

The

SHORT WAVE

25p

Magazine

VOL. XXXI

JANUARY 1974

NUMBER 11

Have you done your sums?

TRIO + PARTRIDGE

= PARTRIDGE PACKAGE

= A COMPLETE RADIO STATION

FOR ANY LOCATION AT A PRICE LITTLE, IF ANY MORE THAN THE COST OF THE TRIO ALONE!!!

FREE

Headphones or Speakers; Suitably Terminated Connectors; Handbook; Carriage; Insurance. In addition a JOYSTICK V.F.A.; JOYMATCH A.T.U.; feeder external mounting Insulators are supplied FREE or greatly reduced when you buy a PARTRIDGE PACKAGE.

A PARTRIDGE PACKAGE constitutes a COMPLETE RADIO STATION—ready to use however confined your domestic space. The World renowned TRIO range of Communications Receivers and Transceivers, the WORLD RECORD, Internationally patented JOYSTICK V.F.A. (all band aerial) only 7' 6" long (assembled) and a JOYMATCH aerial tuning unit, a pair of matching headphones or Internal speaker, plus accessories, go to complete your READY TO USE RADIO STATION at a price that truly represents VALUE FOR MONEY! H.P. FACILITIES WHERE POSSIBLE—24 HOUR DELIVERY (MON.-FRI.) ADD £4.00—OUR RISK!

PARTRIDGE PACKAGE (Write for details of more Partridge Packages)

No. 1 with Gen. Coverage AM/CW/SSB (MW/SW) 9R59DS Receiver	£65.91 (Save £15.30)
No. 2 with Amateur Bands 80 thru 10m. AM/CW/SSB JR310 Receiver	£90.97 (Save £22.35)
No. 3 with Amateur Bands 160 thru 10m. plus 2m. AM/CW/SSB JR599	£165.00 (Save £19.48)
No. 4 with Amateur Bands 80 thru 10m. TS/PS 515 Transceiver, 180w.	£231.00 (Save £37.08)

NOTHING TO PAY!

OUR RISK

Access/Barclaycard orders accepted by 'phone

JOYSTICK V.F.A. £13.75; JOYMATCH TX/RX A.T.U. 111A 1.6-32 MHz £13.75; JOYMATCH A.T.U. 111 RX only 500 kHz-32 MHz £13.75; JOYMATCH A.T.U. LO-2500 TX/RX 500w SSB (PA input), Built-In RF meter £19.91; Communications 8Ω headphones (suitable TRIO, EC10 etc.) £3.14; Matching Speaker (with instructions for internal fitting in 9R59DS and JR310) £2.00; TRIO: Linear Amplifier TL911 £172.15; TR2200 2m personal transceiver £87.45; TR7200 2m car transceiver £142.45; Spare set valves for 9R59DS £2.35; OA2 Mains Stabiliser 74p; GR59DS £52.59 (VAT incl.) plus FREE Speaker del. OUR RISK.

NEW : World-wide reception on the amazing "DX-CRYSTAL SET" £2.42 incl. unique aerial.

NEW : AMTRON QUALITY KITS—send for brochure and prices.

PARTRIDGE BUDGET LINE

Artificial Earth—solves receive and transmit earth problems (as used on North Sea Oil Rigs!) £5.80; Aerial Bandswitch—tuned aerial for domestic receivers £5.80; A.T.U. KIT—for use with transmitters and Communications Receivers £5.80; (assembled £7.01); Mini SWR Bridge—1.8 to 180 MHz, 2 kw P.E.P., 75 or 50Ω SO239 sockets; 1 : 1 to 1 : 3 ratio, 80 x 30 x 30mm £5.60. (All prices quoted INCLUDE V.A.T., CARRIAGE, PACKING, INSURANCE.)

Send 3½p stamp for full illustrated details. Special TRIO brochures (state which) 3½p stamp extra.

NO V.A.T. ON OVERSEAS ORDERS!

Carriage and Insurance extra overseas orders

BOX 4



G3CED — G3VFA

FOR EXPERT ADVICE AND INFORMATION

Telephone: 0843 62535 or 62839 evenings and weekends

★ **Happy New Year** ★

from

LOWE ELECTRONICS

MAIN DISTRIBUTOR FOR YAESU MUSEN EQUIPMENT

Head Office and Service Department (Bill G3UBO, Alan G3MME and John G3PCY)

119 Cavendish Road, Matlock, Derbyshire, DE4 3HE

Telephone : 9 a.m. - 9 p.m. Matlock 2817 or 2430

Southern Sales (Dave G8FAY)
Goring Road, Steyning, Sussex.
Telephone : Steyning 814466.
Just off the A283 on the Shoreham side of the village.

Midland Sales (Peter G3XWX)
Soho House, 362-364 Soho Road,
Handsworth, Birmingham.
Telephone : 021-554 0708

Just off Exit 1, M5—follow the A41 into town for 1½ miles to the Regal (Bingo Hall) Cinema. We are directly opposite, on the first floor. Within easy reach of the South-West or North-East by Motorway

NO PROBLEM PARKING AT ANY BRANCH

In addition to the above shops, which are open 9 to 5.30 Tuesday to Saturday, we have part-time Agents who are available evenings and weekends :—

John G3JYG
16 Harvard Road, Ringmer, Lewes,
Sussex.
Telephone Ringmer 812071

Sim G3SAN
19 Ellismuir Road, Baillieston,
Nr. Glasgow.
Telephone 041-771 0364

Alan GW3YSA
35 Pen Y Waun, Efail Isaf,
Nr. Pontypridd, Glam.
Telephone Newton Llantwit 3809

So, wherever you are, we have a branch or a part-time Agent not too far away. At Matlock, the Branches, or our Agents you will see and can try out the best in both new and second hand, H.F. or V.H.F. along with every conceivable accessory for the complete station.

**NEW
MODEL
FT101B**



This is a new and improved version of the well-known FT101. It is fitted with a cooling fan as standard and is improved in several respects :—

New noise blanker
New inverter transistors
New 8 pole filter

New R.F. board
New 2nd mixer

Further details may be obtained from Matlock. Our catalogues are free but we would appreciate postage, etc., so please send 8p in stamps for our V.H.F. catalogue, 8p for our H.F. catalogue, 3½p for second-hand list, or send us 15p in stamps and we will send the lot.

STOP PRESS : VENUS SSTV - Give us a yell !

Western Electronics (UK) Ltd

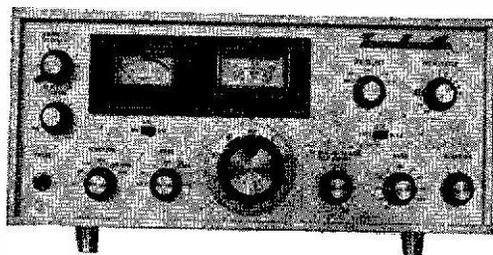
TOTTON
SOUTHAMPTON



YAESU MUSEN U.K. DISTRIBUTOR BUYING A RECEIVER?

THEN DON'T FORGET TO DO YOUR HOMEWORK FIRST! CHECK OUR ARITHMETIC AGAINST THE FACILITIES YOU GET FOR YOUR MONEY ELSEWHERE, ADD-IN THE FINEST ENGINEERING STANDARDS IN THE WORLD AND A HOST OF OTHER "PLUSSES" AND YOU'LL HAVE TO AGREE THE ANSWER IS . . . THE FR400SDX . . . FROM W.E.

FR400 SDX (Ex-Stock)

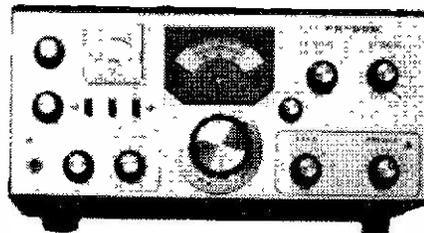


- 160m., 80-10m. ✓
- Full coverage of 10m. 28-30 MHz ✓
- 70-72 MHz (4m.) ✓
- 144-146 MHz (2m.) ✓
- REJECTION TUNING ✓
- AM/CW/SSB/FM/FILTERS ✓
- FM discriminator ✓
- 1 kHz Readout ✓
- TRANSCIEVES (with FL400) ✓
- SUPERB PERFORMANCE ✓

(ALL ADDS UP TO) FR400SDX

- + 1 YR. GUARANTEE
- | AFTER-SALES-SERVICE
- 24/48 HR. SECURICOR DELIVERY
- = YAESU FROM W.E.

FR-50B (Ex-Stock)

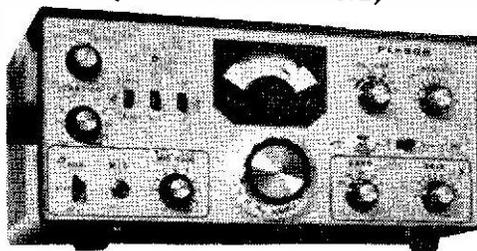


This AM/CW/SSB double conversion receiver offers first class value for money. This comes complete with built-in speaker, crystal calibrator and WWV band at £73.70 inc. VAT.

SPECIFICATION

- Sensitivity : 0.5µV 10 dB S + N/N ratio.
- Selectivity : 3.6 kHz 6 dB.; 10 kHz 50 dB.
- Frequency Coverage : 3.5-3.8 MHz, 7-7.5, 14-14.5, 21-21.5, 28-29.2 MHz.
- Dial Calibration : 1 kHz divisions.
- Image rejection : Better than -50 dB.

FL-50B TRANSMITTER (Ex-Stock) £86.90
(Transceives with FR50B)



NEW/USED EQUIPMENT (Carriage £1 extra then add VAT)

ETM Keyer ... £19.00
Hallicrafters HT32B. ... £79.00
Hallicrafters SX101 plus autotran. ... £55.00
Hammarlund HX50. 10-160m. ... £79.00
Heath SB300. Very good ... £79.00
Heath DX100, SB10 and VFIU ... £25.00

Heath SB303 new and CW Filter, inc. VAT ... £230.00
Heath SB620 ... £59.00
Heath SB303. Very good ... £150.00
Heath HM102. Misc ... £18.00
Heath HP13 DC PSU ... £29.00
KVZ200A National NCX3. Good, 20, 40 and 80m. ... £99.00

Racal MA150 synthesiser (for RA17/117) ... £89.00
Racal MA197 pre-selector, 1-30 Mc/s. ... £65.00
Sommerkamp FL500. Very good ... £105.00
Sommerkamp FT250. Very good ... £140.00
Trio JRS00 SE. New ... £33.00

Trio 9R59DS. New ... £49.00
Trio 310 ... £65.00
Yaesu FT-2FB and AM ... £75.00
Yaesu FT-2FB. As new ... £89.00
Yaesu FL2500. As new ... £99.00
Yaesu FT-75 ... £95.00
Yaesu DC-75 ... £95.00
Prices exclude VAT.
Securicor carriage £1.00 extra.

ROBOT SLOW-SCAN TV

All you need to add to your SSB Transmitter/Receiver is the mode 70 Monitor £257 and model 80 camera £262 in order to send and receive SSTV signals from around the world. Please send s.a.e. for full details (VAT extra).

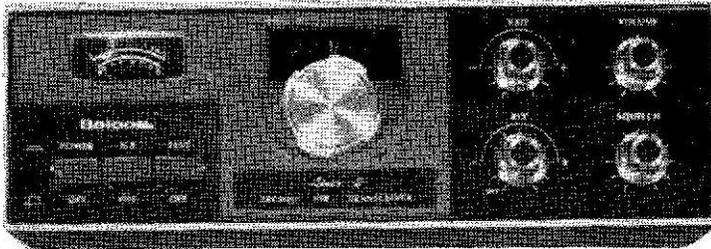
TELEPHONE ORDERS—IT COULDN'T BE SIMPLER!

JUST PHONE US AND QUOTE YOUR ACCESS OR BARCLAYCARD NUMBER AND WE'LL DO THE REST

Western Electronics (UK) Ltd

TOTTON
SOUTHAMPTON

For your LINER 2 144MHZ SSB Transceiver



Price £120 (plus V.A.T.)

24 hour SECURICOR DELIVERY.

Ex-Stock. We have 2 models :

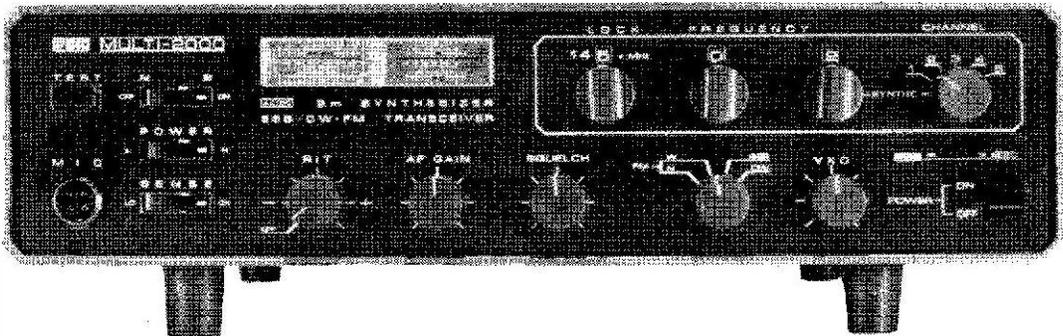
(a) Covers 145.25-145.48

(b) Covers 144.10-144.34
for the new band plan.

At last . . .

What you've all been waiting for!

A 2m. SSB/FM/CW TRANSCEIVER, the FDK Multi 2000



2m. SSB/FM and CW Synthesised 200 Ch. AC/DC. 10w o/p. (S.A.E. for details please)

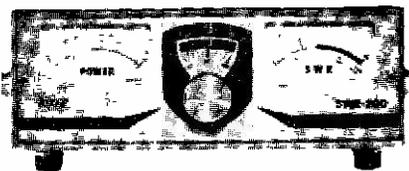
NEW! 2m. and 70 cm. Scanning Receiver

HERE IS EXCELLENT VALUE AND PERFORMANCE WITH THE FOLLOWING FEATURES :

- ★ Scans eight channels.
- ★ Model SM-103 scans 8 VHF channels
- ★ Model SM-104 scans 8 UHF channels.
- ★ Model SM-105 scans 4 VHF and 4 UHF.
- ★ Works on A.C. or 12v. D.C.
- ★ Priority channel on CH1 or CH8 (VHF or UHF)
- ★ FM Mode
- ★ Build-in Speaker
- ★ Complete with mobile mounting bracket and telescopic antenna
- ★ Separate SO239 I/P sockets for VHF or UHF Ant.
- ★ Squelch.

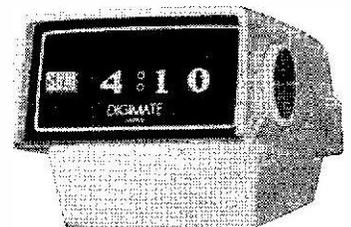
all with 2 IC's, 53 transistors and 41 diodes at only £69 (Carriage/VAT extra)

OSKER POWER METER £18.50 + VAT



If you're one of the few people who haven't bought one at our old price then we suggest you act quickly.

Features: Switchable for 52 or 75 ohm systems. Each instrument is individually calibrated. Four ranges: 0-2, 0-20, 0-200 and 0-2kW, 3-200 MHz. Excellent styling.



BATTERY CLOCK (£6.82 inc. V.A.T.)
This operates for about 6 months on one battery (provided). Ideal Christmas present for the shack or XYL. Available in red, blue, orange, ivory and brown; list your choice in order of preference.

WESTERN ELECTRONICS (U.K.) LTD.

Osborne Road, Totton, Southampton

Western Electronics (UK) Ltd

TOTTON
SOUTHAMPTON

- ★ Your "one stop" single source for masts, towers, rotators, antennas and equipment
- ★ Largest stock range in the U.K.
- ★ Money-saving packaged deals.

THE ALIMAST

A NEW LIGHTWEIGHT TELESCOPIC ALUMINIUM MAST
Heights up to 70ft. Section lengths of 1.5, 2.0 or 3.0m. (5ft., 6ft. and 10ft.)

Our new catalogue (20p) has full details and all are ex-stock

Type	Height	Sections	Price	Type	Height	Sections	Price	Type	Height	Sections	Price
T286A	6m.	(4 x 1.5m.)	£11-60	T3610A	10m.	(5 x 2m.)	£19-70	T3612B	12m.	(4 x 3m.)	£19-60
T287A	7.5m.	(5 x 1.5m.)	£14-50	T3612A	12m.	(6 x 2m.)	£28-90	T3615B	15m.	(5 x 3m.)	£25-00
T289A	9m.	(6 x 1.5m.)	£17-40	T3614A	14m.	(7 x 2m.)	t.b.a.	T3618B	18m.	(6 x 3m.)	£31-70
T2810A	10.5m.	(7 x 1.5m.)	£20-90	T369B	9m.	(3 x 3m.)	£14-60	T3621B	21m.	(7 x 3m.)	£38-80
T2812A	12m.	(8 x 1.5m.)	£23-80								

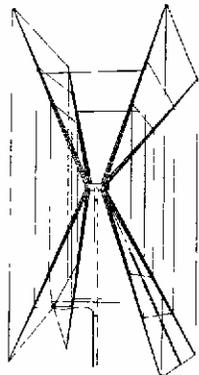
NOTE—T28 Series have 28 mm. o.d. top section. T36 Series have 36 mm. o.d. top section
Prices are Carr. paid ex. VAT

BANTEX FIBREGLASS MOBILE (Carriage 50p) including base (Ex-Stock) + VAT

70½. 70 MHz, ½ wave ...	£3-00	BGA, 144 MHz, ½ wave ...	£6-15	Magnetic mount ...	£6-15	Note. Deduct 50p from price of aerial if base is not required.
144½. 144 MHz, ½ wave ...	£2-85	B5, 144 MHz, ½ wave ...	£4-45	All aerials complete with base.		

G WHIPS (Carriage 50p Coils, 20p) THE FINEST MOBILES (Ex-Stock) + VAT

Tribander 10, 15, 20m. ...	£9-45	LF160 160m coil ...	£7-50	160 Ranger ...	£7-40	80m. coil ...	£4-00
LF40 40m. coil ...	£4-90	Whip for LF coils ...	£1-00	Multimobile '71' 10, 15, 20m. ...	£12-50	160m. coil ...	£4-00
LF80 80m. coil ...	£4-00	160/80m. Doubander ...	£9-00	40m. coil ...	£4-00	Basecount for all coils ...	£1-45
Extendarod ...	£4-75	Flexiwhip 10m. ...	£8-60	Flexiwhip Coils ...	£4-25		



GEM-QUAD £81-95 (inc. VAT)

for 10, 15 & 20m.

- ★ Weighs only 21 lbs.
- ★ Withstands 100 mph winds.
- ★ Forward gain up to 8 dB.
- ★ Balun included.
- ★ Converts to 3 or 4 element quad.
- ★ Fibreglass tri-dectic spreaders.
- ★ Front/back ratio 25 dB.
- ★ Low angle radiation.

HY-GAIN 18AVT

HY-GAIN 18AVT/WB THE GREAT NEW WIDE BAND VERTICAL SELF SUPPORTING FOR 10-80m. (ex-stock) £39-05. Take the wide band, omnidirectional performance of Hy-Gains famous 14 AVQ/WB add 80m. plus extra heavy duty construction and you have the new 18AVT/WB ★ True ½-wave resonance on all bands ★ 52Ω i/p ★ SWR of 2.1 or less at band edges ★ 1 kW (AM) ★ Radiation pattern has an outstandingly low angle ★ Roof or ground mounting. Prices (inc. carriage and VAT).

Hy-tower, 10-80m. (self-sup) £121-00	Hy-Quad, 10-20m. 2 ele. ...	£81-95
18V, 10-80m., vertical (self-sup.) ...	DB10-15, 10-15m. 3 ele. ...	£67-50
12AVQ, 10-20, m. vert. ...	2048A, 20m. 4 ele. beam ...	£88-00
(self-sup.) ...	2038A, 20m. 3 ele. beam ...	£88-00
14AVQ, 10-40m. vert. ...	1538A, 15m. 3 ele. beam ...	£40-15
(self-sup.) ...	1038A, 10m. 3 ele. beam ...	£31-35
18 AVT, 10-80m., vert. ...	LA1 Lightning arrester ...	£15-95
(self-sup.) ...	LA2 Lightning arrester ...	£2-75
LC30Q, 80m. coil for 14 AVQ £8-52	261 ½" + Roofmount + co-ax. ...	£4-40
TH6DXX, 10-20m. 6 ele. beam ...	262 ¾" + Mag. Mount, 18ft. co-ax. ...	£9-57
TH3MK3, 10-20m. 3 ele. 2kw ...	263 ¾" + Boot Lip Mount, 16ft. co-ax. ...	£12-10
TH3 Jnr., 10-20m. 3 ele. 600w. ...	265 3dB gain + Mag. Mount, 12ft. co-ax. ...	£13-75
	SWL Listeners dipole ...	£12-50

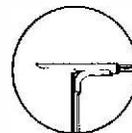
MOSLEY (Carriage paid) (Ex-Stock) from us for fast delivery - VAT

Mustang, 10-20m. 3 ele. 2kw ...	£45-50	TA33 Jnr., 10-20m. 3 ele. ...	£36-50	TA32 Jnr. 'E' for 2" mast ...	£25-50
TA33 Jnr. 'E' for 2" mast ...	£37-80	TA32 Jnr. 10-20m. 2 ele. ...	£29-00	TA31 Jnr. Rotary dipole ...	£17-00

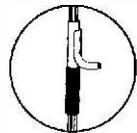
NEWTRONICS HUSTLER HF MOBILE ANTENNA (Carriage 70p VAT extra)

BMI Bumper Mount ...	£4-65	RM40 40m. Resonator ...	£6-90
MO2 Mast ...	£6-90	RM75 80m. Resonator ...	£7-35
RM10 10m. Resonator ...	£4-60	C32 Ball Mount ...	£1-85
RM15 15m. Resonator ...	£5-10	SSM3 Stainless steel spring ...	£5-00
Complete antenna BMI MO2 RM10-75 ...	£36-00	RSS2 Steel resonator spring ...	£2-45
RM20 20m. Resonator ...	£5-55		

MO2 MAST FOLDS OVER
Rotates 360° in horizontal plane



The original hinge and sleeve clutch mechanism.



W.E. QUAD. 10-20m. "boomless" type. Cast aluminium centre, bamboos, etc. £27 (Carriage paid) add VAT

W.E. Trapped dipoles for 10-80m. All are fitted with resin encapsulated traps and a high quality commercial grade centre assembly with cable strain relief. Type S500 watts, £14. Type HP for 1 kw p.e.p., £15-25. Type P with a special copper/terylene braid element for ease of coiling up. Supplied with winding spools and 70' co-ax., £17-50.

WIGHTRAPS. (Carriage 20p) VAT extra

Standard 500w. p.e.p. ...	£2-60	High Power 1 kw p.e.p. ...	£3-75	160/80 Traps ...	£3-75
---------------------------	-------	----------------------------	-------	------------------	-------

ROTATORS CDE and HY-GAIN (VAT inc.)

AR20 (£22)	AR22 (£27-50)	TR44 (£49-50)	HAM-M (£77)	HY-GAIN 400 (£126-50)
------------	---------------	---------------	-------------	-----------------------

DON'T FORGET JUST PHONE US, QUOTE ACCESS OR BARCLAYCARD No. AND WE WILL DO THE REST!

Western Electronics (UK) Ltd

Agents: G3PRR Chesham T024051 4143

Hours of business: 9-5:30; 9-12:30 (Saturdays)

OSBORNE ROAD TOTTEN SOUTHAMPTON SO44DN
TELEPHONE: TOTTEN (04216) 4930 or 2785
CABLES: 'AERIAL', SOUTHAMPTON'



Technical Books and Manuals

(ENGLISH AND AMERICAN)

AERIAL INFORMATION

ABC of Antennas	92p
Aerial Handbook (Briggs)	89p
Amateur Radio Antennas (Hooton)	£1-89
Antenna Handbook, Volume 1	£1-79
Antenna Round-Up, Volume 1	£1-50
Antenna Round-Up, Volume 2	£1-80
Antenna Handbook, 12th Edition (ARRL)	£1-42
Beam Antenna Handbook, 4th Edition	£2-13
Quad Antennae, 2nd Edition	£1-82
Simple Low Cost Wire Antennas	£1-75
73 Vertical, Beam and Triangle Antennas (by E. M. Noll)	O/S
73 Dipole and Long-Wire Antennas (by E. M. Noll)	O/S

BOOKS FOR THE BEGINNER

Amateur Radio (Rayer)	£1-63
Beginners Guide to Radio (7th Edition)	£1-15
Beginners Guide to Transistors	£1-15
Beginners Guide to Colour TV	£2-08
Better Short Wave Reception, 2nd Edition	£1-82
Course in Radio Fundamentals	£1-17
Foundations of Wireless and Electronics	£2-06
Guide to Amateur Radio	90p
Ham Radio (A beginner's Guide) by R. H. Waring	£1-75
How to Become a Radio Amateur	65p
Learning the RT Code	30p
Morse Code for the Radio Amateur	24p
Radio, by D. Gibson	87p
Radio Amateur Examination Manual	90p
Simple Short Wave Receivers (Data)	90p
Understanding Amateur Radio	£1-40

GENERAL

ABC of Electronics (by Farl J. Waters)	£1-60
FM & Repeaters for the R. Amateur	£1-63
ABC of FET's	£1-38
Easibinder (to hold 12 copies of Short Wave Magazine together)	O/S
FET Principles, Experiments and Projects	£2-17
Making Transistor Radios (R. H. Warring)	£1-32
Guide to Broadcasting Stations (17th Edition)	84p
Having Fun with Transistors	£1-61
110 Semi-Conductors Project for the Home Constructor (Iliffe)	£1-31
How to Listen to the World—7th Edition	£1-90
110 Integrated Circuit Projects for the Home Constructor	£1-31
Know Your Oscilloscope (by Paul C. Smith)	£1-82
Microphones	£1-67
Practical Integrated Circuits (Newnes-Butterworth)	£1-03
Practical Transistor Theory	£1-12
Practical Wireless Circuits	£1-35
Prefix List of Countries	24p
Radio Engineers Pocket Book (Newnes) (N.E.)	£1-27
Shop and Shack Shortcuts	£1-77
Single Sideband: Theory & Practice (by H. D. Hooton)	£3-52
99 Ways to IMPROVE YOUR SHORT WAVE LISTENING	£2-06

Telecommunications Pocket Book (T. L. Squires)	£1-33
World Radio and TV Handbook 1973 Edition	O/P

HANDBOOKS AND MANUALS

Amateur Radio DX Handbook	£2-18
Electronic Circuit Handbook, Vol. 1	£1-43
Electronic Circuit Handbook, Vol. 2	£1-43
New RTTY Handbook	£1-82
Radio Amateur Handbook 1973 (ARRL)	£2-90
Radio Amateur Handbook 1973 (ARRL) (Hard Cover)	£3-70
Radio & Electronic Handbook	£1-33
Radio Amateur Operators Handbook, 12th Edition	54p
Radio Communication Handbook (RSGB)	£4-13
Rtty A-Z (CQ Tech. Series)	£2-28
Radio Handbook (W. I. Orr) 19th Edition	O/P
Surplus Conversion Handbook	£1-38
Television Interference Manual (G3JGO)	91p

USEFUL REFERENCE BOOKS

Amateur Radio SSB Guide	£1-60
Amateur Radio Techniques—4th Edition	£1-85
Care & Feeding of Power Grid Tubes (Elmac Division of Varian)	£1-61
Engineers' Pocket Book—8th Edition	£1-49
Guide to Amateur Radio	90p
'G' Call Book 1974	75p
Hams' Interpreter	65p
Hints and Kinks, Vol. 8 (ARRL)	63p
Radio Amateur Examination Manual (N.E.)	90p
Radio Data Reference Book (3rd Edition)	£1-02
Radio, Valve and Transistor Data (Iliffe), 9th Edition	92p
Service Valve and Semiconductors Equivalents	36p
Single Sideband for the Radio Amateur (ARRL), 5th Edition	£1-68
Single Sideband (Theory & Practice) by H. D. Hooton	£3-52
Sun, Earth and Radio by J. A. Ratcliffe	92p
Surplus Schematics (CQ)	£1-23
Transistor Pocket Book	£1-58

TRANSISTOR MANUALS

ABC of Transistors	£1-34
Field Effect Transistors (Mullard)	£1-97
Having Fun with Transistors	£1-61
Handbook of Transistor Circuits	£2-39
Transistor Audio & Radio Circuits (Mullard)	£1-98
Transistor Fundamentals: Basic Semi-Conductor Vol. III, and Circuit Principles, Vol. 1	each £1-95

VHF PUBLICATIONS

VHF Handbook, Wm. I. Orr.	£1-81
VHF Manual (ARRL)	£1-38
VHF/UHF Manual (RSGB)	£1-85

Amateur Radio Awards (RSGB)	£1-40
Questions and Answers on Radio and TV	85p
Integrated Circuit Pocket Book	£2-65
International Transistor Data Manual (Semicon)	£5-80
Teletypewriter Handbook (RSGB)	£5-27

O/P (out of print)
T.O/S (Temp. out of stock)

The above prices include postage and packing.
Many of these Titles are American in origin.

Available from

Publication Dept., 55 Victoria St., London SW1H 0HF

(Counter Service. 9.30-5.15. Mon. to Fri.)

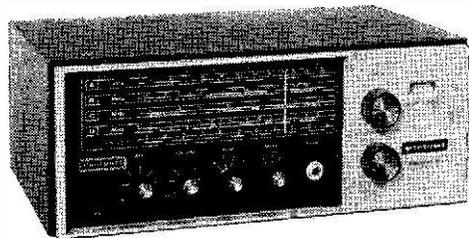
(GIRO A/C. No. 547 6151)

SHORT WAVE MAGAZINE

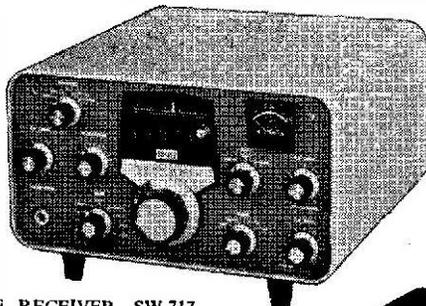
01-222 5341

(Nearest Station: St. James's Park)

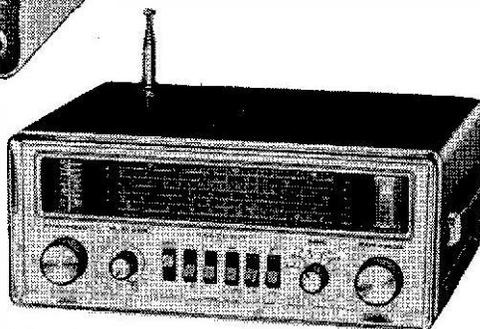
Big performers for the SWL from Heathkit



SW-717



SB-313



GR-78

Monthly
Budget Plans
available—
Send for details

TRANSISTOR GENERAL COVERAGE RECEIVER, SW-717

SW-717 SPECIFICATIONS: Frequency Coverage Band A, 550 kHz to 1500 kHz; Band B, 1.5 MHz to 4 MHz; Band C, 4 MHz to 10 MHz; Band D, 10 MHz to 30 MHz. Meter indicates relative signal strength. Headphone jack, Headphones or an external speaker. Loudspeaker built-in. Controls: VOLUME with on-off switch. MODE (AM, standby and CW) BFO, MAIN TUNING. BANDSPREAD TUNING. ANL (on-off). Power Supply: Transformer operated. Full wave bridge rectifier. Power Requirements: 120v. A.C. or 240v. A.C. 50/60 Hz 6 watts.

Kit K/SW-717 £34.65 Carr. 77p (VAT £3.22 incl.)

HEATHKIT PROFESSIONAL SOLID-STATE SWL RECEIVER SB-313

SB-313 specification: Frequency range (MHz) 3.5 to 4.0, 5.7 to 6.2, 7.0 to 7.5, 9.5 to 10.0, 11.5 to 12.0, 14.0 to 14.5, 15.0 to 15.5, 17.5 to 18.0, 21.3 to 21.8. Intermediate frequency (IF) 3.395 MHz. Frequency stability less than 100 Hz per hour after 10 minutes warm-up under normal ambient conditions. Less than 100 Hz drift for $\pm 10\%$ line voltage variation. Sensitivity: less than 0.5 microvolt for 10 dB signal-plus-noise ratio for SSB operation. Selectivity AM 5.0 kHz at 6 dB down, 15 kHz maximum at 60 dB down (crystal filter supplied). SSB 2.1 kHz 6 dB down, 5.0 kHz maximum at 60 dB down (crystal filter available as an accessory). CW 400 Hz at 6 dB down, 2.0 kHz maximum at 60 dB down (crystal filter available as an accessory). Image rejection: 60 dB or better. IF rejection 3.395—greater than 55 dB. 8.595—greater than 40 dB. Spurious response: all below 1 microvolt equivalent signal input except at 10.0 MHz and 15.375 MHz. Dial accuracy: electrical—within 400 Hz after calibration at nearest 100 kHz or 25 kHz point. Visual—within 200 Hz. Calibration every 100 kHz or 25 kHz. Dial backlash: no more than 50 Hz. Antenna input impedance: 50 Ω nominal unbalanced. Audio output impedance: matching speaker 8 Ω . Matching headphones low impedance. Audio output power: 4 watts at less than 10% distortion. Muting: open external ground at Mute socket. Power requirements: 105 to 130 or 210 to 260 volts A.C., 40 watts max. Overall dimensions: 7 15/16" H x 12 1/4" W x 14" D.

Kit K/SB-313 £209.00 Carr. 99p (VAT £19.09 incl.) less speaker

SOLID-STATE GENERAL COVERAGE RECEIVER, GR-78

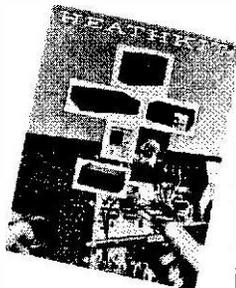
• 190 kHz to 30 MHz in 6 bands • 11 transistors, 5 FET's and diodes • Four ceramic IF filters • Double conversion superhet circuit above 18 MHz for excellent image rejection • Built-in 500 kHz crystal calibrator • Relative signal strength meter • Switchable Automatic Noise Limiter • Switchable Automatic Volume Control • Switch-selected AM, CW or SSB tuning • Receive/Standby switch and receiver muting connection for amateur operation • Operates from built-in rechargeable nickel-cadmium battery • Charges from 120v. A.C. or 12 to 15v. D.C. with internal charging circuit • 240v. AC wiring option • Size: 6 1/4" H x 11 1/2" W x 9" D.

Kit K/GR-78 £75.90 Carr. 55p (VAT £6.95 incl.)

FREE Catalogue

SEE HEATHKIT
EQUIPMENT IN
OUR LONDON
SHOWROOM
233 Tottenham Court
Road
Tel: 01-636 7349

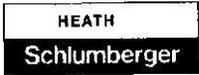
GLOUCESTER
FACTORY AND
SHOWROOM
Bristol Road
Tel: (0452) 29451



Please send me free the Heathkit Catalogue and details of your Monthly Budget Plan.

NAME
ADDRESS

HEATH (GLOUCESTER) LTD.,
Dept. SW/1/74
Bristol Road, Gloucester GL2 6EE



Waters & Stanton Electronics

MINI-BEAMS

Now available from your local dealer or direct from us.
Mini-Hybrid Quad (HQ-1) ... (p.p. £1.50) **£46.75**
Mini-Beam (B24) ... (p.p. £1.50) **£35.75**
Mini-Vertical (C4) ... (p.p. £1.00) **£20.85**
Third Element for B24 ... (p.p. £1.00) **£28.85**
 S.A.E. for Brochure Now.

***TRIO COMMUNICATIONS EQUIPMENT.** Whilst chaos reigns in certain sectors of the Japanese import market in respect of prices, Trio stays cool (and so do their P.A. tubes!) We saw the trouble coming many months ago—that's why we backed Trio. For an unbiased report read Radio Communications review of the TS515 in September 1973.

T5515 Transceiver and p.a.u. ... **£231.00***
TX599 Transmitter ... **£176.00***
JR599 160-2 metre Receiver ... **£176.00***
9R59DS Receiver ... **£54.45**
TL911 Linear 2kW ... **£172.00***
7200 2m. Transceiver ... **£142.45***

*Free Securicor delivery on these items

J-BEAMS

4 element 4 metre beam ... **£6.16**
6 element 2 metre beam ... **£3.85**
6 over **6**, 2 metre beam ... **£7.42**
2XD crossed dipoles ... **£5.06**
2/UGP 2 metre ground plane ... **£3.52**

STOLLE ROTATORS 2010 and 3002

Rotator cable to suit above.

SOLID STATE MODULES

2 and **4** metre Sentinel converters ... **£15.12**
70 cm. converters (144 if) ... **£15.12**
2 metre pre amp ... **£7.15**
2 metre P.A.3 pre amp for "earphones" ... **£5.50**

DON'T FORGET

- ★ Barclaycard welcome—simply quote your number.
- ★ Full H.P. Facilities—20% deposit—up to 3 years to pay.
- ★ All our Prices include VAT.
- ★ Securicor 24 hour delivery available.

"MAGNUM SIX"

The only R.F. Speech Processor available in the U.K. Up to 400% effective power increase—Send S.A.E. now.

Models to suit Collins, Heath, Yaesu, Trio and Drake.

★★ Less than half the price of a linear and just as effective!

GOTHAM RANGE

10-15-20 metre, all metal quad ... (p.p. £1.10) **£27.50**
3 element, 20 metre beam ... (p.p. £1.50) **£26.00**

NEW _____ NEW _____ NEW

OUR LATEST ADDITION

80 / 40 MINI-DIPOLE

S.A.E. for details.

