBW (2.041dBW). An extra 2dB might get your signal heard over the others, but is it worth the outlay? An extra one or two elements on your antenna will give you similar gain at a fraction of the cost. And it works on receive as well.

Applied To Antennas

Logarithmic gain can also be applied to antennas. The term dBi means the gain of an antenna over an isotropic antenna. This is a little confusing, because an isotropic antenna exists only in theory. It's an antenna that radiates equally in all directions, does not have any losses and is totally unaffected by external factors such as buildings, trees, etc.

A more practical measurement is the function dBd. This term is the relative gain of an antenna relative to a dipole for the same frequency. The gain can be measured by taking field strength readings at fixed points.

The graph of **Fig. 2,** shows a graph of the theoretical maximum gain that can be expected from perfect Yagi antennas. Obviously the most dramatic gains are achieved by increasing a beam from two to four elements. Thereafter the gain is roughly proportional to the number of elements.

Very few commercial antennas have optimum spacing. So, your average 16-ele Yagi will be unlikely to achieve the theoretical gain of 16.25dBd, but it will probably be within 2dB of it.

The formula for calculating the real e.r.p. (in Watts) is to take the inverse-log of one tenth of (antenna gain - feeder loss) multiplied by the p.e.p.(in Watts). Using this method returns the logarithm to linear representation.

An Example

A practical example is more helpful. Let us suppose I have an antenna with a gain of 12dBd, about 15m of coaxial cable (RG-215) terminated with good quality 50Ω plugs ('N'-type) and an output of 400W p.e.p.

To be cautious I'd suggest that the length of cable has a loss of 0.3dB and the loss through the connectors is 0.2dB, a total loss of 0.5dB. The formula (the terms 'inv-log' below means inverse logarithm) would then be:-

E.r.p. = inv-log ((12dB - 0.5dB)/10) * 400
= inv-log ((11.5)/10) * 400
= inv-log (1.15) * 400
= 14.125378 x 400
= 5.650kW

Quite a startling high result!

An Average Station

But back to an 'average' station, 25W to a 4-ele beam, the estimated e.r.p. is a lot more than 100W. A 4-ele Yagi constructed correctly could have a gain as much as 9dBd (See **Fig. 2**). It is unlikely to have this gain and probably is more like 8dBd. The coaxial cable loss despite protestations in unlikely to be more than 0.2dB and the loss through the connectors is about another 0.2dB. Using the formula we get an e.r.p. = 143.86W.

Let's take the e.r.p. figure a little further, and consider the effect your transmitter may have on your neighbour's reception of TV or radio broadcast signals. Many TV signals are relatively low level by the time they reach the receiving antenna. They may have to be amplified via r.f. stages not designed to cope with the presence of high field strength signals generated nearby.

Receiver Overload

Overloading of the TV receiver is the bane of any amateur. More especially if the amateur knows his station has a clean signal, is operating within permitted power levels, and has done everything to avoid TVI and BCI.

The measurement of signal level at any particular spot is termed field strength, and the following formula is used to calculate this:

$$e\ (V/m) = \frac{7.02 * \sqrt{e.r.p.}}{d}$$

where e denotes peak field strength in volts per metre (V/m)
d denotes distance from transmitter in metres.

Playing with this formula brings forth some highly interesting if somewhat disconcerting results. For example my antenna is situated some 50m away from a neighbour's house. On 144MHz I can run 26dbW or 400W p.e.p. to an antenna array with an overall gain of 14dBd.

Under these conditions I would have an e.r.p. of approximately 10kW. From the formula I calculate that I would create a 144MHz signal of about 14V/m.

Now our local TV transmitter is situated 33km away and runs 3.5kW e.r.p. It's field strength at my neighbours house is, at best, a derisory 12mV/m. Or less than 0.1% of my signal. Not much comparison is there?

(**Editorial note:** *Lower power TV transmitters usually have directive antennas, to serve specific areas and reduce 'out of area' interference. The actual signal strength could be even less than Patrick has indicated*)

I hope that this wander around the mathematical formulae demonstrates the usefulness of such things, and that they are not something nasty to be studied simply to pass the RAE and then forgotten for evermore.

PW

The decibel (dB) is the basic unit for measuring the ratio between two power levels. It is a non-linear measurement based on logarithms (using the base 10 as opposed to the base 'e'). The original unit (the Bel) is rarely used (1.0B is a ratio of 10:1, 2.0B is 100:1, etc.).

To make things 'easier' the Bel was multiplied by 10 to make the decibel (dB). Now we have 10.0dB =10:1, 20.0dB = 100:1, etc.

The easy way to calculate a power gain is to use the formula
$dB = 10*\log(P1/P2)$
where P1 and P2 are the two levels of power, P1 being the larger.

Incidentally when measuring voltage gain (in dB) the formula is:
$dB = 20\log E1/E2$. Where E1 and E2 are the two measured levels.

Other values may be found by adding known dB values together. For example to find out what 27W is with reference to 1W (dBW) add the value for 9W and 3W together. This gives an answer of 9.542+4.771 = 14.313dBW (9*3=27).

IAN POOLE G3YWX

EQUIPMENT SPECIFICATIONS

Ian Poole G3YWX 'specifies' some advice on what to look out for when buying a second-hand radio.

Ian Poole G3YWX says if you like the feel of a second-hand radio and can see no major problems, then its probably a good buy.

For a number of months I have been looking at the technical specifications of receivers. Before I move away from receivers onto transmitters and other pieces of equipment, I thought it would be worth taking a more practical look at buying a receiver. In particular those points to look for when buying a second-hand set.

First Decisions

One of the first decisions to be made when considering buying a receiver is whether to buy the set from a dealer or from one of the many advertisements in the magazines. This is a personal decision, but obviously with a dealer there is usually a guarantee.

For a private sale, when you have parted with your hard earned cash there won't be any after sales service. Having said this, most people are honest and comparatively few people experience major problems.

However, small problems can be annoying. When you buy a set from a dealer he should fix them. The same is not true of a private sale. Whilst there is better after sales service from a dealer, it obviously costs more.

Take A While

When looking around for a second-hand set, it's worth taking a little while to see what is on the market and what the going prices are. Also make a list of the facilities which you need and the specification the set should meet - filter bandwidths, frequency coverage, image rejection and so forth.

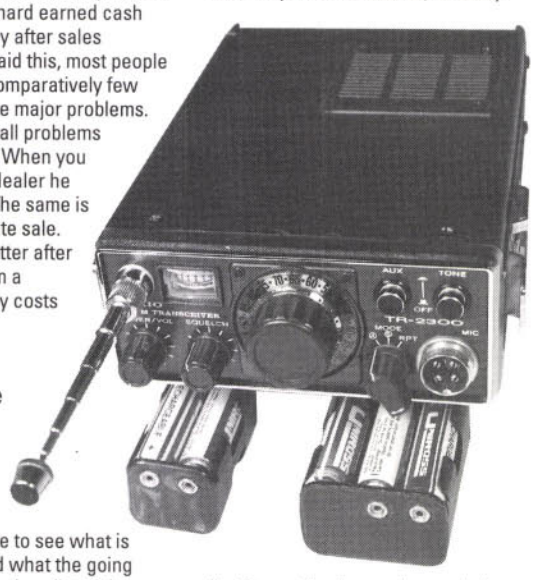
Often, back issues of magazines will have useful reviews. It's also worth asking friends to see if they have ever used any of the pieces of gear you may be considering. They may be able to tell you of any pitfalls before you buy.

When actually going to look at the set try to take someone else with you. This can sometimes help you not to make a rash decision, and the friend may help you to remember the right questions to ask.

The Specifications

You won't be able to give the set you are thinking of buying a complete test to ensure that it meets its specification in every way. You can apply much of the advice given in the car magazines about buying a second-hand car.

Look at all the tell-tale signs, and you should be able to see if you are taking a risk. For example, if the owner lives in a house that is obviously well maintained, it's likely



that the set has been given a similar degree of care. Naturally the reverse is also usually true.

Another point to note is whether the set has been exposed to high levels of cigarette smoke. Over a long period of time, a residue can build up on the switches and controls from the cigarettes and this can lead to poor contacts on the switches and badly functioning volume controls.

Also look at whether the set has been kept in a damp atmosphere. This could also result in problems either now or later.

Trying It Out

It's well worth taking your time to try out the equipment. First of all see if you like the feel of the set. Make sure that you can fit it up to a good antenna and try out as many of the functions as possible.

Look for any tell-tale signs. Does it overload on strong signals or are there none at all? Do the controls feel right, and are any of them stiff.

Look for wear especially on the front panel around the tuning knob. Most sets will show some signs of wear but significant levels mean the set has been very well used.

It's always worth looking at the backlash in the tuning. To do this tune the set into a broadcast station with the beat frequency oscillator (b.f.o.) on (there are plenty at the top-end of 40m band between 7.1 and 7.3MHz) and then tune it back the other way.

A perfect set should immediately tune back in line with the tuning control. In many cases a little mechanical slack has to be taken up before the tuning on the set changes and the beat note is heard to change. This type of problem is most pronounced on older non-synthesised sets because they have a mechanical tuning system.

All the controls should work properly. But switches are a particular problem.

Wave-change switches on older sets can give problems, but even the keypad switches on more modern sets can fail and they are not always easy to replace or clean. Try them all out.

Wave-change switches should be tried to make sure they operate correctly. Tune the set into a broadcast station then move the switch returning it to the original band. The station should remain in tune.

Drift can also be a problem, especially on the non-synthesised sets. Fortunately though this is quite easy to assess.

Once the set has warmed up (this can take an hour in some instances particularly when a valve set is concerned), tune the set in so that it's zero beat with a broadcast station. Leave it for a few minutes and then any drift will become obvious.

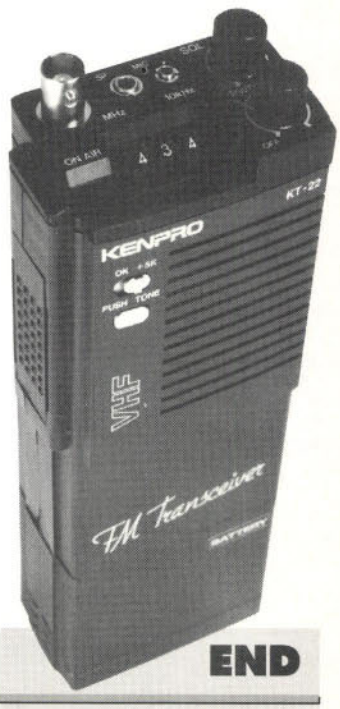
Not Perfect

No second-hand set is likely to be perfect. However, when assessing it, ensure you have enough time to fully get the feel of it.

Ask yourself if any of the problems are significant and are they likely to interfere with your enjoyment of the set. Are they the type of problems which would be annoying during a long time of listening.

If you like the feel of the set, and there are no major problems then it is probably right to buy it. However, do not be rushed into a decision by an over enthusiastic seller.

That's all for this month so, cheerio for now. Next month I'll start unravelling the mysteries surrounding transmitter specifications.

