

VOL. XXXII
No. 2

25p

THE
**SHORT
WAVE
MAGAZINE**



WORLD WIDE
COMMUNICATION

For the Radio Amateur and Amateur Radio

Have you done your sums?

Add THE WORLD RECORD ANTENNA
to THE WORLD FAMOUS TRIO
and YOU HAVE A COMPLETE RADIO STATION
equal TO THE BEST FOR ANY LOCATION —

READY TO PLUG TOGETHER IN MINUTES AT A COST LITTLE **MORE** THAN THE COST OF THE TRIO ALONE!!!

F R E E Speaker ; 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, internal speaker, plus accessories, go to complete your READY TO USE RADIO STATION at a price that truly represents VALUE FOR MONEY! 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 (£46.75).

PACKAGE PRICE £64.52 (Save £14.28)

NOTHING MORE 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-Z500 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 £2.00; TRIO: Linear Amplifier TL911 £172.15 PLUS £32.50 worth of Partridge equipment FREE; TRIO TR2200 2m. personal transceiver £87.45 PLUS £17.50 worth of Partridge equipment FREE; TRIO TR7200 2m. car transceiver £142.45 PLUS £28.50 worth of Partridge equipment FREE; 6 spare valves for 9R59DS £2.35; OA2 Mains Stabiliser 74p; 9R59DS £46.75 (VAT incl.) plus FREE Speaker del. OUR RISK.

Amazing "DX-CRYSTAL SET" £2.42 incl. unique aerial. Free with your Partridge Package.

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 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, 2kw 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.

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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

- ★ 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.

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THIS COMPANY CONTINUES UNDER THE DIRECTORSHIP OF G8KW

Write or phone for catalogue

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



Western



We regret that due to cost increases, Yaesu have increased prices and these are now as follows: (Exc. VAT).

YAESU PRICES (inc. free delivery by Securitor):

TRANSCIVERS

*FT-75	£138-00
FT-101	£280-00
FT-101B	£330-00
*FT-200	£170-00
*FT-401	£310-00
*FT-501	£375-00

*Power supply required.

POWER SUPPLIES

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DC-75	£39-00
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TRANSMITTERS

FL-50B	£70-00
FL-400	£193-00

RECEIVERS

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FR-400SDX	£210-00

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FL-2100	£165-00
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FL-2500	£130-00

until stocks exhausted

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FV-50B for FL-50B	£34-00
FV-50C for FT-75	£34-00
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FV-101B for FT-101B	£48-00
FV-200 for FT-200	£48-00

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SP-101B	£13-00
SP-101P	£26-00
SP-101PB	£29-00
SP-400/401	£13-00

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FT-2 AUTO	£157-00
FT-2FB	£115-00
FP-2AC	£38-00
FP-2AC/B	£71-00
SIGMASIZER 200	£196-00
FT-220	£264-00
FT-620	£170-00

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YD-844 Table Mic.	£14-75
YD-846 Hand Mic.	£5-75
Fan, FT-101	£9-00
FP 50DX L.P. Filter	£12-25
Crystals FT2F/B	pr. £3-50

FREQUENCY COUNTERS

YC-355 AC only	£99-00
YC-355 AC/DC	£110-00
YC-355D AC/DC	£127-00

NEW-Coming shortly
YO-100 MONITOR SCOPE

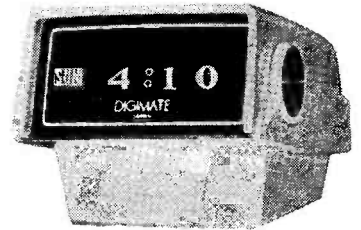
Price £93.00

455 KHz or 9 MHz £2.50 extra

Keep a watchful eye on your transmitter's output or use it to tune-up for maximum p.e.p.!

Can be connected to your receiver also to monitor incoming signals.

BATTERY CLOCK



(£6.82 inc. VAT)

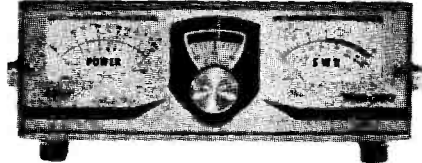
This operates for about 6 months on one battery (provided). Available in red, blue, orange, ivory and brown; list your choice in order of preference.

OSKER
POWER METER

(Ex Stock)

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

Price: £19.50 VAT extra



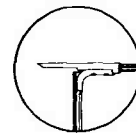
ATTENTION H.F. MOBILE OPERATORS!

Fed-up with having to disconnect resonators/whips before garaging?
Fed-up with having to go slow due to inadequate mounting?
Then here's the answer... the "HUSTLER."

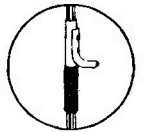
Hustler and only Hustler gives you 12 years of proven performance, mechanically and electrically superior to all others. You get exceptional reports on every band, lowest SWR and broadest bandwidth. Matching devices are not required. Use any convenient length of 52 ohm feed line. Convenience of fold-over mast for rapid band change or easy garaging, optimizes performance on each band and a time proven concept in mobile communications, a concept verified by the overwhelming majority of amateurs, are yours only with the Hustler!

MO2 MAST
FOLDS OVER

Rotates 360° in horizontal plane



The original hinge and sleeve clutch mechanism.



NEWTRONICS HUSTLER MOBILE ANTENNAS. Carr. 75p

BM1 Bumper mount	£5-05	RM10	£5-00	RM20	£6-05
MO2 Mast	£7-50	RM15	£5-55	RM40	£7-50
RM75	£8-00				
Ball Mount	£2-00				
Stainless steel spring	£5-45				
Resonator spring	£2-65				
Carr. 50p.					

VAT extra.

W.E. QUAD 10-20m, "boomless" type. Cast aluminium centre, bamboos, etc. ... £30-00 (Carr. paid)

W.E.J 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 S.500 watts, £16. Type HP for 1 kW p.e.p., £17-25. Type P with a special copper/terylene braided element for ease of coiling up. Supplied with winding spools and 70ft. co-ax, £19-50. VAT extra.

PRICE LIST. Our latest (March) list is available f.o.c. upon receipt of a foolscap S.A.E.

CATALOGUE of Tower, Masts, Antennas, Rotors and Communications Equipment is available at 20p. (No S.A.E. required).

All advertised prices exclude VAT and are subject to manufacturers and currency fluctuations.

50p SMALL ORDER SURCHARGE. Due to the increased costs of handling and processing, all orders under £2 will bear this surcharge.