NEW _____ NEW _____ NEW

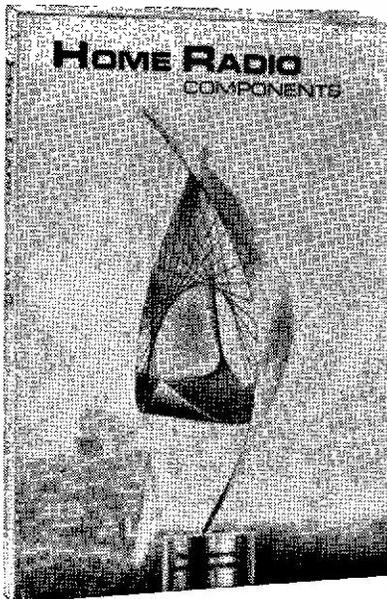
KW 2000B. Superb ... **£175.00**

VHF PROFESSIONAL MOBILE WHIPS

2 metre $\frac{1}{2}$ wave ... (p.p. 20p) **£2.40**
2 metre $\frac{1}{4}$ wave ... (p.p. 50p.) **£13.35**
4 metre $\frac{1}{4}$ wave ... (p.p. 20p.) **£3.45**
 "No Hole" boot mount ... **£3.00**
 High power Wightraps ... (p.p. 20p.) **pr. £3.68**
 "Milliwatt" subscription ... **£1.60**
 $\frac{1}{2}$ " ferrite rings ... **23p**
HP2A TVI high pass filters ... **£1.43**
50 ohm coax ... yd. **15p**
300 ohm feed ... yd. **7p**
PL259 plugs ... ea. **30p**

HOCKLEY AUDIO CENTRE . 22 SPA ROAD . HOCKLEY . ESSEX

Tel. 03704 6835



250 pages 11 1/2" x 8 1/4"

Over 6,785 electronic components clearly listed and indexed

1,750 pictures

10 free Vouchers each worth 5p.

Price list regularly updated

Bookmark with useful list of technical abbreviations

The Catalogue you MUST have!

Details of our popular Credit Account Service and our Easy Ordering System are included in the catalogue.

Please use block capitals

Name



Address

Only 55p.
 plus 22p POST AND PACKING

POST THIS COUPON
 with cheque or P.O. for 77p.

The price of 77p applies only to catalogues purchased by customers in the UK and to BFPO addresses.

HOME RADIO (Components) LTD. 712966 London
 Dept. SW, 234-240 London Rd, Mitcham, CR43HD

WE'RE GOING PLACES . . .

In this year in which Britain joined the Common Market, we have introduced our range of VHF/UHF equipment into the major European countries. We have not been disappointed by the response—amateurs all across Europe have welcomed the arrival of a top-quality range of equipment. Our agents have exhibited our products at the major national exhibitions and rallies. We have found that on the Continent, as in Britain, top-notch equipment sells itself!

QUALITY AND PERFORMANCE GUARANTEED

We have specialised in the production of high-quality converter modules covering the frequency spectrum 50 MHz to 1300 MHz. It is no easy task to mass-produce top-performance equipment of this nature, particularly at the top end of this spectrum. One of the reasons for our achievements in this field is our heavy investment in laboratory standard and automatic test equipment. You can be confident that any of our units you might buy have been rigorously tested to a tight specification.

EX-STOCK DELIVERY

A sound component purchasing policy has ensured return-of-post delivery on the majority of our standard product lines. Other manufacturers are blaming component shortages for poor delivery of finished equipment. The electronic component supply situation has been bad, but so indeed has the management of many of the manufacturing companies. We can honestly say that delivery of our equipment has never been delayed by component shortages. At this time we offer ex-stock delivery of all our product lines, and we will be working hard to maintain this excellent situation.

CUSTOMER SERVICE

Above all else, it is your opinion that matters, and we believe we offer the best service of all British Amateur Radio manufacturing companies. We offer a money-back guarantee should you be in any way dissatisfied with any of our products that you might buy. In addition we give an unconditional 12 month guarantee on all our products. Should repair or service be necessary this will be executed promptly without charge for materials, labour or postage.

144 MHz MOSFET CONVERTER

I.F.s available ex-stock: 14-16, 18-20, 24-26, 27-7-29-7, 28-30 MHz. Price inc. VAT **£16-72**

144 MHz DOUBLE CONVERSION MOSFET CONVERTER

I.F.s available ex-stock: 2-4, 4-6 MHz. Price inc. VAT **£16-72**

144 MHz DUAL OUTPUT PREAMPLIFIER

Gain 18 dB, N.F. 2.8 dB. Price inc. VAT **£9-90**

144 MHz 5 WATT AM TRANSMITTER

5 watts input, six channel crystal controlled. Supplied with crystal for 145 MHz. Price inc. VAT **£35-75**

432 MHz MOSFET CONVERTER

I.F.s available ex-stock: 14-16, 18-20, 24-26, 28-30, 144-146 MHz. Price inc. VAT **£19-91**

1296 MHz CONVERTER

Gain 25 dB, N.F. 8.5 dB. I.F.s available ex-stock: 28-30, 144-146 MHz. Price inc. VAT **£26-40**

432 MHz VARACTOR TRIPLER

Maximum input power at 144 MHz: 20 watts. Typical output power (at maximum input): 14 watts. Price inc. VAT **£19-25**

1296 MHz VARACTOR TRIPLER

Maximum input power at 432 MHz: 24 watts. Typical output power (at maximum output): 14 watts. Price inc. VAT **£27-50**

POST AND PACKING FREE—SEND S.A.E. FOR FURTHER INFORMATION

For The Benefit Of Overseas Readers, We List Our Agents In The Following Countries:

Denmark: Sono Akustik, Store Kongensgade 46, 1264 Copenhagen, Denmark.

France: Vareduc-Comimex, 2 Rue Joseph-Riviere, 92400 Courbevoie, Paris, France.

Germany: UKW-Berichte, D-8520 Erlangen, Gleiwitzer Strasse 45, West Germany.

Holland: S. Hoogstraal Elektronika, Almelo, Oranjestraat 40, Holland.

Italy: STE, Milano, Via Maniago, 15, Italy

U.S.A.: Spectrum International, P.O. Box 1084, Concord, Mass. 01742, U.S.A.

MICROWAVE MODULES LIMITED

11 CRANMORE AVENUE, CROSBY, LIVERPOOL L23 0QD Tel: 051-928 1610 9 a.m.-8 p.m.

SOLID STATE MODULES

63 WOODHEAD ROAD, SOLID, LOCKWOOD
HUDDERSFIELD, HD4 6ER

Telephone: 0484-23991

★ *Compliments of the season to one and all* ★

Before you buy equipment you consider some or all of the following:—

PRICE, SERVICE, QUALITY, PERFORMANCE

Different people give these considerations different priority. WE treat them all equally.

When you select our products you get the best of all the above factors.

DUAL GATE MOSFET CONVERTERS FOR 2 METRE OR 4 METRES

Look at these features:—

- * Protection against reserve supply connection and excess voltage.
- * Protection against MOSFET failure
- * High performance
- * High overtone crystals with no frequency multiplication on all the common I.F. 2 and 4 metre converters
- * By far the most popular converters around.

2 METRE I.F.s AVAILABLE—Ex-Stock

2-4 MHz and 4-6 MHz for use with most general coverage receivers. Double conversion design using 2 mixers and no crystal oscillator multiplication. These techniques minimise breakthrough from out of band signals. Size: 2½" x 4" x 1½".

28-30 MHz and 27.7-29.7 MHz and KW2000 type. For use with amateur band receivers or transceivers. These converters use 116 MHz range crystals with no frequency multiplication. This overcomes the problem of unwanted signals from the fundamental and harmonics of the 3B MHz crystals generally used in other converters.

Other I.F.s in stock 9-11 MHz, 14-16 MHz, 18-20 MHz and 24-26 MHz. 4 metre I.F. 28-28.7 MHz.
All these converters are £15-12.

SENTINEL X DUAL GATE MOSFET 2 METRE CONVERTER—Ex-Stock

This is a de luxe version containing an internal mains power supplier or battery operation. It has a front panel RF gain control. Size: 5" x 1½" front panel, 4" deep.

Stock I.F.s: 2-4 MHz, 4-6 MHz, 27.7-29.7 MHz, 28-30 MHz.
Price: £21-45.

THE SENTINEL M.F. DUAL GATE MOSFET 2 METRE TO MEDIUM WAVE CONVERTER—Ex-Stock

Receives 2 metres on a conventional M.V.B.C. receiver, very good used with a car radio. I.F. output 0.5 to 1.5 MHz for 144.5 and 144.5 and 145.6 MHz in two switched bands. Double conversion design with two switched crystal oscillators. Isolated supply lines. Size: 5" x 1½" front panel, 4" deep. Price: £20-62.

SM70 70CM CONVERTER—Ex-Stock

This one uses an I.F. output of 144-146 MHz. This has enabled us to produce a very high performance converter with a noise figure of 3.5 dB for only £15-12.

2 METRE PRE-AMPLIFIERS (2 MODELS TO CHOOSE FROM)—Ex-Stock

The Sentinel low noise FET pre-amplifier.

- * Built in a box which matches our converters.
- * Isolated supply lines make it compatible with any existing supply polarity.
- * Low noise figure 2 dB. Gain 18 dB.
- * High selectivity tuned circuits. Price: £7-15.

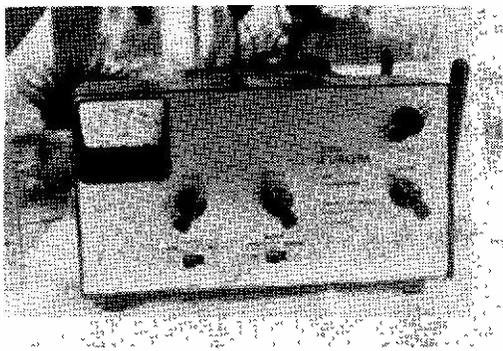
THE PA3 DUAL GATE MOSFET PRE-AMPLIFIER

* Small (about 1 cubic inch) printed circuit pre-amplifier developed to fit inside transceivers where it can be wired into the receiver aerial lead after the c/o relay.

* Low noise figure 2 dB. Gain 18 dB. Price: £5-50.

SSM EUROPA 10 TO 2 METRE TRANSVERTER

The 2 metre band plan change involves the move of the 5SB segment to the bottom half of the band. No problem to Europa users. Tune your dial down the band retune your Europa front panel controls and you are there.



The Europa gives you:—

- * Direct plug into accessory socket in Yaesu-Sommerkamp equipment (plugs and multicore lead supplied).
- * High transmit power—up to 200W input—50% efficiency.
- * Excellent receive converter performance. 2 dB noise figure.
- * Extremely stable operation.
- * Clean output.
- * Attractive appearance—size 9" x 4½" front panel, 4½" deep.
- * Low price: £78-09 complete. £64-35 less valves—valves required are 2 off QQV03/10—1 off QQV06/40A. Additional 12.6v. 2 amps transformer for use with 6-3v. A.C. heater Yaesu equipment (FT401, etc.), £2-20 or in a case to match the Europa, £5-50.

Please note that Amateur Electronics in Birmingham and their Scottish agent are now stocking our equipment.

To obtain any of our products. We can dispatch by return of post. We give same day C.O.D. service. You can call in here any time to look at the gear. Or visit any of our retail distributors. Queries? Write or ring if you have any questions. Paul G3MXG.

TELECOMMUNICATION INTERNATIONAL AGENCY LTD.

LINER 2. Add on amplifier module comprising of 40 watts PEP linear amplifier and mosfet preamp for the RX extremely simple to use with any liner 2, but could be easily adapted for use with any TX/RX requiring more power and better sensitivity. Spec.—RX preamp gain 20 dB NF < 2.5 dB.

Power Amplifier, 10 watts PEP input for 40 watts PEP output
Power requirements 12.5v. D.C.
Price **£62.50** £1 00 carriage.

For further details send S.A.E.

MURPHY FM 40 TR 12 channel FM transceiver for the 2MTR enthusiast. Double conversion RX 0.5uV input for 20 dB sig./noise. Less than 1 dB increase in AF output for 100 dB change > 0.5uV. TX output into 50 ohms > 35 watts. Deviation adjustable 0-15 kHz pre-emphasis characteristic from 300 Hz to 3 kHz relative to 1 kHz. Supplied complete with microphone, holder, etc.
For further details send S.A.E. Price **£127.00** £1 50 carriage.

FM 40 PA Add on RF amplifier. 10 watts input > 35 watts into 50 ohms output. Just connect aerial output on transceiver to the FM 40 PA with switched supply volts and leave all switching of aerial circuits to the P.A. Ruggedised semiconductors will withstand any aerial mismatch, without damage.
For further details send S.A.E. Price **£35.00** £1.00 carriage.

TWO TONE GENERATOR Latest IC techniques used. An essential piece of equipment for achieving the maximum from your SSB equipment whether home made or manufactured.
For further details send S.A.E. Price **£18.50** 50p carriage

2MTR MOSFET CONVERTERS Overall gain of 30 dB. NF < 2.5 dB unit requires 12v. 28-30 MHz f output (others can be supplied on request).

Kit and instructions **£8.00**
Built and tested **£12.50** 50p carriage

MURPHY ROVERS High and low band HYBRID TX/RX. AM. QVQ03-10 PA. Transistor 1F inverter, audio, PSU, etc. Ideal mobile for 2 MTRS. Supplied with all accessories, in good condition.
Base Mount Price **£11.50** £1 25 carriage
Dash Mount Price **£15.00** £1 25 carriage

MAINS VHF RX. First class VHF RX ideal for monitoring, supplied in new 19" cabinets and in working order frequency range 138-174 MHz XTAL control.
Price **£10.90** £1 50 carriage

HIGH AND LOW BAND BASE STATIONS QVQ03-20A infinal. Ideal for converting to amateur use good condition.
Price **£20.00** £2.00 carriage

ULTRA Solid state VHF TX/RX. Low band. Dash or boot mounter. 12J KHX. As new.
Price **£40.00** £1.50 carriage

GEC COURIERS AM high band 12 1/2 kHz in leather cases, complete with batteries and charger. 2 only at **£80.00** pair £1 50 carriage

DC STAB. SUPPLY Small compact mains operated DC supply. 12.5v. at 5 amps. Ideal for running mobile equipment as base station.
New. **£18.50** 75p carriage

NEW SLEEVED DIPOLES Superb construction fit into 2" mast. Ideal for base station aerial.
Price **£13.50** £1 00 carriage

VHF WHIP AERIALS Fibre glass aerials. Robust spring mounting. Please state band to be used when ordering.
Price **£2.50** 50p carriage

MICROPHONES New SG brown. Dynamic microphones PTT operation, robust construction with curly flex.
Price **£2.50** 35p carriage

HAND SETS New SG brown handsets.
Price **£5.00** 65p carriage

PT 4176D 44 watts ...	£3.00	BSX 26 ...	10p
2N 5589 3 watts ...	75p	BC108
2N 5590 10 watts ...	£2.10	AS221 ...	25p
2W 5643 20 watts ...	£2.75	OA2207 ...	30p
AF239 ...	20p	OA2200 ...	30p
ME1001 ...	18p	OA10 ...	15p
2N 5180 (low noise RF)	48p	JN91 ...	12p
BF 115 ...	15p	CA3011 ...	92p
2N 3819 ...	25p	Carriage on transistors	5p

PL259 PLUGS	19p	5 pin type B. Din Plugs	8p
PL259 Sockets	21p	5 pin type B. Din Sockets	8p
BNL Free Sockets	15p	3P 4w. Wafer Switch	15p
QQV03-10A	£1.50		

TRADE ENQUIRIES WELCOME

Terms **CWO** Add 10% V.A.T.

MAIL ORDER ONLY Telephone: Brockenhurst 2219

P.O. BOX 4. BROCKENHURST, HANTS.

B. BAMBER ELECTRONICS

20 WELLINGTON STREET, LITTLEPORT CAMBS. Tel.: Ely 860185 or 860363

Pye Cambridge AM10D, dash mount, good cond., 25 kHz channel spacing. High or Low band, **£25.00**, carriage 50p.

Cambridge AM10D. We have a few sets, complete but untested at **£20.00** + 50p carriage, and a few sets incomplete at **£15** — 50p carriage. Circuits supplied with all sets.

Vanguard AM25B. We have a few sets, incomplete, suitable for spares or rebuild, with circuits, **HIGH BAND, £4.75** — 75p carriage, **LOW BAND, £3.75** + 75p carriage.

Cambridge AM10D Circuits of Tx, Rx, Inverter, etc., **55p** post paid.

Vanguard AM25B Circuits of Tx, Rx, Inverter, Control gear, etc., **65p** post paid.

Pye Bantams, FM, 49 MHz, in leather cases, with battery box, untested at **£22.00** + 50p carriage.

Pye Bantams, AM, 86 MHz, in leather cases, with rechargeable battery, tested at **£44.00** + 50p carriage.

2M Receive Xtals, HC6U, suitable for Cambridge, Vanguard, Westminster, etc. 51.7 MHz for 144.4, 51.70833 MHz for 144.425. 51.7166 MHz for 144.45, **£1.00** each.

PC Boards (made by Solartron), containing minimum of 40 x BC107 on mounts (therefore longer leads), plus hundreds of min. 2w resistors (preferred values), caps, and diodes, good quality and good breakdown value. Not to be confused with common boards containing unknown, unmarked, large components, etc. **ONLY £1.00** per pack.

HARDWARE PACKS

New, surplus, unused items

- Self-tapping screws, asstd., around 200
- 2BA nuts and bolts, asstd., around 150
- 4BA nuts and bolts, asstd., around 150
- 6BA nuts and bolts, asstd., around 250
- ALL AT 25p PER PACK**

SPECIAL 50p PACKS

Order 10 packs and we will include one extra free.

- Belling Lee TV Plugs, 6 for 50p.
 - Belling Lee TV Sockets, 12 for 50p.
 - BNC Plugs, 4 for 50p.
 - BNC Sockets, round, 5 for 50p.
 - Jack Plugs, standard, 4 for 50p.
 - Rubber Grommets, assorted bag, 50p.
 - Tubular Trimmers 1-18pf, 6 for 50p.
 - 4-5 MHz Xtals HC6U, 10 for 50p.
 - 9-10 MHz Xtals HC6U, 10 for 50p.
- (Note: all xtals our selection).
- Silver plated PA coils, mixed bag, 50p.
 - AC128 transistors, 6 for 50p.
 - Hellerman sleeves, mixed bag, 50p.
 - BYX25-600, 600v., at 2A, on heat sink stud type, 3 for 50p.
 - 12v. 10w Zeners, stud type, 3 for 50p.

Box of PC Boards. Various types, RF, audio, prototypes, etc., good breakdown value, **£2.50**.

Valves. QQV03/20 (ex-equipment), **£2.20**. QQV02/6 (Mullard, new, boxed), **£2.00**. 4CX250B (ex-equipment), **£2.20**.

WANTED: MANUALS FOR RADIO-TELEPHONE EQUIPMENT, TEST GEAR, ETC. GOOD PRICES PAID. SEND LISTS OR PHONE (0353) 860185.

Multicore Solder. 1 lb. reel, 60/40 alloy, 205VYG, **£1.25**.

Magnetic Tape. 1in. on 14in. reels (ex-equipment), **£1.50**, carriage 50p.

Sleeving, silicon rubber, 1mm. bore, 24yds., **25p**.

Flexiform Grommet, for odd-shape holes, 30ft. for **25p**.

Reed relays, 12v., 400 ohm, 1 1/2 x 3/8 x 3/16in., 2-pole make, **25p**.

Xtal ovens with bases for HC6U or 2xHC25U, 10 deg. or 0 deg., **35p**.

Please enclose SAE for all enquiries

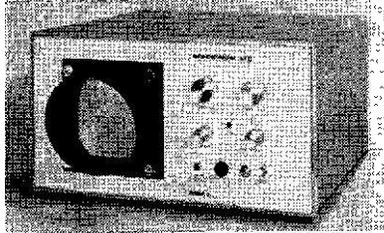
TERMS OF BUSINESS: cash with order. Callers welcome by appointment.

Please note that all prices include VAT.

POSTAGE AND PACKING CHARGE, 20p ON ALL ORDERS, except where stated.

NOW THE NEW SPACEMARK

SLOW SCAN TV MONITOR SSM-I



Plug it into your receiver phones jack and watch SSTV pictures on the Monitor screen from DX stations all over the world.

If desired, SSTV pictures can also be recorded on an ordinary tape recorder for viewing again on your Monitor.

- All solid state except 5" CR tube with 7 IC's, 17 transistors.
- Tuning indicator. ● Conforms to international SSTV standards.
- 4 switched inputs. ● Manual. ● Two tone pvc coated cabinet, 13" w. x 7" h. x 13" d. Weight 17 lbs.

SSM-I MONITOR—£143 (includes V.A.T. and U.K. carr.) . . . Why pay double for an imported Monitor?

ALSO AVAILABLE IN KIT FORM. COMPLETE KIT SSM-1K (less case), £82. SET OF PCB's only with full data, £7.50. Special transformer and some other parts available. Kits come with instructions, circuits, layouts, parts lists. SSTV TAPES and CASSETTES with sync. pulses and patterns for setting up Monitors, £1-80. COMING: SSTV Camera and Fast Scan Sampler.

JOIN THE FAST-GROWING SSTV CROWD NOW!!

SPACEMARK LTD.

SOLID-STATE RTTY CONVERTER-KEYER SRD-1

- COPIES 850/400/170 HZ SHIFTS
- BUILT-IN SINGLE AND DOUBLE CURRENT PSU
- F.S. KEYER FOR TX (AND OPTIONAL AFSK)

Complete and ready-to-go for send-receive RTTY with TX, RX and teleprinter.

- Advanced circuitry, 6 IC's, 25 semi-conductors. ● Input matches receiver outputs 3-8 or 500-600 ohms. ● 3-pole Butterworth input bandpass filter. ● Switched 850/400/170 Hz Amateur/Commercial shifts. ● 2-pole low-pass filter. ● Tuning meter. ● Monitor scope outputs. ● Mark Hold and Normal/Reverse shift switch. ● Built-in loop PSU—Instant switch-selection of single- or double-current printers. ● Narrow-shift CW identification. ● F.S. Keyer output for TX. ● Socket and circuitry already fitted for optional plug-in AFSK keyer module, 850/170 Hz. ● Manual. ● Two-tone pvc-coated case, 9" w x 3 3/4" x 14" d. Weight: 7 lbs

(Optional plug-in AFSK module, SRD1-AK, £6-32. SRD-1 complete with SRD1-AK, £60-50).

RTTY CONVERTER-KEYER Model TTU, £132. ST-5 PCBs and datasheets, £4-56. ST-6 PCBs and datasheets, £12-92. ST-6 KIT complete less case, with datasheets, £68-75. 88 MH TOROIDS, 38p each plus 10% VAT. SAMSON ETM-2b, £34-79. ETM-3b, £38-55. JUNKER Precision hand key, £16-59. BAUER keying lever, £5-88. SSB 90-AUDIO PHASE SHIFT NETWORKS, £3-24. PRINTSET Basi kits.

ALL PRICES INCLUDE V.A.T
(except Toroids - add VAT please).

All goods post-paid U.K. Send stamp for Catalogue SPS.

THORNFIELD HOUSE, DELAMER ROAD, ALTRINCHAM, CHESHIRE.
(Tel. 061-928 8458)

R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

EDDYSTONE EA12	£160-00 (£3-00)
TRIO 9R 59DS	£42-00 (£2-00)
SWAN 500C plus A.C. p.s.u.	£240-00 (£3-00)
KW VICEROY	£80-00 (£2-00)
EDDYSTONE 680X	£85-00 (£3-00)
HEATHKIT DX40 plus VFO	£40-00 (£2-00)
KW VESPA 2 and p.s.u.	£105-00 (£3-00)
HEATHKIT GR 64	£25-00 (£1-00)
LAFAYETTE HA350	£60-00 (£1-50)
LAFAYETTE HA800	£48-00 (£1-00)
LAFAYETTE HE 80	£50-00 (£1-50)
HAMMARLUND SP-600-JX6	£135-00 (£2-00)
EDDYSTONE 370U	£160-00 (£2-00)
HEATHKIT DX 100 Transmitter	£45-00 (£3-00)
KW 2000A with A.C. p.s.u.	£180-00 (£3-00)
TRIO JR-500-SE Receiver	£58-00 (£1-50)
RCA AR88D Receiver	£75-00 (£2-00)

WE CAN ALSO SUPPLY ANY MAKE OF NEW EQUIPMENT—and have pleasure in giving a few examples which are normally in stock:—

AVOMETERS. Model 7, Mk. 2, £43-25; Model 8, Mk. 5, £46-35; Model 40, Mk. 2, £43-25; Model 72, £17-85; Multimeter Mk. 4, £15-40; Standard Leather Carrying Case (Models 7, 8, 40), £8-30; Ever Ready ditto, £9-60; Multimeter Leather Case, £4-30; 10KV D.C. Multiplier for model 8 or 9, £6-50; 30KV D.C. ditto, £11-50; Pair of Long Reach Safety Clips, £1-75; Model EA113 Electronic Avo, £85-60; Model 272 Electronic Avo, £30-60; Model TT169 Transistor Tester, £18-40. All Above post free in U.K. Trade and Educational enquiries invited. All other AVO and TAYLOR products available, ask for quote.

S. G. BROWN'S HEADPHONES. Type "F" 120 ohm, 2000 ohm, 4000 ohm, £7-00 (30p); Rubber Earpads for same, 50p per pr. (5p); Type 3C/1100 Noise Excluding (with superb fitting) high quality, electro-dynamic, £7-58 (30p); Standard Jack plugs, 24p (4p).

EDDYSTONE EQUIPMENT. Receivers EC10/2, £88-00; EB37, £99-00; 1000, £220-00; 1001, £230-00; 1002, £245-00; 1004, £280-00; 924 A.C. mains p.s.u., £8-94 (50p); Doublet Aerial 731/1, £8-00 (50p); Plinth Speaker 906, £7-80 (50p); General Purpose Speaker 935, £6-90 (40p); Edameter 902 Mk. 2, £39-50 (50p); Telescopic Aerial Type 991, £2-80 (25p); Diecast Boxes from 51p (10p). Brochure on request.

CODAR EQUIPMENT, PR40, £8-90 (30p); Leaflets on request.
LAFAYETTE HA600 Receiver £50-00 (50p).
LAFAYETTE HA800, £57-50 (50p).

NOTE: 10% VAT must be added to all prices, new and secondhand, inc. carr. and packing.

Carriage for England, Scotland and Wales shown in brackets. Terms: C.W.O.. Approved Monthly Accounts, Hire Purchase and Part Exchange. Special facilities for export.

At R.T. & I.

- ★ We have full H.P. facilities.
- ★ Part exchanges are a pleasure.
- ★ We purchase for cash.
- ★ We offer a first-class overhaul service for your electronic equipment, whether you are an amateur or professional user.
- ★ We have EASY Packing facilities.
- ★ We welcome your enquiries for specific items which although not advertised, may very well be in stock.

FREE SHURE MIC. WITH EVERY KW TRANSMITTER or TRANSCEIVER purchased

PARTRIDGE "JOYSTICKS." "New Lightweight VFA" £12-10 (40p). "JOYMATCH" III. Aerial Unit, £12-10 (40p). LO-Z500, £17-60 (40p); ATU kit, £4-50 (30p); ATU assembled, £5-50 (30p); Artificial earth, £4-50 (30p); Aerial Bandwidth, £4-50 (30p). Literature on request.

TRIO EQUIPMENT. Receivers: TR7200, £129-50 (£1-00); TR2200, £79-50 (£1-00); 5R59DS, £49-50 (£1-00); JR 310, £75-00 (£1-00); JR 599, £160-00 (£1-50); Transmitter TX-599, £160-00 (3-00); Transceiver TS 515 and PS 515, £210-00 (£3-00); Loudspeaker SP5D, £4-50 (50p); Headphones GS4 (equivalent), £6-00 (20p); Stabiliser, 60p (5p). Leaflets available.

SHURE MICROPHONES, 44AT, £15-00 (40p); 44A, £13-00 (40p); 401A, £6-50 (30p); 201, £5-40 (30p); 202, £6-00 (30p). Full details on request.

KEYNECTORS, piano key mains connector units, £2-95 (30p).

VALVES. Please state your requirements.

ADVANCE DMM2 DIGITAL MULTIMETER, £99-00 (50p), etc., etc. TMK METERS - TMK500, £10-25 (30p); TW20CB, £13-00 (30p); TP55N, £7-25 (30p); 700, £21-50 (30p); also leather case.

PHILIPS PM2403 ELECTRONIC MULTIMETER, £44-00 (30p), etc., etc. We also supply PHILIPS and KORTING COLOUR TV TEST EQUIPMENT, including Colour Bar Generators, Converters, etc.

KW EQUIPMENT (Don't forget your FREE mic. with every Tx. and Txer!) KW2000B, £240-00 (£2-00); D.C. p.s.u. for KW2000B, £44-00 (50p); KW 2000B only, £200-00 (£1-50); KW2000E plus A.C. p.s.u., £265-00 (£3-00); KW ATLANTA + A.C. p.s.u., £190-00 (£2-00); Remote V.F.O. for Atlanta, £34-00 (50p); VOX unit for Atlanta, £7-50 (25p); Remote V.F.O. for 2000B, £36-00 (50p); KW1000 Linear amplifier, £135-00 (£1-50); KW202 Receiver with calibrator, £140-00 (£1-50); KW 202 Matching speaker, £8-00 (80p); KW204 Transmitter, £160-00 (£2-00); KW107 combined E-Z Match + VSWR indicator, dummy load, and ant. switch (4 outlets) 52 or 75 ohms, £46-00 (50p); KW103, VSWR and power meter, 52 ohms, £12-50 (48p); KW101, VSWR meter, 52 and 75 ohms, £8-25 (30p); also E-Z match, dummy load, trap dipoles etc., etc. Details on request.

R. T. & I. ELECTRONICS LTD.

Ashville Old Hall, Ashville Road, London, E11 4DX Tel: 01-539 4986
NEAREST STATION: LEYTONSTONE (Central Line)

Radio Shack Ltd ★

London's Amateur Radio Stockists

Just around the corner from West Hampstead Underground Station

Hy-Gain	
18HT 6-80m, vertical tower	£121.00
12AVQ 10-20m, trapped vertical	£18.15
14AVQ/WB 10-40m, trapped vertical	£26.95
18AVT/WB 10-80m, trapped vertical	£39.05
18V 10-80m, vertical	£14.13
12RMQ roof mounting kit for 12AVQ	£10.00
14RMO roof mounting kit for 14AVQ	£11.66
LCBQC 80m, loading coil for 14AVQ	£8.52
TH6DXX 6 element beam 10/15/20m	£106.70
TH3MK3 3 element beam 10/15/20m	£83.05
TH3IR 3 element beam 10/15/20m	£56.65
TH2MK3 2 element beam 10/15/20m	£56.65
HY-QUAD 3 band 2 element quad	£81.95
DB10-15A 10 and 15m, beam	£63.25
2048A 4 element 20m, beam	£88.00
2038A 3 element 20m, beam	£79.20
1538A 3 element 15m, beam	£60.15
1038A 3 element 10m, beam	£31.35
257 Mobile Mast	£9.35
252 80m, coil and tip rod	£10.70
256 40m, coil and tip rod	£9.62
255 20m, coil and tip rod	£8.80
254 15m, coil and tip rod	£7.15
253 10m, coil and tip rod	£6.05
492 coil and tip rod spring	£1.65
499 flush body mount	£4.67
417 1/2 luxe spring	£5.22
492 miniature spring	£1.92
531 quick disconnect unit	£1.92
415 heavy duty bumper mount	£5.22
BN86 ferrite balun	£8.80
LA-2 lightning arrester (in-line)	£2.75
LA-1 lightning arrester	£15.95
PL259 connectors	40p
PL258 adaptors	£1.10
Reducers	10p
TE 7-01 Antenna noise bridge	£14.85
TE 7-02 Antenna noise bridge	£21.45

Above prices include carriage.

J-Beam	
4/3Y 3 element 4m, dipole yagi	£4.68
2/4Y 4 element 2m, dipole yagi	£3.19
2/6Y 6 element 2m, dipole yagi	£3.85
2/8Y 8 element 2m, dipole yagi	£5.81
2/10Y 10 element 2m, long yagi	£11.00
2/12 double 6 slot-fed yagi	£7.42
2/HM 2m, halo	£2.20
2/XD crossed dipoles	£5.72
2/UG 2m, ground plane	£4.12
SPM portable mast	£4.89
70/HBM 46 element multibeam	£12.10

KW Electronics	
2000E tcvr, with AC power supply	£292.00
202 Receiver with speaker	£163.00
204 Transmitter	£176.00
2000B Tcvt, with AC power supply	£264.00
101 VSWR meter 50 or 75 ohms	£9.10
103 VSWR and power meter 50 or 75 ohm	£13.80
107 Antenna tuning unit	£31.00
108 Monitors	£65.00
E-Z Match 10-80m, A.T.U.	£18.20
Dummy Load 52 or 75 ohms	£8.80
Low Pass Filter 52 or 75 ohms	£8.30
Balun 1:1 dual impedance 52/75 ohms	£2.60
Antenna Switch 3-way	£4.70
Trap dipole 70ft, twin feeder 75 ohms	£16.50
Trap dipole 97ft, coax feeder	£18.20
Trap dipole 97ft, coax feeder and balun	£20.40
Trap dipole with HZP balun	£24.30

CDR Rotators	
AR20 suitable for 2 and 4m. beams	£22.00
AR22R suitable for 3 band beams	£27.50
TR44	£49.50
HAF-M	£77.00
8-core control cable (per yard)	24p
4-core control cable (per yard)	15p

Polyquad	
2 element poly tri quad	£37.50
3 element poly tri quad	£56.50
4 element poly tri quad	£75.00
Spare instruction manual	£1.00

Copal Digital Clocks	
Model 601 24 hr. with day and date	£11.50
Model 222 24 hr.	£5.50

Shure Microphones	
Model 201 ceramic	£5.50
Model 202 noise-cancelling ceramic	£6.05
Model 401A controlled magnetic	£6.60
Model 444 controlled magnetic	£13.20
Model 4405L controlled magnetic	£18.00
Model 2755K ceramic	£4.95
Model 510B controlled magnetic low Z	£1.25
Model 5105B controlled magnetic low Z	£1.50

Trio	
9R5DS Receiver	£54.45
IR-310 Receiver	£82.50
5P-5D Speaker	£4.95

Superex	
CC communications headset 16 ohms	£9.90
CQH communications headset 600 ohms	£11.00
APS-11 communications headset 16/600 ohms	£13.30
MBH-3 high Z boom mic for above	£6.10

Caringella	
ACA-1 Audio compressor	£39.93
ACA-1 Audio compressor kit	£28.05
STR-1 Standard time Rx, 5/10/15 MHz	£52.50
STR-1 Standard time Rx kit	£38.95

Dot Line Mobile Filters	
CB-330 tunable generator filter	£2.36
VF-225 voltage regulator filter	£2.36
VF-104 alternator filter	£1.98
C-40 bulkhead feedthru coax filter	£2.31
C-70 bulkhead feedthru coax filter	£1.32
C-20A bulkhead feedthru coax filter	£1.32
C-20 feedthru coax filter	77p
C-10 bypass capacitor filter	77p

Polythene Rope	
100 metres 110lbs strain	72p
100 metres 240lbs. strain	£1.37
100 metres 500lbs. strain	£2.20

Waters	
Model 372 Clipreamp speech processor	£10.50
Model 359 Compreamp speech processor	£15.75
Model 590G 5-way coax switch	£8.25
Model 550A 5-way coax switch	£5.75
Model 375 6-way coax switch	£9.50

Hustler	
MO-1 foldover mast deck/fender mount	£8.25
MO-2 foldover mast bumper mounting	£8.25
BM-1 bumper mount—stainless steel	£5.35
C-32 ball mount complete with hardware	£2.50
C-29 stainless steel spring	£3.30
RM-10 resonator	£4.95
RM-15 resonator	£5.90
RM-20 resonator	£5.99
RM-40 resonator	£7.70
RM-75 resonator	£7.99
UHT-1 2m. mobile antenna (140-500 MHz)	£5.15

Robot	
Model 80a camera	£220.00
Model 70a monitor	£220.00
11-4 macro lens	£49.50

G-Whip Products	
Tribander helical 10/15/20m	£11.55
Additional coils 40/80/160m	£4.40
Tri-bander 160/80m	£9.90
Ranger single band 160m	£8.80
Multimobile 71 10/15/20m	£13.75
Additional coils 40/80/160m	£4.40
2m. 1/2 G-whip	£4.67
Flexiwhip basic 10m. model	£9.46
Coils 15/20/40/80/160m.	£4.67
Baseunits	£1.59
Telescopic whip	£1.10

Kokusai Mechanical Filters	
MF 45-10CK	£13.80
MF 45-15CK	£13.80

Mosley	
TA-33 JR E triband 3 element beam	£42.90
TA-31 JR Triband dipole	£18.70

Sundries	
Model C3042 Field strength indicator	£5.44
Model C3005 SWR and power meter	£8.25
Model C3041 Field strength meter	£3.71

Model C3043 RF field indicator	£4.90
Model SE406 mini SWR meter	£5.11
TRIO TR2200 2m. FM tcvt.	£87.45
Dial drive mod. kits for HW-100	£3.63
Ferrite rings	per pair 65p
52 ohm lightweight RG174U for above (yds.)	22p
Standard WIGTRAPS 500w.	per pair £3.00
High Power WIGTRAPS	per pair £4.00
KW Traps and t-piece	£5.50
High pass filters type 35A	£2.14
ASAMI RF and power meter	£14.85
Model G222D headphones 8 ohms	£6.27
Model G1600 headphones 16 ohms	£2.97
Model G1105 headphones 2000 ohms	£1.50
Dummy load resistors	£3.85
Tinsley Tx. capacitors 500v. 30-1500pf	£3.85
Apollo 1kV Dummy load/Wattmeter	£58.02

Ten-Tec	
PM-2 low-power 40 and 80m. Tcvt.	£29.70
PM-B2 low-power 20, 40, 80m, Tcvt.	£33.00
PM-3A low-power 20 and 40m. Tcvt.	£40.15
KX-10 15/20/40/80m. Receiver	£33.00
KR-40 Electronic squeeze keyer	£44.15
KR-5 Paddle assembly	£11.00
KR-5 Single paddle keyer	£18.70
Argonaut 5 band 5 watts Tcvt.	£165.00
Model 405 Linear	£85.25
Model 250 Power supply	£28.05

Receivers and Accessories	
2-C Receiver—SSB, AM, CW, RTTY	£158.40
2-C Crystal Calibrator for 2-C	£10.00
2-CS Matching Speaker for 2-C	£11.00
2-CQ Q-Multiplier/Speaker for 2-C	£27.50
2-NB Noise Blaker for 2-C	£14.30
R-4C Receiver—SSB, AM, SW, RTTY	£262.05

FILTERS Bandwidths—250, 500, 1.5, 6.0 kHz for R-4C	
4-NB Noise Blaker for R-4C	£34.10
MS-4 Matching Speaker for R-4C	£12.00
SW-4A Receiver—AM, International SW	£178.20
AL-4 Loop Antenna for SW-4, SPR-4	£15.95
SPR-4 Receiver—General Purpose	£308.00
Amateur Band Crystal Kit for SPR-4	£14.30
5-NB Noise Blaker for SPR-4	£34.10
SCC-4 100 kHz Calibrator for SPR-4	£10.00
TA-4 Transceiver Adaptor for SPR-4	£14.30
T-4XC	£14.30
DC Power Cord for SPR-4	£2.60
DSR-1 Digital Receiver	£1,225.00

Transceivers and Accessories	
TR-4C 5SB Transceiver	£320.00
34-PNB Plug-in Noise Blaker for TR-4C	£34.10
AC-4 115/240v. Power Supply for TR-4C	£54.00
T-4XC	£54.00
DC-4 12v. Power Supply for TR-4C	£66.00
T-4XC and Receiver	£36.00
MMK-3 Mobile Mounting Kit for TR-4C	£3.60
RV-4C Remote V.F.O. for TR-4C	£57.00
FF-1 Crystal Control for TR-4C	£26.40
MC-4 Mobile Console	£36.00

Transmitters and Accessories	
T-4XC 5SB Transmitter (see AC-4 above)	£277.00
L-4B Linear Amplifier (includes Power Supply)	£425.00
MM-4 Antenna Match Network for T-4XC	£54.00
TR-4C	£54.00
MM-2000 Antenna Match Network—2000 watts	£101.50

SENTINEL	
MF VNF 2m. med. wave converter	£20.62
2m. converter IF's 2-4; 4-6; 28-30	£15.12
Low noise FET 2m. preamplifier	£7.15

ALL PRICES INCLUDE V.A.T. BUT DO NOT INCLUDE CARRIAGE.