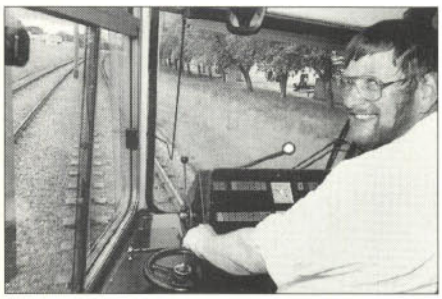


END

Practical Wireless Goes Dutch!

In June, the Editor Rob Mannion G3XFD, accepted a long standing invitation to visit Holland to give talks on behalf of PW. Rob travelled via the Channel Tunnel and also achieved a lifelong ambition by driving a tram in the streets of Rotterdam!

Tram Driver-Instructor Hank van der Hoek, G3XFD, Frank PA3GDV and Fritz Smid PA3GKA. Both Frank and Rob drove Tram 832, but Fritz decided it was better to concentrate on photography when his turn came!



Tram mobile G3XFD. Fortunately for Rob, the tram is equipped for 'left hand' drive. Unfortunately, the microphone is not for amateur radio use, but for passenger information announcements!

The friendly bunch who hide under sand dunes! Peter Visser (centre front) and friends at the Second World War bunkers which provide amazingly secure facilities for the PI4CC contest group's amateur radio station.

***Practical Wireless* has quite a following in Europe, particularly in Holland and Belgium. And it becomes fairly obvious how many of our friends from the Low Countries are interested in the British scene should you meet them at the Picketts Lock show (for just one example).**

In fact, this year's show brought even more visitors from Holland and Belgium. They arrived by train having travelled via the Channel Tunnel.

It was one of our keenest readers and supporters in Holland who invited me to travel over to be a guest of the Amateur Radio community in the Rotterdam area. **Peter Visser**, a keen s.w.l. and supporter of both *PW* and *Short Wave Magazine*, spent weeks organising the trip and many hours telephoning the office to arrange the final details. Peter even went to the very generous extent of airmailing some Edam cheese to the *PW* office!

So, on Tuesday June 13 I headed for Kent, arriving at Cheriton (near Folkestone) for the Channel Tunnel at 5.45pm. Less than an hour later I was driving on the motorway heading out of Calais for the Belgian border and onwards to Holland!

The trip through the Tunnel by the way (if you're one of the many people who say they're not too keen on the idea) is very uncomplicated, quick and better than any ferry. You don't even realise you're in the tunnel! In fact, the average time in the tunnel itself is only 18 minutes.

Bands Quiet

I was surprised at how quiet 144MHz was in France, but my AKD2000 144MHz f.m. transceiver was busy once I got into Belgium and I had several QSOs. And, although of course I didn't actually transmit on the band, I listened on 70MHz with my AKD4000 rig.

Near to Calais and onwards to Belgium, I heard activity on 70MHz (yes, you've guessed...it **was** Packet!). But I didn't hear anything else on 70MHz until I was near the Hook of Holland later on in the week. I think it would have been interesting to have had a crossband QSO (144 to 70MHz).

My Dutch friends were listening out for me as I drove towards Rotterdam. **Frank Brouwer PA3GDW**, the VERON (the Dutch National Society) representative for Gouda, near where I was staying, was alerted by the other stations I worked on 144MHz. Frank sat on the mobile calling channel until I was close enough to Rotterdam to work him.

Once they had got me heading in the right direction, I followed my detailed maps (kindly sent by Peter Visser) and headed for a Hotel in the centre of Rotterdam. Here, I met Peter and Frank PA3GDW, for refreshments before heading to my Hotel in the attractive little town of Haarstrecht.

My Dutch friends had given me a delightful welcome but I was fully aware that it was nearly 1am! I knew Frank had to drive back home and then be up for work later in the morning after guiding me to my hotel.

Needless to say, once installed in the Hotel, I slept extremely well. In the morning I found that it was next to a delightful canal, with a quaint (and very busy) lifting bridge. In fact, the hotel was called 'The Hotel Over de Brug' ('over the bridge').

I was told, over a delightful Dutch breakfast, that the bridge was raised over 9,000 times in 1994. And this is on a canal that only takes pleasure traffic!

Amsterdam Visit

During Wednesday afternoon, Peter Visser and I travelled by train to Amsterdam to visit **Artur Bauer PA0AOB**. Artur has a vast collection of **fully operational** Second World War German equipment (including airborne and submarine radar!).

Artur made us both very welcome, and amongst many other things I saw my first working demonstration of a German Hellescreiber machine. Artur sat down at the machine and transmitted a test signal for me, and I was also given sample of received message tape.

It was fascinating to see the Hellescreiber working. This amazing example of German technology is (in my opinion) in a class of its own, and I think of them as being a hybrid somewhere between a FAX machine and teleprinter. (The final print-out is in the form a strip with a facscimile of the transmitted words).

During our afternoon's visit Artur also showed Peter and I his vast collection of vintage valves and other items. These included the airborne radar unit and some incredibly well engineered (in working condition of course) transmitters and receivers.

Visitors need at least two days to see everything in Artur's collection, but we saw a few examples. Among these was the famous German Kölne communications receiver, a wartime broadcast standard reel-to-reel tape recorder (with original acetate tape) and an amazing Morse training machine employing optical records.

The 'optical records' revolved on a variable speed turntable (the Morse elements were in white and a tracking 'playback' head carried the light source and photocell). It was an amazing

piece of equipment, looking somewhat like a high quality radiogram...complete with wooden roll-top shutter like a desk!

Unfortunately, we couldn't stay for long and soon, after thanking Artur for being a wonderful host it was time to head back to meet Frank PA3GDV again. I had a busy schedule and we were all heading for another amazing Dutch Amateur Radio experience...and this one is buried under the sand dunes at the Hook of Holland.

Underground Amateur Radio

Bearing in mind the wartime experiences of many Dutch radio operators, it's surprising that the term 'underground radio' brings a wry grin. But in the case of PI4CC, the Contest Group Vlaardingen, it does because **they are underground**!

If you ever travel into Holland by ferry via the Hook of Holland, take a close look at the wide expanse of sand dunes off the port side (left) as your ferry enters harbour. Buried there, are a series of Dutch and German (built before and during the Second World War) bunkers, control rooms and gun emplacements.

It's in part of the extraordinary complex that the PI4CC group have their station. They have room for a huge antenna system and even had a 7MHz cubical-quad erected at one time!

Like a miniature version of the famous Maginot Line, the complex had its own narrow gauge railway, hospital and intercommunication tunnels. Although it was nearly dark when I arrived with Peter, Frank and **Fritz Smid PA3GKA,** we had a really good look around.

I suggest that if you're ever in Holland, you visit PI4CC. It's quite an experience!

It was late again and reluctantly, we left for my temporary home, where I arrived back at 1am! But next day (later in the morning really) my Dutch hosts were to excell themselves in their hospitality by granting me a long held wish to drive a Dutch tram!

Tram Mobile

We went 'tram mobile' mainly thanks to Frank Brouwer PA3GDV. He arranged for family friend **Fritz Zonneveld**, the curator of the Rotterdam tramways museum, to open his 'personal' museum in the central depot as the main museum is only open on Saturdays.

After seeing round the museum, we were introduced to our tram 'instructor' **Hank van der Hoek** before being taken around the depot. It was during our tour we met our innocent 'victim' in the form of Tram 832. She was going to suffer at the hands of three radio amateurs!

Peter Visser (wisely perhaps) didn't join us in the tram training session, but took photographs instead. And Fritz PA3GKA decided not to actually risk driving the tram when it was his turn. But he managed to take a photograph of me driving which I shall be proud of for many years.

My expression in the photograph fully reflects my pleasure I can assure you! I know I can never drive the Flying Scotsman, but this was just as good, even at 30kph (indicated on the speedometer).

After safely travelling up and down a city centre route (with a section of private track for training) we left some puzzled intending passengers behind before heading back to the depot. Frank and I were truly grateful for Hank's help, and the tremendous goodwill of RET (Rotterdam Electric Tramways).

After a late lunch, we were to be the guests of the Nedlloyd Shipping Company, who Peter Visser worked for before his retirement. We were to visit the MV *Nedlloyd Africa* , a giant new container ship of 266 metres length carrying 3000 full size containers, be given a grand tour, before being entertained to a marvellous buffet style evening meal.

Once on board the *Nedlloyd Africa* (climbing the gangway up her side was like tackling a mountainside!) I was in for another surprise. This time it came from the Dutch Surplus Radio Society.

May 1945 Issue

I met many new friends on the bridge of MV *Nedlloyd Africa*. They presented me with a copy of May 1945 issue of *Practical Wireless*.

My new friends said the presentation was a fitting tribute to the magazine. Especially as it was also the first copy of *PW* to be available in Holland after the end of the Second World War, just over 50 years ago. Needless to say, their gift has joined the other tributes to *PW*, and is now mounted in my office.

The party continued and we didn't leave until almost midnight, but all the time the ship was being unloaded and re-loaded for her quick turn round for the Far East. Perhaps the most impressive thing about the ship was that she only had a crew of 16!

Friday Talk

Friday was the day I was due to give my final talk, as guest of the Dordrecht (Rotterdam) VERON district. The talk wasn't due to start until late, but many of the members were fascinated to see my AKD rigs and when I told them of the benefits of 70MHz for mobile working I think they were keen to get the band too!

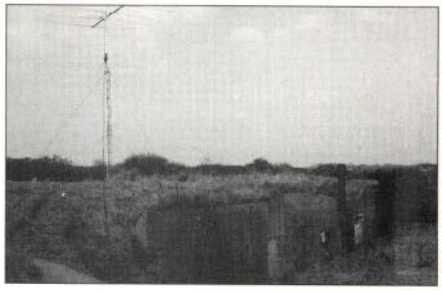
After they'd welcomed me, and I had given the talk, The Dordrecht Chairman **Tjakko Abee** presented me with some Dutch cheeses to take home! The final part of the evening flashed by, but I didn't leave until after midnight when Frank PA3GD and Peter guided me to the motorway before wishing me a good journey.

I was back at Calais in time to catch the 5.15am 'Le Shuttle' back through the Channel Tunnel to Folkestone and was home in Dorset by 8am. I was very tired from the journey, but delighted by the Dutch hospitality.

I can only suggest that if you can, you also visit Holland and try their legendary hospitality and explore the delightful scenery. The Dutch people live in a far more compact country than the UK, and it's interesting to see how they relate to neighbours. And it's not uncommon to see 4-element h.f. beams sprouting from the roof of terraced houses!

There's one final bonus too. Everyone in Holland seems to speak English (just as well for lazy British linguists!) although they're delighted if you try to speak their language! Thanks Peter, Frank and Fritz and other friends...I'm looking forward to my next trip!

PW



Underneath this unimpressive looking mound there lies a secret - in the form of PI4CC. The group's 50MHz beam antenna is one of the few clues to what lies hidden beneath.