Electronics (UK) Ltd

Punch a hole in the Band! with WILSON QUALITY Mono & Duo-Band Beams

New Reinforced wide spaced 40, 20, 15 and 10 metre beams

All W7GVA beam elements are constructed of the finest aluminium available, 6063T832 and 6061-T6 both top quality alloys.
All Wilson Electronics beams have a 3" O.D. boom made of top grade aluminium 6063-T6.
All our beams come complete with adjustable reactance tuned gamma match network which can handle 4 KW plus on CW and SSB.
Prices include carriage (exclude VAT). All models are ex-stock at the time of going to press and all 20 and 40m. models have reinforcing kits for maximum strength.

WILSON MONO BAND BEAMS VAT extra.

Model No.	Beam	Gain	Price
M340	3 ele. 40 metre beam	8.5 dB	£282
M240	2 ele. 40 metre beam	5.5 dB	£140
M720	7 ele. 20 metre beam	Gain 14 dB	£259
M720	7 ele. 20 metre beam	Gain 14 dB	£259
M620	6 ele. 20 metre beam	Gain 13 dB	£199
M520	5 ele. 20 metre beam	Gain 12 dB	£107
M320	3 ele. 20 metre beam	Gain 8.5 dB	£58
M715	7 ele. 15 metre beam	Gain 14 dB	£99
M615	6 ele. 15 metre beam	Gain 11 dB	£83
M415	4 ele. 15 metre beam	Gain 10 dB	£54
M810	8 ele. 10 metre beam	Gain 14.5 dB	£107
M510	5 ele. 10 metre beam	Gain 12 dB	£54

WILSON DUO BAND BEAM

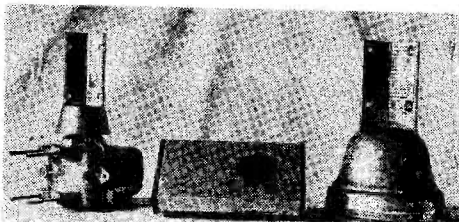
DB62	6 ELE. 20 and 2 ELE. 40 INTERLACED BEAM	Gain 13 dB—20 5.5 dB 40. Boom length 50ft.
DB52	0 ELE. 20 and 2 ELE. 40 INTERLACED BEAM	Gain 13 dB—20 5.5 dB. Boom length 40ft.
DB54	5 ELE. 20 and 4 ELE. 15 INTERLACED BEAM	Gain 12 dB—20 10 dB—15. Boom length 40ft.
DB43	4 ELE. 20 and 3 ELE. 15 INTERLACED BEAM	Gain 10 dB—20 8.5 dB—15. Boom length 30ft.
DB32	3 ELE. 20 and 2 ELE. 15 INTERLACED BEAM	Gain 8.5 dB—20 6 dB—15. Boom length 20ft.
DB76	7 ELE. 15 and 6 ELE. 10 INTERLACED BEAM	Gain 14 dB—15 13 dB—10. Boom length 40ft.
DB65	6 ELE. 15 and 5 ELE. 10 INTERLACED BEAM	Gain 13 dB—15 12 dB—10. Boom length 32ft.
DB44	4 ELE. 15 and 3 ELE. 10 INTERLACED BEAM	Gain 10 dB—15 8.5 dB—10. Boom length 20ft.
DB67	7 ELE. 20 and 6 ELE. 15 INTERLACED BEAM	Gain 14 dB—20. 13 dB—15.

BANTEX FIBREGLASS MOBILE ANTENNAS (Carr. 75p) VAT extra.

70 1/2 70 MHz, 1/2 wave	£3.00	BGA, 144 MHz, 1/2 wave	£6.15
144 1/2 144 MHz, 1/2 wave	£2.85	BS, 144 MHz, 1/2 wave	£4.45
Magnetic Mount	£6.15	Note—Deduct 50p from price of aerial if base is not required.	

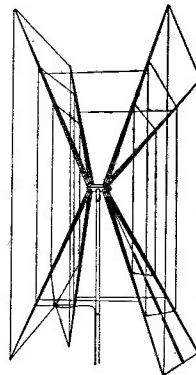
The NEW SILENT CDE ANTENNA ROTORS are ex-stock. These supersede the previous "Clunk-click" models.

CDE ROTOR PRICES:
AR20, £22; AR30, £25; AR40, £30; TR44, £52; HAM-M, £79.
VAT extra.



It's Spring time! Antenna time

For the most comprehensive service and advice we hope that you will feel free to consult us for advice upon your requirements.



From CANADA

GEM QUAD

£72.00 VAT extra for 10, 15 and 20m.

- * Weighs only 21 lbs.
- * Withstands 100 m.p.h. winds.
- * Forward gain up to 8 dB.
- * Balun included.
- * Converts to 3 or 4 element quad.
- * Fibreglass tri-decticspreaders.
- * Front/back ratio 25 dB.
- * Low angle radiation.

From the U.S.A.

HY-GAIN

Hy-gain 18AVT/WB the great new wide band vertical self supporting for 10-80m. (ex-stock). Take the wide band, omnidirectional performance of Hy-Gain's famous 14AVQ/WB add 80 mtrs. plus extra heavy duty construction and you have the new 18AVT/WB * True 1/2 wave resonance on all bands * 52 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.

Hy-Gain (Carr. Paid)			
Hy-Tower	10-80m.	Vertical self supporting	£132.00
18V	10-80m.	Vertical self supporting	£15.50
12AVQ	10-20m.	Vertical self supporting	£20.00
14AVQ	10-40m.	Vertical self supporting	£29.50
LC-80-Q		Loading coil for AVQ, 80m.	£9.30
18AVT/WB	10-80m.	Vertical self supporting	£42.50
TH6DX	10-20m.	6 element beam	£117.00
TH3 Mk.3	10-20m.	3 element beam	£90.50
TH3 Jr.	10-20m.	3 element 600W., beam	£62.00
TH2 Mk. 3	10-20m.	2 element beam	£62.00
Hy-Quad	10-20m.	2 element quad	£90.00
DB10-15A	10 & 15m.	3 element beam	£69.00
DB 24B		3 element 20m., 2 element 40m.	£129.00
402BA	40m.	2 element	£110.00
261		1/2 Wave 108-470 MHz, co-ax and roof mount	£4.80
262		1/2 wave mag mount, 18ft. co-ax	£10.45
263		1/2 wave 130-174 MHz and Boot lip mount and 16ft. co-ax.	£13.20
265		3 dB Gain 144-174 Stainless steel whip and magnetic mount and 12ft. co-ax	£15.00
204BA	20m.	4 element beam	£96.00
203BA	20m.	3 element beam	£87.00
153BA	15m.	3 element beam	£44.00
103BA	10m.	3 element beam	£25.00
LA-1		Lightning arrester	£17.50
LA-2		Lightning arrester	£3.00
12RMQ		Roof mounting kit	£11.00
14RMQ		Roof mounting kit	£13.00
Type 499		Body mount	£5.80
Type S11		Spring, Heavy duty	£5.80
Type 417		Spring	£4.90
E1		End insulator, per pair	£1.80
400		Rotor	£139.00
EN86		Balun	£9.50

VAT extra



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Venus Scientific Inc.