Hours of business : 9.0-9.0 Mon.-Fri.
9.0-1.0 Sats.
(Closed for lunch 1-2 p.m.)

Delivery by Securicor of most items £2.50.
GIRO ACCDUNT NO. 588 7151
S.A.E. with all enquiries please.

DRAKE — SALES — SERVICE

SECURICOR ★ COURIER EXPRESS ★ B.R.S. ★ ACCESS ★ BARCLAYCARD ★ UDT

RADIO SHACK LTD.

188 BROADHURST GARDENS
LONDON, NW6 3AY

OPEN 5 DAYS 9 until 5 p.m. Sat. 9 until 1 p.m. Just around the corner from West Hampstead Underground Station
CLOSED FOR LUNCH 1 p.m. until 2 p.m. Telephone : 01-624 7174 Cables : Radio Shack, London, N.W.6.

Wind, snow or rain —
MOSLEY is the name
 WE ARE THE ANTENNA
 PEOPLE

mosley
makes
impact

TOWERS
 ROTATORS
 COAX
 ROPES &
 LINES

BASIC
 PRICES.
 ADD VAT
 10%

SOME ANTENNAS

MONO-BANDERS

A-310	3 Element, 10 metres	£26.50
A-315	3 Element, 15 metres	£27.50
Classic-203-C	3 Element, 20 metres	£77.00
A-92-S	9 Element, 2 metres	£13.00
D1-10	Ground Plane, 10 metres	£20.00
D1-2	Ground Plane, 2 metres	£7.50
MCQ-10	10 metre Quad	£49.00
MCQ-15	15 metre Quad	£49.00
MCQ-20	20 metre Quad	£53.00

DUAL-BANDERS

Elan	3 Elements, 10 and 15 metres	£33.00
Elan	2 Elements, 10 and 15 metres	£24.00
TD-2	Trap Dipole, 40 and 80 metres	£24.50

TRI-BANDERS

Mustang	3 Elements, 10, 15 and 20 metres	£40.00
Mustang	2 Elements, 10, 15 and 20 metres	£36.00
TA-33 Jr.	3 Elements, 10, 15 and 20 metres	£38.50
TA-32 Jr.	2 Elements, 10, 15 and 20 metres	£27.00
TA-31 Jr.	Rotary dipole, 10, 15 and 20 metres	£17.00
Classic-36	6 elements, 10, 15 and 20 metres	£108.00
Classic-33	3 Elements, 10, 15 and 20 metres	£85.00
V-3 Jr.	Trap Vertical, 10, 15 and 20 metres	£12.00
MCQ-3B	Cubical Quad, 10, 15 and 20 metres	£77.00
El-Toro	Vertical, 20, 40 and 80 metres	£12.00

QUAD-BANDERS

Atlas	Trap Vertical, 10, 15, 20 and 40 metres	£24.00
-------	---	--------

SWL Antennas

SWL-7	Dipole, 11, 13, 16, 19, 25, 31 and 49 metres	£12.00
RD-5	Dipole, 10, 15, 20, 40 and 80 metres	£12.00

Note: All "E" Models (2" mast fitting) ... Plus 50p

Send for **HANDBOOK** containing full details of Antennas and other technical information. 33 pages 20p. Refundable upon purchase of Antenna.

MOSLEY
 Electronics Ltd

All antennas available ex works carriage and insurance extra
 Administrative Address only
40 Valley Road, New Costessey, Norwich, Norfolk
NOR 26K, England.

YOUR MIDLAND STOCKISTS

AMTRON KITS

UK715 Photo Cell Switch	£8.49 20p
UK875 Capacity Discharge Ignition	£14.51 20p
UK325 Channel Splitting 1000/2000 Hz	£7.86 20p
UK330 Channel Splitting 1500/2500 Hz	£7.86 20p
UK300 Four Channel R/C Transmitter	£6.55 20p
UK310 Radio Control Rx.	£3.28 20p
UK345 Supermet R/C Rx.	£6.55 20p
UK120 Hi Fi Amp 12W	£5.20 20p
UK165 RIAA Equip. Stereo Preamp	£5.06 20p
UK110/A Stereo Amp 5 + 5W	£11.07 20p
UK92 Telephone Amp	£7.91 20p
UK145 Amplifier 1.5W	£3.64 20p
UK160 I.C. Amp 8W.	£11.07 20p
UK220 Signal Injector	£2.57 20p
UK135 Hi-imp Preamp	£2.09 20p
00/3009-00 Cabinet 120H 284L 138D	£5.06 20p
00/3009-10 Cabinet 120H 224L 138D	£4.40 20p
00/3009-20 Cabinet 120H 284L 188D	£5.68 20p

DENSHI EDUCATIONAL ELECTRONIC KITS

SR2A 30 Projects	£8.49 25p
ST45 45 Projects	£12.37 30p
ST100 100 Projects	£15.35 30p
SR3A 100 Projects	£17.29 30p
SR4A 150 Projects	£28.58 35p

RAYMART

2M Converter Kit (less crystal)	£4.13 10p
Crystal for above 70 or 75 MHz	£3.00 4p

AGENTS FOR



● A SUPERB RANGE OF ELECTRONIC KITS

FM and AM Tuners, Pre-amplifier, Amplifiers, Quadraphonic Adaptors, YU and Stereo Balance Meters, Power Supplies, Multivibrator, Transistor Tester, Light Cell Units, Triac Light and Power Control Units, Psychedelic Light Unit, Cabinets, etc.

S.A.E. FOR DETAILS OF KITS AND PRICES

The prices shown in the advertisement do not constitute a contract and are subject to change without notice.

All prices include VAT

NO C.O.D. PLEASE PRINT YOUR ADDRESS. YOU MAY ORDER GOODS BY PHONE AND PAY BY ACCESS OR BARCLAYCARD. SIMPLY QUOTE YOUR CARD NO. Enquiries S.A.E. please. TEL.: 021-236 1635

SENTINEL

2M Converter 4-6 or 28-30 MHz	£15.12 22p
70 Cm. Converter 144/146 MHz	£15.12 22p
PA3 Preamp for 2M Equipment	£5.50 6p
2M Preamp in case	£7.15 22p

TEST EQUIPMENT

OSKER SWR200 SWR/Power Meter 52/75 Ω	£20.35 30p
KW107 ATU/SWR	£91.00 50p
KW101 SWR 52 or 75 Ω	£9.10 30p
KW103 SWR/Power 52 or 75 Ω	£13.80 45p
TMK TP10s 2k/v	£8.06 30p
TP5s 20k/v	£10.63 30p
500 30k/v	£15.04 30p
700b 50k/v	£32.94 35p
SANWAP2B 2k/v	£7.33 30p
JP5D 2k/v	£8.25 30p
JP50DX 2k/v	£12.00 30p
A303TRD 20k/v	£16.53 30p
380CE 33-3k/v	£24.01 30p
TECH ITI-2 20k/v	£5.69 30p

AERIALS and ACC.

Bantex Fibre Glass 2M 1/2 wave	£3.14	carr. at cost
Bantex Fibre Glass 2M 3/4 wave	£4.90	approx. £1
New J Beam Fibreglass 1/2 wave	£7.70	
Low Loss Coax 75 Ω	yd.	14p 30p
Low Loss Coax 52 Ω	yd.	28p 30p
ML1 (100 yd.) 100lb line		69p 22p
ML2 (100 yd.) 200 lb. line		£1.38 25p
ML4 400 lb. line	yd.	3p 25p
AT Insulators (centre T)		15p 6p
14 swg H/D Copper Wire 140ft.		£2.04 30p
14 swg H/D Copper Wire 70ft.		£1.05 30p
7/-029 Soft Stranded PVC covered 140ft.		£2.04 30p

AMATEUR RADIO
 CHAS. H. YOUNG LTD.
 170-172 CORPORATION ST. BIRMINGHAM B4 6UD



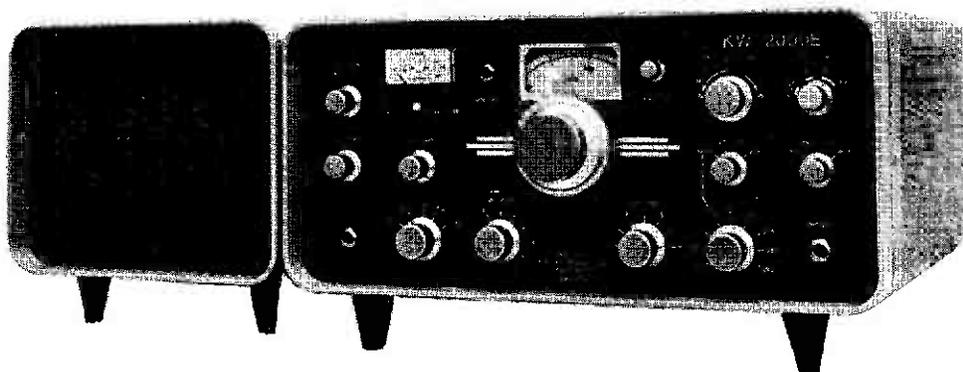
Fine British equipment from

- ★ KW 202 Receiver
- ★ KW 204 Transmitter
- ★ KW 107 Supermatch
- ★ KW 101 SWR Meter
- ★ KW 103 SWR/Power Meter
- ★ KW 100 Linear Amplifier
- ★ KW E-Z Match



- ★ KW Traps (the original and best)
- ★ KW Low Pass Filters
- ★ KW Balun
- ★ KW Antenna Switch
- ★ KW Dummy Load
- ★ KW 108 Monitorscope

The KW 2000 E Transceiver



A COMPLETE RANGE OF EQUIPMENT FOR THE RADIO AMATEUR—SEND FOR CATALOGUE AND ASK FOR DETAILS OF THE NEW KW109 HIGH-POWER SUPERMATCH AND THE NEW KW160 ANTENNA TUNING UNIT

K.W. Electronic Equipment now available exclusively through K.W. Communications Limited.

K.W. Communications Limited has joined the Decca Group, it is company policy to continue manufacturing the finest equipment for the Radio Amateur—British made equipment backed by a servicing facility with available spares—the best in the country.

BY BRITISH—BUY DECCA—KW

THIS COMPANY CONTINUES UNDER THE DIRECTORSHIP OF G8KW

Write or 'phone for catalogue

K.W. COMMUNICATIONS LTD.

1 Heath Street, Dartford, Kent
Tel. Dartford 25574/21919

EASY TERMS ON EQUIPMENT AVAILABLE OVER 12, 18 OR 24 MONTHS

ADVERTISERS INDEX

	Page
Amateur Electronics (G3FIK)	653, 686
The Amateur Radio Shop (Huddersfield)	693
Antec	694
Ashley Dukes (Honda)	694
B. Bamber Electronics	649
B.I.E.T.	695
J. Birkett	690
British National Radio School	689
Derwent Radio	691
Eddystone Agents	693
Eley Electronics	691
G3HSC (Rhythm Morse Courses)	694
G.W.M. Radio	692
Hamegar Electronics	686
Heath (Gloucester) Ltd.	645
D. P. Hobbs Ltd.	694
Holdings of Blackburn	692
Home Radio (Comp.) Ltd.	646
J. H. Associates	687
K.W. Communications Ltd.	654
Lowe Electronics <i>inside front cover</i>	
S. May (Leicester) Ltd.	694
Microwave Modules	647
Miniwise	694
Mosley Electronics	652
Gerald Myers	688
North West Electrics	692
Partridge Electronics Ltd <i>front cover</i>	
Radio Shack Ltd.	651
R. T. & I. Electronics Ltd.	650
Semicon Indexes	694
Small Advertisements	687-692
Solid State Modules	648
Southern Surplus Merchants	694
Spacemark	650
S.S.B. Products	690
Stephens-James	656
Strumech Engineering	689
S.W.M. Publications <i>inside back cover, back cover, 644, 686, 695, 696</i>	
Telecommunications International Agency Ltd.	649
Telesonic Marine Ltd.	692
Teleford Communications	693
T.M.P. (Electrical Supplies)	694
J. & A. Tweedy	687
Reg Ward & Co. Ltd.	693
Waters and Stanton Electronics	646
Western Electronics Ltd.	641, 642, 643
W. H. Westlake	692
Chas. H. Young Ltd.	652

SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXXI

JANUARY, 1974

No. 363

CONTENTS

	Page
Editorial—Dislocation	657
Communication and DX News, by E. P. Essery, G3KFE	658
Broad-Band Antennae for Eighty Metres, by R. L. Glaisher, G6LX	664
Linear RF Amplifier for the HF Bands, by R. I. Thomas, GW4BCD	666
Tuning a G-Whip by Remote Control, by S. R. Tuckley, G3GOP	669
Grappling with Decibels	670
“SWL.”—Listener Feature	672
VHF Bands, by A. H. Dormer, G3DAH	676
Magazine Club Contest—Report and Results	681
New QTH's...	685

Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO/G3SWM)

Advertising: Maria Greenwood

Published at 55 Victoria Street, London, SW1H-0HF, on the last Friday of the month, dated the month following. Telephone: 01-222 5341 & 5342

Annual Subscription: Home: £2.75 (£3.20 first class) post paid
Overseas: £2.75 (\$7.00 U.S.), post free surface mail

Editorial Address: Short Wave Magazine, BUCKINGHAM, MK18 1RQ, England

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

AUTHORS' MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention—see any issue. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

© Short Wave Magazine Ltd.

E. & O. E.

VAT Reg. No. 239 4864 25

655

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The
SHORT WAVE
Magazine

E D I T O R I A L

Dislocation

While we ought to express regret that this issue is so late, it is not really incumbent on us to have to make any apology for circumstances quite beyond our control.

Till the rail go-slow started (holding up the mails) and the Prime Minister made his announcements on Thursday, December 13, we had taken all necessary steps, in co-operation with our printers—the normal Christmas mail hold-ups being allowed for—to ensure appearance of this issue on December 28, the due date.

However, since mid-December it has been impossible to keep to any sort of schedule. What with extended mail delays (it taking anything up to five days even for first-class postings to get anywhere), the Govt.-imposed short-time working and the constant threat of power cuts, any sort of production schedule became impossible to sustain.

Of course, it is not only we who are affected. Any periodical publisher is in the same sort of difficulty. The whole Nation is going through a time of trial, affecting in one way or another the lives of us all.

* * * *

When you will see this we cannot tell—but we do wish you a Happy New Year!

*Austin Forsyth
G6FO*

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

AS suggested by last month's tailpiece, in giving the deadline for this CDXN, the approach this month will have to be somewhat discursive, as it is hardly likely that many folk will have been able to get their letters to us in time for them to be taken into this offering.

But not to worry, there are more things to DX than lists of exotic calls worked, and maybe this month's notes will still be of interest.

The year just completed, taken in retrospect, has been one of ups and downs, perhaps the most notable feature being the virtual death of Top Band as a GDX and EDX carrier, saving among a small group of the faithful—and yet with the continued appearance of DX (almost all in a North-South direction) when all predictions suggested that the band should have reverted to its normal slumbrous state. Perhaps a less obvious, but none the less potent for that, factor was the solar disturbance earlier in the year which did not die away completely till Summer was all but done, giving conditions generally a marked up-and-down movement each month. Forty and Eighty have been their inscrutable selves, each with its devotees.

The year was marked by the sad death of G2DC, Jack Drudge-Coates, and consequent visits to his place at Ringwood to help Mrs. G2DC clear up his shack. Despite time at the workbench spent in building the G3KFE linear, events since its completion have been such that activity has been at an all-time low on the purely transmitting side, even though periods of listening have enabled a very good idea to be acquired about what is happening, on all the bands.

On the technical front, the year has seen a state of no-change in amateur HF-bands apparatus. However, there has, one feels, been a more widespread realisation of the need for attenuation ahead of the receiver when a gainy aerial is in use on the lower bands, and certainly

more people are coming to realise the importance of establishing a good ground system with the loaded vertical aerials which are increasingly popular on most bands. A thought here is that, as far as the receiving set-up goes, is to embody a self-test facility (such as is used on the receivers of secondary radar ground equipments) to give a positive guard against the slow deterioration with age that can occur, particularly in a valved receiver, but less obviously can also appear in solid-state or integrated circuitry. One way of doing it is to terminate the receiver in a dummy load and check the noise output at the audio end under specified conditions, thus measuring the overall gain of the receiver. Another approach is to inject a given signal and to look at the output. Either way requires care, but an experimental set-up on the bench seems capable of indicating the behaviour of the receiver at the flip of a switch—very handy when you are going through one of those periods when no DX appears to be about and the band seems so dead you suspect the receiver.

However, we have not yet got to where we can have a *running* check on the receiver, to bring up an alarm if at any time it goes even slightly off colour, as is possible with sophisticated commercial installations.

Looking Forward

What can we see ahead? Perhaps the most important is the continued long slide down the sunspot cycle slope to a minimum—but then of course will come the rise to a new peak which thousands of amateurs will never have experienced before. Even those who have seen it all before, several times, will know how each minimum has been progressively countered by the improvements in gear, both transmitting and receiving, by the more consistent use of full power in whatever mode, by the advent of SSB, and by the gradual adoption in this country of beams

and vertical antennae. And, of course, the progressive movement of the televiewers from Band 1, Ch. 1 up to the 625-line standard has meant less and less problem with TVI for those of us who live in built-up areas. Coupled with that there has been the realisation of the fact that the braid of the TV coax was most often the route of the interfering signal—which has meant the introduction of efficient braid-breakers to kill a TVI problem hardly noted in the text-books on the subject. Anyway, it should mean that in the coming year yet more stations will be representing U.K. on the HF bands during TV hours.

Top Band

Here our main source of news this time is G3ORP (Maidstone) who not only works the stuff but is full of good schemes for improving signal-to-noise ratios in either direction. First, to the roll-call: On SSB there was KV4FZ, and on CW he booked in VE1MX, K1NOL, VO1KE, W1HGT, EP2BQ, W1BB, KV4FZ, W2DEO, DL2GG/YV5, K4CIA, W1PL, WA8JL, WB8APH, W2PV, W1GBP, K1CPF and PY1RO, not to mention much juicy stuff heard. Peter says the band is "crawling with DX on about four nights each week," with all U.S. call areas audible save the elusive W6/W7 chaps. Operating points: Peter asks that the W's should say where they are listening when they go over—this could save a lot of unnecessary QRM on other people in the 1825-1830 kHz answering segment of the band. G3ORP uses a separate receiver, with its own ATU, and a built-in Q-Multiplier in the ATU, so that he can get a really narrow bandwidth at signal frequency—this is of enormous help when a powerful signal opens up nearby. Incidentally, there are still people about who hear DX on 1803 kHz, and then go and call it on its own frequency—surely *everyone* must know how it is done by now.

Station of W1BFK, Joseph Holder-
ness, 514 Union Street, New Bedford,
Mass., 02740, U.S.A. Licensed since
1929, his main interest is 20m. CW—
at lower right is a genuine McElroy
bug-key. He says he is "100%
English," his folks having come from
Lancashire.



G3APA (Coventry) harks back to the paragraph in the November issue, p.536, about operating from Sark, and says that over the past years he has himself worked from Sark as GC3APA, sometimes for quite extended periods, without any problems. We quite accept that all of *his* Sark activity was authentic and trouble-free—but, somewhere along the line someone has been naughty. To drop a line to the authorities in Guernsey as they ask would seem to be both a courtesy and a guarantee of permission being granted - and, incidentally, the paragraph item on p.536, November, was inserted at the request of the Ministry.

G3ZYE (Tavistock) had a bit of a surprise recently. Robin has an FT-101, feeding a wire about 200 feet long but no more than ten feet high. On November 17 he was calling "CQ Fylde," in the hopes of working some of his buddies at Thornton Cleveleys but had no joy, so wrote "Condx NBG" into his log. Imagine his amazement at receiving an airmail letter from VK3CZ giving him a report of 339 in Australia, who at the same time heard OK1KRS and DK6QI/P. VK3CZ, to aid anyone interested in a VK contact, quotes the *sunrise* times at his end, and says he is on

most mornings for a try his "transmit" frequency being around 1802.5 kHz. Sunrise on January 1 is 1901z; January 14, 1914z; February 1, 1932z; February 15, 1947z; March 1, 2004z; March 15, 2019z; April 1, 2036z and April 15, 2049 GMT. So, there you have it. No doubt VK3CZ would accept a solid and reliable sked arrangement, so why not have a try at working VK—it seems far more people get over one way than ever realise it! VK3CZ is *QTHR*, and you should use airmail.

Eighty Metres

Not given much notice by any of our reporters. G2HKU (Sheppey) turned his beady eye to the Side-band end of the band several times, and worked 5B4FF on each occasion.

Although he has not written in for a while, G3DNF assured us he is far from being out of action. Gordon is preparing a QRP rig with which to try Eighty during the QRP Contest over January 12/13, thus hoping to rake in some QSO points during the hours of dark. One hopes there will be other U.K. entries for this contest, if only to give G3DNF a run for his money! Unlike many of us, Gordon is not bothered by being QRT while constructing a new piece of gear, as

he thoroughly enjoys this facet of the game.

The Royal Navy Amateur Radio Society High Speed Morse (QRQ Runs), which so many people use to bring up their CW speed, will be changing time. Instead of the advertised start at 1900 clock, they are putting the starting time back to 8.0 p.m. so as to enable the chaps who do the sending to arrive at the station and get sorted out without having to rush about. The only information of which we are deprived, having gone through much paper to check, is the *frequency* on which these transmissions can be heard!

G2NJ (Peterborough) mentions one late-night CW contact on Eighty with LAØAR near Oslo, who is British but has never held a U.K. call. He used to live at Chalfont St. Giles and is a radio technician. On the QRP front, G2NJ mentions a contact with G3IFF, Havant, who had three watts input into transistors and a bent dipole as the means to put a solid signal into Peterborough.

Forty

As always, the DX is there if you know how to wrinkle it out. G3RFG (Henlow) recalls the days back in 1925-1928 when the QRM from

perhaps fifty ships all using spark in the same spectrum had to be contended with in order to pick out the wanted one and copy him "sometimes, (he says), in order to aid the concentration, he would close his eyes and let the lower jaw sag". Stan says the training was good—he can still read an S2 signal with S9 QRM practically on top of it (so can any competent CW operator on today's HF bands) only given that both signals are *clean*, the slightest chirp or wobble of either making the situation impossible. Stan's vertical Ae. enabled him to raise, on CW, K2SWP, JA4BJO, VK3MR, W2CBS, WB5DIZ, KV4AM, UK6AAU, VP2ST, YV1AD, ZF1FOC, and ZL2MM, plus a "heard" list twice as long and covering all continents, save Africa—and this on 40 metres!

Your conductor managed to spend the odd hour listening through the rumpus, and in the 2130-2200 period there was no occasion when he failed to log something outside Europe at workable strength; it is largely a matter of using front-end *attenuation*, as much IF selectivity as the signal will stand (depending on the mode) and concentration. This old scribe would hardly claim to be "an OT with crystal filter ears" or anything approaching that, but he manages to find signals on Forty during any evening on which he listens, and to copy complete QSO's, which when all is said and done must be the main criterion of workability.

Reporting the HF Bands

Some Happenings

If you dash for the receiver the very moment you get your copy, you may be in time to hear A55KV (A55KV!)—W6KNH with VU7KV the operators of this expedition. It is suggested they may also appear from Nepal; but the chance of any operation from S21 or AC4 are just about non-existent.

In to mid-January, with any luck, San Andres Is. will be activated by a group of W9's—just what the HKØ call for this effort will be is not known at the time of writing.

The projected Kamaran trip which was to have taken place at the back-end of November—beginning of December time seems to have stalled, with FL8OM and 4W1AF, the instigators, strung up for the reason that the political situation there is distinctly unpleasant; if things cool off a bit, there is said to be some chance they may be able to pull it off in January.

A4XFD is still there from Masirah Is. and has been heard on 21184 kHz and 14210 kHz, working Europeans, his 21 MHz time being around 1015z and on Twenty about 1620z.

It is quite surprising how the influence of JY1 has taken Jordan

out of the lists of rare DX—we notice AP2ZR is reported on 21270-21280 kHz, working to a list taken by JY3ZH. Another AP signal of some interest to members of the Scout movement is AP2BS, who operates from Scout Hq. in Lahore, QSL address P.O. Box 65, Lahore, Pakistan.

Twenty Metres

The all-action, all-QRM band, this one. G3UZ (Goring-by-Sea) found conditions varying from good to indifferent, but nonetheless George's CW penetrated to VK6FT, 4K1A, AX2BJL, VU2ANI, VU2AL, CX2XA, PY7IE, PY7AHO, LU9CV, UA1AA, C11BH, UAØWQ, UAØBL, W6EBG, W6AEM, W6EPQ, W7NHG, KP4CKY, PJ8WW, PJ2DW, VS9MJ, HS1AJB, UH8BDO, UL7WR, UL7PAS, UD6DJT, OD5BZ, LB1D, and HW8TT/FC, plus a string of UA9's. The contact with W6EBG was of interest and lasted for over an hour; this arose because W6EBG knew Tommy, G6QB, well and also the area around Worthing, Goring and Arundel.

VK3AMM is a call perhaps better known as G6XJ, Arthur Edwards late of the Eddystone concern, manufacturers of amateur-band receivers. Arthur has now left New Zealand and at the time of writing is holed up with VK3ML. Then he goes on to VK2EK, Ted Kenny, who was G6XJ's first VK contact back in 1929, and also his first-ever QSO on Twenty—it has taken them 44 years to meet! Another projected trip is to Alice Springs, to see VK8AD, manager of the Alice Airport.

Talking of the Antipodes, a specialist in working them is G2HKU, with his regular morning skeds; in the current month they have produced ZL1AJB, ZL1NX, ZL1VN, ZL3RS, and ZL3SE.

Just one contact is mentioned by W4WFL/1, a new country for him in the shape of 8QAC in the Maldives.



The JOTA station operated by GI3ZIA from Enniskillen, Northern Ireland, worked 300 stations.

The stand of Radio Shack, Ltd., the well-known dealers in the Amateur Radio market, at the Leicester Exhibition. On right, Terry Edwards, G3STS, with G3VKC assisting. One of their choice exhibits was a new Drake Rx priced at £1,133—oh, well!



Morgan is putting a good deal of effort into the CW end of the band, but sad to say, he is finding the pay dirt is only SSB in terms of new countries and other such desirables

QSL Information

W4WFL has some to offer: QSL's for CR6IK, XX6IK, CR6YY, CR6AA, XX6AA, CQ6AA, CR6WW, CR6MT, TY5ABK and EI7CJ all to W8CNL. For CR3AB, send your card to Ritzen, CT2AK, USNAF, Box 15, A.P.O. New York, N.Y.09406. CT1VE, EA5AX, EA7DJ and EA7JL cards should go to KIWPS; VPISYL cards to W4SYL/5, Roger Burt, 6353 Kingston Court, New Orleans. CT2BO, VR1L, and YJ8BL cards are handled by W6NJU, who has recently moved to 7632 Woodland Lane, Fair Oaks, California, 95628.

Talking of QSL's, one wonders how many of the folk who complain about the service from the bureaux ever stop to think that the reason for the slowness, particularly with a relatively inactive amateur, is the time taken for the stations concerned to get around to writing the cards out and posting them to his bureau. You can hardly blame the bureau if you sat on the card for six months!

It is estimated that it can now take one year for a DX card exchange to be effected via Bureau. And it is

not unknown for cards to turn up two years after the QSO—laughable, isn't it! If you are hot about QSL cards the solution, as we have been saying for years, is to QSL direct.

For those who like it, Fifteen is undoubtedly the best band of all, certainly if you want to work the DX in an atmosphere of relative calm.

G3RFG used 15m. at odd times, and surfaced with CX2XA, HC1XG, K2QBN, PY7VOU, VE3ALI, VP2VBU, W1WU, WA3TZZ, WN4FOJ, WB5EDO, W8GZX, W9FD, W0OYP, all mentioned in his first letter; his second indicated some slight lift in conditions and covered CX1JM, HR1AT, K1VTM, K3ZOL, LU3EX, UA9YAG, VO1KE, WA9LHH, WN2FUN, WN4BZL and W5MYA all worked; and there was a getaway list to accompany, which in itself indicated the band was open to most of the world at the times when most people can be on.

Here and There

An interesting thought was raised by a colleague, who is of the opinion that a well-equipped DX station should have both a beam and a vertical or ground-plane aerial if it is to take full advantage of the openings the bands offer. Basically, the argument goes something like

this: Particularly in this country, the height above reference ground of the average twenty-metre beam is pretty low, usually between thirty and forty-five feet; this being the case, the beam has quite major lobes at high angles to the horizontal, and the low-angle lobe is itself not as low as one could wish. On the other hand, the vertical or ground-plane, at the same height of feed-point and adequately provided with radials, will at some times be intercepting more RF from a DX station than the beam would do, particularly at times when the band is just opening or closing. So, taking the argument to its logical limit, when a signal is propagated by "waveguide" action between the ionosphere layers, when it does escape and return to ground the angle of incidence will be so high that a dipole at a few feet above ground may well give more signal pick-up than either a vertical or a beam aerial. Interesting thought, and one which could well be experimented with by some keen DX-minded operator. Your conductor has done a few brief comparisons which, it has to be said, do tend to bear out the theory.

Some new block call sign allocations are notified by the ITU, namely P2A-P2Z, for the Territory of Papua and New Guinea, and S6A-S6Z,

similarly allocated to Singapore who knows but prefixes for these regions may well pop up on our bands.

If you came across KH4NCA recently, around mid-December, it was a station on the appropriately-named Kill Devil Hill, from which the Wright Brothers made their initial tests and finally powered flight back in 1903.

An interesting prefix which has been heard on Forty is 4C5AA, found in the bottom 10 kHz segment on CW. The prefix is for Mexico.

If you are looking for a 9U5 QSO it is now too late. It is understood that operations were to have been suspended as from December 31, 1973; but as early as December 6, it was believed that 9U5CR was the last remaining station active.

4L8A was an interesting prefix from the UH8 area, active at the time of writing, but it is not known just how long he will be there to delight the prefix hunters. 4L0K, on until mid-January, is a DX-pedition by a group of UAO chaps to the New Siberian Is. as a commemoration of the 70th anniversary of the birth of E. T. Krenkel, who used to be active on the bands as RAEM—each stop is good for five points towards the RAEM award. (Even the Russians are getting in on this DX-pedition caper!).

Looking a little forward, maybe

as far ahead as February, we hear a rumour that some operation from Spratly Is. could be coming up, although nothing seems to be definite as yet. Certainly an expedition there could expect to do good business on all bands.

Ten Metres

Not a lot of activity in the way of reports, although no doubt there are some in the pipeline, to be taken up next time. G3KFE has to say, regretfully, that at the times he can operate, there is generally a deathly hush over the band, or at best a tropo opening to somewhere fairly local.

G3RFG seems to have completely deserted 10 metres, and this month has not even mentioned the beacons; on the other hand G2HKU is quite out of his usual run of things when he reports CW contacts on the band with CR6OZ and ZD3X. The ten-metre band should *never* be neglected.

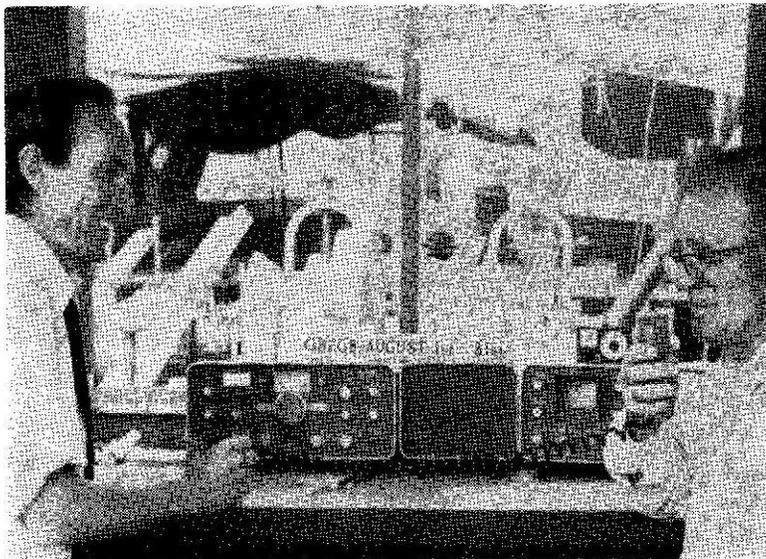
Some Other Points

January is traditionally the time for Good Resolutions, and no doubt those of us who hold a licence and look for DX may well make a few. One, perhaps, could be not to get bad-tempered in a pile-up, no matter what the provocation, remembering that the guy who loses his temper usually loses the battle. Another one, on Eighty, would be for the

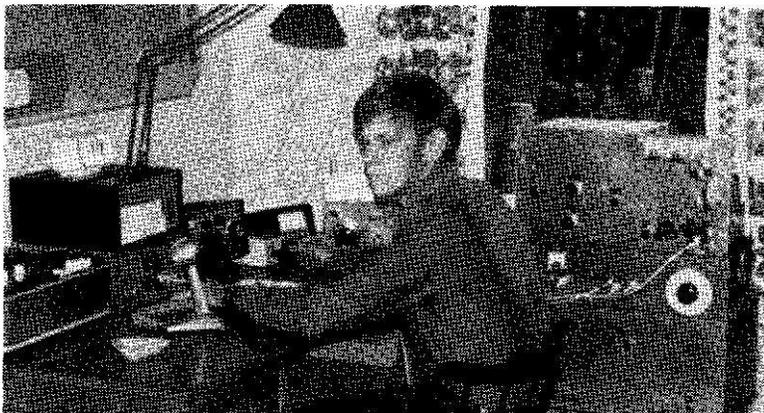
non-DX types to resolve not to interfere deliberately with the DX activity at the HF end of the band, while the DX chaps could at the same time make a resolution to avoid at all costs generating QRM to those rag-chewing within a few kHz of the DX frequency, by over-modulating or any other facet of the excitement of the chase. Phone-only types—for some reason, the YL's are usually more versatile—could well practise their CW, while CW-only men could try Phone once in a while. And both could try SS/TV, or RTTY, or some other angle, even—perish the thought!—VHF. The chaps who buy every item in the station from the tip of the aerial back to the microphone could well resolve to try to *build* something, whether by copying a published design, designing it yourself, or building from a kit. And all of us could well make a resolution never knowingly to break our licence conditions, and to jump *hard* on pirates and other malefactors who, by their activities, may well reduce the freedom from significant supervision we enjoy today.

Back to our muttons. If you are interested in working Crete, as distinct from any old Greek station, try looking for SV0WEE, or SV0WMM. The latter may be found during the early evening on Twenty, while the former seems to prefer to operate in his lunch hour,

Impression of the GB2GB station, s.s. "Great Britain," Bristol, with G5KT (right) and G8GMW. This rather poor picture does not do the set-up justice. The local boys kept GB2GB on the air for the best part of a month and had many interested visitors.



Station of SM7FJE, Bo Nisson, Trelleborg, Sweden, who is one of the younger SM's.



say, 1130-1230 in the U.K.

We have already mentioned the San Andres Is. operation. Just as this was going down, news came in that they will be active on *Top Band*, probably signing HKØBKX, sending both SSB and CW on 1805 kHz, and listening around 1824 kHz for CW replies or 1820 kHz for SSB. This could be quite a QSO from the U.K.! Other frequencies noted are: Anywhere in the band for SSB on Eighty; 7025 kHz CW, SSB anywhere they can get in; 14025 kHz CW, or 14270 kHz SSB; Sideband on Fifteen will be on 21310 kHz, and for Ten it will be on 28.6 MHz.