Members of the Dutch Radio Surplus Group presenting G3XFD with a specially mounted May 1945 issue of *Practical Wireless* (the first issue of *PW* available in Holland after the Second World War) during a ceremony on the bridge of Nedlloyd's MV *Nedlloyd Africa*.

Artur Bauer PA0AOB at the keyboard of his Second World War Helleschreiber machine, part of his collection kept at his home near Amsterdam. (All Artur's large collection of vintage German wartime equipment is fully operational).

Valve & Vintage

As previously announced, the PW vintage 'wireless shop' opens under new management this month. Phil Cadman G4JCP is the first of our new team of three regular authors who will take it in turn to 'man' the shop on a quarterly basis, each presenting their own speciality and interests.

It all started when the Editor asked "So, how would you like to write 'Valve and Vintage' once a quarter then"? I only hesitated a little before agreeing and here I am, the youngest and least experienced of the new team.

You may be stuck with me for some time. So, I thought I'd better tell you a little about myself and answer the question on everyone's lips - 'who is this guy Cadman?'

Well, I was born in the mid 1950s and I first showed an interest in electricity when I was four years old. A man came to rewire our house and apparently I followed him around. I assume this was because I was attracted to the 'pretty coloured wire' he was using and not because I thought he was my father!

The attraction to bits of wire resurfaced a couple of years later when another man came to fix our ancient Pye console television. I still remember the brightly-coloured wires that snaked from the vertically mounted chassis and on to the scan coils.

When I was old enough my parents gave me a 'Magnet-tricity' set. Batteries, bulbs, switches and the like. I learned quite a lot from that set, not least the price of 4.5V batteries.

First Magazine

The very first radio magazine I ever bought was not *PW* (sorry, Mr. Editor) but a copy of the now defunct *Radio Constructor*. The second magazine I bought *was* a copy of *PW* - the August 1968 issue. It cost 2/6d. Oops! Sorry, that's 12.5 new pence.

My interest in amateur radio began in 1970 when I attended a night-school radio and TV servicing class. The classes were free because I was at school and I'd found out that fixing radio and TV sets could do wonders for my financial situation.

The lecturer turned out to be a radio amateur. And fairly soon the radio and TV servicing class became an unofficial RAE class.

Eighteen months later I became a 'G8' (one of the 'Jates' as we were affectionately known). Then in 1979, after just scraping through the Morse Test, I became G4JCP.

Despite trying my best to keep up with new technology, my interest in valves and valved equipment has never waned. I often think back to a time when you could fix a radio - even a television set - with nothing more than a screwdriver, a multi-meter and a bit of luck.

People in the servicing trade might conceivably say the same today. But I'll bet you need an awful lot more luck.

If you're serious about making things with valves then you'll need some ingredients. And you may have difficulty getting them down at your local supermarket.

Suitable Components

A big problem for valve home-brewers and radio restorers is the lack of suitable components. Fortunately though, most valve types are not difficult to get hold of and there are several valve suppliers who advertise regularly in electronics magazines, *PW* included.

Some traditional radio and TV shops still have a few valves lying around too. Then there are the radio rallies where you'll find at least one stall with a box of valves.

Much more difficult to obtain, either in quantity or to a given specification, are components such as transformers and high voltage capacitors. Even suitable resistors can be a bit thin on the ground.

Today's tiny resistors are usually rated at no more than 250V. That can be too low, depending on where the resistor is used.

The same argument also applies to switches. Like resistors, miniature types intended for transistor designs can have insufficient voltage ratings for many valve designs.

Over the coming months when it's my turn to man the V&V 'shop' I hope to cover the selection and acquisition of valve-compatible components. I aim to concentrate on one major component type with each instalment.

The Topics

Now seems the best time to mention the topics I shall be dealing with. As mentioned in last month's *Keylines*, **Ben Nock** is dealing with military equipment and **Charles Miller** is looking after the 'vintage' aspect of this column. That leaves me to cover anything outside those subjects!

In particular, the Editor has asked me to cover several basic topics. First is the restoration of valve equipment with emphasis on domestic radios. Secondly, I shall be looking at updating old *PW* valve designs.

Over the years *PW* became well known for the various blueprints that used to accompany some constructional projects. The Editorial team still receive correspondence about these and I'll be discussing how to build the more popular designs with components that are generally available today.

Please bear in mind, however, I shall not be able to cover constructional topics in great detail. There simply won't be enough space for that.

Besides revamping old designs I'll be suggesting new constructional projects. These will be simple items which can be built in just a few hours. I'll be leaving it up to the constructor to choose exactly how to put the design together.

I'll try, wherever possible, to source components from either major component suppliers (such as Maplin) or from regular advertisers in *PW*.

If you have any suggestions, comments or questions then I'll be

On The Internet

Those of you with World Wide Web access can visit my home page. Its URL is **http://www.worldserver.pipex.com/nc/caddo/index.htm**

I'm intending to reserve part of my web page for 'Valve and Vintage' related topics. There I'll be able to cover items of more limited interest than I would normally be able cover through the pages of *PW*.

What won't be there will be what appears here, in this column, so you'll still have to buy *PW* every month. Not that you need any additional reason to do that!

glad to hear from you, my address is at the end of the column. One thing though, don't expect me to fix your dead radio for you - that's *your* job.

I shall also be covering incidental items relating to valves. For example, books, magazines, techniques, test equipment, events and the like.

Valve Books

On the subject of valve books, many years ago Bernard Babani (Publishing) produced a series of valve manuals. Each manual covered valves from a particular period and gave base connections and characteristic data for each valve type. I think they included just about every valve you were ever likely to find in domestic equipment.

The original books have been out of print for many years but they have now been reprinted (although in a smaller form) in the UK. Entitled *A Comprehensive Radio Valve Guide in five volumes* they are published by G. C. Arnold Partners. If you haven't any information on valves or if your information is limited to one manufacturer then you should seriously consider getting copies of the Babani reprints.

Editorial note: *The valve data books mentioned by Phil are now available from the PW Book Service.*

Another useful reprint for those who like rummaging through boxes of valves at rallies is the *Handbook of Radio, TV, Industrial & Transmitting Tube & Valve Equivalents*. This was originally a Babani book too. Its 'CV' to commercial equivalents list is very useful. British Army, Navy and USA service equivalents also get a mention.

I'll mention more books in my next column. It will be just in time for Christmas!

New Old Stock?

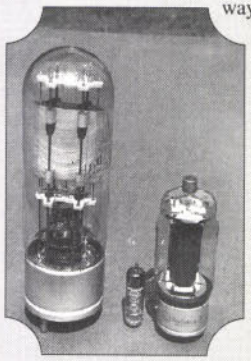
Phil Cadman G4JCP recommends you look out for 'New Old Stock' valves in the manufacturer's cartons.

By 'new old-stock' I mean valves that were made by the major valve manufacturers in their own factories. They should still be in the manufacturers' original packing and when examined will clearly look brand new. Most will be marked as being made either in the UK or in North America.

New old-stock valves are the best valves to buy. Be warned though, the popular valve types - particularly those associated with valve hi-fi - will be expensive.

Because of their cost, and because they are literally irreplaceable, I try to use new old-stock valves only in receiver front-ends, mixers and in low-noise audio stages. But increasingly there are times when I have to use them elsewhere because I simply cannot get modern alternatives.

Ex-military valves become available from time to time. These may be domestic valve types or they may be industrial or special quality types. By the way, 'special quality' means just that.



Despite keeping up with modern technology G4JCP enjoys working with valves like these!

If you're lucky military valves will be marked with their CV number and their commercial number. More likely all you will have to go on is their CV number.

The CV designation stands for 'Common Valve'. It was a notation created by the military and designed to bring some order to all the commercial and military valve designations in use at the time. I don't think it quite worked out as intended though. (I'll try and come back to the CV series sometime).

You do have to be more careful with ex-military valves though. They may not be individually boxed and so may have suffered physical damage. My advice is to look very carefully for cracks and bent pins, etc.

I cannot over stress the importance of carrying a valve equivalents book when visiting shows and rallies. I once missed the opportunity of buying several incredibly cheap transmitting valves simply because I did not recognise the CV number on their boxes. Someone else obviously did because a few minutes later everyone had gone. I daresay that someone had a 'Cheshire Cat' grin for the rest of the day.

Personal Preferences

I have to admit that my personal preferences are not for radio sets built prior to 1934 and I prefer domestic sets from the mid-1930s and after. My favourites come from the 1950s. Something to do with childhood memories, I suppose.

Valve audio is another favourite and yes, I do have valves in my hi-fi system. A pair of Leak TL/12 plus amplifiers and a modern valve pre-amplifier.

Green Wireless

The moment I agreed to contribute to this column the Editor whipped out (from his car boot) a little green wireless and said something like, "here's something you can write about"!

The radio was a 'Lissen' battery valve portable, model 8409, from the late 1930s. It's quite small, just 11 inches wide by 10 inches high by 7 inches deep. Mr. (money no object) Editor had apparently parted with just £5 for it!

Actually the set is not in too bad a condition but it does have one rather nasty fault. The resistance wire on a wirewound potentiometer is completely broken.

Unusually, for such a set, it has four valves. There's an r.f. stage, detector, a.f. amplifier and a.f. output. I would imagine the batteries didn't last long!

On the mains radio front I'll be taking a look at a Cossor 'Melody Maker', model 500 A.C. This radio is typical of what can be purchased for £10 to £20. Indeed, similar radios may turn up for next to nothing at jumble/car boot sales or even for free as 'gifts' from friends or neighbours.

Nowadays, many radio stations have migrated to Band II v.h.f. f.m. and so cannot be received on the majority of valve radios. Also there are older sets that may not take too kindly to daily use. So, in my next column I'll be showing you how, with the help of a modern transistorised radio, to give them a new lease of life. Until then, cheerio for now.

Send your letters to me either via the *PW* editorial offices, via E-mail to *phil@oldpark.demon.co.uk* or direct to me at: 21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX.

National Vintage Communications Fair

The fourth National Vintage Communications Fair was held at the National Exhibition Centre near Birmingham on the May 141995. It's the event for anyone interested in valve radios and their restoration.

It's not all radios though. There were telephones in abundance, 405-line television sets, lots of valved hi-fi and even wind-up gramophones.

I was pleased to see that prices were, in the main, quite reasonable. Unrestored domestic sets from the 1950s costing around £12 to £20. Larger sets from the 1940s and 50s were priced at £20 to £45, again in unrestored condition. Restored sets were anything from £30 to several hundred pounds.

There were a few crystal sets and vintage valve sets for sale. But they had price tags best suited to the more affluent collectors.

As usual there were plenty of valves around but this year I thought there were fewer decent 'new old-stock' valves on sale. (See 'New Old Stock' panel) I'm sure this trend will continue so if you've been planning to get a spare set of branded valves for your pride and joy then you'd better hurry.

Valve audio was as expensive as ever. Asking prices for restored Leak and Quad amplifiers ranged from £280 all the way up to £450. That being said it's interesting

to realise that these asking prices are, in real terms, very close to their original retail prices.