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2nd Generation Slo-Scan

Venus Scientific brings ten years of space-age technology development to the production of the latest breakthrough in HAM Equipment... the SS2 Slo-Scan Monitor. The following unique features of the SS2 have been designed to offer the HAM operator the maximum functional performance in SSTV.

These advances include: **ACCU SYNC**, a diagnostic and tuning aid which converts the SS2 Monitor to an oscilloscope by the flip of a switch that monitors incoming and outgoing video; **LED SWEEP INDICATORS**, go-no-go lights for ease of servicing; **CAMERA ADAPTER** provision to accept Polaroid Color Pack Camera or Polaroid Square Shooter, which enables you to take pictures right off the air; **SIMPLIFIED INDEPENDENT CONTROLS**.
NOTHING COMPLICATED—CONNECTS DIRECTLY TO YOUR LOUDSPEAKER TERMINALS.

PRICE: £249 including V.A.T.

For the full story on how VENUS' SS2 monitor has become the 2nd Generation of Slo-Scan and a list of accessories, write or call today.

U.K. Agents: **LOWE ELECTRONICS RADIO SHACK LTD.**

R. T. & I. ELECTRONICS LTD.

where equipment is fully overhauled

EDDYSTONE EC10	£50.00 (£1.00)
TRIO JR160 2M cal.	£54.00 (£2.00)
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KW77	£85.00 (£2.00)
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)
HEATHKIT DX40 plus VFO	£40.00 (£2.00)
KW YESPA 2 and p.s.u.	£105.00 (£3.00)
HEATHKIT GR 64	£25.00 (£1.00)
LAFAYETTE HA350	£60.00 (£1.50)
HAMMARLUND SP-600-JX6	£135.00 (£2.00)
EDDYSTONE 770U	£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, £46.50; Model 8, Mk. 5, £49.80; Model 40, Mk. 2, £46.50; Model 72, £19.12; Multiminor Mk. 4, £16.55; Standard Leather Carrying Case (Models 7, 8, 40), £9.32; Ever Ready ditto, £10.80; Multiminor Leather Case, £4.82; 10K V.D.C. Multiplier for model 8 or 9, £7.50; 30K V.D.C. ditto, £12.50; Pair of Long Reach Safety Clips, £1.75; Model EA113 Electronic Avo, £92.00; Model 272 Electronic Avo, £32.90; Model TT169 Transistor Tester, £19.80. 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, £7.55 (30p); Standard Jack plugs, 24p (4p).

EDDYSTONE EQUIPMENT, Receivers EC10/2, £102.00; EB37, £99.00; 1000, £220.00; 1001, £230.00; 1002, £245.00; 1004, £280.00; 924 A.C. mains p.s.u., £9.00 (50p); Doublet Aerial 731/1, £8.00 (50p); Plinth Speaker 906, £9.00 (50p); General Purpose Speaker 935, £6.90 (40p); Edometer 902 Mk. 2, £29.50 (50p); Telescopic Aerial Type 991, £2.80 (25p); Active Aerial LP3382, £20.50; Diecast Boxes from 51p (10p). Brochure on request.

CODAR EQUIPMENT, PR40, £8.90 (30p); Leaflets on request.

In present conditions we regret that all prices are subject to alteration without notice.

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 Parking 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

LAFAYETTE HA800, £57.50 (50p).

PARTRIDGE "JOYSTICKS", "New Lightweight VFA" £12.10 (40p).

"JOYMATCH" 111, 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 Bandswitch, £4.50 (30p). Literature on request.

TRIO EQUIPMENT, Receivers: TR7200, £129.50 (£1.00); TR2200, £79.50 (£1.00); SR59DS, £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, 444T, £15.00 (40p); 444, £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, £104.00 (50p); Alpha, £12.00 (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, £49.50 (40p), etc., etc. We also supply **PHILIPS and KORTING COLOUR TV TEST EQUIPMENT**, including Colour Bar Generators, Convergators, etc.

KW EQUIPMENT (Don't forget your FREE mic. with every Tx. and Txcr.!). D.C. p.s.u., £48.00 (£1.00); KW 2000B only, £200.00 (£1.50); KW2000E plus A.C. p.s.u., £275.00 (£3.00); KW ATLANTA + A.C. p.s.u., £200.00 (£2.00); Remote V.F.O. for Atlanta, £34.00 (50p); VOX unit for Atlanta, £8.50 (25p); Remote V.F.O. for 2000B, £36.00 (50p); KW1000 Linear amplifier, £150.00 (£2.50); KW202 Receiver with calibrator, £160.00 (£1.50); KW 202 Matching speaker, £8.00 (80p); KW204 Transmitter, £170.00 (£2.00); KW107 combined E-Z Match; VSWR indicator, dummy load, and ant. switch (4 outlets) 52 or 75 ohms, £60.00 (80p); KW103, VSWR and power meter, 52 ohms, £14.00 (60p); KW109, £75.00 (80p); 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