Also from the same late source we get the mouth-watering informa-

tion that XV5AC has been doing good business on Top Band, at least into the West Coast—but no reports have reached your conductor of anyone in Europe recording him.

Sign-off

That's it for another month. Grateful thanks to all who rushed to put pen-to-paper last time and so enabled this piece to appear as usual; to Geoff Watts and his *DX News Sheet* for its useful advance information; and to the kind soul, whoever it may be, who arranged that weekly copies of the *West Coast DX Bulletin* should appear on this desk at just the right time. To everyone, a Prosperous New

Year, with all the DX you want, when you want it. Finally, a deadline for next time, at **January 10**, latest, addressed as always to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM. MK18-1RQ. 73 de G3KFE.

— —

Editorial Note: It is much regretted that, due to dislocation caused by the Holiday Period over Christmas and the New Year, and unforeseen mail delays, this issue is about a week late. The February *Short Wave Magazine* will, therefore, appear on Friday, February 1, and that for March on March 1—by which time we should be straight again.

CLUB MEMBERSHIP LISTS

We are always interested in seeing these and usually they come out with the newsletter of the Club concerned, as part of the annual summary. For instance, in the case of the Echelford Amateur Radio Society, of Ashford, Middlesex, we find they have over one hundred registered members, of whom about 60 are fully licensed, with twenty or so G8/3's and the remainder in the SWL category. This suggests a pretty fair balance of Amateur Radio interest.

THEFT OF GEAR

We are asked to notify the theft of an HW-100 from Bristol Amateur Radio Club, University Settlement, Bright Street, Barton Hill. The HW-100 itself has circular scratch marks on the dial and an SO239 socket on the

rear chassis drop to replace the B-L type normally fitted, and the PSU to go with it is home-built. Any information to R. J. Harris, G8BIR, 35 Fremantle Road, Eastville, Bristol. (Tel. 70271, Ext. 26.)

TEN-METRE BEACONS

The following beacons are now in regular operation in the 10-metre band: DLØIGI (28.195, alternate 28.2); GB3SX (28.185); VE3TEN (28.175); VP9BA (28.165); ZC4CY (28.180) and 3B8MS (28.190). All frequencies in MHz. These signals are, of course, very important as certain pointers to band conditions on ten metres. Reception reports would be appreciated and when they are heard, the band should be monitored and CQ calls originated. (Data from *Region 1 News*, August).

"Short Wave Magazine" covers the whole field of Amateur Radio and should be obtainable to order through any newsagent.

BROAD-BAND ANTENNAE FOR EIGHTY METRES

SOLVING A COMMON
PROBLEM

R. L. GLAISHER (G6LX)

THE bandwidth of most low-impedance fed aerials is insufficient for complete coverage of the 80-metre band. If only CW (or SSB) is worked and the aerial is cut for the right end of the band, there is no problem, but if both modes are used, then difficulties can arise due to excessive voltage standing waves on the feedline. This can result in poor transmitter loading, spurious emissions such as key clicks and splatter, TVI, flash-over of the PA components, or even overheating and destruction of the feedline.

Most modern transmitters and transceivers are designed to feed non-reactive loads of either 50 or 70 ohms. In order to keep size to a minimum, components are rated so that the PA will only cover a limited matching range and there are no safety factors which will take

care of VSWR's worse than 2 or 2.5:1. An 80-metre dipole resonated in the centre of the band, mounted about 40ft. above electrical ground, will certainly produce SWR's that are greater than 2.5:1 at the band edges. Inverted-Vee's usually have less bandwidth than dipoles, and multi-band trapped aerials even less still. Shortened and loaded aerials are worse than their full sized counterparts, and bandwidths of 25 to 50 kHz for a 2.5:1 SWR are commonplace for these types.

Snags Encountered

In order to overcome the loading and flash-over problems, many amateurs use some form of external tuning unit to match the low-impedance feeder at

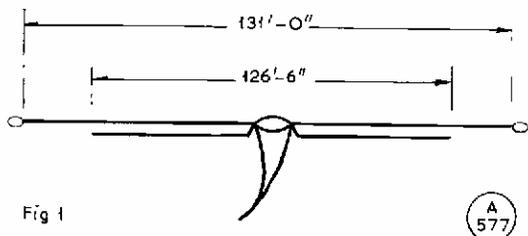


Fig 1

Fig. 1. Multi-resonant dipole for full coverage of 80 metres.

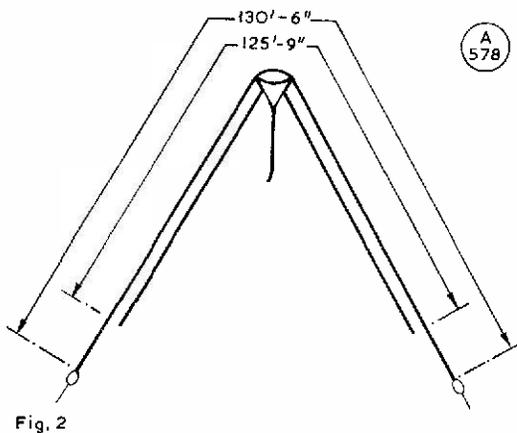


Fig. 2

Fig. 2. Multi-resonant inverted-Vee for Eighty.

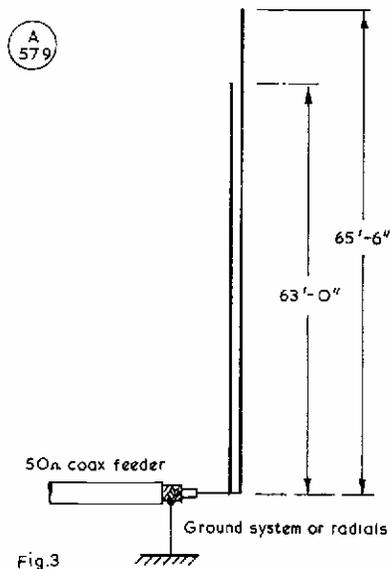


Fig. 3

Fig. 3. Broad-band wire vertical Ae. for 80m.

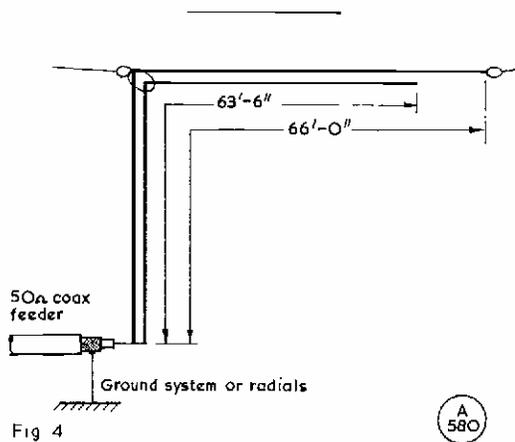


Fig 4

Fig. 4. Multi-resonant version of the 30ft. inverted-L.

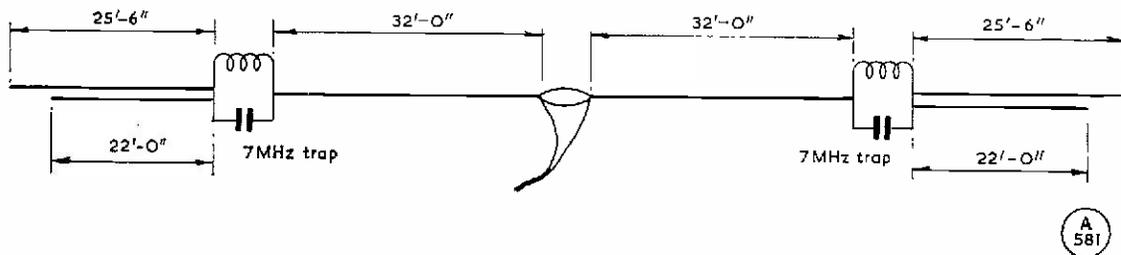


Fig. 5. Broad-banding the W3DZZ multi-dipole array.

different in-band frequencies to the transmitter. While the use of a tuning unit helps to overcome the problems of showing the transmitter a constant non-inductive load, it does not reduce the SWR on the feedline. This can only be done by making the aerial resonate over a wider range of frequencies, or by using some form of multi-frequency matching section at the aerial feed-point. Aerials such as the multi-wire folded dipole and double coaxial bazooka provide sufficient bandwidth for complete coverage, but these tend to become rather complex and are not always as easy to make and erect as a straight wire dipole or inverted-Vee.

Solving The Problem

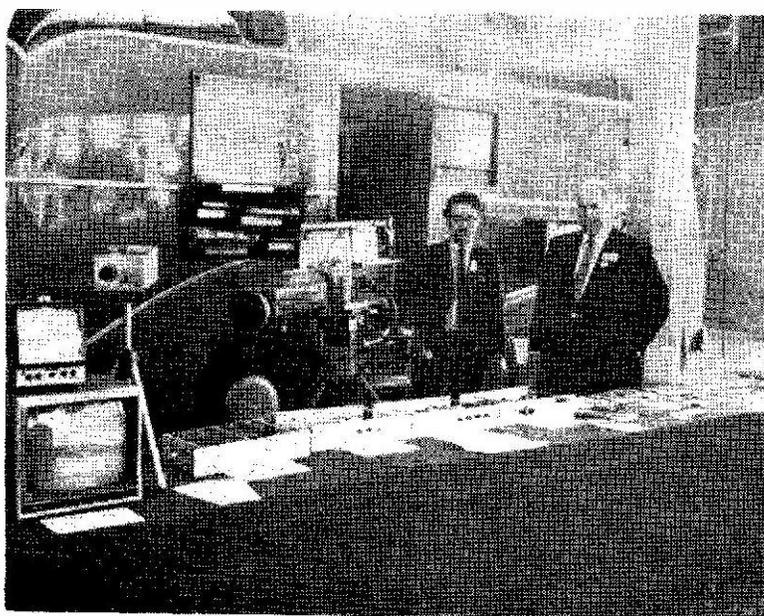
A simpler arrangement is to use a pair of parallel dipoles fed with a common low-impedance line. The parallel dipole arrangement is in common use for two or three band coverage, but it is not generally appreciated that the same technique can be used to provide multi-frequency resonance within a particular amateur band.

If 70- or 300-ohm twin ribbon feeder is used for the parallel elements, it is possible to construct a simple wide-band aerial that is no more difficult to erect than its single wire counterpart.

In practice, one set of elements is cut for resonance at 3575 kHz and the other at 3725 kHz. As both types of ribbon are inherently strong, it is only necessary to support the aerial by insulators attached to the longer of the parallel wires. The shorter element(s) are cut back flush with the insulating material and sealed by the application of gentle heat from a match or a soldering iron. Care is needed in the sealing process, as too much heat will melt the insulation and could cause shorts to the other element.

As shown in Figs. 1 to 5, the parallel-element arrangement can be used to increase the bandwidth of various types of wire aerial. All these have been tried and in no case did the SWR rise above 1.6:1 on any frequency within the 80-metre band.

The British Amateur Television Club had an impressive live show at the Leicester Amateur Radio Exhibition. Their well-equipped vehicle was parked inside the hall, and here we see G6STO/T and G6KOJ/T (right), chairman of B.A.T.C.—and see p.671.



LINEAR RF AMPLIFIER FOR THE HF BANDS

PASSIVE GRID, USING 813's FOR FULL P.E.P.

R. I. THOMAS (GW4BCD)

IT became apparent to the writer that the 50 watts p.e.p. from a single 6146 was not really conducive to having good DX QSO's. Europeans could be worked, but DX contacts were very difficult and a solid DX QSO was the exception rather than the rule. The antenna is, of course, the prime factor, but it no improvements can be made in this direction due to lack of space or QRK (both, in the writer's case), an increase in power should help to find the answer.

Commercial QRO linears are expensive so it was decided to construct a simple linear using 813's, two of which are easily capable of 400 watts p.e.p. output, even with voltages as low as 1.8 kV on the plates. The passive grid mode was chosen to ensure a reasonable match to the exciter without having to provide input tuning, as is necessary with grounded grid stages—the inherent stability of such an amplifier and ease of tuning also played a part in the choice. The screen and bias voltages were already available, so a cheap and effective RF amplifier was put together in a fortnight or so of two-hour evening sessions.

Tank Coil Circuitry

The circuit is shown in Fig. 1. The one departure from a conventional design in the prototype is the π -tank coil, L1, which is a roller coaster type, $\epsilon\lambda$ No. 53 Set, which has been available on the surplus market for some time. This is a beautifully made component, consisting of 48 turns of silver plated 16g. wire on a 2½ in. diameter ceramic former—a silver plated wheel traverses the former, so that any number of turns can be

brought into circuit. (See SHORT WAVE MAGAZINE, March, 1972, p.27, for a full description). The actual RF handling capability of this coil is not known but in the prototype 400 watts of output power has presented no problems.

This tank coil arrangement works well over 3.5 to 21 MHz, but on ten metres efficiency falls off markedly and if much operation is envisaged on this band a purpose-wound coil should be used. It was found that on 21 and 28 MHz the minimum capacity of the anode tuning capacitor was too high to achieve efficiency in RF transference. For a time the amplifier was not used on these bands for this reason, but a solution was found in the *Radio Handbook* the problem was overcome simply by switching out the anode tuning capacitor and resonating the tank circuit with the coil using the inherent output capacity of the 813's to form the C-portion of the requisite LC ratio. A conventional switched coil can, of course, be used, the Eddystone 2½ in. ceramic former being ideal, though a heavy duty ceramic switch is very necessary in this part of the circuit.

Table of Values

Fig. 1. Circuit of the Linear Amplifier

C1 — 01 μ F, disc cer, 5 kV	RFC2, RFC3 — 1.5 mH 250 mA RF choke
C2 — 001 μ F, disc cer, 6 kV	APC1, APC2 — 6t. 16g on 47 ohm resistor body
C3, C4 — 001 μ F, mica, 1 kV	S1 — Heavy-duty on-off, ceramic roller coaster type variable inductor (see text)
C5, C6, C7, C8 — 001 μ F, mica, 250v.	M1 — 0-500 mA
C9 — 01 μ F, disc cer, 1 kV	M2 — 0-100 mA
C10 — 01 μ F, mica, 250v	V1, V2 — 813
VC1 — 150 μ F BC type wide spaced	
VC2 — 1500 μ F BC type	
R1 — 50-400 ohms, see text	
RFC1 — 300t 32g. on 1in. ceramic former (see text)	

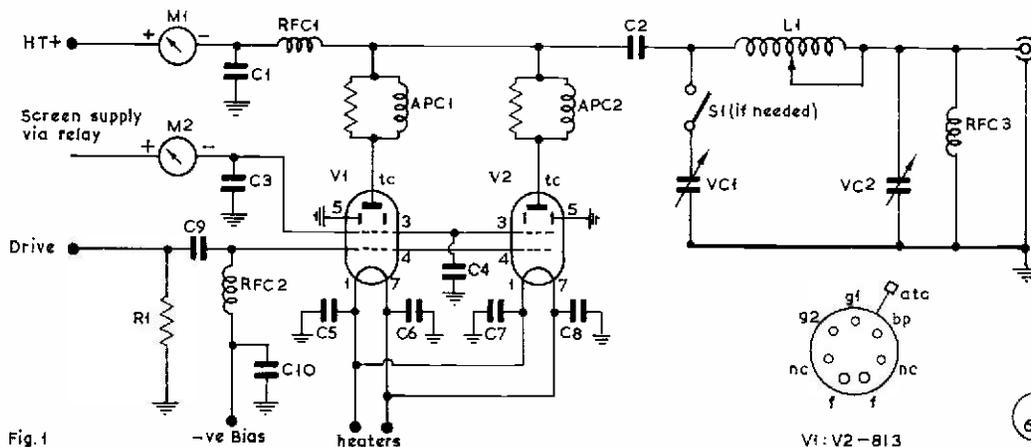


Fig. 1

Fig. 1. Circuit of the Passive Grid Linear RF Amplifier using parallel 813's for full power.

Fig. 1A. Alternative PA tank circuit for 28 MHz band (see text). L1 is 6 turns 12g. air-spaced, about two inches long. L2 is 26 turns 16g. on 2in. Eddystone ribbed ceramic former, tapped at 3, 6 and 13 turns, with one groove-space left between 15-20m. and 20-40m. sections. A roller coaster coil (see text) will cover all bands.

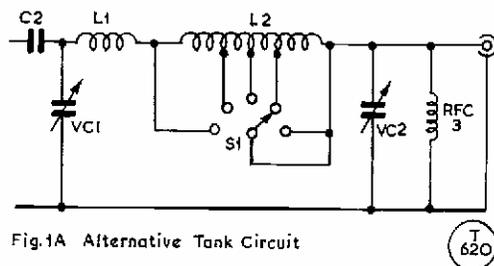


Fig.1A Alternative Tank Circuit

620

Other Circuit Considerations

The grid resistor R1 shown can be reduced if plentiful drive is available, 50 to 75 ohms being the ideal, but with the writer's KW-2000 as driver some 400 ohms at R1 gave full 400 watts p.e.p. output. If the drive available is low this resistor can be increased to get the requisite grid voltage swing, up to the point where the amplifier becomes unstable. This varies from valve to valve but an often quoted value is 1000 ohms. This resistor R1 must be non-inductive and adequately rated for power dissipation. Ten 3700-ohm one-watt carbon resistors in parallel in the prototype cope easily with 50 watts drive from the exciter, showing no signs of over-heating even with prolonged transmissions. The anode RF choke, a vital component in this circuit, is 300 turns of 32g. wire wound on an inch diameter ceramic former 6in. long. These turns are wound in unequal sections as follows: 165, 65, 35, 20 and 15 turns with one-eighth inch spacing between sections. This is as recommended by the books but does not seem critical as a straight 400 turns on a 3/4in. paxolin former was also tried in the prototype and no difference whatsoever was noticed.

The anode tuning capacitor VC1 must be wide spaced, with about 1/10th inch spacing between its stator and rotor plates. VC2 can be a standard broadcast Rx type which will not flash over with RF if a good match exists between aerial load and amplifier. A tolerable SWR is imperative at this power level—a bad match will cause all sorts of problems. Apart from flashover, RF burns from the chassis can occur, TVI (or worse TVI), breakdown of C2, and so forth. The prototype behaves perfectly into an SWR of 2.5:1 but beyond this difficulties do begin to arise.

The receive-transmit relay also switches the screen voltage supply, thus obviating the risk of applying HT to the screens before plate voltage which could destroy even the 813's, the most robust of QRO valves. This arrangement also allows the 813 standby current to be zero, thus preserving the IVS rating of the mains transformer in use. The screen voltage in the prototype is not stabilised—no ill effects have become apparent because of this. A heavy-duty change-over relay is required, as now normally available.

The bias input choke RFC2 is a standard 1.5 mH pie-wound component, as is RFC3 across the output, the latter being required should the blocking capacitor C2 fail. Originally, in the prototype, the output choke was across the antenna socket but when the amplifier was switched to "receive" and this choke switched out, the PA loading capacitor flashed over with DC. This apparently impossible phenomenon was due to the fact that the PA tune and load capacitors VC1 and VC2 have a proportion of HT across them, despite a perfectly good blocking capacitor at C2. Therefore, the output choke RFC3 should be across the tank circuit under both "receive" and "transmit" conditions.

Layout and Construction

In the writer's experience layout is not particularly critical, provided the standard precautions are taken. Probably the prime consideration in this respect is that the input must not "see" the output. This implies getting all input circuitry below chassis and all output above it. All leads carrying RF should be short and stout. Single-point earthing was not employed in the prototype either for decoupling or the π -network capacitors, instead emphasis was placed on keeping component lead length as short as possible—this seems to have been successful as the amplifier is completely stable over its range. Neutralisation is not necessary—though it might be in some cases.

The amplifier should be built into an RF-tight cabinet and, needless to say, sturdily. Blowing the 813's is not necessary but free circulation of air is required. (A surplus hair-dryer motor is employed in the prototype).

Power supply circuitry, at Fig. 2, is self-explanatory. The required smoothing is accomplished by a series-parallel arrangement of capacitors with equalizing resistors. The cans of C1 to C4 inclusive are at varying potentials above earth so should be encased in tubing for operator safety. The series arrangement of diodes gives a total p.i.v. of 6 kV, which is an adequate margin. However, the equalizing resistors should not be omitted under any circumstances. Using the mains transformer rated as specified HT off-load is 1775 volts, dropping to 1500 volts at full rated output. The bias supply is arrived at by the voltage divider network shown—adjustment of RV1 allows the standing current to be varied. Maximum plate dissipation of the 813 is 125 watts for one valve. The HT voltage is, of course, lethal and the voltmeter should always be scrutinised for a zero reading before delving into the power supply. The voltmeter is shunted by five 2-watt resistors to avoid arc-over across the resistor bodies, which could (and did) occur if only one or two resistors of higher value are used. The capacitor bank retains a hefty charge for some time after switch off and the power supply as a whole is approached here very warily. At this QTH it is built into a sturdy earthed steel case and placed in such a manner that it cannot be touched from the operating position.

Setting Up

Tuning the passive grid linear is simplicity itself, especially if a switched-coil type π -tank is incorporated. A small amount of drive is applied until the plate current just moves off the resting current position and the anode tuning capacitor meshed to find resonance as shown by

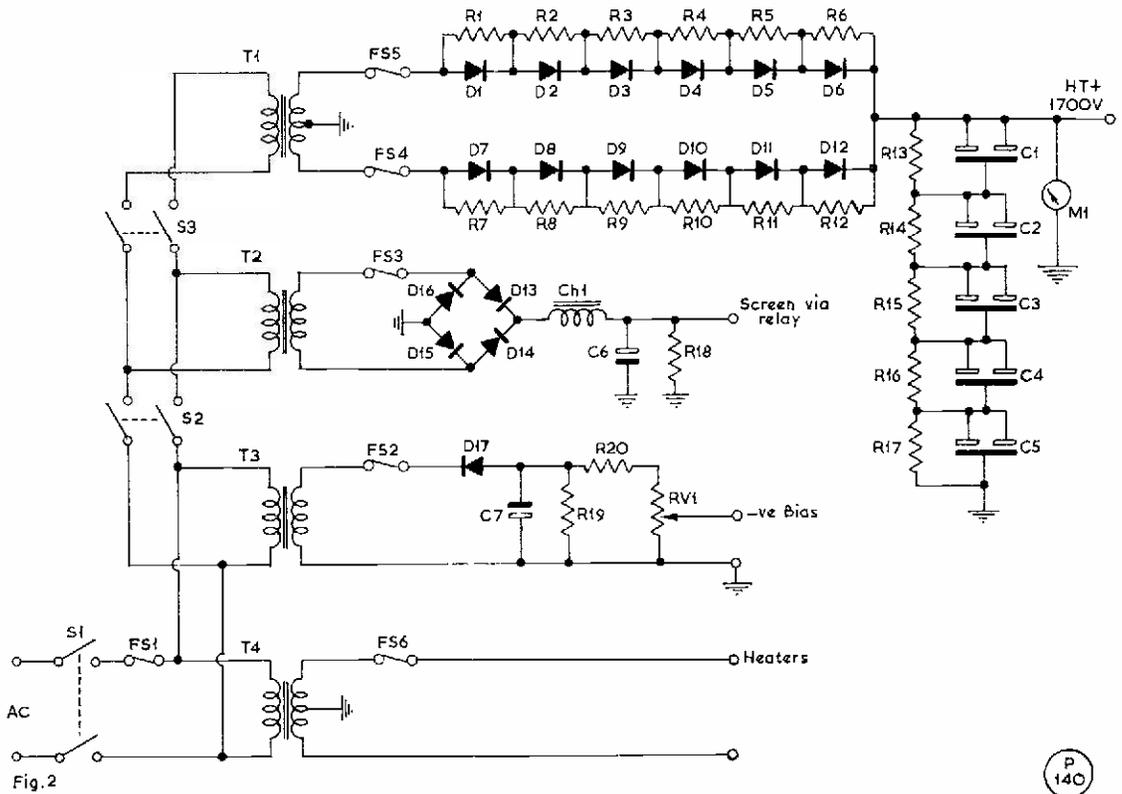
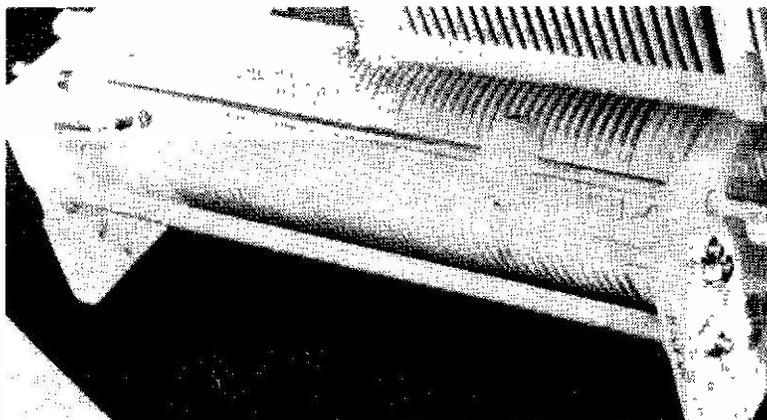


Fig. 2. Power Supply Unit for the 813 Linear Amplifier.



Suitable roller coaster tank coil—see text.

Table of Values

Fig. 2. Power Supply Unit for the Linear

C1-C5, incl. — 80 + 80 μ F. 450v. wkng.	Ch1 — 10 H _v , 250 mA
C6 = 32 μ F. 450 wkng.	F21 — 5 amp fuse
C7 = 8 μ F. 250v. wkng.	F22 = 30 mA fuse
R1-R12, incl. — 270K, 2w.	F23 = 100 mA fuse
R13-R17, incl. — 470K, 2w.	F24 — 500 mA fuse
R18, R19 = 470K, 2w.	F25 = 13 amp fuse
R20 = 20K, 5-watt	T1 = 1125-0-1125v 565 mA
VR1 — 20K, 5w, wire-wound	I2 — 200-0-200v., 100 mA
D1-17, incl. = 1N4007, 1000 p.i.v., 1 amp	T3 — 0-175v. 50 mA heater, centre-tapped

Notes: 11-T4 have standard mains primaries. S1, S2, S3, heavy-duty DPST rated 250v. 6 amp M1, 0-1 mA shunted by five 2w. 500K resistors, to read 0-2.5 kV Fuses FS1-FS3, anti-surge.

reference to the "forward" position on an SWR bridge. Drive is then increased and the amplifier loaded to its peak current by both "tune" and "load" capacitors. Drive should then be backed off so that the maximum plate current on speech peaks is about half the peak loaded current. Tuning should always be directed towards producing maximum RF rather than for dip, as with most unneutralized linears. With the roller coil shown in Fig. 1 tuning is initially more difficult, but once the optimum I:C ratio has been found and logged it becomes very straightforward. As a rough guide to any prospective user of this method maximum RF is produced (with the 53 Set roller coil) in the prototype with the following number of turns in circuit for 3.5 to 28 MHz respectively: 19, 9, 4, 2, 1.

At this QTH, the amplifier is used into a matched ended wire or 30ft. vertical and has given the expected 2 or 3 S-points increase in reports. More important, "talk power" has increased, turning an R3 report to R5, which makes operating a lot more rewarding, to put it mildly.

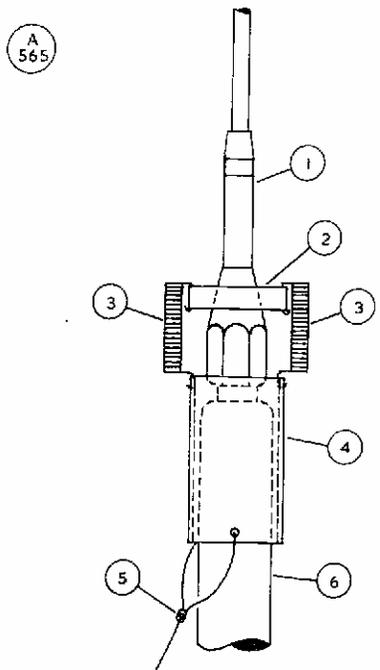
TUNING A G-WHIP BY REMOTE CONTROL

USING AN INDUCTANCE SLEEVE

S. R. TUCKLEY (G3GQP)

USERS of the popular centre-loaded whips will know that they are very frequency conscious. Tuning the transmitter 10 kHz either side of the resonant at which the whip is set results in a considerable increase in the SWR and should one wish to call a station, say on 80m., 100 kHz off the whip frequency setting, unless a separate Z-match is in use, it will be necessary to adjust a section of the aerial before transmitting on the new frequency, or accept a deplorable SWR and risk damage to the final amplifiers.

The writer uses a very simple method of tuning the G-Whip antenna quickly and accurately. It depends on the well-known trick of sliding a hollow metal cylinder over an inductance to alter its resonant frequency. The Mk. I version of this device employed a 1in. diameter tube, 2½in. long, made of copper foil soldered down the seam and then mounted on a 51in. length of ¼in. wooden dowel, weatherproofed, and held close to the lower section of the G-Whip, but loosely coupled by a ¾in. wide polythene ring, cut from 7/8in. tube, and placed at a suitable position about 2ft. up, so that the dowel could slide easily. It will stay-put due to the helix and can be slid to a tight fit when storing the G-Whip away. The lower end of the dowel is tapered and pressed into the expanded end of a 2in. length of old ½in. coax — this again accepts the stranded steel wire, inner of a suitable length of bicycle brake cable, the sleeve of which is anchored on the stout bracket to which the G-Whip is mounted. The cable extends to the operating position, a small knob pulls the cable inner out about 1in., thus in turn bringing the copper tuner down the loading



Sketch to show, in section, the G3GQP modification to a G-Whip to vary resonance by remote control.

coil from the top also about 1in. This was sufficient to tune the G-Whip from 3.6 to 3.8 MHz, resulting in a 1:1 SWR on any required frequency between these limits.

This design was tested static and considered satisfactory. The Mk. II version shown here was developed

after discussing the project with G6XP who offered the useful idea of using cord drive. The drawing, which should be self-explanatory, shows (1) telescopic section of G-Whip fully extended on 80m.; (2) section of polythene tube $\frac{5}{8}$ in. diam. $\frac{1}{4}$ in. deep, pierced vertically each side to take the two similar light rustproof springs (3); (4) Copper or aluminium (cut pharmaceutical container) cylinder, lined with plastic tape to give a close fit over the already well-insulated loading coil of the G-Whip. (5) Nylon fishing line with a loop attached each side of the cylinder to give an even pull against the springs downwards, thus increasing the resonant frequency of the G-Whip antenna; and (6) loading coil.

The Nylon line could be taken either by any suitable means direct into the vehicle, using a small lever, giving say a 2 : 1 ratio, or it could be attached to a bicycle brake cable as in the Mk. I idea.

It is thought the Mk. II version might be used for Mobile working. On 40m. a shorter tuning cylinder of $1\frac{1}{2}$ in. is suitable, and for the G-Whip only about $\frac{3}{4}$ in. diam. to tune over the 100 kHz allocated. Obviously, a SWR bridge is essential for correct operation. One can operate the tuner control and watch the SWR drop down to 1 : 1 from near the red, without any need for an additional Z-match unit.

GRAPPLING WITH DECIBELS

One has only to switch on a receiver and listen to a few QSO's to be certain that the abbreviation dB (decibel) is very frequently used. But does every amateur really understand the meaning and use of this expression? It is doubtful.

So, what is a dB? Firstly, a decibel is a part of the unit "Bel". In general, a Bel is the ratio of 10 : 1 between two different power levels. Better to understand the Bel, three different cases will be considered. If the power level in Case B is ten times greater than in Case A, one can say that the power level is 1 Bel up. If the power level in Case C is ten times greater than in Case B, it must be 2 Bels up on Case A—or 100 times greater.

A power ratio of 100 : 1 = 2 Bels; 1000 : 1 = 3 Bels; 10000 : 1 = 4 Bels; and so on.

It can be seen that the relationship is logarithmic. The log of 100 to the base 10 is 2, the log of 1,000 is 3, and so on. The exact relationship is given by the equation:

$$\text{Loss in Bels} = \log \frac{P_1}{P_2}$$

To take an example: A transmitter with an output power of 600 watts is connected to a dummy load/wattmeter by a coaxial cable. At the dummy load a power of 450 watts is measured. What is the loss in the cable?

$$\text{Loss} = \log \frac{P_1}{P_2} = \log \frac{600}{450} = \log 1.33 = 0.126$$

The loss is, therefore, 0.126 Bels

As the unit Bel is rather large, the smaller unit Decibel (written dB) is used. Now, 10 decibels = 1 Bel, so a value of

$$100 : 1 \text{ (2 Bels) is also } 20 \text{ dB}$$

$$1000 : 1 \text{ (3 Bels) is also } 30 \text{ dB}$$

The equation now becomes:

$$\text{Loss in dB} = 10 \log \frac{P_1}{P_2}$$

It should be clear that decibels measure only a *ratio* between two values and do *not* represent any definite power level. In the previous example, a figure of 0.126 Bels was derived from the equation but,

$$\text{Loss in dB} = 10 \log \frac{600}{450} = 10 \log 1.33$$

$$= 1.26 \text{ dB.}$$

Voltage and current ratios can also be expressed in dB. Since power is proportional to the *square* of the voltage or current, the equation becomes

$$\text{Loss in dB} = 20 \log \frac{V_1}{V_2} \text{ or } 20 \log \frac{I_1}{I_2}$$

Here are some practical examples.

(1) A VHF antenna has a gain of 12 dB. What is the voltage multiplication factor?

$$12 \text{ dB} = 20 \log \frac{V_1}{V_2}$$

$$\log \frac{V_1}{V_2} = \frac{12}{20} \text{ dB} = 0.6 \text{ dB}$$

$$\log 4 = 0.6$$

The voltage multiplication factor is therefore four times, *i.e.* the voltage at the input to a Rx is four times greater than would have been the case with a half-wave dipole. An S-meter reading of S6-7 would be increased to S9.

(2) A transmitter has an output of 100 watts. The field strength at the receiver needs to be increased by 10 dB. On the one hand, a beam with a gain of 10 dB could be used, and on the other, the output power of the transmitter could be increased. What power increase would be required to give the extra 10 dB?

From the equation:

$$\text{Power in dB} = 10 \log \frac{P_1}{P_2}$$

we get

$$10 \text{ dB} = 10 \log \frac{P_1}{P_2}$$

$$\log \frac{P_1}{P_2} = \frac{10}{10} \text{ dB} = 1 \text{ dB}$$

$$\log 10 = 1,$$

$$\text{Therefore, } \frac{P_1}{P_2} = 10$$

The transmitter power must be increased by 10 times *i.e.* $100 \times 10 = 1 \text{ kW.}$

(3) A signal report is given as S9 + 60 dB. What is the receiver input signal voltage?

For an average short wave receiver, a typical reading

of S9 would be equivalent to an input of between 50 and 100 microvolts. A reading of S9 + 60 dB would therefore be approximately equal to an input of $75\mu\text{V} + 60\text{ dB}$.

$$60\text{ dB} = 20 \log \frac{V_1}{V_2}, \log \frac{V_1}{V_2} = \frac{60}{20} = 3$$

$$\log 1,000 = 3$$

$$\frac{V_1}{V_2} = 1,000$$

$$75\ \mu\text{V} \times 1,000 = 75\ \text{mV}$$

The receiver input voltage is, therefore, 75 millivolts.

The Table opposite gives a few useful dB values.

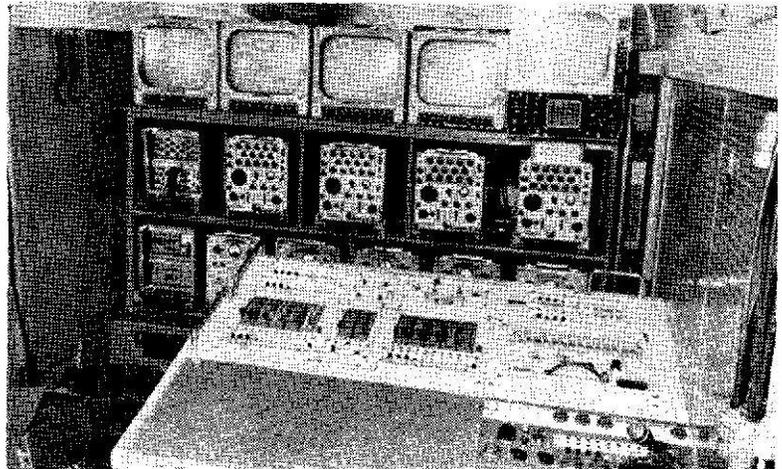
dB	$\frac{P_1}{P_2}$	$\frac{V_1}{V_2}$
0	1.0	1.0
1	1.26	1.12
2	1.5	1.24
3	2.0	1.41
4	2.5	1.6
5	3.2	1.8
6	4.0	2.0
7	5.0	2.2
8	6.3	2.5
9	7.9	2.8
10	10.0	3.2
20	100.0	10.0
30	1000.0	32.0

A.H.D.



The stand of Amateur Electronics (G3FIK), Birmingham, at the Amateur Radio Exhibition in October had as supporters, from the left, G8GUS, G8HBE and G3RGD, with Ken Perfect himself, G3FIK, right.

Interior view of the B.A.T.C. van, with its impressive console layout, fitted up by members, who also renovated the vehicle, which has all amateur TV facilities. It can be taken anywhere for any A' TV activity.



To keep in touch with the world of Amateur Radio, read "Short Wave Magazine" regularly — Independent, Unsubsidised and now in its 31st volume.

• • • **SWL** • • •

SHORT WAVE LISTENER
FEATURE

By *Justin Cooper*

**CALIBRATING A FREQUENCY METER -
NOTES AND NEWS FROM READERS—
THE HPX LADDERS**

HERE we are once again, with the Christmas celebrations safely out of the way; your conductor hopes all his readers have thoroughly enjoyed their break, and also found time for a spot of listening on the bands or maybe a bit of construction -or even just playing with the new toy in the shack!