MIKE RICHARDS G4WNC

BITS&BYTES - COMPUTING IN RADIO

Mike Richards G4WNC rounds-up the latest news from the world of Computing in Radio and starts off with a digital signal processing update.

As promised, this month I'm going to spend some time running through the digital signal processing (d.s.p.) software on my DSP Starter Disk. The object of the disk is to provide a cost effective way of using d.s.p. in an amateur radio environment.

All the software on the disk has been written by **Johan Forrer KC7WW**. It represents a considerable effort on his part, so please register!

The software on the d.s.p. disk requires specialist hardware to operate and the requirements can be divided into two distinct categories - AdSP soundcards and the Texas DSP Starter Kit. Of these two systems, the most versatile is the AdSP sound board option.

The most popular version of an AdSP sound card is the Orchid SoundWave 32. This is a fully SoundBlaster compatible sound board, but features the vital ADSP-2115 digital signal processing integrated circuit.

The Texas TMS320C26 starter kit also contains all the essentials for d.s.p. work, but the board is supplied as an unboxed unit. The audio input and output is via standard phono plug whilst a 9-pin D connector is used for the connection to the PC.

There are two software packages on my starter disk that will work with the Texas DSK. The first (DSKMODEM) is a basic h.f. modem that can be set-up for use either with Johan's PC-TOR program or G4BMK's decoding software. The use of a d.s.p. modem secures a level of performance that will rival almost any conventional analogue modem.

The second program is a full featured AMTOR program with the DSK code built-in. The program is easy to install and is very fast to use.

There are all the usual options such as type ahead buffer, listen mode, and hot keys for sending pre-prepared messages. If you have chosen the AdSP route, you will find three specialist programs on the disk.

The first (DSPSND5) is an excellent d.s.p. audio filter system with all the main parameters adjustable from the keyboard. In use, you just connect the microphone or line input of your sound card to the audio output of the receiver/transceiver and listen to the processed audio via your computer speakers.

The filter provides either a general noise reduction, notch filter or both. I've found the filter extremely useful and the notch filter is particularly impressive.

A second, and rather novel application is the FFTSCOPE program. This uses a fast Fourier transform algorithm to create a 0Hz to 4kHz audio spectrum analyser.

The spectrum analyser is extremely fast and responsive with a very clear display. The options available from within the program are pause and store.

The pause is activated by hitting any key and freezes the display to allow closer investigation. The store or persistence mode causes each trace to remain on the display so creating a pattern of more common frequencies to emerge.

The final software package (PSATOR23) is comprehensive AMTOR and PACTOR program using the AdSP h.f. modem to provide excellent decoding features. One of the great advantages of d.s.p. modems is their ability to adapt to the incoming signal. Whereas a conventional, analogue, modem requires very accurate tuning, the d.s.p. system can cope with fairly coarse tuning.

To help you with the tuning PSATOR includes an on-screen dual bargraph display that shows tuning and signal level. For details on how to order the d.s.p. starter disk see the special offers listing at the end of this column.

Multiscan

Bristol based company **Amdat** have recently sent me a review copy of a brand new multi-mode data package for the IBM PC. The program, MSCAN, comes in two different versions (1.3 and 2.0) both of which are available as shareware or fully registered.

Both programs feature transmit and receive FAX and SSTV whilst version 1.3 also features receive monitoring of RTTY, AMTOR and NAVTEX. The program MSCAN 1.3 is designed to be run on a standard PC, but you will need a 286 or better processor and at least VGA graphics capability.

Although MSCAN 1.3 is a DOS based program, the user interface is very good indeed with clearly labelled on-screen push buttons that can be operated either by function keys or by using a standard mouse pointer. Interconnection to your transceiver could be via two options depending on which version of the program you're using.

The Microscan version requires a simple comparator interface and is fully compatible with those units sold for use with HAMCOMM and JVFAX. The alternative requires the Multiscan version of the program and uses a special Multiscan interface.

The interface uses well established PLL techniques with the popular XR2211 specialist PLL decoder. The range of facilities in the program was really very good indeed and included a fully automatic receive mode for FAX.

The MSCAN software was one of the easiest I've used and the program did all the hard work of tracking the start and stop tones and allocating appropriate file names. The excellent receive modes were matched by a good range of tools to help prepare transmitted images.

On the file management side MSCAN has the usual load and save options for images but there's also an interesting multi-load option that displays a thumb-nail print of all the images in the current directory. This was great for quickly reviewing images. If you purchase a fully registered version of MSCAN 1.3 you will have all the options of the shareware version plus the ability to transmit.

Moving on to MSCAN 2.0, this is really an improved version of 1.3, but without the AMTOR, RTTY and NAVTEX receive options. This version has an even better user interface, but demands a 386 or better processor and VGA or SVGA graphics.

Thanks to AMDAT, I now have shareware versions of MSCAN 1.3 and 2.0 available for distribution to readers. However, if you would like to go for the full Multiscan package AMDAT will be pleased to help.

The contact details are **AMDAT, 4 Northville Road, Bristol BS7 0RG**. My thanks to AMDAT for the loan of the review versions.

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, and audio filtering software for ASP sound boards plus h.f. modems using Texas DSK.
- **JVFAX 7.0** - FAX & SSTV transceive for IBM compatible computers.
- **HAMCOMM 3.0** - RTTY, CW & AMTOR transceive 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 JVFAX and HAMCOMM Primer** - Receiving your first FAX and RTTY signals.
- **FactPack 5 On the Air with JVFAX 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 JVFAX/HAMCOM/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 for this month so keep computing and don't forget to keep sending your computing questions to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3XD. CompuServe: 100411, 3444; Internet: mike.richards@bbcnc.org.uk

END

LEIGHTON SMART GW0LBI

HF FAR & WIDE

Leighton Smart GW0LBI welcomes you once again to the column for h.f. operations where your input is very important.

Sunny June finally arrived and with it came the annual Sporadic-E season. And already there have been some spectacular openings on the 28MHz band, with signals received in the UK at tremendous strengths from all parts of Europe, even from stations running very low power into extremely basic antennas.

I've noticed however, that while 27MHz CB allocation seems to burst into life when the band opens, the 28MHz amateur band is very often totally empty! There are many agencies and other organisations looking for valuable h.f. allocations - is this another case of use it or lose it?

Listening Watch

At the bottom of page 63, you'll find as promised, a list of stations, both amateur and s.w.l.s, who are taking part in the *PW* Listening Watch initiative. If you can, please call, (or in the case of s.w.l.s listen) around these frequencies - you may work or hear a fellow participant.

Of course, I would also appreciate your reports on what you hear/work, to be published in the column. Hopefully, the Listening Watch will grow to greatness from its humble beginnings!

Your Reports

I'm starting your reports off with 1.8MHz and the first of 11 reporters this month is **Pat Painting G3OUC** in Newbury. Pat, is like myself a 'Top Band' addict, and uses kites to support his antennas while operating portable.

Using a home-brew 1.8MHz rig designed by himself and called the 'Skyliner 160', **Fig. 1**, Pat reports working HB9ADQ Switzerland on this band using a kite antenna and 75W of s.s.b.

Pat also forwarded a list of regulations that apply to flying kites and balloons. If anyone would like a copy, drop me an A4 s.a.e., and I'll send you a copy.

Yours truly GW0LBI, has reappeared on the 1.8MHz band since having his rig repaired. Using 5W c.w. into a 70m long wire I worked YU1AAM Serbia at 2255UTC plus SM5EDX Sweden with 1W c.w. at 2333UTC.

Eric Masters G0KRT in Worcester Park, Surrey, using a QRP Plus transceiver and a 26m long W3EDP antenna tried 1.8MHz for the first time and worked DK3KD Germany at 2041UTC, G3LKZ in Harwich at 1935, G3VMK at 2113 and GW3LNS/P at 2150UTC, all at 5W using c.w.

The 3.5MHz Band

Eric G0KRT has at last hooked his first Novice on the 3.5MHz band in the form of 2E0AGP in Margate at 2109UTC. Eric also worked F5GIG in Paris at 2302, and G4ALE/P, all on QRP c.w.

Listener **John Bidgood G20344**, in Eastleigh, Hampshire using a Yaesu FRG-7700 receiver and a 9m wire antenna reports reception of GB50RN (HMS *Belfast* moored on the river Thames in London). They were working Mike G3OOQ in Stratford upon Avon at 1900UTC.

The 7MHz Band

It's up to the 7MHz band now and a welcome back to **Ted G2HKU** in Kent. Ted uses a Ten Tec Omni V rig and a HF6 vertical antenna on this band lists: ZL3NB New Zealand, VK9NS Norfolk Island, TI 2KWN Costa Rica, PZ1DV Surinam, and ZA1AB Albania, all on c.w., but doesn't mention times.

Up in Aberdeen, s.w.l. **David Henry** has logged (amongst others) CJ1YX Nova Scotia, (QSL via VE1YX), PP5UA Santa Caterina Island, 6V1A Singapore, and ZD9JR Tristan da Cunha (QSL via PO Box 455 Gough Island), whilst using a Trio R-1000 receiver and an indoor 20m long wire antenna.

New reporter **Carl Mason GW0VSW** in Skewen, West Glamorgan uses an Icom 737A transceiver at 10W output into a half-sized G5RV antenna. Carl reports YS0GA El Salvador, CU2BD Azores Is., LX0ITU Luxembourg on s.s.b. and F5INB France on c.w.

Eric G0KRT reported working

Fig. 1: 'Top Band' addict Pat Painting G3OUC, shown here with his 1.8MHz 'Skyliner 160' transceiver, flies kits to get his antenna to a good height (see text for further details).

CT1WN Portugal at 0108, DL3EBW Germany at 0830, and US5I at 0100UTC. All contacts were on c.w.

The 14MHz Band

A propagation report starts off the 14MHz report this month and it comes from **Don McLean G3NOF** in Yeovil, whose antenna systems are shown in **Fig. 2**. Don says that conditions on the h.f. bands have been very patchy, with very strong short skip on the higher bands with even UK stations very strong.

On 14MHz Don says that VK, ZL and Asian signals were heard from 0700 onwards, and on the short path. The Asian signals came in after 1500, with African stations a little later.

Don reports s.s.b. contacts with A71A Qatar, BV5GU Taiwan, CO0OTA (NA - 204) Cuba, J28JJ Abu Ail, JY4CI Jordan, and 7Q7AN Malawi. He was using a Kenwood, TS-950 SDX, and a TET 3-element beam antenna at 20m (see **Fig. 2.**).

Steve Locke GW0SGL near Aberdare found conditions on the 14MHz band variable. But he managed to work s.s.b. with KG4MN Guantanamo Bay at 2206UTC, Selim TA2DS Istanbul at 2245, AK1L New Hampshire with 5W c.w. Steve then worked FY5YE French Guyiana (QSL via F5JLU) at 2232, Jimmy BV9P Pratas Island (QSL via KU9C), 5N0HMN Victoria Island (QSL via Box 74768 Lagos, Nigeria), and John ZD7RWG St Helena (QSL via WA2JUN), all using his new TH7 beam antenna at 12m and 50W s.s.b.