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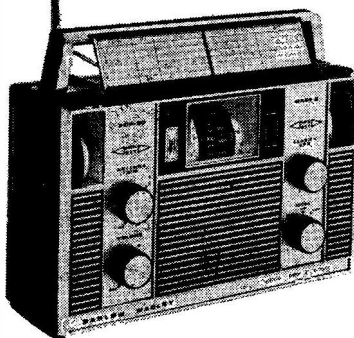
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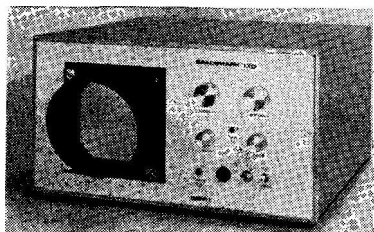
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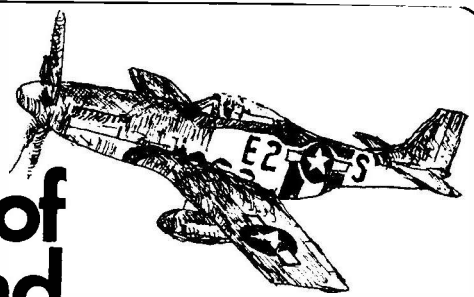
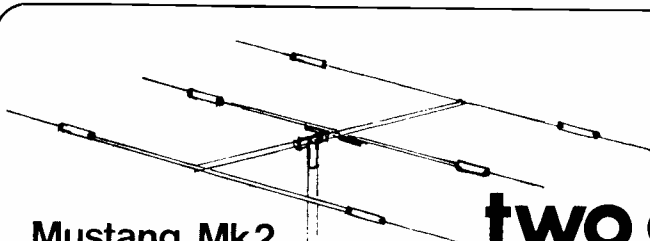
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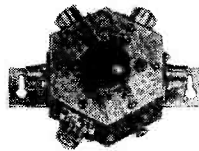
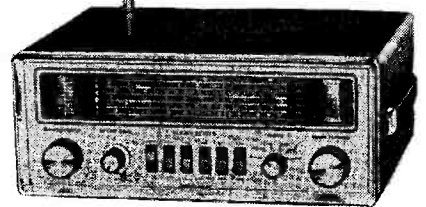
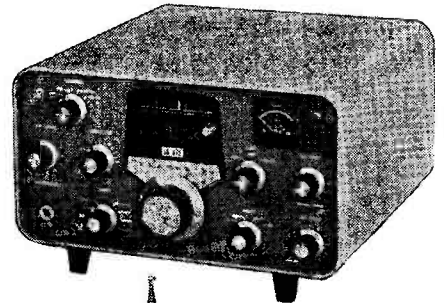
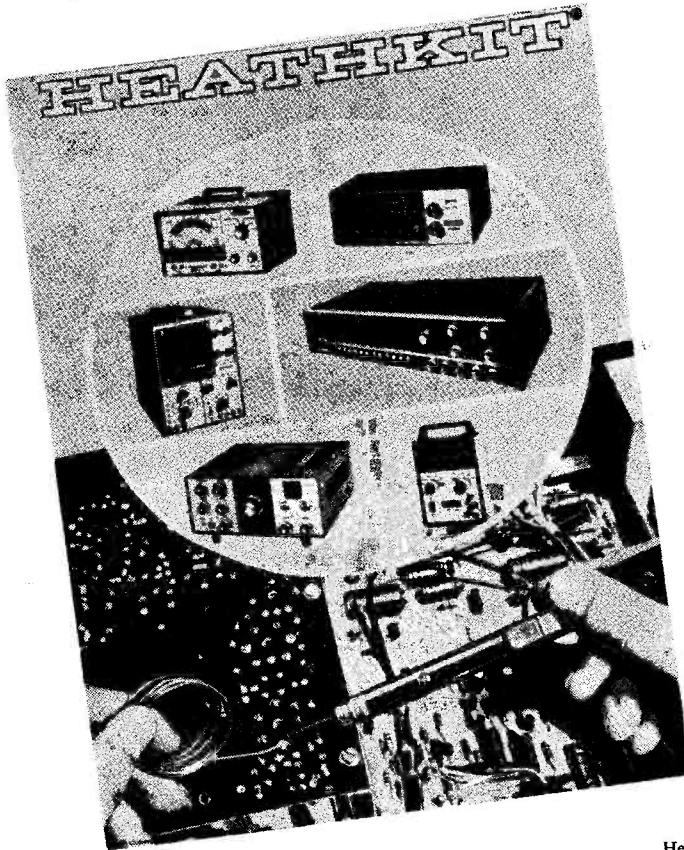
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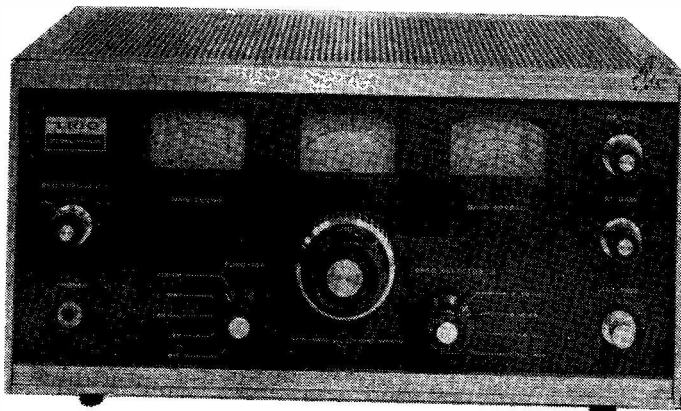
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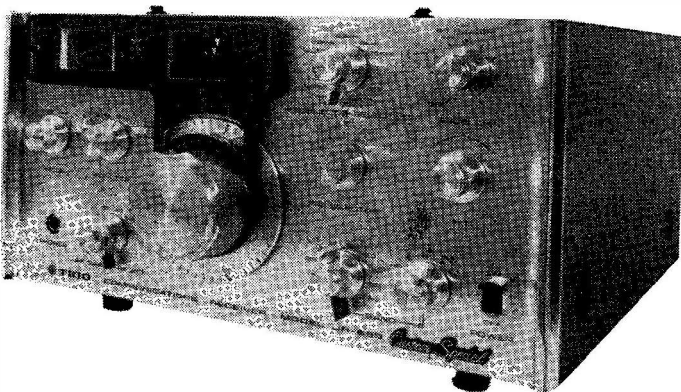
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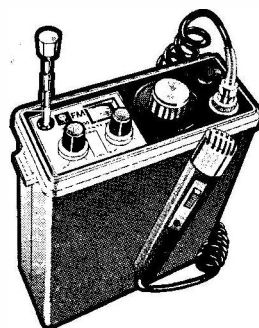
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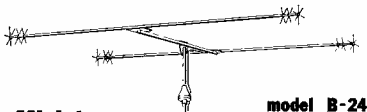
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28-30 MHz and 27-7 MHz. These converters use 116 MHz range crystals with no frequency multiplication. This overcomes the problem of unwanted signals from the fundamental and harmonics of the 38 MHz crystals generally used in other converters. Other I.F.s in stock 9-11 MHz, 14-16 MHz, 18-20 and 24-26 MHz. £15-12.

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Receives 2 metres on a conventional M.W.B.C. receiver, very good used with a car radio, I.F. output 0.5 to 1.5 MHz for 144.5 and 145.6 MHz in two switched bands. Size: $5'' \times 1\frac{1}{2}''$ front panel, $4''$ deep. Price: £20-62.

SM 70 70CM CONVERTER

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 (Use it with the Europa).

2 METRE PRE-AMPLIFIERS—Ex Stock

Perhaps I had better clarify the difference between our two models of pre-amplifier. The Sentinel Pre-Amplifier, which we have been making for 4 years, is designed for absolute optimum performance on noise, gain and selectivity. It is built in an aluminium box which matches our converters and has isolated +ve and -ve supply lines to make it compatible with any existing supply polarity. The PA3 is a small printed circuit amplifier (approx. 1 cubic inch) with solder pins for connections with small size the primary consideration. This was done to satisfy the large demand for a high

performance pre-amplifier to put inside transceivers (Japanese types and surplus ones) where it can be fitted in the receive aerial lead after the c/o relay. We have maintained the same gain figure, slightly inferior noise figure and a less than ideal selectivity characteristic. However its many users will testify to the great improvement in receive sensitivity realised.