Technical Points

The first one comes from *W. J. Wellington (Whitley Bay)* who writes again after a long silence while he recovered from the R.A.E., in which he was rewarded by the receipt of a pass slip. He has a BC-221T which is in full working order but less the charts, so he wants to know how to calibrate it. A tall order on amateur resources, but this might be a way to try it: First, you need to borrow another BC-221 with its charts, or use an oscillator and a good counter, accurate to one part in one million at least. First, copy out the printed part of all the 72 pages of calibration and instruction; that will leave the figures under the heading "Dial" on each page to be filled in. First, you must check and adjust the calibrator crystal within the BC-221. To do this you need either to couple the wavemeter into a counter as loosely as possible and tweak the 12 μ F capacitor across the crystal until the '221 is bang on frequency, or (and this is the most likely way) you can find MSF or WWV on 5 to 10 MHz on the station receiver, couple a bit of wire to the Ae. terminal of the BC-221, and tune for zero-beat, which will be when the beat note has been got rid of and the S-meter is just slowly rising and falling at a rate slower than one beat a second; you may have to play with the relative coupling of the BC-221 to the receiver to get a clear indication. Now switch the wavemeter to "Check" from "Crystal" and set the "Corrector" to the middle of the scale. Tune for the various check points on the calibration charts, and mark in the dial reading, *not* forgetting the vernier reading. Now comes the tricky bit: You have to couple the two BC-221's together, as loosely as may be to get a decent signal in the phones of the one being calibrated but not too much, or spurious responses will appear. You can then set frequencies as indicated on the other BC-221 and zero-beat them on your unit as carefully as you can, entering all the figures in the appropriate spaces on the calibration charts. Finally, you can take the two wavemeters to a transmitter friend (or use a signal generator to produce a signal) measure its frequency with each BC-221 in turn and check that they give the same answer. If they do, you're home and dry—all you then need to do is to check and reset the crystal periodically against WWV or MSF, and run through the check points in the

book to see that all can be met within the range of the Corrector control.

* * *

Actually, to purchase a BC-221, or any other sort of heterodyne frequency meter capable of accurate calibration, without its charts or curve book is, these days, rather like buying a car without its petrol coupons—it will go, but runs out of accuracy just when you need it most. Every BC-221 and LM-14 (which are virtually the same thing) was issued originally with its own calibration book, numbered for that particular instrument.

* * *

We made a bit of a boob somewhere last time when we talked about the use of an attenuator with the FR-50B, as proposed by *A. West (Herne Hill)*. What we should have said, when referring to the RF gain control, should have been the Monitor control, which is not much used by SWL's, although of course the RF gain is continually used—so it is all—same as was said, except for "RF Gain" read "Monitor."

How does one judge the selectivity of a receiver, in SSB terms? This is the question posed by *L. Craven (Alvechurch)*. The bandwidth to the 6 dB points should be about 2:1 to 3 kHz, and the bandwidth to the 60 dB points as little greater as may be. Another way of expressing it is to give the "shape factor," which should be as low a ratio as possible when comparing 6 dB and 60 dB points. What it boils down to is that if the receiver is designed for SSB and has either a multiple-crystal filter, a mechanical filter or even, as in the case of the Drake-2B and the KW-77, an LC filter at low frequency, the *shape factor* of the IF response is the important thing. For CW, you want a much narrower "nose" bandwidth to the 6 dB points, say, 200 cycles or so and again the best possible shape factor to the 60 dB "skirt" bandwidth. The RF stages and mixer contribute effectively nothing to the total bandwidth where adjacent-channel rejection is concerned, although the image ratio in dB should be as great as possible and this latter is a function of front-end design.

Signals around 4.9 MHz are queried by *J. Hamill (Trinity College, Dublin)* using such call signs as VQ5X19, and talking about "cadets." Almost certainly these would be Cadet Force transmissions, on Service frequencies.

The frequency of the crystals contained in his Trio JR-500SE is puzzling *B. Rhead (Stoke-on-Trent)*. He hasn't a manual for his receiver, but has found by experiment that pulling the 5.1 MHz crystal affects the 14 MHz band section. This is quite possible, and would depend on the frequency range chosen for the tunable oscillator and the second, fixed, IF at which the selectivity is generated. This should all be made plain in the "book of words" for the receiver.

George Briddon, of Westbury Cottage, Wellington Street, Matlock, Derbyshire is 73 years of age—and has been an SWL for 50 of them. He has had some memorable experiences in that time, building his own receivers from the crystal set days. The Rx now is an AR88D.



New Entries

Mrs. J. B. Jane (*East Looe*) has taken over the Codar CR-70A left vacant when the OM treated himself to a 9R-59DS—but she admits to having a little look round on the Trio when he is out, or even to hearing a few new ones when he is at the controls. Not so few at that, for Jacqueline comes in with an entry of 448 prefixes heard as a starter. A query raised is the status of an "S6BIA" heard working K4RA and clearly identified. Sad to say, it is probably a "dud" or even a mishearing due to gabbling a callsign.

Another one with queries is G. George (*Woodmancote, Glos.*) who has "ZQ1AA" and "Z1D," both reckoned to sound "fairly respectable." Respectable-sounding or no, it is to be feared they are not all they seem to be! Gareth is using an HRO which came from G2FWA, and he admits to lots of help from G4BRX and G3IXI.

M. Eccles (*Lancaster*) comes in to the list with an entry of 305 prefixes heard with a 9R-59DS and an untuned long-wire of some 200 feet doubled back on itself in a roughly North-South direction.

Up in *Seahouses, Northumberland*, lives R. Kell, who has a CR-100 which has been endowed with 6SG7 RF stage valves, an EL33 output stage, a Codar Q-Multiplier and preselector, and other modifications. Currently work is in hand on a Slow-Scan TV Monitor, also a home-construction exercise—Rick has good workshop facilities and seems to be coping quite nicely without any outside help. Good!

Other Letters

J. W. Sutton (*Fareham*) wonders what receiver your old scribe uses. The main Rx is a KW-2000B with an added Q-Multiplier, with an Eddystone 888 and Codar CR-70A as the back-up; in addition there is the facility for reception on Two in the shack. Aerials are an ended for Top Band and Eighty, a vertical for the 7-28 MHz region, or a triband beam; odd contraptions often

also appear in the loft space in the course of researches into that most fascinating topic of aerials, to be compared against the normal antennae which are used as standards of comparison. On the test gear side, there are RF and AF generators, a brace of oscilloscopes with single and *times ten* probes, two-tone generator, BC-221, and various other bits and pieces mainly of use in attaining some degree of precision in frequency and aerial measurements. Otherwise, J.C. prefers to live in peaceful anonymity, although he will admit, if pressed, that the Editor has some slight idea of his identity!

Although this period has given K. Kyezor (*Perivale*) more time for serious listening, it has been a time when, in his view, the bands have varied from passable to damnable. Agreed! Nonetheless, OM Kyezor has hiked his total up from 1163 to 1211, which is no mean jump.

R. Carter (*Blackburn*) has taken the advice of G3KFE in CDXN, and spent some time on Forty, the noise on which band Ben likens to that in a Lancashire weaving shed of years ago, so intense that speech was impossible and one had to learn to lip-read! True enough at first hearing, but a careful use of the controls on the receiver, and if possible an attenuator in the aerial feedline, will make a considerable improvement. A query signal heard was a "BQØKT" who has the nerve to tell a UK4 station he was a new prefix for Tibet!

Much contest activity is noted by J. H. Sparkes (*Trowbridge*) who duly profited thereby, as his score

ANNUAL HPX LADDER

This will close on December 31, 1973, and the last showing will be the list published in March 1974 "SWL" for which the deadline is January 17. Following issues will contain a new Annual Table, starting January 1, 1974. Rules will be as before.

shows. SWL Sparkes notices the absence of WB3 from the prefixes heard and wonders if any such are in existence; a look at J.C.'s copy of the U.S. *Call Book* indicates there are none, but of course the position may have changed in the last year or so. Among the special prefixes recorded, we note such as ZY, from Brazil, XX6 from the Launda State Fair again this year, and HW6 as a commemoration prefix used by some French stations.

C. Henderson (*Beckenham*) is very keen on contest listening and has put entries into several major ones, as well as logging for the Cray Valley Club, G3RCV, during their operation for the CQ *WW Contest*, in which they rolled up a claimed total of 1,200,000 points, to give some poor soul a gigantic job in making up the fair log for an entry—that's the hard part of any contest!

Not much to report this time, complains R. H. McVey (*Weston-super-Mare*) thanks in the main to heavy outside commitments, like work for example—we know the feeling! However, Roger did manage to rake up 30 new ones for his HPX score.

A lot of time spent on Top Band has been profitable for A. Judge (*Bishops Stortford*) in terms of DX heard, both European and Trans-Atlantic, and, we are pleased to see, Tony's loggings are both Phone and CW. Two metres is catered for by way of a halo in the loft, and so far three countries have been heard on this band, plus a crop of local and semi-local G's. As a final note Tony has congratulations for John Fitzgerald on that worthy schoolmaster's passing of R.A.E.

Oddly enough, the next letter on the pile is from J. Fitzgerald (*Gt. Missenden*). John finds he still has not recovered the speed in CW which he attained while he was going to the Grafton Club R.A.E. and Morse classes, and he wonders whether petrol will continue to be available in sufficient quantity to enable him to carry on with his present Morse course. One hopes so, of course, but having got so far it is doubtful if John will let a trifle like petrol shortage stop him getting a ticket now! On a different point, John wonders whether he can put an entry into the CW list as well as his SSB entry; of course, as long as the two entries are clearly marked and kept separate.

* * *

In answer to S. Sharred (*Birmingham*, 33), there is no separate Annual CW list—you go straight on to the All-Time with a starting score of at least 200 prefixes. Stanley harks back to the chap with the 3.5 MHz Quad, and says he has been told of an American amateur who has a rotatable array for Top Band—although we would think it is probably apocryphal. However, the Verulam chaps have been known to rotate their Top Band dipole by manpower during MCC, hence to improve their scoring rate.

As a result of his mention of Slow-Scan TV last time out, P. Barker (*Sunderland*) received four letters. He is obviously interested in this mode, as he has started a HPX list off on Slow-Scan, which so far has brought him up to 15 countries, scattered over Europe, Asia and North American continents. All this on home-built gear, plus an HPX claim for the ladder in the normal way.

Having acquired a preselector, and noted the comments from time to time about these boxes, M. Kitchener (*Hitchin*) has been doing some researching and experi-

HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
<i>PHONE ONLY</i>			
W. Bingham (<i>Carrickfergus</i>)	1434	M. Cuckoo (<i>Herne Bay</i>)	717
R. Shilcock (<i>Iye</i>)	1428	R. H. McVey	
T. Rootsey (<i>Ilford</i>)	1355	(<i>Weston-super-Mare</i>)	712
S. Foster (<i>Lincoln</i>)	1339	J. Gravell (<i>Burry Port</i>)	709
K. Kyezor (<i>Perivale</i>)	1210	C. K. Verstage (<i>Old Basing</i>)	695
J. Fitzgerald		P. C. Jane (<i>East Looe</i>)	682
(<i>Gt. Missenden</i>)	1164	L. Thomas (<i>Castleford</i>)	674
A. W. Nielson (<i>Glasgow</i>)	1138	H. A. Londesborough	
L. A. S. Poole		(<i>Swanland</i>)	640
(<i>London N.21</i>)	1083	P. L. Barrett (<i>Welwyn</i>)	634
R. Carter (<i>Blackburn</i>)	1059	B. Cushing (<i>Hove</i>)	611
I. Brown (<i>Newtownabbey</i>)	1044	J. R. Cowan (<i>Rochford</i>)	589
H. Alford		M. J. Stringer	
(<i>Burnham-on-Sea</i>)	1034	(<i>Southend-on-Sea</i>)	577
B. Hughes (<i>Worcester</i>)	954	K. C. Webb (<i>Earley</i>)	572
M. J. Quintin		P. Barker (<i>Sunderland</i>)	567
(<i>Wotton-u-Edge</i>)	941	C. L. Lee (<i>Ilford</i>)	554
G. W. Raven		M. Kitchener (<i>Hitchin</i>)	533
(<i>London S.E.13</i>)	912	S. Eldridge (<i>Crawley</i>)	527
J. H. Sparkes (<i>Trowbridge</i>)	094	R. Smye	
D. Rodgers (<i>Harwood</i>)	901	(<i>Shrewsbury School</i>)	503
C. Henderson (<i>Beckenham</i>)	857	G. Lucas (<i>Kennoway, Fife</i>)	505
N. Henbrey (<i>Northiam</i>)	856	<i>CW ONLY</i>	
P. L. King (<i>Ermsworth</i>)	843	A. Glass (<i>Plymouth</i>)	957
N. Askew (<i>Coventry</i>)	841	T. Rootsey (<i>Ilford</i>)	723
A. West (<i>Herne Hill</i>)	840	G. Proud (<i>Letterston</i>)	693
A. R. Holland (<i>Malvern</i>)	783	W. B. Taunton (<i>Meopham</i>)	646
E. W. Robinson		C. Henderson (<i>Beckenham</i>)	587
(<i>Bury St. Edmunds</i>)	775	H. A. Londesborough	
H. M. Graham (<i>Harefield</i>)	772	(<i>Swanland</i>)	490
A. Judge (<i>Bishops Stortford</i>)	770	D. Rodgers (<i>Harwood</i>)	434
W. B. Taunton (<i>Meopham</i>)	767	W. Hutchinson	
E. Parker (<i>Hove</i>)	756	(<i>Hornchurch</i>)	256
O. L. Cross (<i>Bexleyheath</i>)	735	S. J. Proud (<i>Letterston</i>)	201
B. Thomas (<i>Pontefract</i>)	734		

Starting score 500 for Phone, 200 for CW. Listings include only recent claims. Rules for HPX—see Panel, p.163, May issue.

menting for himself. On his receiver, running the preselector all but flat out on Ten and Fifteen gives a worthwhile improvement in sensitivity and image rejection; on bands from 14 MHz downwards, it is vital to run both preselector and receiver with gains turned well down, when it can be said to show a limited improvement. In other words, if one has such a box-of-tricks, it is essential that you use it with discretion if benefit is to be gained from it—if you don't you are likely to lose more than you gain.

A photograph, unfortunately not contrasty enough for reproduction, accompanied the letter from J. Bingham (*Carrickfergus*) together with an extremely amusing but, we fear, far-fetched, description of the two-metre aerial mast and aerial; it involved parts of a motor-car, a flag-pole lying horizontally, a vertical section made from vacuum-cleaner pipe, parts of two car axle-stands, some coat-hangers, and some fishing-line without the hook on the end. Nothing like inspired improvisation! On a more serious tack, they have still kept their omnidirectional crossed dipoles for Two, but have added to the aerial farm with a J-Beam eight-element array.

Not a lot to report says S. Foster (*Lincoln*) who finds time hard to come by. However, the old maestro can still produce the odd prefix to add to his score, this time taking it to 1339 prefixes.

Strange how many SWL's and licensed amateurs have

faith in Santa Claus when it comes to new equipment. P. Davies (*Stoke-on-Trent*) reckons on the old gentleman coming across with a two-metre converter and pre-amp, plus a beam and an omni-directional array for the band.

An audio-frequency noise processor has been built by S. Eldridge (*Crawley*), and aerials have been changed; the new one is outside and fed through an ATU which has helped also with the problem of TV timebase interference. Stephen had several prefix queries, all of which are quite OK.

A commemorative call sign which has been puzzling a few people was II4FGM, which was in connection with the Marconi celebrations and was from Bologna, using the phonetics "Foundation Guglielmo Marconi" when calling and signing. E. W. Robinson (*Bury St. Edmunds*) came across this chappie among others during his rather abbreviated time on the bands during this period.

N. Henbrey (*Northiam*) seems to have spent quite a bit of time on Forty, from which he emerged with honours, and many DX'y countries heard, although not much in the way of prefixes which had not been heard on other bands. However, the thing is that if one can wrinkle the stuff out on 7 MHz, you can surely do it on any other band! Norman sent in some photographs of his aerial arrays, which no doubt have some considerable bearing on the DX heard, both on the HF bands and at VHF; what a pity they don't have enough contrast to reproduce.

* * *

A. May (*Bromsgrove*) is chasing the various States of America as an exercise, but cannot tell which station is which without a U.S. *Call Book*, which he does not have. So, take a trip to the Birmingham Reference Library, and consult their copy, which, it must be said, took them an hour to find, thanks to Andrew forgetting the *Call Book* is a magazine and filed as such. It offers the chance for your old J.C. to point out to any readers who may feel that help is necessary, or plenty of funds, to the business of becoming an SWL, or, indeed, a licensed amateur, that it is not so, provided one is prepared to help oneself, and use the avenues which are open. For instance, both the British and American *Handbooks* are available in the local library or can be got on request; Morse can be learnt quite as easily by listening as by teaching; and R.A.E. can be passed by absorbing all the material in, for example, Rayer's *Amateur Radio* as thoroughly as possible, the while carefully considering one's technique in the examination. J.C. knows of lots of amateurs who got their ticket completely unaided, and at a late age at that.

* * *

M. Cuckoo (*Herne Bay*) spent ten hours in the CQ WW Contest, listening to the battle, and found the bands quite lively all around the globe, with alarming QRM on Twenty; but, sad to say, he only turned up 16 new prefixes and one new country for his pains—such is the luck of the game.

Two reasons have held back his HPX score, says E. Parker (*Hove*)—the first is that Ernie has been busy with the HAB business, the other being the one that affects so many of us if we are honest with ourselves—the spirit is willing, but the body persists in dropping off to sleep!

ANNUAL HPX LADDER

(Started January 1, 1973)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
L. Craven (<i>Alvechurch</i>)	489	P. Eaton (<i>Folkestone</i>)	343
M. Whitfield (<i>Stroud</i>)	482	G. Ridgway (<i>Darlington</i>)	340
B. F. Hughes (<i>Worcester</i>)	452	S. Sharrad (<i>Birmingham</i>)	324
Mrs. J. B. Jane (<i>East Looe</i>)	448	M. Rodgers (<i>Harwood</i>)	317
D. Churchill (<i>Bexleyheath</i>)	446	M. Eccles (<i>Lancaster</i>)	305
W. J. Smith (<i>Benfleet</i>)	444	M. Hartley (<i>Preston</i>)	305
D. Johnson (<i>Clitheroe</i>)	442	S. Hall (<i>Huddersfield</i>)	304
B. Rhead (<i>Stoke-on-Trent</i>)	421	A. May (<i>Bromsgrove</i>)	296
M. Wickstead (<i>Taplow</i>)	376	R. Shelley (<i>Bisley</i>)	282
P. Davies (<i>Stoke-on-Trent</i>)	369	C. B. Russell (<i>Runcorn</i>)	281
C. M. Little (<i>Addiscombe</i>)	366	W. McFaul (<i>Londonderry</i>)	252
M. Smith (<i>Matamata</i>)	354	R. Kell (<i>Seahouses</i>)	248
W. H. Smyth (<i>Hartlepool</i>)	349	G. George (<i>Woodmancote</i>)	228

Starting score 200, in accordance with the HPX Rules.
All prefixes to be heard between January 1, 1973 and December 31, 1973. A new list starts January 1, 1974.

M. Wickstead (*Taplow*) has been to VE6-land to stay with some old friends since last we heard of him. As so many before him, Maurice is full of praise for the welcome he received in Canada and reckons it is a FB place to go for a holiday; among others, he mentions meeting VE6AMR who works in Calgary. Back on HPX, Maurice has tried tacking a preselector on ahead of his 9R-59 receiver in order to reduce the images on the HF bands, but he finds it still not enough—probably the gain is being run up a bit too far to get the best out of the selectivity in the preselector and the front-end of the receiver.

M. Smith (*Matamata, New Zealand*) sent in his HPX log-book, in which he makes a fair copy of his loggings after going through the rough ones against the checklist. It certainly is a fine piece of work, but rather heavy to shuttle back and forth with postage rates, even U.K. ones, let alone airmail. However, in years to come, Mike will be able to look back at his logbook and bring back memories.

Conclusion

At this point we have reached the bottom of the pile, saving for those who sent in just a Table entry with little or no comment. We acknowledge such from: P. C. Jane (*East Looe*); C. L. Lee (*Ilford*); T. Rootsey (*Ilford*); B. Thomas (*Pontefract*); L. Thomas (*Ferryfryston*); H. Alford (*Burnham-on-Sea*); K. King (*Beeston*); G. Raven (*London S.E.13*); M. Rodgers (*Harwood*); A. Glass (*Plymouth*); H. A. Londesborough (*Swanland, Yorks.*); W. McFaul (*Londonderry*); G. G. & S. J. Proud (*Letterston*); T. Gravell (*Burry Port*); D. Johnson (*Clitheroe*); R. Shilvoek (*Kingswinford*); and L. A. S. Poole (*Winchmore Hill*).

Final—Final

It just remains for J.C. to wish everyone a Happy New Year; and to give a deadline of January 17—early because of the short month of February. The address, as always, is SWL, SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ.

New Band Plans

WE dealt last month with the general background of the new band plans to come into force on February 1, 1974, with emphasis on the Two Metre plan. This month we shall deal with the plans for the other bands. Before doing so, however, here are some details of the frequencies allocated to special activities in the two-metre band.

144-00

144-10 MHz — EME
 144-10 MHz — Random Meteor scatter
 144-20 MHz — SSB calling channel
 144-60 MHz — RTTY (DX) channel
 145-30 MHz — RTTY (Local) channel
 145-50 MHz — Mobile calling channel
 (National and International)
 145-55 MHz — International mobile working
 channel and FM Simplex

It should be noted that the appellation "All Modes," shown at the lower frequency end of two metres in the diagram on page 615 of the December issue as embracing the SSB allocation, has now been modified to apply only to those frequencies above the SSB allocation. This is a welcome change since it will help to avoid the mode overlap which would have been possible under the original arrangement, and on which comment was made last month. In the interest of harmonious relationships between those who operate with a carrier and those who do not, it would still be fruitful if those who use SSB worked below 144-35 MHz and AM/FM users operated above that frequency.

70 Cms. and 23 Cms.

The diagrams herewith are pretty well self-explanatory, and in most respects follow the general pattern of the two-metre plan with DX modes at the lower end of the bands. The following spot frequencies may be noted:

432-00

432-10 MHz — EME
 432-10 MHz — Random Meteor scatter
 432-20 MHz — SSB calling channel
 432-60 MHz — RTTY (DX) channel
 433-30 MHz — RTTY (Local) channel

1296-00

1296-10 MHz — EME
 1296-20 MHz — SSB calling channel
 1296-60 MHz — RTTY (DX) channel
 1297-30 MHz — RTTY (Local) channel

It will be seen also that provision has been made for repeaters on 70 cm. These will have a spacing of 1.80 MHz between input and output channels, i.e., three times that on two metres, when, and if, they are approved by MPT.

VHF BANDS

A. H. DORMER—G3DAH

Four Metres

No plan exists for this band since it is not allocated for use on the Continent. Readers views on the suitability of 70-20 MHz for the SSB calling channel, which at least has the merit of the "20" as for the other bands, would be welcome. The alternative would appear to be 70-15 MHz as many operators now use. It has the advantage that it is nearer the other DX band (CW) and that users of equipment with 200 kHz band segments might find it a bit of a chore switching segments (or transverter xtals). The important aspect is to agree on one discrete frequency as a calling channel.

It is a little early to determine the majority view on this subject, but of those operators questioned so far most people see no objection to 70-20 MHz. There is, of course, the licence restriction on transmissions between 70-10 MHz and 70-30 MHz north-west of a line joining the Firth of Lorne to Moray Firth, but activity in that area is minimal. There is also the fact that 70-20 MHz (and 70-15 MHz come to that) fall within the EI frequency allocation which was extended this year to 70-125—70-45 MHz, and a final choice should take account of these factors.

Three-Band Annual VHF Tables

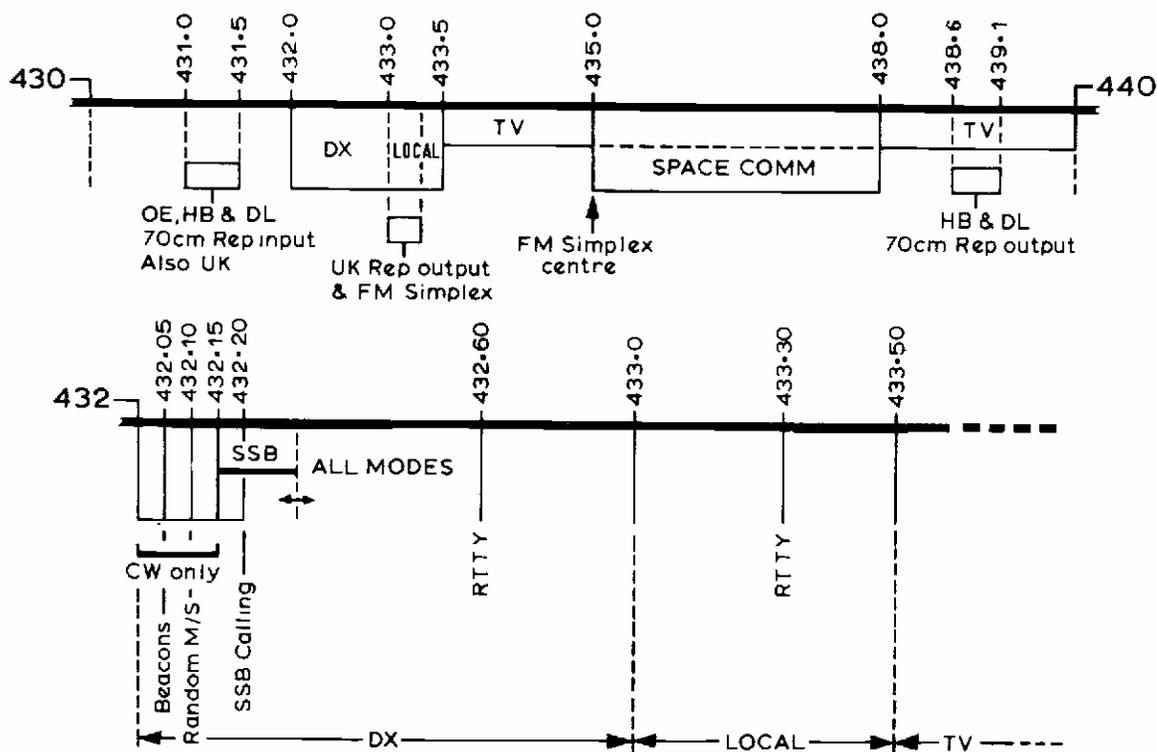
In view of the short notice this month of the reader deadline for

sending in claims for these Tables, there have been few changes and it seemed appropriate, therefore, to give the breakdown by bands this time.

Encouraged though we be by the support you have given to this feature, and the total number of claims has been increasing yearly, we feel that the time has now arrived when a couple of changes would enable us more clearly to reflect present-day conditions on the VHF bands. First, there is the significant increase in activity on 23 cm. and, with the object of reporting and encouraging this, it is proposed that in 1974 a Table should be published alongside the Three-Band Tables to show results achieved on this frequency. There are a number of ways in which this information can be displayed, indeed there are a number of alternatives in the selection of specific information for inclusion in the display but, initially, it is proposed that the Table should show "All Time" 23 cm. contacts by county and country and be brought up to date by monthly, claimed additions. When activity warrants it, or if there is a demand for it, the Table may be amended to show annual scores only, on the lines of those submitted for the other VHF bands. At any time after January 1, 1974 therefore, we shall be pleased to receive your claims for contacts on this band, to date.

Secondly, encouragement is not so vital, nor performance so remarkable, on the other bands. We are all well aware of the high level of 2m. activity, for example, so it seems reasonable, and will keep the Tables to manageable proportions, if a lower limit be set for claims. In the early part of the year, when scores are fairly uniformly low, there should be no need to apply any restriction, but the situation will be reviewed after a few months and it may be that we shall then rule that, to figure in the Tables, a minimum score of say, 25 or 30 will be required. We shall, of course, give you plenty notice of any change.

A reminder that the Tables closed for the year on December 31, 1973 and re-open on January 1, 1974. In order that the final 1973 results may be published in the February issue, as usual, final claims should be sent in to Buckingham by January 10,



430 - 440MHz

latest, allowing for possible mail delays.

VHFCC Awards

It is regretted that space considerations did not permit the inclusion of certain Awards last month.

Six Awards to report this month—all for two-metre contacts. Certificate No. 197 goes to Geoff Wynes, G3TLV (Middlewich, Cheshire). He first came on the band in September, 1972 with an IC-21 which gave him about 10 watts output, but this has now been pushed up to 100 watts with a solid-state PA. In addition to this FM rig, Geoff has a "Liner 2," believed to be the first sold in this country. The 14-ele. Parabeam is at 72ft. and the QTH 125ft. a.s.l. with a clear take-off for about 10 miles all round. The 40% QSL return rate on this band compares unfavourably with the 70% achieved on the HF bands.

G8GLV is A. A. Brown (Great Missenden, Bucks.) who collects Certificate No. 198. He came on in August, 1972 and is another who

finds QSL's hard to come by—41% in his case. He reckons that, on the basis of contacts made, cards sent and received, one should allow about *one year* for a Bureau-to-Bureau exchange of cards. If this is his experience, he would seem to be one of the less fortunate ones, in that most people would reckon in terms of three months or so, although it must be admitted that the last batch of QSLs received by G3DAH included two dated 1967! 'GLV runs a mobile type Tx with 23 watts into a QYV03-20A and for reception has a Mosfet converter into an AR88D tuning 2-4 MHz. The home-built antenna is a 6/6 slot at 27ft. a.g.l. rotated by Bowden cables from the bedroom/shack. The 635ft. a.s.l. site up on the Chiltern Hills enables him to put out a good, all-round signal.

Paul Marks, G8FVK, operating from Woodford Green, Essex gains Award No. 199. He has been on Two since March, 1972 at which time he was running a Pyc base-station with 60 watts output, now

replaced by a home-built, NBFM Tx with 10 watts out. (Not often that one hears of chaps *reducing* the output power). The DL6SW converter feeds an Eddystone 730/1A Rx tuning 19-21 MHz and the antenna at 35ft. is an 8-cle. beam. Paul expects to be QRV on 70 cm. shortly—he already has the 8/8 slot up on the mast—and current projects include an SS/TV monitor and an SSB Tx.

We welcome another GW to the fold, this time GW8FHW, Leslie Hodson-Hirst, who has been putting out a big signal from Cardiff on SSB recently. He must spend as much time on the air as does GW3ZTH! Since coming on 2m. in October, 1971 he has worked some 700 stations and had over 7,000 QSO's, most of these with 2 watts output from a Ranger, although he now has a "Liner 2" to supplement it. The antenna is a 14-ele. Parabeam at 45ft. and the QTH rises to 208ft. above the Bristol Channel which gives him a very nice take-off for both local and DX working. The

THREE BAND ANNUAL VHF TABLE

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3NHE	46	6	76	15	45	9	197
G3ZMD	59	6	69	13	42	7	196
GD2HDZ	41	5	78	10	34	7	175
G3DAH	49	5	58	15	33	8	168
G4BMM	39	3	57	13	35	7	154
G30HH	59	6	57	10	9	2	143
G3FIJ	43	4	52	9	27	7	142
G4BEL	23	2	60	11	30	6	132
G2AXI	48	5	46	8	20	3	130
G8FLI	--	--	78	11	28	3	120
G8EOP	--	--	64	10	31	6	111
G8GNE	--	--	64	11	17	7	99
G4ASR	28	2	58	10	--	--	98
G8BXX	--	--	62	12	19	2	95
GW8FOL	--	--	82	11	--	--	93
G8FMK	--	--	45	9	34	5	93
GW8FKB	--	--	82	11	--	--	93
G8DNK	--	--	76	13	--	--	89
G8ECK	--	--	67	13	6	1	87
GW3ZFH	--	--	66	14	--	--	80
G3BW	--	--	71	9	--	--	80
G3XDY	--	--	65	11	--	--	76
G8FQE	--	--	61	13	--	--	74
G8CKZ	--	--	60	14	--	--	74
G8CKY	--	--	53	10	7	2	72
GW8DUP	--	--	59	9	--	--	68
G8GPR	--	--	60	7	--	--	67
G8BKR	--	--	41	5	18	2	66
GM3ZVB	9	1	46	8	--	--	64
G8FWB	--	--	53	11	--	--	64
G8HEL	--	--	50	12	--	--	62
G4AEQ	--	--	36	4	17	3	60
G18EWM	--	--	48	7	--	--	55
G8ATY	--	--	43	7	2	1	53
G3SMU	18	3	10	2	16	3	52
GW8EHK	--	--	44	8	--	--	52
G3FPK	--	--	43	6	--	--	49
G4AJE	--	--	38	8	1	1	48
G4BKG	--	--	40	7	--	--	47
GW8BXQ	--	--	39	8	--	--	47
G8CBU	--	--	36	3	7	1	47
GW3CBY	7	2	21	5	5	2	42
G8DGR	--	--	32	2	6	1	41
GW4BXE	--	--	35	6	--	--	41
G8COG	--	--	28	3	5	1	37
G8EMS	--	--	27	7	2	1	37
G8DOT	--	--	27	8	--	--	35
G8HRJ	--	--	32	3	--	--	35
G8GXE	--	--	28	5	--	--	33
G8GNC	--	--	28	2	--	--	30
G8GBV	--	--	19	3	5	1	28
G4AEZ	--	--	23	5	--	--	28
G4BOW	--	--	24	3	--	--	27
GD4BJL	4	3	13	5	--	--	25
G4CMV	--	--	19	3	2	1	25
G8FUL	--	--	23	2	--	--	25
G8GJB	--	--	21	3	--	--	24
G8ECU	--	--	19	2	--	--	21
G3KEP	8	3	4	2	2	2	21
G3WHK	--	--	17	3	--	--	20
GW8CMA	--	--	14	3	--	--	17
GW8CGH	--	--	12	2	--	--	14

This Table closed on December 31, 1973. Final placings for the year will appear in the February issue. The Table re-opened w.e.f. January 1, 1974, and new scores should be sent in as they accrue.

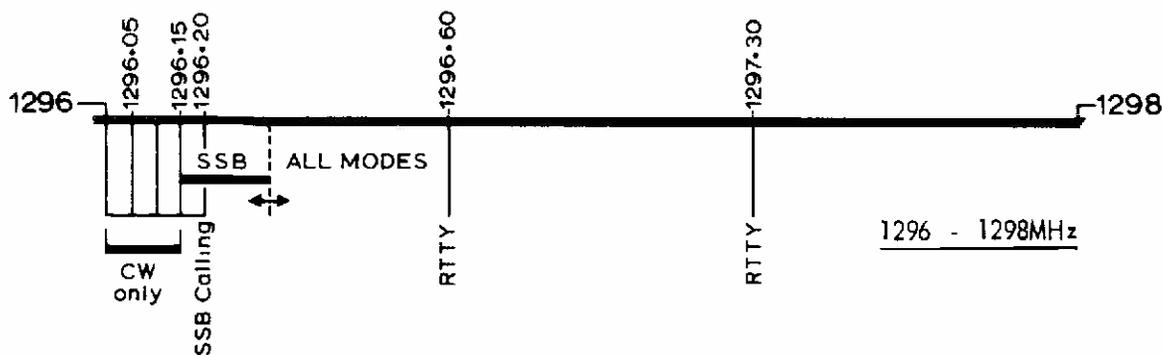
Microwave Modules converter feeds a CR-150. As further proof of his activity and ability, we must congratulate him on winning the U.K. section of the Bristol Activity Award, which brought him credit and a dozen bottles of Harvey's Bristol Cream—very nice too, just before Christmas! Award No. 200 goes his way.

From Colne, Lancs., we have Eddy Waddington, G8EDI, who has made his century with an HW-17 and a 4/4 at 14ft. fixed on a SW heading, this dictated by the location which, although up at 500ft. a.s.l., is screened in all directions, bar the south-west, by hills up to 1,000ft. a.s.l. However, Eddy has invested in an 8-ele, fully-rotatable job to see what can be done with "knife-edge" refraction. He gains Award No. 201. His station picture appeared on p.618 of our last.

Finally, Vernon Cracknell (March, Camb.) gains Award No. 202 for operation under the callsign G8GNE. He started up in September, 1972 after a period as an SWL and, initially, ran a Cambridge and B.40 with a halo on the chimney stack. This has now been exchanged for 30 watts of AM from a QV06-40A, a "Liner 2" and a 10-ele. at 48ft. He is also QRV on 70 cm. with 5 watts of NBFM and a Multi-beam at 52ft.

While on the subject of VHFCC Awards, it may be of interest to note that, to date, 202 Certificates have been issued for two metres, 16 for 70 cm. and only seven for 4m. Of these, six each have been gained by GW and GM, three by GC and two by GI, the remainder being G, plus a few Continentals who are subscribers to the Magazine. Included in these totals are 140 G8/3's, about 62% of the whole.

What conclusions can be drawn from these figures? Well, first of all, it is fairly obvious that the high proportion of G8/3 calls reflects the tremendous increase in two-metre activity since the introduction of the Class-B Licence and the admission of those licences to the 2m. band. Only 13 of them have gained an Award for 70 cm., although this represents some 75% of the total. Secondly, it is pretty obvious that it is far easier to get the Award on two than any other band, in view of



the high level of activity there. However, both these comments are equally applicable to holders of older call signs and one wonders if the lack of a greater number of claims from these operators is due to the fact that they have done it all before. Could be, but we should still welcome more claims from the holders of older call signs.

The object of the creation of the VHF Century Club was to recognise ability and to encourage activity on the various VHF bands and, for those reasons alone, it would be gratifying to see an increase in the claims for other than 2m., although, obviously, possession of the Award for *any* band lifts one out of the run-of-the-mill category.