John Heys G3BDQ near Hastings, using all wire antennas, found conditions not very exiting for him. With solar flux numbers falling to 66 or 67 on occasions, things are picking up a little every 27 days but not as good as he'd like it!

John reports just ID9/I4RFZ Folie Island, and JA5PL Japan both on c.w. He heard the BV9 DXpedition, but found them quite weak and the whole world was calling them!

Carl GW0VSW reports QRP contacts with VO1NP Nova Scotia, 4U1ITU Geneva, W1AW U.S.A.,CO7JC Cuba, and R100P Russia, again with 10W s.s.b. and a G5RV dipole antenna.

Eric G0KRT used QRP to snag VE9ST Canada, KA4RRU U.S.A. and RA9WN Asiatic Russia all at around 2200UTC.

Gordon Foote G7NCR in Bristol using a Howes DcRX single band receiver and a loft mounted wire antenna reports reception of W6ZZ in San Diego at 1800 UTC, EA8AMT Canary Islands at 1807, and GM3PXK in Motherwell via short skip conditions at around 1800UTC plus a load of European stations (all during the evening).

Ted G2HKU in Kent found conditions to be pretty poor with lots of noise and QSB (fading) but managed c.w. contacts with BV7FF Taiwan, VP5/JAXBG Turks & Caicos Islands, TU2XZ Ivory Coast, YI9CW Iraq, OY1G Faroe Islands, plus an s.s.b. contact with 9K2MU Kuwait.

Listener **David Henry** logged RO/UR8LV the Polar base at Cape Chelyuskin (QSL via PO Box 32, Dickson Island 663241, Rep. of Russia), CQ5I Pego Island, (QSL via CT1CFI) 4X4HQ the Tel Aviv Club station operated by 4Z9EBI on his 13th birthday, LX6SNG Luxembourg, a special event station for the Small Nations' Games, 8R1WD Guyana, and ES2RW/P/4 (DXpedition to Windlow Island, QSL via ES2RIQ).

Finally for 14MHz, there's a report from **Brian Russell G0NSL** in Runcorn, Cheshire who lists 5W s.s.b. contacts with 9Q5TT Zaire, VS6WO Hong Kong, VP5A Turks and Caicos Islands, LU4FM Argentina, and FS5PL French Saint Martin using a Trio TS-130V transceiver and a single element horizontal wire loop at 10m.

The 18 & 24MHz Bands

John G3BDQ found the 18MHz band to be very poor during late May/early June. He reports only TA2/OK2ZW Turkey on c.w., and TK5BF Corsica on s.s.b.

Don G3NOF indicated that the short path on 18MHz to Asia has been opening at around 1000UTC, with some African stations heard at approximately 1600. He found that the best time on the band has been from 2000 onwards, mostly for North and South America, although some Japanese stations were also heard.

Don lists A45ZZ Sultanate of Oman, BV5DI Taiwan, TO9IS Devil's Island, VP2MBO Montserrat, VP8CQR S. Shetland Islands, 5N0PYL Nigeria, JT1BG Mongolia, XE3WAO Mexico, YB2ARW Indonesia, and 9X5/ON4WW Rwanda. His 24MHz log shows EA8/DJ3OS Canary Islands, ET3BT Ethiopia, HC1JQ Equador, and 7X5JF Algeria, again with a TET 3-element Yagi antenna.

Ted G2HKU worked QRP on 18MHz with an Icom IC-721S transceiver into G5RV and MFJ loop antennas. He worked EA7GS/QRP Spain, EA8CN Canary Islands, CT3/DL6RAI Madeira Island, and EA6/DJ8VG/P Balearic Islands all on c.w.

Again on QRP, Eric G0KRT worked DL5YEE Germany at 1529UTC on 5W s.s.b, HA8KV Hungary at 2043. The 24MHz band provided Eric with HB9CEX Switzerland at 2022UTC, LA8LA Norway at 1946, and OK1RR Czech Republic at 1923, all on c.w.

The 21MHz Band

Up to 'Fifteen' now, and with propagation conditions on the 21MHz band reported as being 'pretty ropey', Steve Locke GW0SGL reports a 100W s.s.b contact with George 9J2GA in Zambia at 1734UTC. (George operates around 21.300MHz every Sunday at 1600UTC).

Steve says 21MHz conditions have been quite poor for both short and longer distance working. But nevertheless, he says there have been times when the band has shown some signs of life.

Ted G2HKU has listed ZS6KR South Africa, and 9X/ON4WW in Rwanda on 21MHz.

Don G3NOF contacted VP8CRS Falkland Islands, and 5N9WKO in Nigeria, both on s.s.b.

Eric G0KRT had QRP contacts with G2XP/P and G3GRS/P via very short skip (possibly Sporadic E?) and IK1HQP/P Italy, HB9AJ/P Switzerland, and US3IMZ Ukraine Republic using c.w. on the band.

Finally on 21MHz, John G3BDQ hooked up with AP2JZB Pakistan, DA0ITU Poel Island, and PP1CZ Victoria Island, Brazil, on s.s.b. Just goes to show how a dead band throws up some surprises!

The 28MHz Band

The 28MHz band has come back to life, albeit just for the summer months with very intense sporadic 'E' openings taking place. It appears very often when it's not expected...hence the term 'sporadic'!

Steve GW0SGL disconnected his TH7 7-element beam and used an ex 11m vertical on this band at 5 metres, and using 100W s.s.b. worked Bert DH1PAH Germany at 1605UTC, SM7ATL Sweden at 1207, Micklos HG1ZV in Kanizsa, Hungary at 1325, and Alois DL7RBL, Passau in Germany. (Alois who has visited Steve's local club, the Nelson and District ARS intends taking part in the Flatholm Island DXpedition this August with the Barry Radio Club).

Eric G0KRT used c.w. to work HG5M Hungary at 1004UTC, OE3ATW Austria at 1902, S50W Slovenia at 1004, and SQ5ALL Poland, at 1248. These were Eric's first QSOs on this band.

Fig. 2: Don McLean G3NOF, based in Yeovil, Somerset, has been reporting on h.f. operations to *PW* for many years. The photograph shows Don's (top of tower) TET HB33SP 3-element, middle is the Tonna 9-element for 144MHz and bottom is the Cushcraft A3WS 3-element antenna. Don's trapped dipole can also be seen mounted on the pole on the side of his house.

Sign Off

Well that's about all for this month, time to sign off. My thanks to all our correspondents for their help (and patience!) in getting the column going so well.

As usual I would appreciate your reports, and information (don't forget to let me know the times of your contacts, so we can help others to work the DX). And just as important, let's have some photographs of yourselves and your stations (please face the camera!) by the 15th of the month to: **Leighton Smart (Marking your envelope 'HF Far & Wide') GW0LBI, 33 Nant Gwyn, Trelewis, Mid Glamorgan CF46 6DB, Wales. Tel: (01443) 411459.**

END

Practical Wireless Listening & Operating Watch List

To join the *PW* 'Listening Watch', send your details direct to Leighton Smart GW0LBI.

Charlie Blake RS96032 listens: 0500-0700UTC 7.061MHz s.s.b. with NRD 525 RX/Sloping Wire.

Gordon Foote G7NCR listens 1730-1930 & 2030-2200 (weekdays) 14.250MHz s.s.b. using Howes DcRX/Long Wire & 1430-1630 (weekends).

Steve Locke GW0SGL operates: 2000-2100 (Sundays) 14.250MHz s.s.b. Yaesu FT-757 and TH7 beam.

John & Tony Bidgood G20344/G20345 listen: 0800-1400 (Variable) 3.765MHz s.s.b. using a Yaesu FRG 7700/9m Long Wire & 28.367MHz s.s.b.

Leighton Smart GW0LBI operates: 2100-2300, 1.949MHz s.s.b.Yaesu FT-747/70m Long Wire

Rob Mannion G3XFD listens and operates: (weekdays and weekends) 1800-1830, 3.7MHz (s.s.b. 100W), 3.530/25 c.w. 5-15W) KW2000B & Trio TS-120V, trap dipole, and long wire. Also 2300UTC on either 3.530, 7.025MHz (c.w.) 5W, or 3.7MHz (s.s.b.). Occasionally on 7.025MHz between 0100-0200UTC.

PETER SHORE

BROADCAST ROUND-UP

Peter Shore brings you all the latest news from the international broadcast bands.

Radio Australia have received mail from listeners in the countries whose flags are shown in this photo ANDhave recently added an E-mail address to its telephone Openline (see text).

First this month it's straight into news from the bands to help you find your way around international radio. Radio Ukraine International is on the air with English at: 0000-0100 on 11.95, 11.78 and 9.75; 0300-0400 on 9.86, 9.835, 9.685 and 7.405 and at 2100-2200 on 11.95, 11.875, 11.825, 11.78, 11.61, 9.75, 9.56, 7.285, 7.24, 6.09, 6.02, 6.01, 5.905MHz

A report of a newly heard station has recently come my way. Radio Pilipinas is on the air in English at 0230 for 60 minutes beaming apparently to the Middle East. Try 17.76, 17.865 and 21.58MHz.

The Radio Pilipinas transmission is beamed from a Voice of America relay station at Tinang in the Philippines. The station's address is **Sgt Esguerra Avenue, Quezon City, 1103 Metro Manila, The Philippines.**

Radio Ulan Bator in Mongolia is on the air with English to Europe at 1930 on 7.53 and 4.08, and to the Americas at 0300 on 12.0 and 9.96MHz. At 0910 there is a transmission to the Pacific on the same frequencies. All broadcasts last half an hour.

Radio Australia has added an E-mail address to its telephone Openline. If you are connected to the superhighway, contact the station at **raust3@ozemail.com.au**

The telephone Openline for Radio Australia is **+61 3 626 1825**. The station's address for good old fashioned mail is **PO Box 428G, Melbourne, Victoria 3001, Australia.**

Radio Australia recommends the following frequencies for listeners in Europe (including the UK): 21.725 from 0800 to 1100; 15.530 from 1100 to 1300; 15.510 from 0030 to 0400 and 0600 to 0700; 11.66 from 1430 to 1800; 9.615 from 1100 to 1800; 7.26 from 1800 to 2100 and 6.09MHz from 1530 to 1900UTC

Radio Thailand is on the air in English at: 1900 on 11.905, 9.655 and **7.20** and 2030 on 11.905, 9.655 and **9.555**MHz. At 0000 English is on 11.905, **9.69** and 9.655 and at 0030 try **15.37**, 11.905 and 9.655MHz. The frequencies shown in bold are beamed from the VoA relay at Udon Thani which has 500kW transmitters.

Feeling The Pinch

Several broadcasters are feeling the pinch this year. The Voice of America (VoA), Radio Canada International (RCI) and Radio Australia (RA) are all facing uncertain futures as their funding is threatened.

The VoA looks as though it will suffer the worst cuts, losing perhaps as much as a third of its annual operating income. That will mean drastic reductions in its operation, already trimmed in some areas (it mothballed a transmitting station in the US last year), with the likelihood of several language services ending.