SENTINEL LOW NOISE FET PRE-AMPLIFIER.

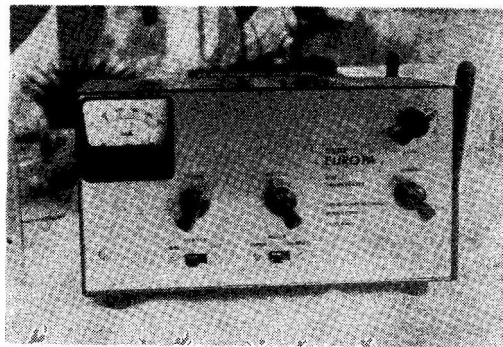
* Low noise figure 1 dB. Gain 18 dB. Price: £7-15.

PA3 DUAL GATE MOSFET PRE-AMPLIFIER

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

SSM EUROPA 10 to 2 METRE TRANSVERTER

As you will have seen from the new 2 metre band plan the SSB section is shown from 144.15 to 144.5 (285 kHz) with a footnote to the effect that the upper limit is flexible—extending up to 145 MHz. This, of course, recognises the fact that the use of SSB as a dx communication mode is growing as quickly on 2 metres as it did on the H.F. bands several years since. It is, therefore, important that your equipment can cover the whole band. The Europa will give you complete 2 metre coverage with 28-30 MHz H.F. equipment.



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SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXXII

APRIL, 1974

No. 366

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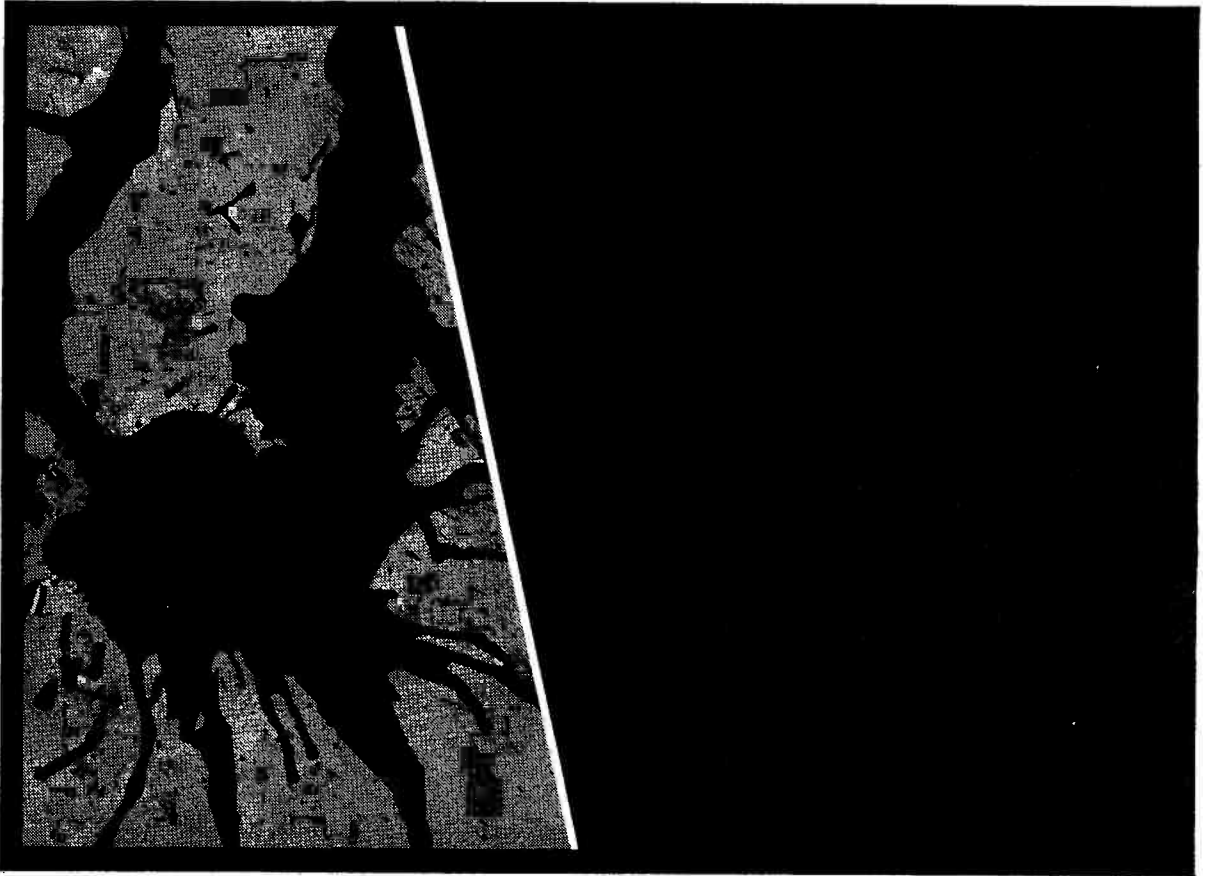
AUTHORS' MSS

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.

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The SHORT-WAVE Magazine

EDITORIAL

“CALCULATORS FOR THE R.A.E.”

Reference that item on last month's Editorial page, we are now officially informed by the City & Guilds that calculators are *not* permitted to be taken in for the R.A.E., Subject No. 765, the next examination being on May 16, at centres up and down the country. However, this matter of the use of calculators, readily available for the sort of simple sums encountered in the R.A.E., is to be reviewed by C. & G. at the end of this year, it being recognised that pocket calculators are allowed in many professional examinations, and by Universities. After all, these calculators do no more than give a quick mathematical answer—provided you know how to answer the question. Anyway, in a subject like the R.A.E., where there is a choice of questions in Part II, you can dodge the mathematical ones altogether and still get pass marks.

* * *

BUREAUCRATIC EFFRONTERY

It seems that a licensed amateur at Thurnscoe, Yorks. (callsign not given) was ordered by the local Dearne Valley council—*ordered by his local council*, mark you—to “cease operating on the grounds of amenity and nuisance” (*sic*). His neighbours had complained of TVI. And who, do you think, clamped down on this council on his behalf? Not the *Daily Mirror*, reporting the matter in their issue of March 12, but the Post Office, who said that in the first place the amateur concerned was *not* causing TVI and that anyway the Dearne Valley Council had no authority whatever to close down, by their *diktat*, a licensed amateur—who happens, incidentally, to be a 54-year-old confined to a wheel chair with multiple sclerosis.