Contests

Results: Pye Telecomms Contest Group was an easy over-all winner with a lead of nearly 3,000 points in the VHF/NFD event in September. They also headed the 432 MHz and 1296 MHz sections, came 3rd on 70 MHz and 5th on 144 MHz. Over-all runners-up were the March and District Society and the Midlands A.R.S. Leading scorers on the other bands were the Cornish R.A.C. VHF Group on 4m. and the Surrey R.C. Club on 2m.

Reports: Conditions were reported as generally poor for the 70 cm. Cumulative contests of November 6, 14 and 30, but were good for that on November 22, the North/South path being particularly favourable, with GW8AWS/P in Flint a colossal signal the whole time. Propagation was average for the 4m. Cumulative on November 11, but several operators reported high noise levels which made the DX difficult copy. Conditions were much better for the November 25 event in this series

but, once again, local noise levels were reported high in many places, and those operators with CW, and the increasing number who use SSB on the band, gained substantial advantages.

Forthcoming Events: 4m. Cumulative on January 6, 1974. A 432 MHz SSB event has been organised for January 20 and a 4m. Fixed Station contest for the weekend of January 26/27.

Notes from GM

His friends will be pleased to learn that Bill Miller, GM5VG of Glasgow, is now out of hospital and back on the 2m. air. Our congratulations and best wishes go to "The Scottish Radio," Syd Rowden, GM6SR, who is keeping the flag flying (with a Vanguard) on his 85th birthday!

New calls on 2m. this month are GM3DJT, Balerno, and GM3HUN, Edinburgh. Heriot Watt are also up on Two with their GM3WEE call. Although not a newcomer to the band, GM4BHA is operating portable on 2m. and, as he travels a great deal, is popping up in all sorts of places, which may help the county chasers.

GM8BJF has now got his transmitter fully operational with a QQV06-40A PA. GM8FFX of Aberdeen reports and Aurora on 2m. on November 24, although the effect was weak and limited in extent.

General News

Conditions: G4BMM (Luton) worked HB9AEN/P on November 18. So did many other G stations, but the interesting thing about this contact was that the HB9 was on the mobile calling channel on SSB and was not replying to calls on FM

or AM, but working a string of French stations. A call on CW produced an immediate reply with a 5 & 9 report. It's always worth trying this technique. Propagation was good on all VHF bands around this date, with a peak over November 21/22. The HB9 beacon was audible on 2m. right up into the Midlands at good strength and several contacts were being made with French stations well south of Paris. Conditions had reverted to normal again by November 24, although G8CBZ (Brixham, Devon) was still a good signal on the morning of the 25th. GW8FKB (Anglesey) has been getting some nice results with *Oscar VI*. He has worked 10 countries with 30 watts to a 9-ele. Yagi on 2m. and crossed dipoles in the roof-space for the reception on 10 metres. He says that high power is *not* necessary to work through the satellite.

On 432 MHz many operators contacted ON5FF and HW6BQH/P (G3KMS had two F QSO's) and the North/South path in this country as far down as GC was wide open. Once again, GW8AWS/P was the star performer from the North in the South.

Four Metres: There are some massive four-metre antenna arrays around these days. G3JYP (Appleby, Westmorland) uses a 12-ele. colinear stack at 60ft. and has worked G3RWM, G3FDW and G3FNQ (and by now probably others) on two-way SSB. G3ZRH (Brentwood, Essex) uses a pair of cross-polarised, 8-ele. beams which should also be useful for his MS skeds with SM6FO, GM3WOJ and GM3UAG. Tests with GW3MHW/A (Cardigan) have proved its superiority over the 8-ele. horizontal for tropo. transmissions.

According to G3JHM, the Sussex

FOUR METRE ANNUAL TABLE

January 1 to December 31, 1973

Station	Counties	Countries	Total
G3ZMD	59	6	65
G3OHH	59	6	65
G3DAH	49	5	54
G2AXI	48	5	53
G3NHE	46	6	52
G3FIJ	43	4	47
GD2HDZ	41	5	46
G4BMM	39	3	42
G4ASR	28	2	30
G4BEL	23	2	25
G3SMU	18	3	21
G3EKP	8	3	11
G3ZVB	9	1	10
GW3CBY	7	2	9
GD4BJL	4	3	7

TWO METRE ANNUAL TABLE

January 1 to December 31, 1973

Station	Counties	Countries	Total
GWSFOL	82	11	93
GWSFKB	82	11	93
G3NHE	76	15	91
G8DNK	76	13	89
G8FUI	78	11	89
GD2HDZ	78	10	88
G3ZMD	69	13	82
G8ECK	67	13	80
GW3ZTH	66	14	80
G3BW	71	9	80
G3XDY	65	11	76
G8GNE	64	11	75
G8EOP	64	10	74
G8BXX	62	12	74
G8FOE	61	13	74
G8CKZ	60	14	74
G3DAH	58	15	73
G4BEL	60	11	71
G4BMM	57	13	70
GWSDDUP	59	9	68
G4ASR	58	10	68
G3OHH	57	10	67
G8GPR	60	7	67
G8FWB	53	11	64
G8CKY	53	10	63
G8HET	50	12	62
G3FIJ	52	9	61
G8EWM	48	7	55
G2AXI	46	8	54
G8FMK	45	9	54
GW3ZVB	46	8	54
GW8FHK	44	8	52
G8ATY	43	7	50
G3FPK	43	6	49
G4BKG	40	7	47
GW8BXQ	39	8	47
G8BKR	41	5	46
G4AJE	38	8	46
GW4BXE	35	6	41
G4AEQ	36	4	40
G8CBU	36	3	39
G8DOT	27	8	35
G8HRJ	32	3	35
G8DGR	32	2	34
G8EMS	27	7	34
G8GXE	28	5	33
G8COG	28	3	31
G8GNC	28	2	30
G4ALZ	23	5	28
G4BOW	24	3	27
GW3CBY	21	5	26
G8FUL	23	2	25
G8GJB	21	3	24
G8GBV	19	3	22
G4CMV	19	3	22
G8ECU	19	2	21
G3WHK	17	3	20
GD4BJL	13	5	18
GW8CMA	14	3	17
GW8CGH	12	2	14
G3SMU	10	2	12
G3EKP	4	2	6

70 CENTIMETRE ANNUAL TABLE

January 1 to December 31, 1973

Station	Counties	Countries	Total
G3NHE	45	9	54
G3ZMD	42	7	49
G4BMM	35	7	42
G3DAH	33	8	41
GD2HDZ	34	7	41
G8FMK	34	5	39
G8EOP	31	6	37
G4BFL	30	6	36
G3FIJ	27	7	34
G8FUI	28	4	32
G8GNE	17	7	24
G2AXI	20	3	23
G8BXX	19	2	21
G8BKR	18	2	20
G4AEQ	17	3	20
G3SMU	16	3	19
G8CKY	7	2	9
G8CBU	7	1	8
G8ECK	6	1	7
GW3CBY	5	2	7
G8DGR	6	1	7
G8COG	5	1	6
G8GBV	5	1	6
G8EKP	2	2	4
G8ATY	2	1	3
G8EMS	2	1	3
G4CMV	2	1	3
G4AJE	1	1	2

beacon on 4m. should be in service again early in the new year with an improved keyer, designed by G8AZU, and a solid-state Tx. G3DAH now has SSB available on 4m. if anyone is looking for Kent on that band in that mode.

Above the Blue Horizon: Things are happening up aloft, as it is being reported that the *Kohoutek* Comet has possibly broken up and, even if it hasn't, is not likely to provide quite the brilliant display predicted. We may never know whether communication *via* the comet was possible!

The Russian News Agency TASS has put out a report of the reception of signals from outer space which they claim could not have originated from an artificial satellite and indicate the existence of "a technically, highly developed, extra-terrestrial civilisation." The signals lasted several minutes and were repeated several times during the day. . . .

Oscar VII looks very promising. The 70 cm. *Oscar VII* 2m. transponder has been flown in California with complete success and the launch date is now put at March/April, coincident with the launch of *JOS-G*.

Group Activity

The U.K. FM Group (Southern) report considerable progress with their 2m. repeater. Proposed site is at Alton, Hants; power, 25 watts;

QRG, 145.125 MHz and 145.725 MHz; call, not yet allocated (and presumably won't be until the installation is authorised) but may be either GB3SO or GB3SN; access by 1750 Hz tone.

The U.K. FM Group (Northern) was formed on October 28 last, and is on each evening on 144.48 MHz during 2230-2300z. Anyone interested in becoming a member should contact Harry Aldridge, G3WQA, *QTHR*.

The South East UHF/VHF Group have their AGM in the Electronics Building, University of Kent, Canterbury on January 18. Details of other meetings from G3DAH, *QTHR*.

DX-Peditions

Havering Radio Club is proposing to activate Rutland on March 30/31, before the county disappears under the Local Government reform plans due for introduction on April 1. Details as follows: Call, GB3RUT; Time, 48 hrs. continuous; Bands, 4m. 2m., 70 cm. and 23 cm.; QRG, 70-25 MHz, 145.1, 145.4 MHz; 432-173 MHz and 1296-52 MHz. Modes: 4m., A1, A3; 2m., A1, A3, A3j and F3; 70 cm. as for 2m.; 24 cm. A1 and F3. For skeds, send s.a.c. to G4ALN, *QTHR*. QSO limit, over 100 miles+ on 2m. only with no restriction on other bands.

Reader Deadline

Deadline for the next issue is **January 10**. The address for news, views, claims and comment is "VHF Bands," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18 1RQ. Another year has come and gone and your scribe would like to thank all those who have given him their support during 1973, to hope that you all have had a pleasant Christmas and to wish you good fortune and good DX during the coming year. *Vy 73 de G3DAH*.

Editorial Note: It is much regretted that, due to dislocation caused by the Holiday Period over Christmas and the New Year, and unforeseen mail delays, this issue is about a week late. The February *Short Wave Magazine* will, therefore, appear on Friday, February 1st, and that for March on March 1st—by which time we should be straight again.

MAGAZINE CLUB CONTEST

REPORT AND RESULTS, THE 28th

ANNUAL MCC, NOVEMBER 3-4, 1973

IN terms of the entries listed, the 1973 MCC was distinctly less successful than the last few in the series — and we have been running this Annual Club Contest for the best part of 30 years.

The falling-off this time has been variously ascribed to (a) The alleged complexity of the Rules, (b) Dropping of the Club code-identification system we have been using for some years, (c) Scoring rules said to be designed to give an advantage to GM/GW stations and others outside the G area, (d) Lack in many Clubs of competent CW operators because of the current black-box phone addiction, and (e) The coincidence of the Contest with Bonfire Night.

All these criticisms have a certain superficial validity. Taking them *seriatim* (1) Of course, the Rules were a bit more complicated this time — they had to be if county scoring was to be taken into account, the last time it would be possible by the present geography, (2) The Club ident. code was dropped because for the last few years MCC had degenerated into rubber-stamp exchanges (“RST 579 C31 AR”), the information as to who was working who being derived, not over the air, but from the book. MCC is a CW *operating* contest and this time it was for those doing the operating to find out if the other end of the QSO was a Club, and to identify as a Club—this is what operating means. We did not mind *how* it was done, so long as it *was* done, thus bringing out the *operator* aspect. Furthermore, the publication of identification codes took up an enormous amount of space, since all Clubs had to be allotted a code, just in case they entered. (And please don't anybody suggest that this could be overcome by asking Clubs who wished to enter to apply for a code—we tried that once, some years back, and the result was a shambles, because so many Clubs left their applications till the last moment, making it impossible for us to publish a full, up-to-date list).

(3) As to the scoring system: Many hours were spent drafting Rules (5) and (6), not only to make them comprehensible to anyone taking the trouble to study them but to ensure also that as far as possible all U.K. Club stations on Top Band would have an even chance. Nevertheless, we have been assailed by complaints that “No G station could have a chance of winning” that “the loading was in favour of the GDX Clubs”—and so forth. Now look at the actual results. Could there be a fairer or more reasonable result in terms of geographical spread?

(4) As to the lack of competent CW operators in

today's active Clubs — well, as far as the invigilators could hear, MCC again showed a good standard of operating ability and the Clubs who had taken the trouble to understand the Rules seemed to be having no difficulty. (5) The coincidence with Bonfire Night “and the children having to come first”: This also was understood and foreseen—but anyone looking at last November's contest calendar would see that, for Top Band, the week-end November 3-4 was the only reasonable one for the 1973 MCC. It would have suited us much better to put it the week-end later, but what a fine old scheme that would have been, with another Top Band contest running at the same time! The fact of the matter is that, nowadays, there is so much scheduled contest activity going on that there are very few clear week-ends. For MCC, we only ask for one, and for nearly 30 years this has always been chosen in November, over a particular period when GDX conditions should be right for Top Band. Indeed, it was SHORT WAVE MAGAZINE that initiated, as far back as 1946, the whole idea of a 160-metre contest for Clubs.

The Log Evaluation

In general, the Logs were well presented — neat and tidy and headed up as required by Rule 7, which was essential in order to check quickly and accurately. But in spite of the fact that the point was re-emphasised in “Clubs” in the November issue, there were exceptions.

One entry came in on sheets headed “RSGB VHF/UHF Contest Log,” with no Club name anywhere, though this was specifically laid down in Rule 7. This log was thrown out, the claimed score (unchecked) being 13,838 points. Two other logs were also eliminated for presentation not in accordance with Rule 7, and another casualty was the Club station one of whose operators could not differentiate between “H” and “S” in his callsign. This caused incredible confusion all through the logs and many Club operators commented on it. In the circumstances, we felt justified in dropping that entry altogether.

There were no eliminations under Rules (8) and (9) though there were one or two border-line cases, when key-clicks appeared on certain signals for short periods. One Club was very nearly disqualified for vulgarity, by reason of the ident. group they chose (it had better not happen next year!—*Editor*). However, they were let off because the letters used were in fact the initials of the Club's name. (Over

Before the actual checking, the logs were placed in claimed-score order. Though nearly all logs required adjustment, either by reason of arithmetical errors (it made us goggle a bit when the Manchester Technical Institute Transmitting Society, G3CXX, put in a claimed score of 312,000 points!), over-claimed multipliers or duplicated entries, in fact after the checking and correction the final placings, as shown in the Table herewith, were not substantially different from the claimed-score order. This suggests that the scoring system was well understood and also that any necessary adjustments and corrections have been fairly applied.

On the other hand, it must also be said that many Clubs did register a protest against the alleged difficulties of the scoring system, with a plea for a return to the ident. scheme for individual Clubs. This takes us back to what has already been said.

Operating Generally

As usual in MCC, the operating varied from very good to pretty mediocre. But this is not to criticise the latter efforts, there to do their best and learning all the time. The worst fault was over-fast keying with the preliminaries, e.g. "CQ de G4XYZ, MCC," and then the obvious inability to read, through the QRM, somebody coming back at the same sort of speed. Why it should be thought necessary to scuddle along at break-neck speed on a bug not adjusted to the operator's real keying and reading ability has never been understood.

A bad operating fault was sending a simple group like the RST about five times and then quite a complicated Club name/QTH once only—this happened time and again, with the inevitable query for a repeat. Has nobody ever taught today's amateur CW operators that a proper name should always be sent at least twice? This is one of the hall-marks of good operating.

But also there was some very nice signal procedure, in the sense of clean, steady sending, easily readable at good speeds with no ambiguities, leaving the "feel" that here was an operator who knew what he was doing and understood the principles of making himself intelligible on CW.

As always in recent years, there was the MCC characteristic of playing it out over a narrow band of frequencies, with bunching in the 1830-1850 kHz area, resulting in a good deal of avoidable QRM. The feeling appeared to be "That's where the action is so it's there that we must get."

Band Conditions

On the whole, Top Band was electrically quiet and the GM's were getting down South early in both sessions. Some stations reported bad local-thunder-storm QRN for short periods. There was evidence of QSB over intermediate distances of 100 miles or so, rather a curious propagation effect on Top Band.

Some Europeans appeared, there being several OK's on, who between them worked EI1AA, GM3FXM, GM3OLK and GW3UCB for good Top Band EDX

contacts under severe QRM conditions. Other EU's noted in MCC logs were HB9JD, DJ4KW, DK3BJ and DL7AA (Berlin), all EU callsigns well known on the 160-metre band. We are often asked "Why don't you bring in the Europeans to make MCC more interesting?" The answer is that it would mean circularising all EU periodicals with the Rules (which they could have copied from our October issue, anyway) and the certainty that the support would not be significant for what is essentially a U.K. inter-Club contest. It is just not feasible to attempt to cater for everything that might happen on the band. As it was, for the first time in MCC, by Rule (6) stray contacts with EU's were brought in to score as multipliers.

Station Equipment

Looking at the first three in the 1973 MCC, the lead station G3CXX ran a throttled back KW-2000A with choice of two aeriels, an end-fed dipole at 150ft. above ground and a $\frac{3}{4}$ th-wire sloping at 45° with its top end 250ft. a.g.l. (Of course, up there with tall University buildings, they can rig up antennae of this sort).

G3SSO, Cheltenham, had a KW-2000 as 10w. Tx and a Collins 51-S1 Rx, into a Top Band dipole at 100ft. average height.

Over in Dublin, the Irish boys' EI1AA (and we were glad to see them doing so well in this 28th MCC) ran a KW-2000A as Tx, with a Hammarlund HQ-170 receiver and as aerial a dipole rigged as an inverted-Vee with its apex at 50ft.

Many Club stations worked with modified FT-101's or KW-2000 transceivers and all the leading stations had large aeriels—aiming to be half-wave end-fed or centred dipoles, in either case involving space to get out the wire. There were also those using a quarter-wave wire with a counterpoise earth, or a "5RV" type with strapped feeders working against ground.

Operator Aspect

Most Clubs had at least two operators—some as many as six—working in turn either on the key or keeping the log, but it was no use having loggers who were slow with the Morse. Several Clubs were able to enter more than one station.

The lead station, G3CXX, was well operated by G3RYU and G3ZSS, and to these two much credit must go for the show they put up. The second-placed station, G3SSO, GCHQ, Cheltenham, also had two ops., G3MZV and G3SNN.

Over in Dublin the operators were EI2CA, EI8CC, EI2CL and EI2CC, with SWL assistance. Manchester University, signing G3VUM, had as operators G3XDY, G3ZPY and G3ZUJ. On the other hand, GM3FXM for Glenrothes "A" was a single-operator effort.

The Walton, Surrey, Contest Group, placed 7th, had as operators G4BEG, G4BJA and G4CCZ. Further down the placing, other multi-operator stations were Sutton & Cheam, with G2DMR, G3DCZ and G3LCH,

THE 28th ANNUAL MCC
Positions and scoring

POS'N	CLUB NAME	CALLSIGN	POINTS
1	Manchester Technical Inst. Transmitting Society	G3CXX	28,160
2	Govt. Communications Hq., Cheltenham	G3SSO	27,771
3	Leprechaun Contest Group, Dublin	EI1AA	22,593
4	Manchester University Radio Society	G3VUM	22,556
5	Glenrothes Radio Club, "A" Stn.	GM3FXM	22,059
6	Glenrothes Radio Club, "B" Stn.	GM3OLK	19,737
7	Walton Contest Group, Sy.	G4BEG	19,282
8	Watton Radio Club, Norfolk	G4AFS	17,756
9	Glenrothes Radio Club, "C" Stn.	GM3YOR	17,565
10	Kingsway Tech. Amateur Radio Club, Dundee	GM4AAF	17,473
11	University College Amateur Radio Society, Bangor, "A" Stn.	GW3UCB	17,375
12	Glenrothes Radio Club, "D" Stn.	GM4ALK	16,459
13	Chiltern Amateur Radio Club	G3CAR/A	14,698
14	Leyland Hundred Amateur Radio Society, Lancs.	G3GGS	14,672
15	Maidstone YMCA Amateur Radio Society	G3TRF	14,289
16	Wheatsheaf Contest Group, Grimsby	G4BTJ	14,095
17	Sutton & Cheam Radio Society, "A" Stn.	G2DMR	13,995
18	Cambridge University Wireless Society	G6UW	13,692
19	White Rose Radio Society, Leeds	G3XEP	13,638
20	North Staffs. Amateur Radio Society	G4BEM	12,384
21	University College Amateur Radio Society, Bangor, "B" Stn.	GW4BUC/A	12,267
22	Echelford Amateur Radio Society, "A" Stn.	G3UES/A	12,237
23	Mid-Sussex Amateur Radio Society	G3ZMS	12,154
24	Conway Valley Amateur Radio Club	GW6TM	11,762
25	Standard Radio Club, Harlow	G3NIS	10,467
26	Southampton Radio Club	G3SOU	10,430
27	East Kent Radio Society	G3LTY/A	10,368
28	Edgware & District Radio Society	G3ASR/A	10,345
29	Hereford Amateur Radio Society	G3YDD/A	10,109
30	Sutton & Cheam Radio Society, "B" Stn.	G4ADM	9,710
31	Acton, Brentford & Chiswick Radio Club	G3HU	9,636
32	Thornton Cleveleys Amateur Radio Society, Lancs.	G4ATH	9,265
33	Kingston & District Amateur Radio Club	G1KIN	8,674
34	Purley & District Radio Club, "A" Stn.	G3FTQ/A	8,592
35	Purley & District Radio Club, "B" Stn.	G3TJW	8,470
36	Echelford Amateur Radio Society, "B" Stn.	G3SAZ	7,819
37	Clifton Amateur Radio Society, London	G3GHN	7,321
38	Oxford University Radio Society	G3OUR/A	7,313
39	Solway Radio Club, Cumberland	G4BBX	5,212
40	Ely Amateur Radio Society, Cambs.	G3MRN/A	4,330
41	Southdown Amateur Radio Society, Eastbourne	G3WQK	3,971
42	Shirehampton Amateur Radio Club, Bristol	G4AHG	3,805
43	Silverthorn Radio Club, East London	G3SRA	3,004

Above are the final corrected scores, in most cases less than totals claimed. It should be noted that only a few over-claimed score points and one or two multipliers too many could make a large difference to the final total.

and Cambridge University, who had in their team G3YCY, G3ZNU, G4AOL, G3ZAY, G3XZP and G3ZHL—just the sort of participation one likes to see in an event like MCC.

Many Clubs worked from the home QTH of one member as not every Club has its own callsign and Hq. station. This was quite in accordance with RULE (4) and has always been an accepted feature of MCC.

What They Say

As usual in the MCC Report, we now quote *verbatim* some of the comments from the logs. These have been selected to give as fair a picture as possible.

"We feel lack of activity this year was due to abolishing Club code numbers" (*Silverthorn, G3SRA*) . . . "Our main objective is not to win but to give some of our members contest experience. Last year's rules were better in that a code is much easier to copy than a QTH" (*Shirehampton, G4AHG*) . . . "What we really need is a simpler form of scoring" (*Southdown, G3WQK*) . . . "High activity but not many interested in us" (*Ely, G3MRN/A*) . . . "We think the scoring system was slightly in favour of GM/GW; our main failing was a 2.8 kHz bandwidth; the Tx ran 10w. to a BD123 from a 12v. accumulator, with home-built 160m. Rx and dipole, QTH St. Catherine's College" (*Oxford University, G3OUR/A*) . . . Nice to have Club names to exchange, instead of strings of numbers; hope the University stations will be able to work out the scoring system!" (*Clifton, G3GHN*) . . . "We like the new points system" (*Purley, G3FTQ/A*) . . . "It was often impossible to establish whether a station was a Club or not without resorting to the call book" (*Kingston, G3KIN*).

"Changed the direction of our aerial 90° from last year which proved to be a disadvantage" (*Hereford, G3YDD/A*) . . . "Scoring system is good and seems fair all round but Rule 4 is as useless a rule as ever was devised (*Edgware, G3ASR/A*) . . . Examination of the scoring ratio GM/GW to G makes it apparent that they will get almost double the points of English stations having the same number of contacts, and why should we have a multiplier? Do the rules stem from the fallacy that it is harder to work 400 miles than 50 miles on Top Band?" (*East Kent, G3LTY/A*) . . . "Whilst appreciating that a variation of the long-standing MCC rules could make the Contest more interesting, we regret that the new rules seemed to cause considerable confusion" (*Southampton, G3SOU*) . . .

"All here enjoyed the Contest very much but we would like an extra hour for each session" (*Conway Valley, GW6TM*) . . . "Contest timing good and chance for that last pint!" (*Bangor University, GW4BUC/A*) . . . "Lots of Clubs not making it clear they were Clubs and many didn't give a county" (*Mid-Sussex, G3ZMS*) "Once again, a most enjoyable contest, lively and interesting" (*North Staffs., G4BEM*) . . . "It would seem that this contest was biased towards the GW/GM stations—please give the North its multiplier back" (*White Rose, G3XEP*).

"In general, we preferred the new scoring system

but felt that counties should be scored either as multipliers or as extra points, not both" (*Cambridge University, G6UW*) . . . "Principle of scoring very good but contest exchanges should be more closely controlled by the rules, the word 'Club' being made a compulsory part of the exchange" (*Sutton & Cheam, G2DMR*) . . . "Most Clubs did not fully identify themselves. Will scoring system give bias in favour of non-G participants? Multiplier system generally liked" (*Wheatstone, Grimsby, G4BTJ*) . . . "Whoever devised the rules must either be in the legal profession or he works for the Inland Revenue!" (*Maidstone, G3TRF*) . . . "The scoring system heavily loads the contest against G stations and is far too complicated" (*Chiltern, G3CAR/A*) . . . "General opinion that scoring system much improved on last year" (*Kingsway Tech., Dundee, GM4AAF*) . . . "Rules not specific enough as to what identification had to be sent" (*Glenrothes "C", GM3YOR*) . . . "This was the first try-out at a contest by this Club and it was most enjoyable but we do suggest going back to the ident. code system" (*Watton, G4AFS*) . . . "A much better contest than last year's with the multiplier to keep us searching for new ones. Thanks for organising a very enjoyable event". (*Walton, Surrey, G4BEG*).

"The scoring system is ridiculous—Clubs in England stand no chance of winning with the double-point bonus for inter-G country working" (*Manchester University, G3VUM*) . . . "Contest thoroughly enjoyed as usual, though scoring took a bit of figuring out"

(*Leprechaun Contest Group, E11AA*) . . . "The scoring system is heavily biased for anybody except G Clubs and it would be surprising if any G station could be placed in the top ten overall scores" (*UMIST, Technology Institute Transmitting Society, G3CXX*).

We suggest that anybody having read through the foregoing comments, taken *verbatim* from the logs, should look again over the actual results, particularly in regard to the alleged scoring bias in favour of non-G Clubs!

And we must also record the fact that other useful and interesting suggestions which, regretfully, there is no room to discuss here—were put forward by many of the entrants.

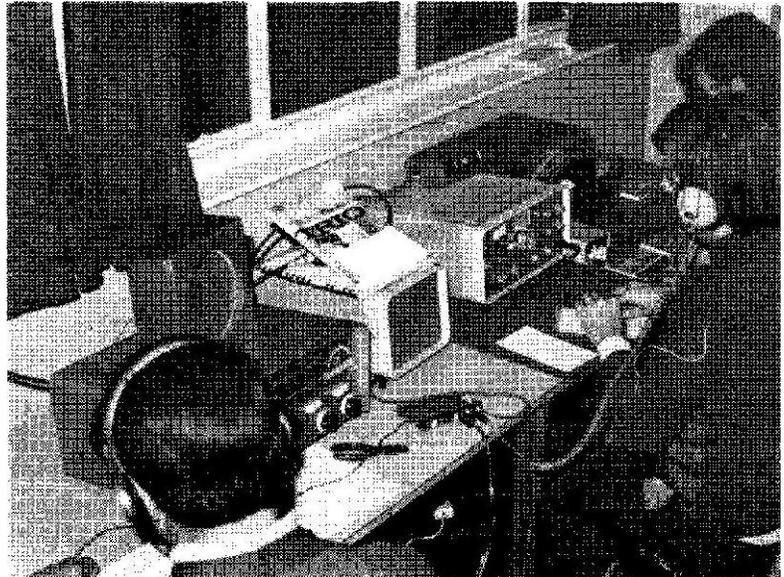
It should likewise be mentioned that there was a good sprinkling of single-op. non-Club stations on throughout the Contest; they added considerably to its interest and helped to pile up the multipliers.

Final Comment

As to what form the next MCC is to take—or even whether it is desirable to have one at all—will be decided in due time.

For the present, we would like to thank all who supported the 1973 MCC, which from our point of view again turned out to be a good Contest, well worth the labour it entailed at our end.

One of the MCC stations, G4BEM, North Staffs. Amateur Radio Society who clocked up 12,384 points to come 20th in MCC. Left to right: G4CJM, G3VIE and G8FGR (logging).



NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, as issued or changes of address of transmitters already licensed. All addresses published here will be reprinted in the U.K. section of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

- EI2IHE**, Amateur Radio Club, National Institute for Higher Education, Plassy, Limerick.
- G3BGR**, S. D. Percival, 33 Arden Road, Worcester, WR5 3BD (*re-issue*).
- G3BIT**, G. S. Ellery, 24 Penwerris Avenue, Osterley, Middlesex, TW7 4QX (*re-issue*).
- G4BOH**, C. Cummings, 3 Kensington Drive, Elton, Bury, Lancs. (Tel. 061-764 7483.)
- G4BOJ**, N. E. K. Greenstreet, 223 Uppertorpe, Walkley, Sheffield, S6 3NG. (Tel. Sheffield 665851.)
- GC4BSL**, J. A. Moran, M.B.E., La Cotte Cottage, Route Orange, St. Brélade, Jersey. (Tel. Jersey 42162.)
- G4CKJ**, A. E. Jesse, 14 Gospel Oak Road, Nunts Park, Coventry, Warks.
- G4CMN**, A. R. Peel, 55 Buckswood Drive, Gossops Green, Crawley, Sussex. RH11 8HU.
- G4COB**, Amateur Radio Club, Bridgnorth College of Further Education, Stourbridge Road, Bridgnorth, Salop.
- G4CPA**, G. S. Hanson, 36 Keighley Road, Silsden, Keighley, Yorkshire, BD20 0EA.
- G4CPD**, G. J. Knox, 20 Pullan Avenue, Eccleshill, Bradford, Yorkshire. BD2 3RT. (Tel. Bradford 630266.)
- G4CPL**, G. McGee (*ex-G8BYT*), 10 Queensville Road, Clapham Park, London, S.W.12.
- G14CPP**, W. Adamson (*ex-G18HHB*), 12 Greenland Walk, Ferris Park West, Larne, Co. Antrim, BT40 1NJ.
- G4CPT**, E. J. Dyer, 6 Aldersbrook Avenue, Enfield, Middlesex, EN1 3JB.
- G4CPU**, J. Blenkey, 108 Wood Lane, West Bromwich, Staffs., B70 9PX.
- GW8HKY**, J. L. Gearey, Ardwyn, 61 Abergwili Road, Carmarthen, SA31 2HH.
- G8HMP**, F. L. Robinson, 47 Ashford Road, Swindon, Wilts.
- G8HSH**, F. J. Chinn, 5 Shrubbs Drive, Middleton-on-Sea. Bognor Regis, Sussex, PO22 7SQ. (Tel. Middleton-on-Sea 2335.)
- G8HWQ**, D. E. Mappin, 39 Clarence Drive, Filey, Yorkshire, YO14 0AZ.
- G8HXH**, S. Chester, 12 Paterson Road, Aylesbury, Bucks., HP21 8LL. (Tel. Aylesbury 3356.)
- G18HXY**, N. Henderson, 12 Marlborough Crescent, Carryduff, Co. Down.
- G8HYD**, D. C. Andrews, B.A.(Mus.) Hons., 7 Junction Road, Reading, Berks., RG1 5SA. (Tel. Reading 666502.)
- G8HZK**, A. E. Lee, 50 Church Road, Tupsley, Hereford, HR1 1RS.
- G8IAH**, Dr. J. F. Fraser, 35 Carleton Road, Pontefract, Yorkshire, WF8 3ND. (Tel. Pontefract 2343.)
- G8IAS**, J. M. Truman, Ford Rectory, Etal, Cornhill-on-Tweed, TD12 4TN. (Tel. Crookham 248.)
- G8IBY**, J. H. Duncan, M.Sc., Gorsedene Lodge, Long Road, Rowledge, Farnham, Surrey. (Tel. Frensham 3121.)
- G8ICQ**, B. A. Triplett, 3 Fir Close, Poynton, Cheshire. (Tel. Poynton 5414.)
- G8IDP**, G. R. Eddowes, O.B.E., 3 Albion Way, Hoveton, Norwich, Norfolk, NOR.06-Z. (Tel. Wroxham 2332.)
- CHANGE OF ADDRESS**
- G2AKM**, K. E. Salmon, 16 South Avenue, Aldwick Gardens, Bognor Regis, Sussex. (Tel. Bognor Regis 24393.)
- G2CKM**, M. Salmon, Hillside Cottage, Bramham, Yorkshire, LS23 6QX.
- G3ADM**, G. H. Killick, 52 Trident House, Town Centre, Hatfield, Herts., AL10 0NH.
- GC3GPL**, K. R. Davis, Haut du Pré, Fern Valley, Mt. Cochon, St. Helier, Jersey.
- G3ICH**, P. N. Pitt, 25 Park Road, Freemantle, Southampton, SO1 3AS.
- G3JCX**, M. T. Jones, 28 Stirchley Road, Telford, Salop, TF3 1EH.
- G3KSR**, R. E. Edwards, Terranson, Deane Close, Stogumber, Taunton, Somerset, TA4 3TE.
- G3PFS**, D. King, The Hall, Stalham, Norwich, Norfolk, NOR.34-Z.
- GW3RGE**, K. G. King (*ex-G3RGE*), Golden Lion, Church Street, Holt, Wrexham, Denbighshire, LL13 9JP. (Tel. Farndon 411.)
- G3TTH**, T. S. Coltman, 80 Main Street, Normanton - on - Soar, Loughborough, Leics., LE12 5HB.
- G3UAF**, M. W. Smith, 39 Ruskin Road, Prestwich, Lancs.
- G3UOF**, M. R. Wadsworth (*ELON MM*), c/o MRW Enterprises, P.O. Box 11, Durham, DH11 5PP.
- G3VGG**, Bromsgrove and District Amateur Radio Club, c/o 22 Elm Grove, Bromsgrove, Worcs., B61 0EH. (Tel. Bromsgrove 76941.)
- G3VLS**, D. Latimer, 44 Lyndale Avenue, Barrow - in - Furness, Lancs., LA13 9AR. (Tel. Barrow 25728.)
- G3WGM**, J. D. Heck, 19 Georgian Close, Gordon Avenue, Bushey Heath, Herts.
- G3YIB**, M. C. Knowler, 87-A Sandon Road, Hillside, Southport, Lancs. (Tel. Southport 60118.)
- G3YVH**, A. C. Boyne, 94 Common Road, Newton-le-Willows, Lancs., WA12 9JH.
- G3ZOJ**, B. D. Corper, 3 Stanton Place, Haverhill, Suffolk.
- G3ZRF**, D. W. Slater, 25 Copse Close, East Grinstead, Sussex, RH19 3EF.
- GM3ZSP**, K. M. Riddoch, 9 Birnie Street, Lochgelly, Fife, KY5 9JZ.
- G3ZWW**, M. J. Quee, 18 Oak Road, Tiptree, Essex, CO5 0NF. (Tel. Tiptree 815027.)
- G4ACY**, R. B. Ratcliffe, A.R.I.B.A., 32 Eastlands Road, Rugby, Warks. (Tel. Rugby 3826.)
- G5IG**, C. H. Bahbs, Flat 1, The Square, Fawley, Southampton, SO4 1DD.
- G6CL**, B. W. Warren, Yew Tree Cottage, Kiftgate Court, Chipping Campden, Glos.
- G8GZR**, R. J. Langdon, 3 Hyde Way, Hayes, Middlesex, UB3 1LB. (Tel. 01-848 8155.)

AMATEUR ELECTRONICS G3FIK**BIRMINGHAM 021-327 1497 021-327 6313****WE URGENTLY REQUIRE** the following equipment :-

ALL TYPES OF HIGH QUALITY GENERAL COVERAGE COMMUNICATIONS RECEIVERS
 ALL TYPES OF HIGH QUALITY AMATEUR BAND ONLY RECEIVERS
 ALL TYPES OF COMMERCIAL SSB EQUIPMENT IN UNMODIFIED CONDITION
 REDUNDANT STATION ACCESSORIES AND ANCILLARY EQUIPMENT
 FM OR SSB COMMERCIAL 2 METRE EQUIPMENT IN UNMODIFIED CONDITION

The following RACAL EQUIPMENT :

RA17 RECEIVERS, UNMODIFIED AND ORIGINAL
 RA117 RECEIVERS, UNMODIFIED AND ORIGINAL
 SSB ADAPTORS
 LF ADAPTORS
 PANORAMIC DISPLAY UNITS
 ANY ANCILLARY EQUIPMENT BY RACAL
 RECEIVER SUB-ASSEMBLIES AS FOLLOWS :
 1st VFO UNITS 2nd VFO UNITS
 IF STRIPS CALIBRATOR UNITS
 MAIN CHASSIS ASSEMBLIES

WE ALSO REQUIRE ANY RACAL HARDWARE SUCH AS FRONT PANELS, DIAL ESCUTCHEONS, DIALS, SIDEPLATES, KNOBS, DRIVES, CASES OR WHAT HAVE YOU.

PLEASE WRITE OR TELEPHONE WITH FULL DESCRIPTION AND PRICE REQUIRED

ELECTRON HOUSE, 508-514 ALUM ROCK ROAD, BIRMINGHAM 8

HAMGEAR ELECTRONICS

Presenting our latest preselector for the serious Dxer,
 the **P.M.IID**

Covering from 1.5 to 34 MHz in five overlapping bands.

- * Has a built in Pi Tank antenna tuner.
- * Has a "Listen Thru" switch position, to switch the unit in or out at will.
- * Has an average gain of better than 32 dBs checked at six points over the ranges covered.
- * Will suit most communication receivers, but not your transistor portable.
- * Has an FET plus two Bipolars in cascade, common emitter mode with negative feedback.

Battery powered and priced at **£11.50** plus 27p postage.
 Send for further information on this and the rest of our range of preselectors/calibrators.