Everything hangs on the autumn budget round in the US government. A likely outcome, whatever the decision on Capitol Hill, is that VoA will be moved into the US State Department and be more closely aligned with government.

One way that VoA is finding to bypass some of its day-to-day funding difficulties is to broadcast underwriting messages. If you have ever had the chance to listen to Public Radio in the States, then you will probably have heard announcements saying that the programme you're listening to has been "made possible by" Dallas Autospares, or something along those lines.

The VoA is now accepting underwriting - look out for Grundig's name during the Atlanta Olympics next year. And Lufthansa, Germany's national airline is already supporting the station providing airline tickets for staff covering some events in return for an on-air mention.

It's not advertising, says the VoA, but simply a means of making sure that VoA can afford to provide the best service to its listeners. "Everyone wins" says a spokesman. More news in this column about VoA's future as it breaks.

Don't forget to tune in to the weekly *Communications World* at 2130UTC Saturdays on 6.04, 9.76 and 15.205MHz on VoA. It has news from the world of broadcasting, and about the fast developing world of electronic communications.

Gene Reich is the usual presenter, but during June the Voice's Audience Research Officer, Kim Elliott, hosted the show - and he explained about the underwriting deals that the station has entered into. Despite this, I understand he is still employed at 330 Independence Avenue.

New Station

There is a new commercial station in a European country. Not a story worthy of particular comment, you might think. But the station is in Albania, and it has been set up by a man who made his money as a waiter on the holiday island of Corfu. And it's Albania's first independent radio station. Will it last?

Reports suggest that the station is not making any money (and can you really earn enough in tips to invest in studio equipment?) at the moment, but maybe this marks the start of real radio in the country.

If you want to tune to Radio Albania, you will find English to Europe at: 1600-1615 on 9.76 and 7.155; 1830-1900 on 9.73, 7.26MHz. There's also 1458kHz and to North America at: 0145-0200 and 0230-0300 on 7.16 and 6.145MHz.

Cuban Ear

You may have noted that the British press is carrying an increasing number of stories about the possibility of President Fidel Castro relinquishing control of Cuba as the island's economic situation deteriorates. So, keep an ear to Radio Havana Cuba which has English to Europe at 2100-2200 on 11.715, 2200-2300 on 6.18 and 11.96 (u.s.b.) and to the Americas at 0100-0200 on 6.0, 0200-0400 on 9.83, 9.82 and 6.0; 0400-0500 on 9.82 and 6.18 and 0500-0700 on 9.82MHz. Radio Havana Cuba can be contacted by FAX on **+53 7 795007**, or by their E-mail address of **radiohc@tinored.cu**

German Electronics Fair

If you get the chance, be in Berlin sometime between August 23 and September 3. That's when the Internationale Funkausstellung or consumer electronics fair takes place.

The Internationale Funkausstellung is the biggest show imaginable. It has every conceivable gadget for listening and viewing in the home, in the car, on the street and anywhere else for that matter.

There will be new short wave sets, including the Grundig Satellit 900 which will have the largest liquid crystal display that has ever appeared on a radio set. I will have more news from the show in *PW* during the winter months.

Finally

Finally this month, a reminder that AWR's *Wavescan* DX programme can be heard by listeners in Europe on Sundays at 0920 on 15.62 and at 2120 on 11.61MHz.

That's all for now, until next month, good listening - and let me know of any interesting stations you hear.

END

ROGER COOKE G3LDI

PACKET PANORAMA

In this latest bulletin Roger Cooke G3LDI brings you more from Australia, an up-date for Sinclair Spectrum owners and a Virus Alert with 'BayCom v1.7'

One callsign which will obviously be familiar to digital communications fans, is **VK2AGE** belonging to **Gordon Dowse** in Goonellabah. I was chatting to Gordon whilst out in Australia last year and he promised to send me details of his activities. He was as good as his word and Gordon is shown sitting at his station terminal in **Fig. 1**.

Gordon's interest in digital communications began, like so many of us, (especially those with older callsigns!) in the good old days of RTTY. Having had his share of the mechanical method of operating RTTY, Gordon decided to move into what he calls "glass RTTY". I must say I like that term!

His first computer was an OS1 Superboard with 4k (yes all four thousand bytes of it) RAM. He then upgraded it to 8k of RAM and used it as a receive only RTTY Mailbox.

Gordon was then introduced to AMTOR by **Allan G3RSP** and became hooked. Along with with **Syd VK2SG** and **Clive VK3BUS** Gordon sent for a kit of parts. The famous three were the only Amtor stations on from Australia for some time and the only DX to be worked was with English and other European stations.

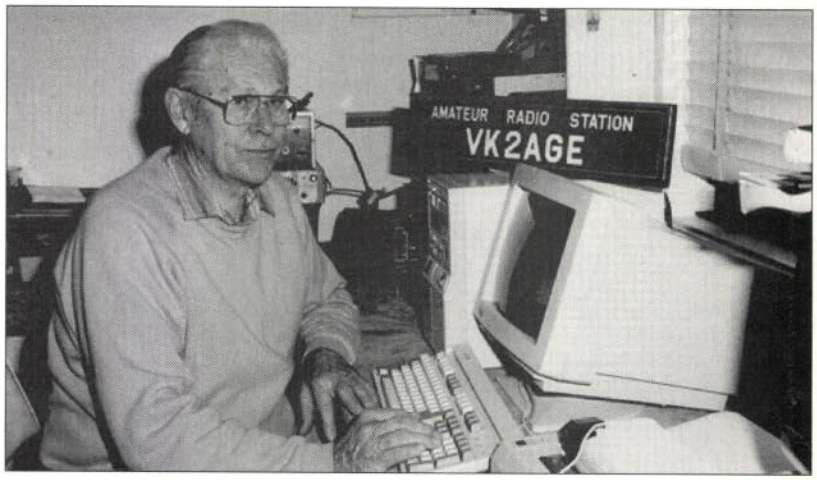


Fig. 1: Gordon VK2AGE sitting at his station terminal

New Mode Problems

Operating a new mode brings its supply of problems, and G3RSP, VK2AGE and VK3BUS found themselves being reported to the authorities as intruders, illegal operators or just plain pirates! In fact, it became so bad that Syd had a tape made and played on the Wireless Institute of Australia (WIA) news broadcasts, along with appeals to give them a fair chance and not to be deliberately jammed.

In 1983, Gordon decided, with prompting from **Chris HB9BDM**, to set up a store and forward mailbox in VK. He obtained an Apple 2+ computer and Chris supplied the software. Initially it was set up on 14.075MHz with the beam pointing towards Europe.

There really was no need to point anywhere else as there was no activity from other parts of the world. The mode was still illegal in the USA, although there were four stations operating under their Special Temporary Authority (STA).

The 'STA' tests proved a success and user numbers began to increase. By the end of the 1980's, it became evident that the system was now too small to handle the traffic.

Local packet networks were springing up and the next step was to interface AMTOR to Packet. Gordon was in touch with **Craig WA8DRZ**, who suggested that he try APLINK, a program written by W5SMM.

The APLINK programs duly arrived and another computer was needed, as APLINK will only run on an IBM PC (or 'clone'). With the addition of the PC, Gordon was now able to control the beam as well as run a BBS. The system is now in constant demand and sometimes runs for up to 10 hours continuously as the beam moves from the USA to Asia and then Europe at the appropriate times.

Several upgrades have been implemented over a period of time and the whole system is shown in **Table 1.**

Gordon has to be congratulated for an excellent station and also for his dedication to providing such a superb support for the world-wide interest in the ever-increasing digital revolution. 'Good on ya Gordon', we need more like you!

Table 1

Transceivers: Kenwood TS-450S HF

Phillips 747 UHF

Antennas: TH6DXX 14/21/28MHz

1/4 wave verticals 10 and 14MHz

Computer: PC386DX40 with 4Mb RAM

80Mb HD with six serial ports

HF Beam pointing Kansas City Tracker

Freqs: 7045, 10127, 10111, 14075, 14077, 21076khz

440.050MHz into the Packet Network

All frequencies are scanned at 3 seconds per frequency.

For Clover, add 2.1kHz for Clover centre frequency.

BBS Program is Aplink by W5SMM running under Windows for Workgroups 3.11

TNCs: Clover = HAL PCI-4000, Pactor = PK232MBX, Amtor = AMT1

Packet TAPR TNC2.

Spectrum Users

I had an enquiry a while back from a Sinclair Spectrum user asking about a Spectrum Packet Modem. **Mike G1VVF** (@GB7SUT) kindly sent me full details. The modem made by **J & P Electronics Ltd., Unit 45, Meadowmill Est, Dixon St., Kidderminster DY13 1HH**. Their phone number is **(01562) 753893**. It fits all versions of the Spectrum but if you want a PMS, you need to have the microdrive or a disk drive.

Software comes with the box (ask for tape or disk) and they may even supply leads to rigs if asked. Some commands are strange, but it does work. I suggest that any Spectrum user interested should give them a ring and find out more.

Virus Alert

This is a virus alert for amateurs who use BayCom software. Shortly after the release of BayCom 1.6, a version of BayCom, called 1.7, started to appear on the Internet. It turns out that this version was not put out by Johannes and the team from Germany, but by some unscrupulous operator who planted a virus in the L2.EXE program of an earlier version of BayCom and then released it as 1.7.

Some unsuspecting amateurs have already been hit by the virus and word has got around so, it has been deleted from Internet sites. If you are offered BayCom 1.7, just say no, and your hard disk will be that much healthier for it!

The BayCom team have since announced that there will be **no** version 1.7. The next version will be 2.0 and it is due towards the end of 1995. (This warning was a snippet taken from the AAPRA bulletin, by **Gerard VK2DAA**, many thanks to AAPRA).

As usual comments and photographs all welcome via 'Snail-mail' to: The Old Nursery, The Old Drift, Swareston, Norwich NR14 8LQ, or packet messages to: G3LDI@GB7LDI. Happy packeting de Roger G3LDI.

END

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: **Zoë 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 **Zoë 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

AA size NiCads, 1.25V, 750mAh, (new), made by Gates Ind., USA, £1 each plus P&P. Rapid chargers, plug-in type, 50p plus P&P - I've got loads of them! Ken G7KMY, Derbys. Tel: (01773) 606301.

Clark Scam 40, 40ft air mast, field legs, guys, etc. with mains compressor, buyer collects, £275. P. Adams G4IYA, Kent. Tel: (01795) 421207 evenings.

Cossor CDU150 oscilloscope. Philips SBC530 and other test gear. Ring for details. Tel: Essex (01702) 522929.

Icom 740 h.f. transceiver. Icom AT150 automatic antenna tuner. Icom PS20 p.s.u., all mint condition, boxed with manuals, £750. Tel: Worcester (01562) 515305.

Icom IC-28H 45W t/squelch, £170. Two BNOS (LPM144-3-100) linears with pre-amp, £160 each. Yaesu FT-23R hand-held, t/sqelch, new 12V NiCads, ext. speaker/mic., charger, £150. All mint. Tel: Surrey 0181-397 7823.