The *Daily Mirror* report is fair enough as to the facts. But one may ask, how compassionate can some neighbours be? Those who live in Whin Gardens, Thurnscoe, may be scratching their heads a bit by now.

And with what arrogance can local council officials,

who are no more than servants of the public and should constantly be reminded of that fact, invest themselves! After all, one of the functions of your local “chief executive” (as they like nowadays to be called) is to empty your dustbin.

* * *

WHAT, NO INDEX?

Normally, a full Index to the last Volume, as a free loose supplement, would have appeared with the March issue of SHORT WAVE MAGAZINE, with which we started Vol. 32. However, this was not possible due to the recent printing difficulties, it having been necessary to reduce machine work to a minimum while the 3-day week restriction remained in force. It is hoped that the Index to Vol. XXXI will be included in the May issue.

* * *

NORTHERN RADIO CONVENTION

This well-established annual event will be held on Sunday, May 12, as usual in the Exhibition Hall, Bellevue, Manchester, organised by the Association of Northern Radio Societies. Opening at 11.0 a.m., each member-Club will be represented by a stand, and there will also be trade participation, a raffle, an SS/TV demonstration, an inter-Club quiz and a constructors' contest. Details from D. G. Mott, G8BZY, 17 Newall Carr Road, Otley, Yorkshire.

* * *

MORE DISRUPTION

Just as this was going down, it was announced that a trade dispute in the printing industry would mean restricted working with effect from March 27—which could further delay publication. At the moment of writing it cannot be said when the May-June issues will actually appear.

Austin Forsyth
G6FO

SSB TRANSVERTER FOR FOUR METRES

RUNNING MEDIUM POWER—
DESIGN AND CONSTRUCTION

A. H. DORMER, C.Eng., F.I.E.R.E. (G3DAH)

THE transmitting licence limits the DC input to the final, Class-C stage of a four-metre transmitter to 50 watts. Assuming 100% plate-and-screen modulation, the instantaneous modulation envelope peaks will be four times this value, *i.e.* 200 watts, which is also the input peak envelope power (p.e.p.) permitted when the transmitter is operated under Single Sideband conditions.

Such power may be obtained from a QQV06-40A, but only by grossly exceeding the manufacturer's ratings, since the valve must be operated as a linear amplifier for SSB operation and the efficiency drops from about 66% to nearer 30%.

An alternative is to use one of the external-anode tetrodes of the 4X150 class, although this involves expensive power supplies, blowers and high voltage PA components and, to keep within the licence limitations,

means that the valve must be underrun and, therefore, operate inefficiently.

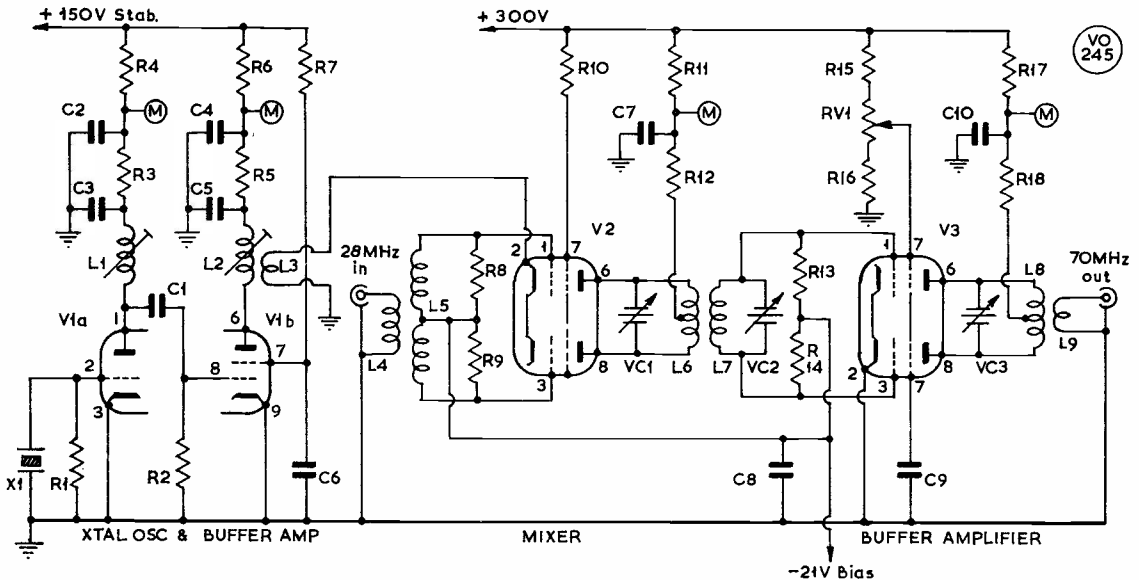
If the power quoted above is reduced by half, it becomes a practical, and economical, proposition to use the QQV06-40A in this application, with the nett result that the signal at the receiving end will be but 3 dB down, —less than one S-point on most receivers.

The transverter to be described has been designed to operate at the recommended voltages and currents for the '640A, and to handle 100 watts p.e.p. at the anode of the PA.

Circuit Description (See Fig. 1)

A triode-pentode valve operates as the generator and buffer of a 42 MHz signal which, together with an SSB signal around 28 MHz, is applied to a low-level, balanced, mixer valve and thence, *via* another buffer amplifier to the QQV06-40A PA. A simple drive control is provided to allow the correct conditions to be established in the final amplifier for local/DX working and to cope with other transmission modes.

Measurements with a spectrum analyser show the in-band spurious at the anode of the buffer amplifier to be negligible, and the only out-of-band signal of any significance, on 210 MHz, to be some 70 dB down on the main carrier at the antenna. This result can only be achieved if the SSB input signal is itself "clean", and it is