Office only :-

**2 CROMWELL ROAD,
 SPROWSTON,
 NORWICH, NOR 65R.**

"RADIO HANDBOOK"

19th Edition, by Wm. Orr, W6SAI
 (974 pages). O/P.

"ARRL HANDBOOK"

1973 Edition (50th) of this indispensable Radio Amateur manual, for so many years recognised as the "bible" in the Amateur Radio field. Price **£2.90** (Limp Edition) or **£3.70** (Buckram Edition).

"RADIO COMMUNICATION HANDBOOK"

4th Edition of the Original RSGB "Amateur Radio Handbook." Price **£4.13** (incl. of postage and packing).

Available from:

**PUBLICATIONS DEPT.
 SHORT WAVE MAGAZINE
 55, VICTORIA STREET,
 LONDON, SW1H 0HF**

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

6p per word, minimum charge £1.00. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50% for Bold Face (Heavy Type). Box Numbers 15p extra. No responsibility accepted for transcription errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, SW1H 0HF.

TRADE

PYE Base Station Tx, QQVO6-40A PA, pair 6V6 modulators, internal PSU, and crystal controlled, for High-Band £22, Low-Band £20. **Pye Base Station Rx**, xtal controlled, similar "Cambridge" Rx, internal PSU and speaker, high and low band, £18. **Pye Base Station Tx/Rx**, complete in cabinet, £40. **Pye Cambridge**, dash mounting, high band, £23; also boot-mounting, with cables, etc., high band, £20. **Pye Pocketphones**, will retune to 432 MHz. Tx and Rx, less batteries, £18. **Pye Vanguard**, AM25B, less cables, etc., high-band, £8. Brand new service manuals for Pye equipments, £2 any model. All prices include VAT and postage. Please include s.a.c. with all enquiries.—**Castle Electronics**, 61 Walsingham Road, Woodthorpe, Nottingham, NG7 3AA.

NEW JR-599, £149.00, including VAT, special offer, full 12 months guarantee, Securicor delivery £3.30 extra.—**G3LLL**, Holdings, 39/41 Mincing Lane, Blackburn, BB2 2AF, Lancs. (Tel: 59595/6).

JR-310 super de luxe, Top Band, calibration unit, 29.5 to 30.1 MHz coverage, better on 40m., send for best report, price £93.50 including VAT. Also JR-310 accessories, VAT and post paid: 10AZ, CW or SSB filters, £16.50. Crystals, specially made wire-in (sorry, no mod. details) for Top Band, £3.00, and 29.5 to 30.01 MHz, £3.30.—**Leeming, G3LLL**, Holdings, 39/41 Mincing Lane, Blackburn, Lancs., BB2 2AF. (Tel: 59595/6).

QSL Cards for Tx and SWL. Send s.a.e. for samples stating which type required.—**Beaumont, G5YV**, 8 Ashfield Avenue, Morley, Leeds, LS27-0QD.

QSL Cards: Tx, G8, SWL. One to four-colour designs. Good selection. Send s.a.e. for samples.—**Printon**, 105 Fleetwood Street, Preston, Lancs, PR2 2PT.

VERNITRON Ceramic Filter Resonators, 455 kHz. Special types for SSB and NBFM. Send s.a.e. for list.—**Amatronics Ltd**, 396 Selsdon Road, South Croydon, Surrey, CR2 0DE.

QSL CARDS and G.P.O. approved Logs (hard back), prompt delivery. Send 4p stamp for samples.—**Elmtree Press**, Looe, Cornwall, PL13-1JT.

FEBRUARY Issue: Due out February 1st. Single-copy orders, 32p, post free, to reach us by Wednesday, January 30, for posting on January 31.—**Circulation Dept.**, Short Wave Magazine Ltd, 55 Victoria Street, London, SW1H-0HF.

S-METERS suitable for R.C.A. AR88D D/LF receivers, 2½-in. diameter, 5 mA full-scale deflection, right-hand zero, complete with detailed fitting instructions, price £4.75 each, post paid. Also available spares for AR88 D/LF receivers, send s.a.e. for list.—**A. J. Reynolds**, 5 Headland Way, Lingfield, Surrey.

SPECIALS FOR THE AMATEUR

2 Metre Transmitter Unit on heavy duty Pc B, E90 Fosc. 5854 trip, EL95 doubler QQEO 3-12 PA (10w). Pc B contains phase mod circuit—needs 8 meg crystal. Complete with circuit £4-50

NEW EQUIPMENT

Asahi MEIIN. SWR Meter (very accurate) Individually calibrated £18-50
Hansen SWR/Field Strength Meter £4-25

Send S.A.E. for descriptive data and list of many other components and test equipment.

Prices include VAT and Postage.

JH ASSOCIATES LIMITED

Cricketfield Lane, Bishop's Stortford, Herts.

Tel.: 027-556347 Telex: 81675

G2CTV J. & A. TWEEDY (Electronic Supplies) Ltd. G3ZY
SPECIALISING IN AMATEUR RADIO EQUIPMENT

KW 2000E + A.C. p.s.u. £292.00	KW 202 Receiver ... £154.00
KW 101 VSWR 50 or 75 Ω ... £9.10	KW 204 Transmitter ... £176.00
KW 103 VSWR/Power Meter ... £13.80	KW 107 A.T.U. ... £51.00
KW 108 Monitor Scope	KW E-Z Match A.T.U. £18.20
KW Dummy Load 50 or 75 Ω ... £8.80	KW Balun 1 : 1 50/75 Ω £2.60
KW Antenna Switch 3w. £4.70	KW Trap dipole 70' twin Fdr. ... £16.50
KW Trap Dipole 97' coax ... £18.20	KW Trap dipole + balun £20.40

TRIO 9R59DS Rx. G.C. £54.45	TRIO JR599 160-10 + 2 £176.00
TRIO JR310 80-10 ... £82.50	TRIO TS515 Transceiver £230.90

SENTINEL 2m. CONVERTERS. I.F.s 2-4, 4-6, 28-30 MHz £15.12
LOW NOISE F.E.T. 2 metre pre-amp £7.15
EUROPE 10 metre to 2 metre transverter with built-in converter less valves £64.35; complete £78.00
YAESU equipment and accessories in stock.
J BEAM Aerials; **G WHIP** Products; Tavasu Mobile Aerials; **MINI PRODUCTS** Compact Beams; **HU-GAIN** Verticals; **MOSLEY** Tri-Band Beams.
SHURE 444T Microphones £17.82
COPAL Clocks; **STOLLE & CDR** Rotators; **R.S.G.B.** Publications.
TRONILEX 144/432 MHz Tripler Amplifiers ... (2 only) £13.20

USED EQUIPMENT

TRIO JR310 extra filter £66.00
LAFAYETTE HA600 £42.00
YAESU FT200 £140.00
HEATHKIT DX40 £12.00
GEC BRT 400 £48.00

All prices include VAT but not carriage.

79 CHATSWORTH ROAD, CHESTERFIELD DERBYSHIRE, S40 2AP

Telephone: 34982 (68005 evenings)
OPEN TUESDAY TO SATURDAY 9 a.m. to 5.30 p.m.

ESSENTIAL BOOKS

HOW TO MAKE WALKIE-TALKIES FOR LICENSED OPERATION. Only 40p, p.p. 10p.

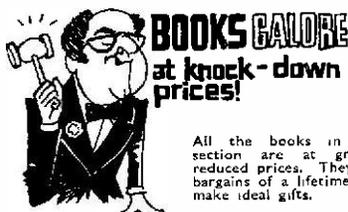
MOBILE RADIOTELEPHONE EQUIPMENT HANDBOOK. Gives circuits data and illustrations plus some valuable modifications for amateur use for commercial radio telephone equipment including PYE and other popular makes. Price £4 including postage.

HOW TO MAKE 2 AND 4 METRE CONVERTERS FOR AMATEUR USE. 60p, p.p. 15p.

THE GOVERNMENT SURPLUS WIRELESS EQUIPMENT HANDBOOK. Gives circuits, data and illustrations plus valuable information for British/U.S.A. receivers, transmitters, transceivers. With modifications to sets and test equipment. Latest impression, £3.25 including postage.

DIRECTORY OF GOVERNMENT SURPLUS WIRELESS EQUIPMENT DEALERS. Gives details of surplus wireless equipment stores and dealers including addresses plus equipment and spares that they are likely to have available. A valuable book, only 40p, p.p. 10p.

SECOND BOOK OF TRANSISTOR EQUIVALENTS AND SUBSTITUTES. Just published. Over 58,000 entries. Includes British, U.S.A. and Japanese transistors. Price 95p, post free.



AN ILLUSTRATED ENCYCLOPAEDIA OF BALLOONING. This remarkable book is the result of several years research into aeronautical literature. With nearly 200 pictures, 20 of which are in colour. 13" x 10". Published at £6.30. Knock down price £3.50, p.p. 50p.

THE FAMILY LAWYER. Provides a volume of answers to everyday problems. 750 pages fully illustrated concentrating on matters that affect the layman. Includes every conceivable aspect of the law. Published at £6.50. Knock down price £3.50, p.p. 50p.

THE THEORY OF GUIDED ELECTROMAGNETIC WAVES. The most comprehensive book yet written about waveguides, transmission lines, cavity resonators. Over 500 pages. Ideal for anyone interested in Radar etc. UHF. Published at £11.50. Knock down price £4.50, post fr. e.

THE SCATTERING AND DIFFRACTION OF WAVES. A goldmine of information for the experimenter, amateur and scientist. Profusely illustrated. Published by Oxford University press at £1.60. Knock down price 80p, p.p. 20p.

MODERN ASTRONOMY. By a world famous astronomer. Start a new hobby. This informative book is an ideal handbook for the beginner and established enthusiast. Covers many developments in astronomy. Detailed illustrations. Published at £2.60. Knock down price £1.25, p.p. 25p.

PRINCIPLES OF ELECTRICITY AND MAGNETISM. Page & Adams. An important book for the student, electronics engineer and technician who wishes to improve his basic knowledge. 532 pages. Hardback. Fully illustrated. Published at £4.50. Knock-down price £1.50, p.p. 25p.

A COMPREHENSIVE WORKING HANDBOOK OF SATELLITES AND SPACE VEHICLES. A handbook that provides important data both tabular and graphical enabling space scientists, technicians and telecommunication engineers to acquire a greater working knowledge of satellite and space vehicle design, launching, orbiting, etc. Includes a detailed coverage of COMMUNICATIONS IN SPACE. An imposing book of 457 pages. Published at £8.20, but last dozen copies available at the trade price of £6.50, post free.

WANTED. Original handbooks, circuits and manuals for all commercial communications receivers, radio-telephone equipment, test equipment, etc., top prices paid.

PERSONAL CALLERS WELCOME AT OUR NEW SHOW-ROOM AND TRADE COUNTER at 138, Cardigan Road, Headingley, Leeds 6. The North's largest selection of Radio and Electronics books plus thousands of books on ALL SUBJECTS at discount prices.

GERALD MYERS

(SW)

Publisher & Bookseller

All mail orders to:

18, SHAFESBURY STREET,
LEEDS LS12 3BT

TOP Band on Yaesu 401/560. Conversion kits £11.00 inclusive VAT. Full details s.a.e.—**G3LLL, Holdings, Ltd., 39/41 Mincing Lane, Blackburn, Lanes., BB2 2AF.** (Tel: 59595/6).

READERS ADVERTISEMENTS

3p per word, minimum charge 50p payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 15p extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, SW1H 0HF.

READERS

FOR SALE: Pair Pye Pocketphones, both working and fitted PP3 batteries, with information, £26.—**Jaques, 47 Newstead Road, Urmston, Manchester.**

WANTED: K.W. Viceroy Tx with PSU, or K.W. Vespa Tx. Also Low-Pass Filter. Will collect within 50 miles.—**Petty, 130 Whitstable Road, Canterbury, Kent. CT2 8EG.**

EXCHANGE: Zenith Royal-1000 eight waveband portable receiver, in good condition, with cash adjustment **FOR Eddystone 830/4, Plessey** or similar type of Rx.—**Ring Shuman, Heywood (Lancs.) 60676.**

SELLING: FT-101 Transceiver, coverage 10 to 80m., as new, used two hours only, price £150. New **KW-107 tuner, £38. Also new Heath Monitor 'scope, £40.—Sissons, 25 Southlands Grove, Bromley, Kent, BR1 2DA.**

WANTED: Mint Eddystone EC-10 Mk. II, also Heathkit RG-1, similar condition.—**Jepson, Beech Cottage, Oaklands Hall, Uckfield, Sussex. (Tel: Nutley 2855).**

FOR SALE: Automatic Digital Keyer, 256-bit memory programmed by diode matrix, two auto-stops, repeat capability, ideal for Contests, £20. **TIL-209 L.E.D.'s, 12p. BC-107, 5p. BF-240, 8p. 2N3055, 25p. Avo-7 Multi-meter, faulty, £6.50. — Ring Matthews, G3WZT, 0403 710565, Horsham, Sussex.**

WANTED: A pair of hand-portable two-metre Tx/Rx's, or similar, suitable for a Scout group. Details and price please.—**Brown, 169 Lindores Drive, East Kilbride, Glasgow (21071), Scotland G74 1HL.**

FOR SALE: FT-2FB as new, in original packing, £70. (Hants).—**Ring 042126-4478 after 6.30 p.m., or Box No. 5189, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.**

OFFERING: Drake MSR-1 synthesised receiver, 19-in. rack model, fully digital to 100 Hz, coverage 10 kHz to 30 MHz, modes CW/MCW/DSB/SSB/ISB, three months old. Sensible offers? (Leicester).—**Box No. 5190, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.**

EXCHANGE Or SELL: Hallicrafters SX-62A, £70; Teleton TF-181, £40. Or exchange for AR8516L, HQ-180, 51-J2, Eddystone 730/4, KTR-1770, etc.—**Ring Szmids, 021-354 8689 (Birmingham).**

SALE: Heathkit GR-54 receiver, £25; Green 2-metre nuvistor converter, £5; Heathkit 3-SU beam switch, £10; Tech TE-15 GDO, £5; Taylor signal generator, £10; Joystick de luxe aerial and Joymatch 4RF, £7; also components and valves.—Burnard, 26 Northolme Gardens, Edgware, Middlesex HA8 5BB. (Tel: 01-952 6566).

EXCHANGE Or SELL: Eddystone EC-10 Mk. II with AC/PSU, good condition, £64. Exchange for Yaesu FR-50 (Notts.).—Box No. 5191, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SELLING: Liner-2, new, £110; Heath HW-32A, 20m. SSB, with HP-23B PSU, HRA10-1, KW-103 and K.W. LPE, all new and unused (cost £135), accept £80, or will sell separately.—Ring Carey, G8HRM, 01-599 7027 (Romford).

SALE: Late model G3JCQ-type "Transistor two-filter" receiver, with HF linear amplifier and power supply. Bits and pieces, s.a.e. for lists.—Shannon, G9KKJ, QTHR.

EXCHANGE Or SELL: Eddystone EC-10 Mk. II with PSU and BSU, FOR Trio 9R-59DS, plus £25 cash.—Hannah, 11 Lancaster Avenue, Skegness, Lincolnshire.

SELLING: AR88D receiver, excellent condition, £60; Heath DX-100U transmitter, unused, £50. Both with makers' handbooks.—Ring Duxbury, 01-727 7796.

FOR SALE: CD711S.2 'scope, very good condition, £35; TCS-12 with mains PSU, £12; 19 Set with mains Rx PSU, £7. All good working order.—Ring Allinson, Aspatria (Cumberland) 20243, evenings.

FOR SALE: Heath SB-401 Tx with all crystals, manual and spare valves, unused, £200.—Rawlings, G5RS, 20 Hedgeway, Guildford, Surrey.

SELLING: PMI mains preselector, £6.—Bull, 50 Woodlesford Crescent, Moor End Road, Halifax (0422-53979), Yorkshire.

SALE: K.W. Vallant, good condition, £20.—Poole, G3YWX, QTHR. (Tel: Leeds 680645).

SELLING: Insulated copper aerial wire, 100-ft., for 55p; s.a.e. for sample and lists.—Box No. 5192, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

FOR SALE: TA-33Jr., £20. AR-22R rotator and control, little used, £20; approx. 30-yds. of 4-core cable, £4; Panda PR-120V Tx, £20. Will deliver up to 40 miles, or buyers collect.—Hattersley, G3PJN, Hilltop, Chesterfield, Derbys. (Tel: Chesterfield 6040 after 6 p.m.).

SALE: G3ADZ moving QTH at short notice and must dispose of: Vanguard 4m.; Hudson 108 4m.; Class-D No. 2 wavemeter; R.1132A; Joystick with ATU; large quantity of junk including valves and radio magazines. Buyers must collect. Balance by junk sale on Saturday, January 5th, 1974, at 2 p.m.—Haylock, G3ADZ, QTHR. (Tel: Liss 3314).

INSIST ON VERSATOWER

Acclaimed as the World's leading telescopic tilt-down tower in the field of radio communication. Models from 25' to 120'.

Enquiries to:
Western Electronics (UK) Ltd
Osborne Road, Teston, Southampton



Look for the name
STRUMECH

Strumech Engineering Co Ltd
Caprice Side, Brownhills, Walsal, Staffs



become a RADIO-AMATEUR!

learn how to become a radio-amateur in contact with the whole world. We give skilled preparation for the G.P.O. licence

free! Brochure, without obligation to: SWB-1/4

BRITISH NATIONAL RADIO & ELECTRONICS SCHOOL
P.O. BOX 156, JERSEY, CHANNEL ISLANDS

NAME : _____

ADDRESS : _____

BLOCK CAPS please

G3EKX **S.S.B. PRODUCTS** G3EKX**XTALS — XTALS — XTALS**

Mixed frequencies 120 kHz to 110 MHz. Large stock, especially 3.5 to 3.8 MHz, 512 kHz, 1564 kHz, 2.5 MHz, 12 and 14 MHz, 14.5 MHz, 24 MHz, 47 MHz, 83 MHz, 100 MHz; also 36-11870, 24-225, 12-5736, 4-433619, 8-118, 5-920, 5-0155, 20-045, 11-100, 58-416, 10-245, 10-2075, 1-580, 5-182, 2-436, 58-506, 69-825 MHz. These taken at random. Types HCB/U, HC18/U, etc. Prices from 75p to £1.50 + 6p ea. P. & P. Send us your requirements plus alternatives. No cash initially. **JUST AN ESSENTIAL S.A.E.** All communications to us must have an s.a.e. included please.

TRIO TRANSCEIVER, TS/PS 510. New...	£180.00
TRIO VFO 5. New	£20.00
TRIO 9R59DS + SP5D SPEAKER	£48.00
TRIO JR500S + SP5D SPEAKER. Bargain	£48.00
E-ZEE AERIAL "IZ" MATCH. As new	£12.00
MINI-VERTICAL C4 20-15-10-5 METRES	£15.00
CODAR PR30. POWERED PRESELECTOR	£5.00
OLD HALLICRAFTERS SX28. Needs peaking	£18.00
BURNDYPT B.C. RADIO. TRAWLERS. Push pull	£12.50
160M. VERTICAL AND BASE. 2 ft. (tuned 1.9 MHz)	£9.50
3M. BACKGROUND MUSIC. 8 hours continuous.	
As new, with manual 6W, O/P, Inc. pre-rec. tape	£33.00

ALL PRICES INCLUSIVE. CARRIAGE EXTRA

SPECIALLY MATCHED VALVES
FOR LONGER LIFE

PAIR MATCHED 6HF5's R.C.A.	... (30p)	£5.50
PAIR MATCHED 6146 R.C.A.	... (30p)	£5.00
PAIR MATCHED 6146B R.C.A.	... (30p)	£6.20

**1 FRANCES STREET, TRURO,
CORNWALL Tel. 0872-862575**

10.7 MHz CERAMIC FILTERS with data for modification for 10 kHz Bandwidth at 27p ea.
470 kHz CERAMIC FILTERS with data at 46p ea.
455 kHz MECHANICAL FILTERS 4 kHz Bandwidth with data at £1.10.
Set of 3 10.7 I.F. TRANSISTOR TRANSFORMERS at 33p.
Set of 3 455 kHz Plus 10.7 MHz I.F. TRANSISTOR TRANSFORMERS at 33p.
6 MHz TRANSISTOR I.F. TRANSFORMERS at 6p. ea.
3/16" COIL FORMERS with core at 3 for 6p, 2" Alladin Formers with core at 5p.
SUB-MINIATURE 4-7pf to 20pf CERAMIC TRIMMERS at 3 for 10p.
30pf MINIATURE OXLEY AIRSPACED TRIMMERS at 5p ea.
FET's similar to 2N 3819 2 for 60p.
SGS 1 GHz R.F. AMPLIFIERS type BF 271, 18p ea. 4 for 60p.
MULLARD 1-2 GHz 100 mW R.F. TRANSISTORS at 60p ea.
250mW AUDIO I.C. AMPLIFIERS. Tested with circuit at 35p.
ME 1100 NPN 100 Volt 200 mW TRANSISTORS at 11p ea.
FX 1115 FERRITE BEADS at 15p doz.
COMMUNICATION SERIES OF I.C.'s untested consisting of 1xR.F., 3xI.F., 2xVOGAD, 2xAGC, 1xMike Amp., 2xDouble Balance Modulator, 1xMixer for £3. Separate I.C.'s 27p ea.
VHF FET's similar to 2N 5245 (T1588), 36p ea., 2 for 60p.
20 ASSORTED HEAT SINKS TO 18 etc. at 44p.
20 ASSORTED BRANDED 250mW ZENERS form 3 to 13 volt at £1.10.
MOTOROLA VARI-CAP DIODES FT 200 MHz 24 to 29pf type MV 1626 at 30p ea.
TRANSISTORS SIMILAR TO BC 108 at 44p doz.
10 UNTESTED 10 AMP DIODES at 25p, 10 20Amp DIODES untested at 30p.
600 MHz TRANSISTOR ARRAY SIMILAR TO CA3045 untested, 3 for 35p.
AMERICAN PLASTIC TRANSISTORS LS918 (2N918) at 22p, 2N3563 at 22p, 2N 3564 at 12p, 2N 5130 at 15p, LS 2220 (2N2220) 250 MHz 60 volt at 10p, LS 3702 (2N3702) at 10p, LS3703 (2N3703) at 10p, LS3704 (2N3704) at 10p, LS 3705 (2N3705) at 10p, LS 3706 (2N3706) at 10p.
SPECIAL OFFER OF BRAND NEW PRINTED CIRCUIT BOARDS with TWO 2N 3866 VHF POWER TRANSISTORS, 3 Ferrite Transformers at 75p.
P.C. BOARD WITH THREE 2N 3866, 3 FERRITE TRANSFORMERS, 4xR.F., Chokes at £1.10, P.C. BOARD WITH 2 FERRITE TRANSFORMERS at 12p.

J. BIRKETT

Radio Component Suppliers
25 THE STRAIT, LINCOLN, LN2 1JF.
Telephone: 20767

SELLING: Heath HW-30 2m. transceiver with PSU, excellent condition, £15. — Ring Purchase, Gloucester 27836 weekdays after 6 p.m.

FOR SALE: Yaesu FR-50B with crystal calibrator and handbook, £60; Trio JR-500S with speaker and handbook, £45.—Smith, 19 Hyde Road, Kenilworth (54609), Warks.

OFFERING: Yaesu FT-2100. new; BC-221M; Katsumi EX-9X keyer; Frequency meter 20-250 MHz; Frequency meter 375-725 MHz. Offers?—Liming, G3XNM, QTHR. (Tel: East Horsley 3982. Surrey).

SALE: 25-ft. wood-lattice type boom for full size 3-ele. 20m. beam, weighs 25lbs., with four coats of paint, £10. Buyer collects.—Hattersley, G3PJN, Hill Top, Holymoorside, Chesterfield, Derbys. (Tel: Chesterfield 6040 after 6 p.m.).

STILL REQUIRED: Hallicrafters Sky Buddy receiver.—Litherland, G8CFB, 11 Birch Grove, Chippenham (50707), Wilts.

WANTED: KW-600 or KW-1000 (or similar) linear amplifier. Details and price, please.—Breach, G10JO, 1 Massey Park, Belfast, N. Ireland.

OFFERING: Marconi RC-411/R receiver, featuring: Electronic digital frequency indication, full synthesising, phase-locked loop, tuning 15 kHz to 31-0999 (no gaps) in 31 bands, 100 kHz/10 kHz/100 Hz and 0-100 tuning controls, oscillator stability better than one part per 100 million per day drift, sensitivity better than 0.5 microvolt in AI, A3A, A3J modes, four positions of crystal selectivity, three settings AGC, RF/AF level monitor, aerial attenuator, one watt and 10 mW audio output, all solid-state with over 540 semi-conductors and 18 IC's cabinet size 49 by 23 by 48 cm., 3 vols. Marconi manual (list price £1,500), £500, or near offer. A similar receiver is the main Rx aboard Q.E.2. (Private owner). (Staffs).—Box No. 5176, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

FEBRUARY Issue Short Wave Magazine due out on Friday, February 1st. Single copies at 32p post free can be supplied to orders reaching us by Wednesday, January 30th, for despatch on Thursday 31st, the day before publication. These copies go out flat in an envelope, first-class posting. Limited supply only. Orders with remittance to:— Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: The larger trimming tool for an AR88 receiver.—Jamison, 311 Old Glenarm Road, Larne, Co. Antrim, Northern Ireland, BT40 1TU.

SELLING: KVG filter XF9B, brand new and unused, with crystals. £15. Tequipment 'scope. S51B. new, unused, mint condition, boxed, with guarantee and instructions (cost £65). scfl for £35.—Ring McCallum, East Horsley 4376 (Surrey).

WANTED: Faulty CR-100 or B.28 receiver, any condition acceptable, even incomplete. Please state price. Anywhere.—Briscoe, 27 De Vere Gardens, Ilford, Essex. (Tel: 01-554 6631).

FOR SALE: Yaesu Musen Rx FR-400SDX, mint 1973, in original packing, complete with handbook and kit of spare connectors, £135. Eddystone 680X receiver, as new, £50. BC-453 (Q-Fiver) as new and unmodified, £5.—Davies, West Wit Cottage, Little London, Basingstoke, Hants., RG26 5EV (Tel: Basingstoke 850134, after 6.0 p.m.).

OFFERING: AN/APR-4 UHF receiver, tuning 38 to 1000 MHz, complete with three tuning units, recently serviced, price £70 or near offer. Or EXCHANGE for Eddystone 730/4 receiver.—Parkins, 25 Watford Road, Kings Langley (63773). Herts.

SALE: AM10D Pye "Cambridge" two-metre Tx/Rx, tunes 144-146 MHz, with microphone and crystal, £30. Heathkit SWR Bridge, HM-15, £6.—Abel, G3ZHI, QTHR.

FOR SALE: Heathkit SB-102 transceiver with AC/PSU and SB-600, complete with CW filter, professionally wired, one year old, in mint condition, £200. Hy-Gain 18-AVT/WB vertical Ae., perfect, £25. Telomast, 50 feet, with almost complete rigging kit, perfect, £20.—Menzies, 48 Eaglesham Road, Newton Mearns, Glasgow. (Tel: 041-639 2173).

WANTED: Racal RA-17. Full details, please.—Hobin, G3XIX, QTHR.

MUST Be Sold: Heathkit RA-1 Rx, complete with crystal calibrator, speaker, headphones and handbook, price £23. R.208 receiver, coverage 10 to 60 MHz, £4. VHF/UHF Manual, £1.—Roberts, 9 High Street, Bala, Merioneth, North Wales, LL23 7AG.

WANTED: General-coverage short-wave receiver for newly interested SWL. Maximum £15 offered.—Smith, 19 Bridgeway Court, Kirkintilloch, Glasgow, G66 3JN. (Tel: 041-776 2707, after 5.30 p.m.).

RELUCTANT Sale: Racal Diversity Switching Unit HA.168B, £40. Frequency calibrator CT.432, price £20. As-new condition.—Harper, 19 Netherfield, Highley, Bridgenorth, Shropshire, WV16 6EZ.

WANTED: Heath SB-310 in mint condition, with AM/SSB filters.—Leyland, 12 Cross Street, Morecambe (410114), Lancs.

FOR SALE: Digital Voltmeter, complete but has fault, £16. Pye-made No. 62 Mk. II transceiver, 12v. DC. coverage 40-80-160m., in good working order, with handset, £16. **WANTED:** Good quality modern oscilloscope (brief details, please).—Westall, 11 Clarendon Street, Accrington, Lancs., BB5 6TA.

FOR SALE: Any Reasonable Offer Accepted. Two new B.44 transceivers, unconverted. Advance signal generator, calibrated, Type B4B, coverage 30 kHz to 30 MHz; ditto Type 71/D1, with charts, 10 to 300 MHz. No. 10 crystal calibrator, as new. Murphy two-metre transceiver, Type MR820/25, with manual. Ericsson Decade Unit Type 101, four-digit, rack mounting. Also various PSU's, independent and rack type, one 3-ft. rack unit, various relays, microswitches and other miscellaneous gear. Moving QTH, so must clear!—Tarr, GW3PUR, 43 Castle Park, Ruthin, Denbighshire. (Tel: Ruthin 3512).

DERWENT RADIO

5 COLUMBUS RAVINE, SCARBOROUGH. Tel. SCA 65996
Showroom open Tuesday/Thursday/Friday/Saturday

KW2000E and A.C. p.s.u.	£291-00	Amphenol SO239 PTFE	33p
KW 202 receiver and speaker	£163-00	Amphenol SO239 STD	28p
KW 204 transmitter	£176-00	SO239 single hold fixing	28p
KW 107 match	£50-60	Reducer	8p
KW EZ match	£18-70	Double sided copper clad	9p
KW 101 swr bridge	£9-00	Transistors 2N3819	38p
KW 103 swr and power	£13-75	2N3053	26p
KW aerial switch	£4-65	2N3055	44p
KW Balun	£2-53	3N140 & 141	80p
KW Atlanta vfo	£39-00	RCA	4073
Yaesu FR50B	£71-50	BC 107 108 109	12p
Yaesu FL50B	£82-00	Dosemeters	12p
Unica ULR1A	£27-50	10PF variable capacitor	17p
Skywood CX203	£35-70	25PF double bearing cap	25p
Lafayette HA800	£62-00	30PF double bearing cap	25p
Trio 9RS9DS	£51-70	50PF DIFF	19p
Trio JR310	£82-00	100PF double bearing	33p
Trio JR599 receiver	£176-00	500pf two gang	66p
Trio TX599	£176-00	90pf two gang	66p
Codar multiband kit	£12-85	Liliput lamps, 6v. or 12v.	8p
TE15 GDO	£16-50	25 amp (car type) croc.	8p
Type 500 test meter	£9-75	Mono/stereo headphones	£2-65
Sentinel 2m. converter	£15-12	Decon printed ckt. pen	70p
Sentinel 4m. converter	£15-12	300 ohm twin feeder yd.	8p
Sentinel 70cm. converter	£15-12	Telephone pick-up coil	38p
Sentinel 2m. pre-amp	£7-15	Veroboard assortment	67p
50 way intercom	£2-85	Yeropsins 11 or 15	17p
2,000 ohm headset	99p	Egg insulators	6p
1-20v. D.C. p.s.u. 1A stab.	£11-80	Panel "S" meter 2"	£1-80
2" speaker 8 ohm	38p	Slow motion dial 77p, 84p,	£1-10
3" speaker 8 ohm	48p	R substitution box	£1-80
6 BA bolts pack	11p	C Substitution box	£1-65
6 BA nuts pack	11p	Pre set caps 4 of 320pf	4p
20 IC's with data	£1-10	10-40 10-120pf	3p
G Whip tribander	£11-53	Service head/microphone set	£1-40
Coils	£4-40	Panel mains neon	20p
G whip 160/80m.	£9-90	Meter test prods and leads	38p
G Whip flexiwhip	£9-46	In line fuse holder	8p
Coils	£4-67	20mm. fuse links 500ma	2p
G Whip basemount	£1-59	to 3A	21p
Wighttraps standard	£3-00	36" chrome Whip aerial	44p
Wighttraps high power	£4-10	56" chrome Whip aerial	88p
Shure 201	£5-50	Mini push switches	13p
Shure 444	£13-20	All boxes 2 1/2" x 4" x 1"	27p
Acos Mic 45	£1-12	2 1/2" x 5 1/2" x 1 1/2"	30p
Dynamic 50K ohm P.T.T.	£3-95	2 1/2" x 4" x 1 1/2"	29p
"J" Beam Halo	£1-82	2 1/2" x 3" x 1 1/2"	27p
Boom mic (ceramic)	£4-95	7/8" x 4" x 1 1/2"	48p
4 digit impulse counter	12p	Wander plugs black or red	4p
90 resistors	17p	Banana plugs black or red	5p
50 2w. resistors	22p	Phone plugs	7p
50 capacitors	55p	Phone sockets	8p
50 disc ceramics	33p	Phone sockets double	12p
20 wire wound resistors	15p	Phone sockets four way	10p
10 mixed potentiometers	50p	Ferric chloride 1lb bag	35p
10 mixed wafer switches	80p	10-1mmid 400v. capacitors	17p
10 croc. clips	40p	10 mixed electrolytics	35p
Mixed sleeving pack	15p	10 mixed silver micas	12p
American flat 2-pin plug	10p	3 C60 cassettes (screw fix)	£1-00
Line socket for above	10p		
14 and 16 way DIL sockets	17p		

QSL POCKETS for 120 cards 40p incl. VAT/Post. We are looking for good condition modern transmitters and receivers etc. and will pay cash or give good trade in prices. Please let us have details with s.a.e. for offer. DES WOOD, G3HKO
PLEASE ADD EXTRA FOR CARRIAGE. S.A.E. FOR LISTS MAIL ORDER TO

(Telephone 63982)
28 HILLCREST AVENUE, SCARBOROUGH, YO12 6RQ

ELEY ELECTRONICS

NEW DYMO PLASTIC TAPE PRINTERS 68p + 15p carr.
NEW lft. TUBULAR HEATERS, 250 watt. 83p | 27p carr.
NEW CONDENSERS. 0-1mf 750 volts. Box of 20. 22p | 18p carr.
NEW MICROSWITCHES. Small, medium, large 164p + 5p carr.
5/H SMALL DITTO ... 33p a dozen | 8p carr.
OP AMPLIFIERS 741 TO-5 ... 25p + 3p carr.
B or 14 DIL ... 33p + 3p carr.
VALVES: QQV02-6 ... 55p | 5p carr.
QQV03-20a ... £3-30 } for callers only
2C39A ... £1-10 }
WANTED: G.E.C. Brown Relays with change over contacts.

102 BEATRICE ROAD, LEICESTER

G. W. M. RADIO LTD.

All prices include VAT and post/carriage.

TEST EQUIPMENT. All standard mains

NOISE GENERATORS CT82 for comparative Noise Factor measurements in Receivers covering 100 kc/s. to 160 mc/s. Clean condition, untested. £7.50.

RADIO TELEPHONES. PYE VANGUARD AM25B. High or Low Band available, complete with cables, control box and speaker. £15 carriage paid. A few AM25T, High or Low Band, with accessories, £20 carriage. These are recently out of service, in clean condition and less crystals.

CALIBRATORS FREQUENCY CT432. 110/250 A.C. 12" x 6" x 7 1/2". 100 kc/s., 1 Mc/s. and 10 Mc/s. outputs from integral crystals. Provision for external crystals in the range 100 kc/s. to 10 Mc/s. 4 front panel bases suit most types. RF sources may be fed in and calibrated by beating against desired crystal. Audio output to headphone sockets. In Ministry packing and as new condition, £13.65. A few used but good, £9.80 both Carriage paid. Two Burnpudt Co-ax plugs on lead to fit, 65p, post paid.

TRANSMITTER P.A. UNITS, STC T4188. Tunes 2.8 to 18 Mc/s., manual or 28v. motor driven. 13" x 8" x 8". Pair CV518 (4x150) 28v. blower cooled. Bases are NOT U.H.F. type. Ideal basis for linear amplifier construction, £8.75.

RACAL Frequency Standard and Power Supply Unit for Channelizer RA150. Comprises mains power unit giving outputs of 6.5v. 11.5v. Negative 78v. and 250v. stabilised. (Transformer HT rating is 450mA). Also contains 12v. crystal oven for 100 kc/s. crystal. Clean and untested, £7. RACAL 55B Adaptors RA218 for RA17 and RA117 Receivers, clean and untested, £30.

OSCILLOSCOPES. SOLATRON CD1212. 5" tube, TB 100 nanosecs. to 5 secs. Input 200 mc./volts to 100 volts. Clean condition and working order, with 24 mc/s. dual trace plug in unit, £80. Wide band 40 mc/s. unit, £20 (only sold with scope). CT436 (Military version of Solatron CD1014) DC to 6 mc/s., 10mV per Cm. sensitivity double beam, £55. Solatron S735/2 (CT386a) DC to 10 mc/s., sensitivity 1mV per Cm., £44. Miniature CT52 DC to 1 mc/s. restricted time base 10 c/s. to 40 kc/s. but very useful, £22.

RECEIVERS B40a. "As new" condition, good working order. In original Ministry crates with all plugs, £55.

All Receivers and Test Equipment are in working order at time of dispatch Carriage charges included are for England and Wales only.

Telephone 34897

Terms: Cash with order. Early closing Wednesday.

40-42 PORTLAND ROAD, WORTHING, SUSSEX

MORE V.H.F. GEAR

PYE VANGUARD AM25B, 25 kHz High Band sets only without controls (all Valves inc. and in excellent condition) £10.00 each
Complete with Control, Mic, speaker, cables etc. £19.50 each
As above but AM 25 T Transistor Model ... £12 and £22

PYE CAMBRIDGE. AM10D, few only at £19.50 each, excellent order High and Low.