Kenwood TH-79E dual-band hand-held, boxed, as new, £300. Cushcraft R5 28-14MHz vertical, MkII model, as new, £170. Philips ex-p.m.r. radios M294 (70MHz), M296 (430MHz), £30 each. Drew GM0BRJ. Tel: (01236) 824781 after 6pm.

NiCads batteries (new) AA512E 1.25V 750mAh, loads of 'em, two batteries and charger on a card, £2.50 each including P&P or sale job lot, or might swap? Ken G7KMY, Derbys. Tel: (01773) 606301.

Silent key sale: Trio TS-530S, £430. Lowe HF-150 receiver, £280. Belcom linear 2 plus p.s.u., £100. KW E-Zee match, £40. Swan 500 transceiver plus p.s.u. Offers? John, Birmingham. Tel: 0121-730 1762 evenings.

Trio 520S, built-in p.s.u., s.s.b. filter, five-band, mic., boxed, in good condition with handbook, £300. Tel: Bridlington (01262) 673905.

Variable power output on 430S, no alterations necessary, £25 plus £2 P&P postage. Transmatcher Zetagi 1000W, TM1000, £43. Kenwood MC50 mic., £50 o.v.n.o. J. Tarleton, Derbyshire. Tel: (01283) 121870.

Yaesu FT-747GX, 100W, h.f., all bands transceiver, all modes including f.m., brand new, boxed, five year warranty if required, £500. Tel: Norfolk (01760) 337463.

Exchange

19 set, professional conversion to mains, c/w variometer, excellent worker, v.g.c., swap for FG70G (preferred) 101B or EE, etc., or base all-mode, 144 or 430MHz. Andy G7UAD, Derbys. Tel: 0115-930 8096.

Icom IC228N, used for home base only, for h.f. receiver or transceiver with cash adjustment. Dave, London 0181-749 8530.

Wanted

Camper & Nicholson receiver, model 720, will purchase outright or exchange for my Eddystone Pandaptor, model EP14. Also any Eddystone receivers, particularly models EC10, EB35, 870, 960 please. For cash, collection possible. Tel: (0374) 128170 or FAX (01372) 454381.

Howe's DXR20 complete receiver, reasonable price, etc. Tel: Merseyside 0151-648 3031.

KW202 and KW204 manuals, purchase/pay for photocopying. Also Racal s.s.b. adapter, RA17 cabinet and an old all-valve h.f. transceiver. Any help appreciated. Tel: Beverley (01482) 869682.

Murphy type 618 h.f. TX (AP100333) plus p.s.u. R109, R206 MkII, any 'CT' test equipment. Peter, Berks. Tel: (01734) 733633.

Photocopy of an article in *Wireless World*, probably 1945-1960 describing a potentiometer tuned audio boost or reject heterodyne filter using triodes called 'Select-O-Ject'. Can you help me please? All letters answered and costs refunded. E. F. C. Owen, 28 Chartfield Road, Reigate, Surrey RH2 7JZ.

Yaesu FT-726R with 144/430/50MHz, must be in good condition. Ken Hurst G7ULS. Tel: (01279) 641248.

CLOSING DATE FOR OCTOBER ISSUE, 17 AUGUST.

BARGAIN BASEMENT ORDER FORM PLEASE WRITE IN BLOCK CAPITALS

Please insert this advertisement in the next available issue of *Practical Wireless*.

I enclose Cheque/P.O. for £.....(£3.00) made payable to PW Publishing Ltd.

Name .....

Address.....

.....

.....

Access, Visa and Mastercard accepted

Card number .....
Expiry date of card .....

Signature .....

Subscription Number (free ad for subscribers).....

FOR SALE/ WANTED/ EXCHANGE

	(30)		

CONTACT DETAILS FOR ADVERT

			(12)

Bargain Basement September 1995

Classified Ads

To advertise on this page see booking form below.

Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

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.

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.

R.A.E. Pay as you learn correspondence. £3 per lesson includes tuition. Ken Green, C Eng, M.I.E.E., Chylean, Tintagel, Cornwall. Tel: (01840) 212262.

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 G0LOJ

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 couteous service. Visitors by appointment only (we are a very busy Export Warehouse). Billington Export Ltd. Tel: (01403) 784961. Fax: (01403) 783519.

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 interested 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.

SIGNA GENERATOR, frequency range 100kHz to 150MHz up to 450MHz on harmonics, accuracy 1.5% R.F. output 100mV up to 35MHz. £60. Tel: (01224) 822693.

TRANSCEIVER PRC 316 HF, AM, CW, watts output with headphones and boom microphone and manual last few. £105. Megger crank handle type 500v. £45. All prices include P&P send large SAE for list. C.P. Surplus, 56A Worcester Street, Wolverhampton WV2 4LP. Tel: (01902) 203115.

24cm ATV EQUIPMENT, transmitters, Pre-Amps, Antennas. SAE G81KP, 1 Melstock, Weymouth, Dorset DT3 6JX.

TECHNICAL MANUALS, AR88, CR100, R210, HR0. £5 each. Circuits £1.50. Hundreds available. SAE list. Bentley, 27 De Vere Gardens, Ilford, Essex IG1 3EB. Tel: 0181-554 6631.

VINTAGE COLLECTION. CR100, 1155 (2), 1154, RF unit 26, amps (4), P.U. RCA speaker, 200 valves, technical books. Offers. Tel: Credition, Devon (01363) 773386.

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.

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.

REMEMBER RADIO LUXEMBOURG, London, Caroline etc. Radio tapes from £2.20. Camradio, 70 Willow Way, Ampthill, Beds MK45 2SP.

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: .....

Receivers

B.F.O. KITS Resolves single side-band on almost any radio, £16.49. H. CORRIGAN, 7 York Street, Ayr KA8 8AR.

YAESU FRG9600 SCANNER 100kHz - 960MHz boxed, ERA Mk2 microreader boxed, Datong active antennas outdoor/indoor. Offers. Must Sell. Tel:)01224) 899496.

Morse

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.

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. Installation, 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

Access VISA

ELECTRONICS VALVES & SEMICONDUCTORS

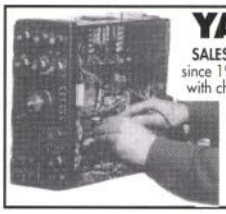
Phone for a most courteous quotation

081-743 0899
Fax: 081-749 3934

We are one of the largest stockists of valves etc, in the U.K.

COLOMOR (ELECTRONICS) LTD.

170 GOLDHAWK ROAD
LONDON W12 8HJ



YAESU, ICOM, AOR etc.

SALES & SERVICE Holdings of Blackburn Ltd. Inc. 1952, Yaesu Agents since 1972. G3LLL 40+years in electronics. Best prices for callers (try us with cheque or 'real money' if you want to bargain) only xyl and self to pay so we can afford to give good prices – valves and CW filters for old Yaesu eg. Phone, normally open Tues, Wed, Fri and Sat. Lunch 12.00-1.30 but phone first we enjoy a few holidays!

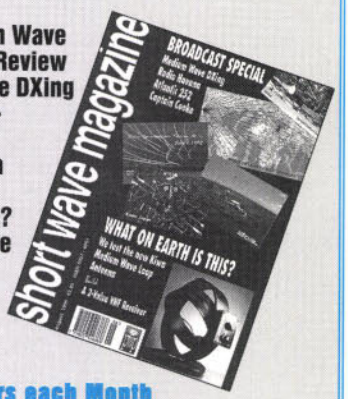
G3LLL HOLDINGS, AMATEUR ELECTRONICS
45 JOHNSTON STREET, BLACKBURN, BB2 1EF
(0254) 59595

Please mention practical Wireless when replying to advertisements

SHORT WAVE MAGAZINE

This Month: Broadcast Special

Reviewed:
- ★ Kiwa Medium Wave Loop Antenna - Review
- ★ Medium Wave DXing
- ★ Atlantic 252 - Station Profile
- ★ Radio Havana
- ★ Will It Get Foreign Stations?
- ★ Captain Cooke - The Enduring Pirate?



Plus Regulars each Month

Coming Next Month: Our Antenna Special

- ★ A Medium Wave Booster
- ★ Simple 2 Valve SW Radio - Part 2
- ★ Antenna Rigging
- ★ Baldock Monitoring Station
- ★ Low Noise Vertical Antenna Design
- ★ Modified ATU
- ★ The Easy Dipole
- ★ Opto 'Scout 40' and Reaction Tuning
- ★ The Rainbow Loop - Antenna Project
- ★ World Exclusive Review - Lowe HF250 Receiver

SEARCHLIGHT MIRRORS. 19" dia 3¾" deep new. £28.50. **MINE DET** Army type 4.C transis with inst book. £26.50. **OSC ASS** low frew 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 gange 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 mt new. £26.50. **MORSE KEY** Army enclose adjustable. £16.50.

ABOVE PRICES ARE INCLUSIVE GOODS EX EQUIP UNLESS STATED NEW.
2 X 25p stamps for list 57

A. H. SUPPLIES
Unit 12, Bankside Wks, Darnall Road, Sheffield S9 5HA
Tel: 0114-244 4278

EX – WWII ALADDINS'S CAVE

A truly superb treasure trove of Ex.WWII equipment you will not see anywhere else in the World. Thousands of plugs and sockets for all types of radio equipment used in aircraft, including P.O. plugs and sockets, aircraft instruments, switches, lamps, valve bases, resistors, condensors etc, incl radio sets BC/624A receiver and BC/625A transformer – £110.00 pair complete. Also APN1 ***radio set*** £48.00 each. Why not visit our four warehouses and see for yourself our vast stockholding. Our customers come world wide – so why not you? *Must phone or fax for appointment.*

METHODICAL ENGINEERS LIMITED
Manor Trading Estate, 4/6 Armstrong Road, Benfleet, Essex SS7 4PW England
Tel: (01268) 792681 Fax: (01268) 795375 Telex: 99214

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 OFFER Page 24
❑ I am a *PW* Subscriber. Please send me ..... copy(ies) of *All About VHF Amateur Radio* @ **£9 inc. P&P (UK).**

❑ I am a *PW* Subscriber. Please send me ..... copy(ies) of *All About VHF Amateur Radio* @ **£9.75 inc. P&P (overseas).**

My Subscriber Number is.....

SPECIAL OFFER Page 24
❑ Please send me ..... copy(ies) of *Short Wave Communications* @ **£5.50 inc. P&P (UK).**

❑ Please send me ..... copy(ies) of *Short Wave Communications* @ **£6.25 inc. P&P (overseas).**

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,

.....**£**
.....**£**
.....**£**
.....**£**

❑ My book order totals over **£20 excluding P&P**, please send me my **FREE** copy of *25 Simple Amateur Band Aerials* **(BSPW9).**

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

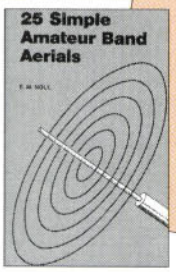
The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

TO ORDER: PLEASE USE THE ORDER FORM ON PAGE 70 OR TELEPHONE THE CREDIT CARD HOTLINE ON (01202) 659930 (24 HOURS)

FREE BOOK

For every book order received between **August 10** and **September 14** that totals £20 or more excluding P&P, the customer will receive a **FREE** copy of *25 Simple Amateur Band Aerials*. If ordering by telephone please quote **BSPW9** to qualify for this offer.