(M) = Metering points

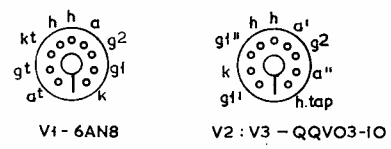
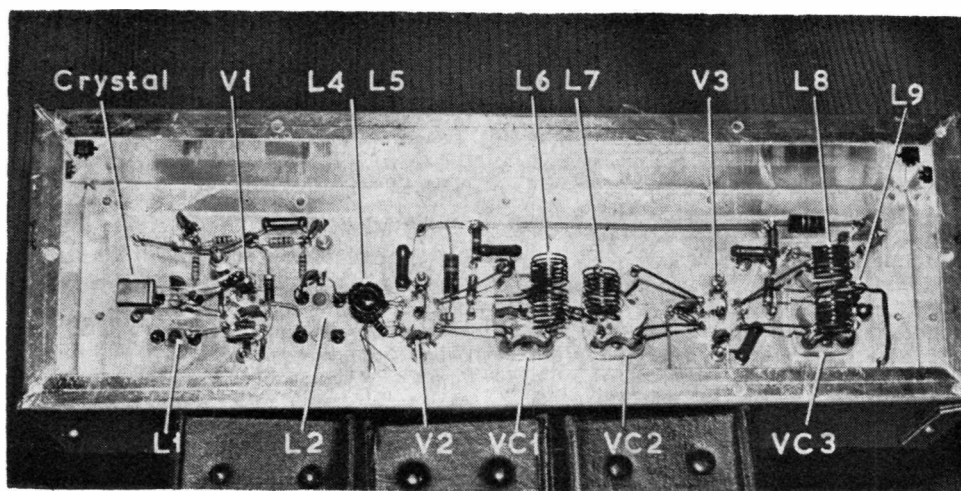


Fig.1 FOUR METRE TRANSVERTER DRIVER CHASSIS

V1 - 6AN8
V2 : V3 - QQV03-10

Fig. 1. Circuit of the Four-Metre Drive Unit for the G3DAH Transverter.



Under-chassis layout for the Drive Unit
—compare Fig. 1.

strongly recommended that a good passband filter be used at the output of the prime mover.

Many years of SSB and CW operating on both the HF and the VHF bands have convinced the author of the desirability of a "split-frequency" capability and no provision has been made in this design for transceiver operation although, if this is required it is necessary only to take an output from the anode of the 42 MHz buffer amplifier and use it as the injection voltage for a converter with a 28 MHz IF.

Xtal Oscillator and Buffer Amplifier

It cannot be emphasised too strongly that, in any design for a VHF transverter, the xtal oscillator should operate on as high a fundamental frequency as economics and technical considerations will allow in order that

there should not be a multiplicity of frequencies generated in subsequent harmonic amplifiers which may mix with the input signal to produce undesirable in-band or out-of-band radiation. There is obviously an upper frequency limit for the xtal which is reached when the difference between the injection and radiated frequencies is so small that tuned circuits after the mixing process cannot differentiate adequately between the two.

A number of combinations was tried before the present design was finalised. A 56 MHz xtal and 14 MHz SSB input looked promising, but produced an obtrusive in-band beat ($2f_1-3f_2$). A 41 MHz xtal and 29 MHz SSB combination worked reasonably well, but it was discovered that the output of the prime mover, which was then operating near the upper limit of its range, was not as good as could be desired. It was with some trepidation that 42 MHz and 28 MHz was tried, since $3f_1-2f_2$ came out in the band, but in the event, the use of a balanced, push-pull mixer and adequate filtering provided the necessary protection, and this combination was finally adopted. It also had the advantage that the whole of the 4m. band could be covered (with the FT-101 as the prime mover) which would not have been the case had the SSB frequency been on 14 MHz, unless switched xtals were used in the transverter.

The oscillator design is standard for overtone operation. The 6AN8 was used since the pin arrangement allowed a neat layout. An ECF80 or ECF82 should work equally well in this position, with minor circuit changes. If a single valve is used for the oscillator, it should be followed by a buffer amplifier. The buffer amplifier design requires no particular comment.

The Mixer

Balanced, push-pull mixers are superior to single-ended types in this application, since they can provide inherent discrimination against unwanted harmonics, and the QQV03-10 is a logical and readily obtainable choice.

Table of Values

Fig. 1. The Drive Unit Chassis

C1 = 33 μ F	R10 = 22,000 ohms
C2-C10 = .001 μ F, disc ceramic	R11, R12, R17, R18, R19 = 100 ohms, $\frac{1}{2}$ w.
VC1, VC2, VC3 = 15 μ F, butterfly preset	R13, R14 = 820 ohms, $\frac{1}{2}$ w.
R1, R2 = 100,000 ohms, $\frac{1}{2}$ w.	R15, R16 = 15,000 ohms, 2w.
R3-R6 = 1000 ohms, $\frac{1}{2}$ w.	VR1 = 20K pot., w/wound
R7 = 10,000 ohms, $\frac{1}{2}$ w.	Xtal = 42 MHz, HC-18U
R8, R9 = 470 ohms, $\frac{1}{2}$ w.	V1 = 6AN8, or equiv.
	V2, V3 = QQV03-10

TABLE OF COIL DATA

- L1, L2 = 20 turns 30g. on $\frac{3}{8}$ in. dia. slug tuned former
 L3 = One turn at cold end of L2.
 L4, L5 = Primary 8 turns 28g. enam. Secondary 11 + 11 turns 28g. wound on FX1597 ferrite ring.
 L6 = 6 + 6 20g. enam., $\frac{3}{8}$ in. dia., spaced wire diameter with $\frac{1}{8}$ in. centre gap.
 L7 = 8 turns $\frac{1}{8}$ in. dia. 20g. enam., $1\frac{1}{2}$ in. long.
 L8 = 6 turns 20g. enam., $\frac{3}{8}$ in. dia., with $\frac{3}{8}$ in. gap at centre.
 L9 = 2 turns $\frac{3}{8}$ in. 20g. at centre L8.

Notes: Chassis is 12 x 4 x 3in., with cover. Connectors are BNC 50-ohm. Meter for points M can be 0-50 mA. Unless otherwise stated coils are self-supporting.

Feeding the 28 MHz signal into the grids gives protection against the second harmonic of that frequency and the coupling circuit used eliminates the need for a further LC circuit. Oscillator frequency injection at the cathode of the mixer permits a neat lay-out and the third harmonic, although not cancelled by the push-pull action of the mixer, is sufficiently low in amplitude to be ignored. The mixer anode circuit is loosely coupled to the grid circuit of the following buffer amplifier, and the tuning of both is staggered to provide broad-band coupling and obviate the need for a front panel control.

Buffer Amplifier

A straightforward amplifier is included to provide additional selectivity rather than additional gain, and is a ready means of controlling the amount of drive to the final. Although there is enough output from the mixer to drive the PA in Class-AB1, the valve *should not* be omitted. With the layout shown in the photographs, it was not found necessary to use a screen across the buffer amplifier valveholder, but if, in other arrangements, there is any sign of instability, it is a simple matter to fit one.

The Linear Amplifier

The photograph shows the layout of the QQV06-40A stage, and the circuit diagram appears in Fig. 2, p.000. Note the screen across the chassis between grid and anode circuits. If a screening ring is not used with the valveholder, it is advisable to mount the valve so that the screen is level with the bottom of the anode plates.