PYE REPORTER. High or Low... .. £3 each

PYE RANGER. High or low £4 each

PYEBANTAM. Battery Cassettes, empty. New 75p each

VALVES. Ex-equipment, QQVO3/10, 45p each ;

QQVO3/20 £1.90 each

CARRIERS for Cambridges and Vanguards ... 50p each

Postage Extra on all above. Every letter answered. SAE please

**W. H. WESTLAKE, CLAWTON, HOLSWORTHY
DEVON (MPT RTD 1059 Engineer)**

NEW JR599, £149.00 inc. VAT

Special offer, full 12 months guarantee.
Securicor £3.30 extra.

G3LLL HOLDINGS

39/41 Mincing Lane, Blackburn, BB2 2AF.
Tel. 59595/6

NORTH WEST ELECTRICS

ALL PRICES INCLUSIVE OF V.A.T.

CABINET FOR FREQUENCY COUNTER. 12" x 3" x 6" with cut out to suit 8 digit readout. Ventilation louvres. Silver grey stove enamelled, £3.57. Post 30p.

FIBRE GLASS BOXES With fitted all panel.
9" x 4" x 3" ... £1.54 5 3/4" x 3 3/4" x 4" ... £1.37
5 1/2" x 2 3/4" x 2" ... 42p 7 3/4" x 5 1/2" x 5" ... £2.20
Postage 16p. Large case can be supplied with panel cut to fit 7" x 4" speaker. 20p extra for hole.

DIE-CAST BOXES. With fitted lid. Post 16p per box.
Cat. No. 7969P 3 1/2" x 1 1/2" x 1 7/32" 43p
Cat. No. 7134P 4 1/2" x 2 1/2" x 1" 50p
Cat. No. 6908P 4 1/2" x 3 1/2" x 2" 71p
Cat. No. 6827P 7 1/2" x 4 1/2" x 2" £1.14
Cat. No. 6357P 7 1/2" x 4 1/2" x 3" £1.24
Sizes shown are approx. internal dia.

ALL-MINI BOXES. With fitted lid. Post 10p per box.
3" x 2" x 1" ... 36p 5 1/2" x 4" x 1 1/2" ... 44p
4" x 2 1/2" x 1 1/2" ... 41p 4" x 2 1/2" x 2" ... 41p
4" x 4" x 1 1/2" ... 41p 5" x 2 1/2" x 1 1/2" ... 41p

POLYPROPYLENE ROPE. 500lb. strain, 100 yd. reel, £1.10, post 20p.

Most items as previous adverts still available.

**769 STOCKPORT ROAD, LEVENSHULME
MANCHESTER 19 Phone: 061-224 4911**
MEMBER OF THE RADIO AMATEUR RETAILERS ASSOCIATION

telesonic marine

MARINE ELECTRONICS ENGINEER

Are you experienced in installing and servicing marine electronic equipment such as Radar, Navigation Equipment, and Radio Telephones. We require such a man for a fascinating job travelling to luxury yachts, etc., all round the country. If you live near London and are able to drive, a good salary awaits you working in an idyllic friendly atmosphere. Apply: **Telesonic Marine Ltd. Tel. 01-387 7467.**

"DX ZONE MAP"

ANOTHER REPRINT!

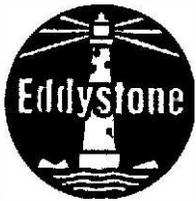
In four colours, on durable paper for wall mounting, 35in. wide by 25in. deep. Giving essential DX information—bearing and distance of all parts of the world relative to the U.K., the 40 Zone areas into which the world is divided for Amateur Radio purposes, with major prefixes listed separately. Distance scale in miles and kilometres. Time scale in GMT. Marking of Lat./Long. close enough for accurate plotting. Hundreds of place names, mainly the unusual ones, and most of the rare islands.

With new Prefix List revised to Sept. 1973
Price £1.20

including postage and special packing in postal tube to avoid damage in transit.

Publications Dept.

Short Wave Magazine Ltd., 55 Victoria Street,
London, SW1H 0HF (01-222 5341/2.)



"LISTEN TO THE WORLD WITH EDDYSTONE"

Your local Eddystone dealer is:

CHESHIRE
The Transistor Centre
(Wimslow) Ltd
Green Lane
Wimslow Z4766

CORNWALL
R. V. Heming Ltd
(Peter Heming G3WBW)
Cliff Road, Newquay
Newquay Z191
S.S.B. Products
(Norman Birkett G3EKX)
1 Frances Street
Truro
Devoran B62575

DEVON
Reg. Ward & Co. Ltd: G2BSW
Axminster
Axminster 3163

ESSEX
F. E. Smith
184 Moulsham Street
Chelmsford
Chelmsford S4594

IRELAND
John F. MacMahon
10, Church Street, Enniskillen
Co. Fermanagh, N. Ireland
Enniskillen 2955

LANCASHIRE
Holdings Photo Audio Centre
Mincing Lane - Darwin Street,
Blackburn BB2 2AF
Tel. S9595
Stephen-James Ltd
70 Priory Road, Anfield
Liverpool L4 2RZ
051-283 7829
North West Electrics
769 Stockport Road
Levenshulme, Manchester 19
061-224 4911
Crafflin Ltd
46 Friargate, Preston PRI-2AT
Preston S5244

LONDON
Imhofs (Retail) Ltd
112-116 New Oxford Street
W.C.1
01-636 7878
R. T. & I. Electronics Ltd
Ashville Old Hall
Ashville Road Leytonstone, E.11
01-539 4986
Radio Shack Ltd
188 Broadhurst Gardens
London, N.W.6
01-624 7174

NORTHUMBERLAND
Aitken Bros. & Company
35 High Bridge
Newcastle upon Tyne NE1 1EW
Newcastle upon Tyne 26729

WARWICKSHIRE
Chas. H. Young Ltd
170/172 Corporation Street
Birmingham 4
021-236 1635

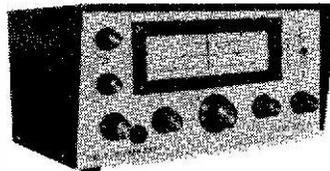
YORKSHIRE
The Amateur Radio Shop
13 Chapel Hill
Huddersfield
Tel. 0484-20774

TELFORD COMMUNICATIONS

The BRITISH firm to contact for ALL your 2 Metre requirements, who are engaged 7 days a week endeavouring to meet your requirements.

All our equipment is BRITISH designed—BRITISH built—BRITISH components whenever possible. We offer full, fast servicing; help and advice by phone, letter or personal call.

If you're thinking of new or additional equipment for the New Year why not do YOUR BIT to help our BALANCE OF PAYMENTS and buy BRITISH.



YOUR COMPLETE 2 METRE RECEIVER

To start the New Year off we offer for JANUARY only our TC7 Tunable I.F. plus GBAEV converter for £60, including VAT.

WATCH OUR FUTURE ADVERTISEMENTS for additions to our range in 1974.

Large SAE please for fully detailed leaflets of all our equipment and current supply position.

Terms: Cash or 10% deposit, Balance pro-forma.

Hire Purchase available

78b High St., Bridgnorth, Shropshire, WV16 4DS

Telephone: 074-62 4082

REG. WARD & CO. LTD.

(G2BSW)

WE ARE OFFICIALLY APPOINTED K.W. AGENTS FOR THE SOUTH WEST (Somerset, Dorset, Devon, Cornwall)

KW Atlanta with p.s.u.	£210.00
KW 2000B with p.s.u.	£240.00
KW 2000E TCVR.; & A.C. p.s.u.	£265.46
KW 202 Receiver with matching speaker	£148.18
KW 204 Transmitter	£160.00
KW 1000 Linear	£135.45
KW 101 VSWR Meter (52 or 75 ohm)	£28.26
KW 103 VSWR Meter and Combined Power Meter	£12.50
KW E-Z Match. 10-80m. ATU	£16.55
KW 107 Combined E-Z Match, VSWR and R.F. Power Indicator, Dummy Load and Antenna Switch for 4 Outlets	£46.36
KW Trap Dipole 70/75 ohm Twin Feeder	£15.00
KW Trap Dipole 97' Coaxial Feeder	£16.55
KW Trap Dipole with Balun	£18.55
KW 3-way Antenna Switches (for coax)	£4.27

YAESU

FR50B Amateur Bands Receiver	£59.00
FT101 260w. Transceiver, with mic.; spkr. and built-in A.C./D.C. p.s.u.'s.	£246.00
FR50 + Cal. VVVV	£63.00
FT100 Transceiver and FP200 A/C PSU	£190.00
FR400SDX Rx. (with 160 and 2m.)	£175.00
SP400 Speaker	£11.00
Caslon 24 hour Digital Clocks	£7.42

EDDYSTONE RECEIVERS
EC10 Mk. II £99.00; New Model 1000, £246.50.
WE ARE THE DISTRIBUTORS OF EDDYSTONE PROFESSIONAL RECEIVERS FOR THE SOUTH WEST.

SHURE MICROPHONES
Model 444, £13.50; Model 201, £5.70.

ANTENNAE J-Beam 2 metre Beams in stock. Also Joystick and Joymasch A.T.U.'s, Stolle Ant. Rotators, 140ft. coils 14G, Copper Antenna Wire and Ribbed insulators, T-insulators, U.H.F. Co-ax. Plugs and Sockets. 75 and 52 ohm Co-ax. Cable.

R.C.A. VALVES for KW and Heathkit equipment, 6146, 6146B, 6HF5, 6LQ6, 6GE8, 6GWB, 6GK6, 6CM6, 6CL6, 6CB6, 6BN8, 6HS6, 6EV6, 12BA6, 12BE6, 12B26, 6JS6C, etc. and many other types.

TRADE INS WITH PLEASURE. OUR STOCK OF GOOD SECOND HAND EQUIPMENT CHANGES DAILY — LET US KNOW YOUR REQUIREMENTS.

Due to currency fluctuations prices of imported equipment are liable to alteration. Add 10% VAT to all prices.

WE STOCK R.S.G.B. PUBLICATIONS, LOG BOOKS, Etc.
HP TERMS AVAILABLE CARRIAGE EXTRA ON ALL ITEMS
AXMINSTER — DEVON Telephone: 33163

THE AMATEUR RADIO SHOP G4MH

13 CHAPEL HILL, HUDDERSFIELD,

Telephone: 20774

MEMBER OF THE A.R.R.A.

K.W., TRIO, EDDYSTONE, J BEAMS, YAESU, SHURE, Etc.

NEW STOCK TRIO:

TSS15 and p.s.u.	£231	JR 310	£84
JR599...	£176	9R59DS	£54
TX 599	£176	Filters, Calibrators, etc.	

SECOND-HAND:

FR400 SDX	£145	SP600 JX	£98
KW 202	£110	AR88D	£45
JR599	£135	RAI	£28
EC10 Mk. II	£48	DX100	£28
9R59DS	£40	DX 40	£12
Eddystone 940	£110	Heath HW100 with p.s.u.	£120

The 4 MH 2 Metre Tx and Modulator. 15 watts input. All plugs and xtal supplied fully air tested.
Tx ... £12.50 Mod ... (inc. VAT) £12.50

Antec 5/8 2 Metre Whips ... £4.50
Tavasus G Whips in stock.

Shure Mics.:
201 ... £5.75 444 ... £14.00 444T ... £15.75

WANTED, WANTED. All types of gear. The best prices paid for good equipment.

Odds and Ends

BC107 type Transistors. All good	doz.	30p
5 pin Din Plugs	ea.	7p
2 pin Din L/S Plugs	ea.	6p
Morse Practice Oscillator	Key	75p
Fans, 240v.		£2.50
2 Metre 8 MHz xtals.	S.A.E. lists.	

CLOSED TUESDAYS LATE NIGHT THURSDAYS
ALL OUR PRICES INCLUDE VAT

Walkie-Talkie No. 98 ex. WD 14 valve four channel transmitter/receiver unit, £6-50, carriage 68p. Limited supply, No. 19 ex. WD used transceiver valved unit, only £6-50, carriage £1-40. Salvage speaker, tape unit multi-valve receiver telemeter, sealed cartons, £4, carriage £1. Padded moving coil ex. WD unused headphones, great at £1-50 plus 35p p.p. 16 KV Meters ex. WD 3 1/2", boxed, £5-50 plus 50p p.p. American ex. WD, featherweight, low resistance headphones, unused, £1-25 plus 25p p.p. Remington speech recorder valved unit, £5-50, 75p p.p. Grundig steno-copier office recorder, ics microphone, £8-50, carriage 75p. Loaded staff car aerials, unused ex. WD, £1-25, 25p p.p. 625 colour and black and white 9 element, 35 box grid reflector, heavy duty aerial, £3-25, 50p p.p. Three 4ft. tank aerial top sections, 85p, 35p p.p. Government Leather, new motor case and shoulder strap, 5" x 4 1/2" x 1", 625p, 20p p.p. Mains Meters, unused, powerful 1/2" spindle, £5, 75p p.p. Hoses, approx. 60" x 1/2", 50p, 20p p.p.

All ex. WD transmitters for modification require licence. Callers welcome.

SOUTHERN SURPLUS MERCHANTS, LTD.

66 London Road, Kingston-upon-Thames, Surrey
(Tel.: 01-546 9263)

THE INTERNATIONAL TRANSISTOR DATA MANUAL FOR 1974

The improved and updated 1974 edition will be available in April. Basic characteristics on upwards of 20,000 transistors of international origin with substitutes. Make sure of your copy. Order now direct from:

SEMICON INDEXES LTD.
Free Post, Wokingham, Berks., RG11 1BR
Price: £6.20 in U.K. £7.30 overseas (includes surface mailing)

**MORSE MADE !!!
EASY**

FACT NOT FICTION. If you start RIGHT you will be reading amateur and commercial Morse within a month. (Normal progress to be expected.)

Using scientifically prepared 3-speed records you automatically learn to recognise the code RHYTHM without translating. You can't help it. It's as easy as learning a tune. 18-W.P.M. in 4 weeks guaranteed. For Complete Course 3 Records & Books send £4.50 P.P.I. etc plus 10% (overseas £1 extra.)

For further details of course Ring 01-660 2896 or send 4p stamp for explanatory booklet to:—S. BENNETT, G3HSC
(Box 14) 45 GREEN LANE, PURLEY, SURREY

G3ACQ offers:—

CRYSTALS as usual FT 75—FR/FL 50 combo in stock. TRIO JR599 — TRIO TS515 — 9RS9DS, J BEAMS and Rotors — Mini-Beams — HY-GAIN VERTICALS — TH3 — Bantex whips — SOLID STATE MODULES, converters and transverters.

HAPPY NEW YEAR

S. MAY (Leicester) LTD.

12/14 CHURCHGATE, CITY CENTRE,
LEICESTER LE1 4AJ

Telephone 58662

PORTABLE PETROL ELECTRIC GENERATORS

HONDA

ALL MODELS, FROM THE INCREDIBLY QUIET HONDA E300E WHICH GENERATES 300 WATTS A.C. PLUS 12v D.C. AND MEASURES ONLY 13" x 12" x 9" TO THE HONDA E4000E, 4 KW DIESEL SET.

For brochure & full details, call, write or phone
GODALMING 23279

ASHLEY DUKES

FARNCOMBE STREET, FARNCOMBE,
GODALMING, SURREY.

G3HEO

G8FAL

D. P. HOBBS LTD.

Most radio components for the amateur, including: Trio equipment, Microwave Modules converters, J-Beam aerials, Bantex whips, test meters, etc.

THIS MONTHS BARGAIN OFFER
DET22 VALVES—NEW AND BOXED, £1-00 each.
5 for £4-50.

Postage 20p, add 10% for VAT

11 KING STREET, LUTON
Telephone 20907

**Use your tape recorder
to widen your horizons**

Our unique self-test instructional tapes will guarantee you rapid and painless mastery of morse. Send now for full details of our efficient and inexpensive programme, or begin immediately by including £1.45 (which will be instantly refunded if you are not delighted) and obtain our introductory lessons by return of post.

(State whether cassette or lp tape required.)

MINIWISE PRODUCTS

PO BOX 99, BLETCHLEY,
MILTON KEYNES MK3 5BR.

G8CKN



G8DGR

BASE AND MOBILE ANTENNAS
We have designed a wide range of Antennas suitable for both mobile and base applications in the 4m., 2m. and 70 cm. bands. We will also produce special types if required.

ANTEC
74 UPPER SHERBORNE ROAD
BASINGSTOKE, HANTS
Telephone Basingstoke 27527 or
Northbrook 7236 (evenings and weekends)
S.A.E. for Cat.

IRON POWDER TOROIDAL CORES

CORE No.	2 Mix Red 50k-30MHz μ = 10	5 Mix Yellow 10-90 MHz μ = 8	10 Mix Black 30-150MHz μ = 7	12 Mix Grn/White 60-200MHz μ = 5	OD"	ID"	TH"
T-200	£1-15				2-000	1-250	550
T-130	83				1-300	780	437
T-106	42				1-060	560	437
T-68	21	£0-27	£0-31		690	370	190
T-50	19	21	25	£0-27	500	303	190
T-37	19		19	23	370	205	128
T-30	15	17			307	151	128
T-25			17	19	255	120	906

TOROID CORE KITS

TK-101 contains 8 T-50-2 7 T-68-2 cores. £2-30
TK-102 contains 7 T-50-6 6 T-68-6 cores. £2-35
TK-103 contains 4 T-50-2 4 T-50-6 3 T-68-2 3 T-68-6 cores. £2-31
Balun kit makes a 1:1 or 4:1 1Kw balun, with instructions. £1-85
Balun ready wound, state radio required. £2-40
All items despatched by return of post. Terms CWO Mail order only.
Postage extra on all items.
Further details, information, advice, s.a.e. to the admin, address below.
T.M.P. ELECTRONICS SUPPLIES
3 BRYN CLYD, LEESWOOD, MOLD, FLINTSHIRE, CH7 4RU

CALL BOOKS

INTERNATIONAL :

- RADIO AMATEUR CALL BOOKS (1974)**
 "DX Listings" £3.82
 "U.S. Listings" £4.25
 "G's" only 1974 Edn. 75p

MAPS

- DX ZONE MAP (GREAT CIRCLE)**
 In colour with Country/Prefix Supplement Revised to September 1973 £1.20
- AMATEUR RADIO MAP OF WORLD**
 Mercator Projection — Much DX Information — in colour. Second Edition 66p
- RADIO AMATEUR MAP OF THE U.S.A. AND NORTH AMERICA**
 State boundaries and prefixes, size 24" by 30", paper 62p
- RADIO AMATEUR'S WORLD ATLAS**
 In booklet form, Mercator projection, for desk use. Gives Zones and Prefixes (New Edition). £1.11

LOG BOOKS

- Standard Log (New Glossy Cover)** 62p
Receiving Station Log 46p
Minilog 26p
 (The above prices include postage and packing).

MORSE COURSES

- 63HSC Rhythm Method of Morse Tuition**
- *Complete Course with three 3 speed L.P. records with books including U.K. P.P.I. etc. £4.95
 - *Beginner's Course with two 3 speed L.P. records with books including U.K. P.P.I. etc. £3.63
 - *Single 12" L.P. Beginner's with book . including U.K. P.P.I. etc. £3.02
 - *Single 12" L.P. Advanced with book . including U.K. P.P.I. etc. £3.02
- Three speed simulated GPO test, 7" d.s. E.P. record, including U.K. P.P.I. etc. 93p

Prices include postage, packing and insurance in U.K. only *Overseas orders + £1.00.

Available from

SHORT WAVE MAGAZINE

Publications Dept., 55 Victoria Street, London, SW1H 0HF 01-222 5341

(Counter Service, 9.30-5.15, Mon. to Fri.)
 (Nearest Station: St. James's Park)

(GIRO A/C No. 547 6151)



"I MADE IT MYSELF"

Imagine the thrill you'll feel! Imagine how impressed people will be when they're hearing a programme on a modern radio you made yourself.

Now! Learn the secrets of radio and electronics by building your own modern transistor radio!

Practical lessons teach you sooner than you would dream possible.

What a wonderful way to learn — and help qualify yourself for a new, better-paid career! No dreary ploughing through page after page of dull facts and figures. With this fascinating Technatron Course, you learn by building!

You build a modern Transistor Radio . . . a Burglar Alarm. You learn Radio and Electronics by doing actual projects you enjoy — making things with your own hands that you'll be proud to own! No wonder it's so fast and easy to learn this way. Because learning becomes a hobby! And what a profitable hobby! Because opportunities in the field of Radio and Electronics are growing faster than they can find people to fill the jobs!

No mathematics, no soldering — yet you learn faster than you ever dreamed possible.

Yes! Faster than you can imagine, you pick up the technical know how you need. Specially prepared step-by-step lessons show you how to: read circuits — assemble components — build things — experiment. You enjoy every minute of it!

You get everything you need. Tools Components. Even a versatile Multimeter that we teach you how to use. All included in the course AT NO EXTRA CHARGE! And this is a course anyone can afford. You can even pay for it in easy payments — in fact you could make extra cash from spare-time work when you've turned yourself into a qualified man through B.I.E.T. training.

So fast, so easy, this personalised course will teach you even if you don't know a thing today!

No matter how little you know now, no matter what your background or education, we'll teach you. Step by step, in simple easy-to-understand language, you pick up the secrets of radio and electronics.

You become a man who makes things, not just another of the millions who don't understand. And you could pave the way to a great new career, to add to the thrill and pride you receive when you look at what you have achieved. Within weeks you could hold in your hand your own powerful radio. And after the course you can go on to acquire high-powered technical qualifications, because B.I.E.T.'s famous courses go right up to City & Guilds levels.

Send now for FREE 76 page book — see how easy it is — read what others say!

Find out more now! This is the gateway to a thrilling new career, or a wonderful hobby you'll enjoy for years. Send the coupon now. There's no obligation.

POST TODAY FOR FREE BOOK

To: **BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY**
 Aldermaston Court, Reading RG7 4PF BSW 09

Yes, I'd like to know more about your course. Please send me free details — plus your big, 76-page book that tells about all your courses.

NAME

ADDRESS

Technatron

BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY

MORE BOOKS DESCRIBED

RADIO AND ELECTRONIC HANDBOOK

by G. R. Wilding

Technicians and service engineers in the Radio and Electronics industry require a considerable amount of data which is spread over many books. It is often difficult and time consuming to locate in a hurry. Students, however, who may have to study a whole series of course-books will find a condensation of such information, which gets down to the essentials, extremely useful. *Radio & Electronic Handbook* has been designed to provide, on the one hand, a reference book and, on the other, a revision guide.

The intention has been to summarise basic electronics into four separate, easily assimilated sections, which will provide rapid reference to important principles, formulae and applications. These four main sections are: Direct current theory; Alternating current theory; Valve theory and applications; and Transistor theory and applications. Practical worked examples and circuits diagrams have also been utilised whenever necessary.

The concise presentation, which covers all the relevant ground, makes for easy learning and the book should prove invaluable for both practical and examination requirements. **£1.33**
149 pages including 84 diagrams.

QUESTIONS AND ANSWERS ON RADIO AND TV

3rd Edition

PREFACE

Curiosity is the keystone of learning. The man who "wants to know" has a far better chance of digesting and retaining information than he who ploughs through a set subject simply because it has been put before him.

Hence the "Question and Answer" form of this little book. Wherever possible, the questions have been arranged to follow the growth pattern of information. Questions arise from the previous answers. This means that the book differs from a standard textbook in that subjects are not cajoled neatly into place; except that main chapter headings give a guide to the line of questioning, the reader can treat these pages as bedside or benchside reading. Mathematics and unwieldy formulae have been avoided. Circuits and other diagrams give the basic information and confusing frills are omitted.

There are many textbooks to which the reader who wishes to augment the information given here can resort. These chapters will whet his curiosity **85p**

HAVING FUN WITH TRANSISTORS

by Len Buckwalter

It covers 13 exciting transistorised projects, and while creating, one can learn, and while learning one can find enjoyment for himself, his family and friends as he builds such unusual items as BORIS, the talking skull, or a unit that enables you to see while blindfolded. All is described in a simplified form so that even a youngster can understand it. **£1.61**

110 INTEGRATED CIRCUITS PROJECTS FOR THE HOME CONSTRUCTOR

Integrated circuits are the most important new semiconductor devices to have been developed within the past decade. They are compact, easy to use and less expensive than their discreet transistor-resistor equivalents. This volume gives an entirely practical introduction to these devices by describing one hundred and ten constructional projects in which they can be used.

The projects range from simple low-level amplifiers to complex test equipment and include a number of hi-fi circuits and logic circuits. The integrated circuits used are internationally available types and all the projects have been designed, built and fully evaluated. The book should prove to be of practical interest to the professional engineer, the student and the amateur. **£1.31**

INTEGRATED CIRCUIT POCKET BOOK

by R. G. Hibberd

This book is a logical companion to the Authors' previous book—*The Transistor Pocket Book*, and is intended primarily for technicians and students whose courses include semi-conductors devices, but it will also be of interest to all those who are concerned with integrated circuits and their applications. **£2.65**

DICTIONARY OF TELECOMMUNICATIONS

R. A. Bones, B.Sc., Ph.D., ACIS, CEng., MIEE, AInstP.

Economic growth throughout the world is closely linked with the development and growth of telecommunication systems. Modern industry demands ever-improving facilities for its executives to be able to speak to each other from opposite sides of the globe; to be able to transmit drawings, documents and pictures rapidly over large distances; and now to be able to send data accurately and quickly from computer to computer.

Telecommunications is an industry with a high growth rate and, like all technologically based industries, a new language has developed: a language which grows daily as new materials, techniques and systems are developing. This dictionary is an attempt to document that language.

The wide range of definitions, including many reproduced from, or based on, British Standards recommendations, is supplemented by appendices including units and abbreviations, wavelengths and frequency bands, and signal reporting codes.

The concise explanations of the terms in use should prove valuable to engineers, students, technicians, and to all whose work or interest requires them to understand modern telecommunication terminology. **£2.37**

MICROPHONES

by A. E. Robertson

A general treatment, in twelve chapters with appendices.

£1.67

WIRE ANTENNAS FOR RADIO AMATEURS

by W. I. Orr

What this Handbook contains:—How to build costed wire antennae (for two metres to 160m.—Top Band) that really get out—horizontals, verticals, beams, trap antennae, ground planes, etc. "Invisible" aerials for amateurs in flats and other locations where radio and TV antennae are "prohibited."

Exact dimensions in feet and inches—also in metres and centimetres—for every antenna described—no guesswork!

How to build two "all-purpose" aerial tuners with 100 uses!
The truth about baluns. How to build an efficient, inexpensive balun for optimum antenna performance and accurate SWR readings
The construction of 2, 3, 4 and 5-band trap dipoles. How to make your own efficient traps and save real money.

Three-band dipole for 80, 40 and 15 metres—only one feedline!
Ground plane aerials for VHF and 10, 15, 20 and 40 metres.

High-gain beam antennae especially suited for VHF FM.
The efficient "folded Marconi" antenna for 40, 80 or 160 metres.

Clear explanations of resonance, radiation resistance, impedance, standing wave ratio (SWR), balanced and unbalanced aerials.

Plus—radial wire ground systems; lightning protection; wood masts; counterweights; the easy way to use coax connectors—and much more!

This book is an American publication by a well-known author in the field of Amateur Radio. **£1.75**

American & English Books.

The above prices includes postage and packing.

Available from

Publication Dept., 55 Victoria St., London SW1H 0HF

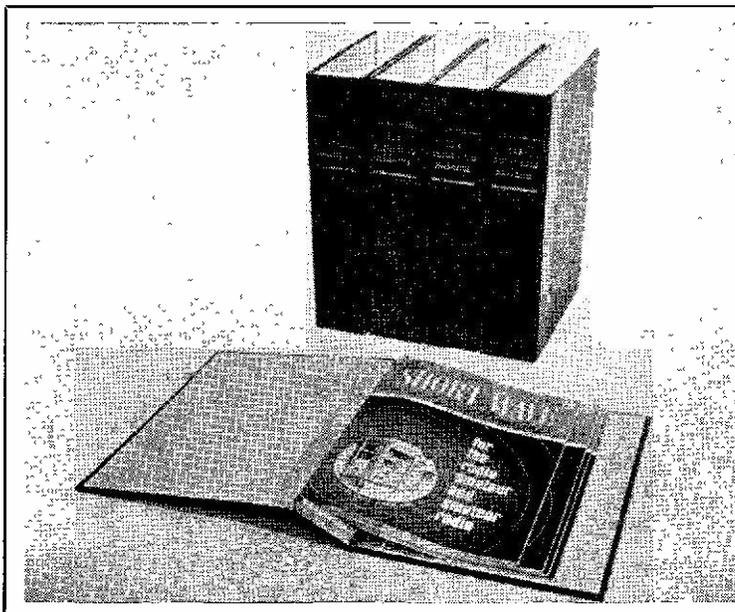
(Counter Service, 9.30-5.15, Mon. to Fri.)

(GIRO A/C. No. 547 6151)

SHORT WAVE MAGAZINE

01-222 5341

(Nearest Station: St. James's Park)



CREATE YOUR OWN REFERENCE LIBRARY

The "EASIBINDER" is designed to bind 12 copies of the Magazine as you receive them month by month, eventually providing a handsomely bound volume for the bookshelf.

No need to wait until twelve copies are assembled. As each copy is received, it is quickly and simply inserted into the binder. Whether partially or completely filled, the binder is equally effective, giving the appearance of a book, with each page opening flat.

Strongly made with stiff covers and attractively bound in maroon Leathercloth and Milskin, the binders have only the title gold blocked on the spine.

Price £1.15 post free.

(Available end of February 1974)

PUBLICATIONS DEPARTMENT
SHORT WAVE MAGAZINE
55 VICTORIA STREET
LONDON, SW1H 0HF

*Subscription rate to Short Wave Magazine is £3.20 (First Class)
£2.75 (Second Class) for twelve issues.*

CALL BOOK 1974

**NOW AVAILABLE
FROM STOCK**

DX LISTINGS £3.82

U.S. ,, £4.25

The above prices include postage and packing.

Please order your copy early from:

Publications Dept.,
SHORT WAVE MAGAZINE
55 Victoria Street, London, SW1H 0HF
01-222 5341

RADIO AMATEUR HANDBOOK (ARRL 1973)

This HANDBOOK, the most widely used manual of communications theory, design, and construction, contains descriptions of the latest solid-state devices and their application. The construction projects included cover the entire field of Amateur Radio interest. Written in a no-nonsense style, the HANDBOOK appeals to beginners and advanced amateurs alike. This edition contains 700 pages, including index, and nearly 100 new illustrations and drawings. The price remains at **£2.90**, also available in a hard-covered clothbound edition at **£3.70** (both post free).

Order from

Publications Dept.
SHORT WAVE MAGAZINE LTD.
55 VICTORIA STREET,
LONDON, SW1H 0HF

SOME TITLES DESCRIBED

ABC's of ANTENNAS

The introductory chapters cover the fundamentals of radio-wave propagation and basic antenna characteristics. The remainder of the book is then devoted to a discussion of the various types of antennas and their uses. Antennas for radio, television and two-way communications are included. Business radio, amateur, both mobile and fixed-station operation, are covered. The final chapter should be particularly appealing to those interested in microwave uses and radio-navigational systems. A perusal of this book will provide any student with an excellent foundation for more advanced study in antenna design.

92p

AMATEUR RADIO SSB GUIDE

Single-sideband receivers, transmitters, and transceivers are now available which have higher frequency stability and are much easier to tune than the early models. In this book, the author presents a guide to single-sideband and single-sideband equipment, which will be useful to any amateur considering or already operating SSB.

By W6TYH

£1.62

BEGINNER'S GUIDE TO RADIO

For many years "Beginner's Guide to Radio" has been extremely popular as an introduction to the subject of radio-and-how-it-works. The many advances made in recent times have rendered a new edition necessary.

This seventh edition has been completely rewritten and brought up-to-date to take account of the latest techniques and methods, and covers every aspect of the modern radio scene, while including the important basic information necessary for the newcomer to the subject. The reader is guided from the first principles of electricity and magnetism, through radio waves, modulation and radio components, including valves and transistors, taking in radio transmitters and stereo broadcasting, and ending with hi-fi reproduction.

The book will be of interest to all who wish to understand the how-and-why of radio, whether it be for a hobby or a profession.

Seventh Edition

£1.15

RADIO AMATEUR OPERATOR'S HANDBOOK

The opportunity has been taken of bringing this edition—the twelfth—right up-to-date and of incorporating extensive revisions. The book covers in detail the Post Office regulations governing the issue of transmitting licences.

The purpose of this Handbook is to provide all the information which the operator of a radio station may need about such matters as Country Prefixes, Call Sign Areas, Frequency Allocations, Standard Frequency Transmissions, Time Factors, Distance Tables, and so on. For the newcomer, this manual enables him to find the basic answers and to obtain the maximum pleasure from his hobby.

54p

TRANSISTOR FUNDAMENTALS Vol. I

This book is a carefully planned programmed introduction to semi-conductors and the basic electrical circuits. It begins with a brief description of transistors and later devotes an entire chapter to an explanation of transistor principles. Sandwiched between these chapters are explanations of voltage, current, and resistance; and the all-important Ohm's Law and Kirchhoff's laws. The book also looks at the more complicated nature of inductance, capacitance, and resistance in AC circuits.

£1.95

RADIO CIRCUITS

By Thomas M. Adams

This volume deals in great detail in explaining the action of the various circuits used in radio receivers—also voltage analysis and signal substitution methods for servicing typical valve and transistor receivers.

£1.85

KNOW YOUR OSCILLOSCOPE

By Paul C. Smith

The oscilloscope provides you with a "third eye" which lets you see what is actually happening in electronic circuits. But you must know something of the nature of this valuable instrument, and how to use it, before it will serve you. This book presents complete information on the circuitry, functions, and applications of the oscilloscope in easy-to-understand language. Worthwhile reading for anyone who uses an oscilloscope... a "must" for service technicians and students.

£1.82

(American and English Books)

The above prices include postage & packing.

Delivery is from stock.

Available from

Publications Dept., 55 Victoria St., London SW1H 0HF

(Counter Service, 9.30 - 5.15, Mon. to Fri.)

(GIRO A/C. No. 547 6151)

SHORT WAVE MAGAZINE

01-222 5341

(Nearest Station: St. James's Park)

PRACTICAL INTEGRATED CIRCUITS

This is the first British book to be published on micro-electronics for the amateur experimenter. With circuit diagrams, layouts and easy instructions, it shows how to construct ten practical radio and electronic devices using integrated circuits (IC's) which are now available at low cost from many component stores. Micro-electronics—the big development in electronics since the transistor—involve complex circuits in the form of tiny "chips", incorporating several circuit elements, to which it is only necessary to make connections. Various kinds of micro-circuits are already available to amateurs, with new ones regularly coming on to the market. In this book the authors provide, in addition to practical projects, an introduction which shows clearly the present state of the art and a summary of the items available commercially. The advent of the integrated circuit (IC) opens up a fascinating new field for the electronics student, constructor and experimenter. This book shows how to get started and produce some really interesting and worthwhile equipment.

O/P

HANDBOOK OF TRANSISTOR CIRCUITS

By Allan Lytel

Here is a collection of more than 200 practical transistorised circuits for use in counters, power controls, timers, indicators, photoelectric devices, power regulators, amplifiers, power supplies, oscillators, power converters, and other applications. Schematic diagrams, parts lists and descriptions of operation are included for each circuit. Planned as a supplement and companion volume to author Lytel's previous book, *Transistor Circuit Manual*, many of the circuits employ such specialised semi-conductor devices as silicon-controlled rectifiers, photocells, zener diodes, and tunnel diodes, in addition to standard diodes and transistors.

This book is a handy source of information on the design, operation, and application of a wide variety of transistorised circuits. Engineers, technicians, students, and hobbyists will all find the circuits of interest and the material of value in research, development, experiment, and general studies of circuitry.

£2.39

PRACTICAL WIRELESS CIRCUITS

There are more than 50 different circuits detailed in this book. Transistor receivers, 22 in all, range from an ultra-simple crystal diode circuit to a very sophisticated 10-transistor communications Rx. Valve receivers cover MW, SW and FM. Transistor and valve amplifiers include preamplifier, PA and Stereo.

There is a chapter on transmitters and transceivers, and another on transmitter and receiver circuits for Model Control. Circuits for an extensive range of Test Gear cover everything from a simple Transistor Tester to a Comprehensive Multimeter, including a Pocket Signal Tracer (RF, AF and IF), also FM, Square-Wave and Noise Generators.

Among the special circuits are a recording level meter for tape recorders, an electronic photographic timer and a solar cell receiver.

The first few simple circuits are accompanied by step-by-step instructions to enable the absolute beginner to gain enough experience with circuitry building to tackle the more complicated work.

£1.35

49 EASY TRANSISTOR PROJECTS

This book is for the electronic hobbyist who is interested in developing projects that can be fun as well as useful. Most projects can be constructed in one evening using only a few inexpensive parts. Many of the parts can be salvaged from old radio and television chassis. Each project is presented in an easy-to-understand way, with a parts list and a schematic diagram. Many value substitutions can be made in resistors and capacitors without affecting the end result, providing that the proper transistors, coils, and transformers are used.

Projects in this book, which include an AM radio, an FM receiver, light relay controls, audio amplifiers, code practice oscillators and test equipment—each designed with only two transistor types.

O/P

110 SEMICONDUCTOR PROJECTS

Due to the rapid advances in semiconductor technology, many engineers and certainly most amateurs have found it impossible to keep track of the new devices that become available because of lack of readable information. This book introduces the reader to such outstandingly useful new devices as the field-effect transistor, uni-junction transistors, silicon controlled-rectifiers, silicon planar transistors and integrated circuits, giving their properties and methods of operation, with full constructional details of many exceptionally useful circuits.

Of particular interest to the amateur are simple amplifiers, lamp and relay driving circuits, electronic switches—operated by light, sound or contact with water—and delay circuits ranging from a fraction of a second to 35 minutes. Among the many circuits which will be of interest to the practising engineer are amplifiers with input impedance as high as 500 megohms, voltage and current regulators, waveform generators, analogue-to-digital converters and logic circuits. All circuits are designed around internationally available semiconductors.

124 pages, including 110 illustrations

£1.31