So, don't delay, browse through our book list and order those 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.
108 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

HIGH IN THE SKY
NEW
Davis Barker & McKenzie
This new edition comprises ten sections. The first seven sections are an introduction of radios, antenna and radio communications, information about airways, sections covering v.h.f. and h.f. aeronautical communications, and a brief look at ACARS. The majority of the book is taken-up by section eight, which lists all known Selcalls in three different sequences (by airline/operator, by Selcall and by registration). The 9th section is devoted to Selcalls used by executive jets; these are separate, since these Selcalls are not always fixed. Mostly re-written this volume contains the all-important frequency listings for the aeronautical networks, airlines, the military and the commercial networks.
166 pages. £6.95

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 para-military 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 f.m. 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. aerials, RDS, the Radio Authority and developments from Blaupunkt.
68 pages. £3.45

POP WENT THE PIRATES
Keith Skues
A very compresensive 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 depth, 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

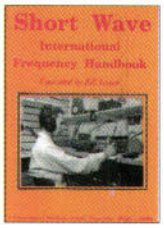
PASSPORT TO WORLD BAND RADIO 1995
This book gives you the information to explore and enjoy the world of broadcast band listening. It includes features on different international radio stations, receiver reviews and advice as well as the hours and language of broadcast stations by frequency. The 'blue pages' provide a channel-to-channel guide to world band schedules.
416 pages. £14.50

PW BOOK SERVICE

Access VISA MasterCard AMERICAN EXPRESS

(01202) 659930 (24 HOURS)

Internet orders: bookstore@pwpub.demon.co.uk



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 scanning in the UK.
335 pages. £17.50

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 needis 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
BP290. 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 Breeds
This book deals almost exclusively with television broadcast satellites and is a

comprehensive collection of chapters on topics, each written by a 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 K2UBC
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. Taggart 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 ban on Scanning, deals with the subject of scrambling and encryption systems. The author explains in simple terms how p.m.r. 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 title 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 folklore exposed. All the information need 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 VERTCAL ANTENNAS
W. I. 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.t.u.s.
192 pages. £7.50

ANTENNA EXPERIMENTER'S GUIDE
Peter Dodd G3LDO
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

ANTENNA IMPEDANCE MATCHING (ARRL)
Wilfred N. 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 fed 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 forth 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. I. 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-QRP CLUB ANTENNA HANDBOOK
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GW0LNQ.
This book is a collection of antenna and related circuits taken from Sprat, the G-QRP 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.
155 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

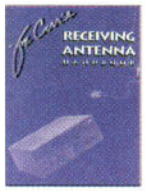
PRACTICAL ANTENNAS FOR NOVICES
John Heys G3BDQ
In this guide, written especially for newly qualified holders of the UK novice Licence, John Heys describes in detail how to build simple but efficient antennas for each of the Novice bands up to 434MHz, as well as useful ancillary equipment to ensure that 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 at 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 comm-unication. 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. I. 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. I. 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 DeMaw 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

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 Amateur's 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

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.

187 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

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. **O/P**

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.

86 pages. £3.95

NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition

Michael Tooley

An invaluable compendium of facts, figures, circuits and data which is indispensible 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.

438 pages. £15.95

EMC

INTERFERENCE HANDBOOK

William R. Nelson WA6FQG

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 G3JWI

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 Gernsback

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 Clarricoats 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 callsign 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 a brightly coloured map clearly showing callsign 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. **O/S**

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 SSTV 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 tecnique. 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. £8.95

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

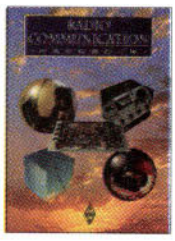
MARINE VHF OPERATION

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 Biddulph 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 'guru' 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 Horzepa 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 to 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 Branegan GM4IHJ
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 Sprat 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 QST 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 suitable for the UK Novice bands (including microwaves). Although the book is 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

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

I.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 r.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 comparitors, 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 consise 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 indispendable. This book is an invaluable compendium of facts, figures and formulae. Managers, designers, students and service personel 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 unstabilised 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

PRACTICAL ELECTRONICS HANDBOOK

NEW

Ian Sinclair
"The best value handbook on electronics you can buy", so claims the sleeve notes of the 4th edition. They're not far of the mark either. The volume covers a wide range of disciplines. These include passive and active discrete components, i.c.s both analogue and digital including A/D and D/A. Microprocessor and systems. Much reference data is also included. A book worthy of space in your library.
439 pages. £13.95

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 designer's '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, formulæ 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.

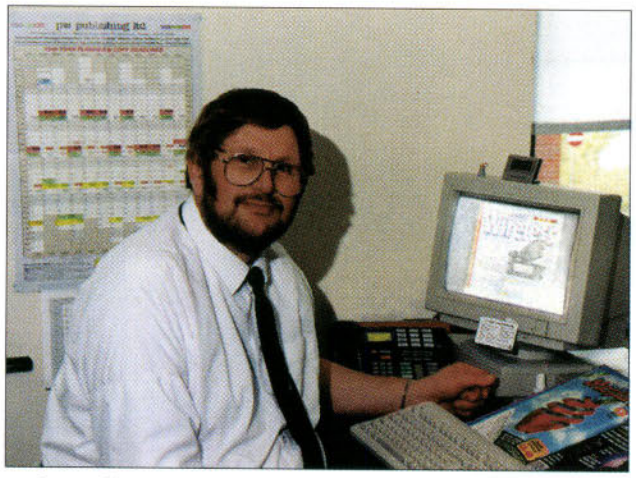
SHORT WAVE SUPERHET RECEIVER CONSTRUCTION BP276

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



As usual, everyone on the *PW* Editorial team hope you've enjoyed reading this issue. In the 'themed' part of the magazine, there was certainly a lot to encourage people to use this part of the spectrum and enough information to get you going on 50MHz!

It's also a pleasure to report that I'm now on the air on s.s.b. much more than I used to be, thanks to buying a KW2000B recently, to supplement my QRP Trio TS-120V. If you would like to join me on 3.5MHz, I'm often on at 7 or 10pm UK time, at a frequency of around 3.720MHz.

In fact, I've received a lot of feed-back from reader friends over the air who've tried some of the Delta Loop antenna ideas we published last month. Very successful from what I've heard!

I'd also like to 'push' a personal interest now, and mention my enthusiasm for railways. In my efforts to learn as much as I can about my surroundings, and those of fellow radio amateurs, I often chat about railways. If you're interested in railways (anywhere in the world) how about a special Net? I would be delighted to hear from you on this point and to work you on the air, on c.w. or s.s.b.

Incidentally, a KW2000A was my first s.s.b. transceiver. What was your first rig? Drop us a line, with a photograph if possible, we'd be interested to hear from you.

I hope you enjoyed sharing the pleasure of my trip to Holland. And since that trip, it's also occurred to me how little I know what it's like to **be** a radio amateur abroad. So, if you live abroad, how about an article on amateur radio from your country and your point of view?

We've got our 'Receiving Special' coming next month, with some interesting ideas, so make sure you get your copy!

Cheerio for now.

Rob G3XFD

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.

YOUR LOCAL DEALERS

Index to Advertisers

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 ΔTX with calculate function
- Memo pads
- PBT function and notch filter
- Speech compressor
- VOX function
- Double band stacking register
- 101 Memory channels
- Versatile scans

ICOM

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.

MAPLIN

ELECTRONICS AND BEYOND

FULL COLOUR GUIDE TO ELECTRONIC PRODUCTS

NEW **1996 CATALOGUE**

Bigger, Brighter and *Better Value* than ever before. Over 1180 Full Colour pages with hundreds of Brand New Products at Super Low Prices

on sale from 1st September

only £2.95

from all branches of WHSMITH and other major retail outlets.
Order by post including P & P £3.45

01702 554161

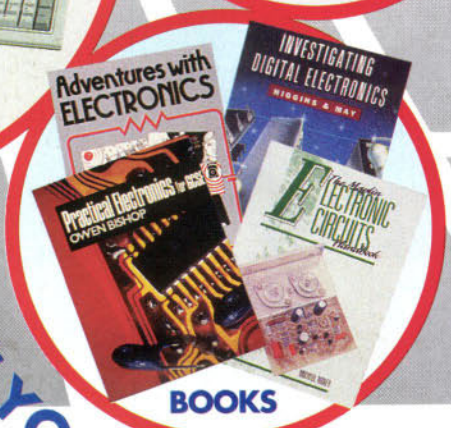
TEST GEAR

PCB EQUIPMENT

COMPUTER ACCESSORIES

ELECTRONIC COMPONENTS

TOOLS



BOOKS

VISIT YOUR LOCAL MAPLIN STORE TODAY

To place your order and to discover a world of electronics and beyond

Belfast 357-359 Lisburn Road. **Birmingham** Sutton New Road, Erdington. **Bradford** 28 Valley Road, Hamm Strasse. **Brighton** 65 London Road. **Bristol** 302 Gloucester Road. **Cardiff** 29-31 City Road. **Chatham** 2 Luton Road. **Coventry** 12 Bishop Street. **Dudley** Unit 7, Pedmore Road. **Edinburgh** 126 Dalry Road. **Glasgow** 264-266 Great Western Road. **Ilford** 302-304 Green Lane. **Leeds** Carpet World Building, 3 Regent Street. **Leicester** Office World Building, Burton Street. **Liverpool** Edge Lane, Fairfield. **London** 146-148 Burnt Oak Broadway, Edgware; 107-113 Stanstead Road, Forest Hill; 120-122 King Street, Hammersmith. **Manchester** 8 Oxford Road; 169 Cheetham Hill Road, Cheetham Hill. **Middlesbrough** Unit 1, The Forbes Building, Linthorpe Road. **Milton Keynes** Unit 2, Office World Building, Snowdon Drive, Winterhill. **Newcastle-upon-Tyne** Unit 4, Allison Court (The Metro Centre), Gateshead. **Northampton** 139 St. James Road. **Nottingham** 86-88 Lower Parliament Street. **Portsmouth** 98-100 Kingston Road. **Preston** Unit 1, Corporation Street. **Reading** 129-131 Oxford Road. **Sheffield** 413 Langsett Road, Hillsborough. **Slough** 216-218 Farnham Road. **Southampton** 46-48 Bevois Valley Road. **Southend-on-Sea** 282-284 London Road, Westcliff-on-Sea. **Stockport** 259-261 Wellington Road South. **Stoke-on-Trent** 39-45 London Road. Plus many NEW stores opening soon. Tel: (01702) 552911 for details of your nearest store.