Power Supplies

Many constructors will have suitable power supplies available, or wish to construct them with available components. The PSU shown in Fig. 3 has no unusual features with the exception of the variable supply for the QQV06-40A grid. A stable, low-impedance output is required here, and the arrangement shown is to be preferred to the usual wire-wound pot. across a negative

supply. The transmit/receive relay, which switches cut-off bias to the mixer, buffer amplifier and PA valves and earths the screen of the '640A in the "receive" position, is installed on the PSU chassis, but details are not included since constructors are likely to have their own preferences for station switching.

Caution: It should be noted that HT is applied to all valves from switch on.

Construction

The photographs show the transverter built on two chassis which are installed side-by-side in a cabinet with the power supply. The component layout should be obvious. Driver and PA could be built on a single chassis with additional screening between them. The arrangement used here was selected so that if, at a future date, it was decided to go for a larger PA stage, the driver chassis could be removed easily and installed elsewhere.

Both chassis are fitted with covers to provide complete screening, the lid of the PA box being made from perforated metal to afford ventilation.

Table of Values

Fig. 2. The Four-Metre PA Chassis

C1 = .001 μ F, 1 kV wkng., disc ceramic	VC1 = 12 + 12 μ F, split stator
C2 = .001 μ F, 500v. wkng., disc ceramic	VC2 = 20 + 20 μ F, split stator
Ft = All .001 μ F, feed thru	R1 = 1000 ohms, 1w. R2, R4 = 100 ohms, $\frac{1}{2}$ w. R3 = 100 ohms, 5w. V1 = QQV06-40A

TABLE OF COIL DATA

- L1 = One turn, $\frac{1}{2}$ in. dia., 18g. enam.
 - L2 = $3\frac{1}{2}$ + $3\frac{1}{2}$ turns, 18g. enam., $\frac{1}{2}$ in. dia., each section $\frac{1}{2}$ in. long, with $\frac{1}{2}$ in. gap at centre.
 - L3 = Six turns 1in. dia. 14g. enam., 1 $\frac{1}{2}$ in. long, with $\frac{1}{2}$ in. gap at centre.
 - L4 = Two turns 14g., 1in. dia., at centre of L3.
- Notes: Chassis 12 x 4 x 3in., with cover. Meters should be 0.5 mA for grid and 0.200 mA at anode. Connectors BNC 50-ohm type. Coils are wound to be self-supporting.

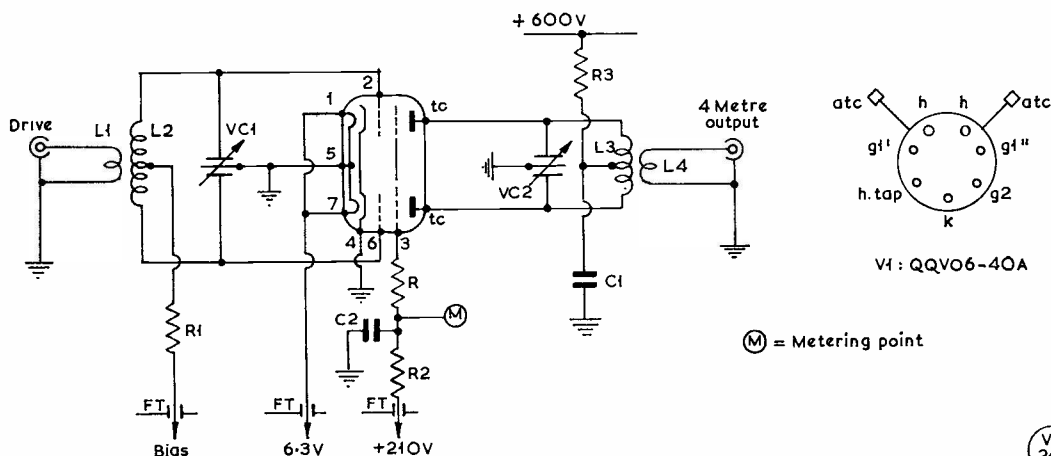
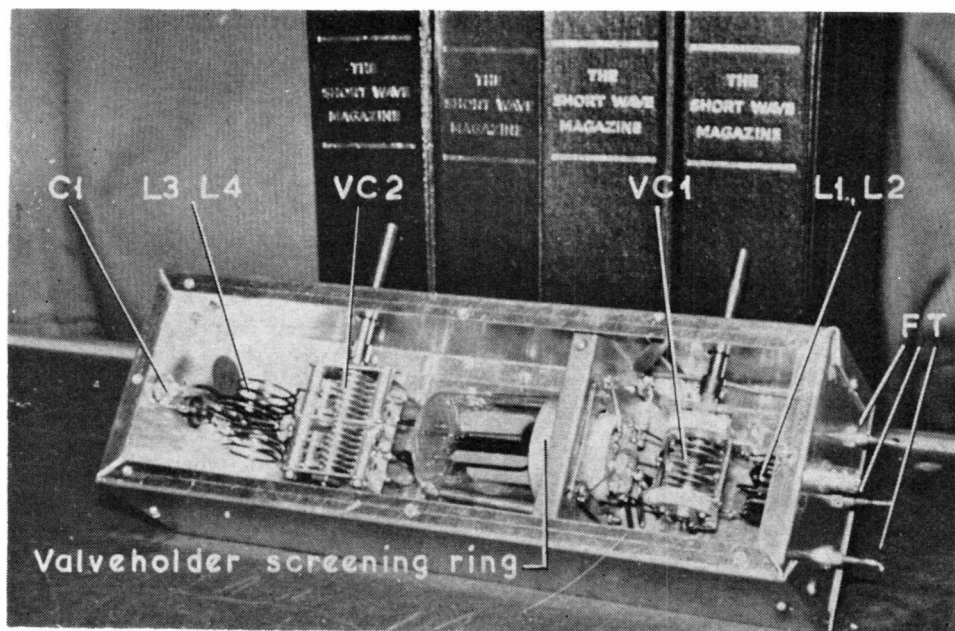


Fig.2 FOUR METRE TRANSVERTER PA CHASSIS

Fig. 2. PA section of the Four-Metre Transverter.





Detail for the Four-Metre PA chassis, input end to right.

Setting-Up

Apply voltage to the xtal oscillator and buffer stages and tune L1 and L2 for resonance. This should result in anode currents of 8 mA and 5 mA respectively. Apply voltage to the QV03-10 mixer and buffer stages. With no input from the xtal stage, the anode current of the mixer should be approximately 15 mA which should drive up to 28 mA on the application of the 42 MHz signal. Ensure that it does not rise above this figure since the valve maximum rating is 9 watts (30 mA at 30 volts). Apply a 28 MHz signal to the mixer grid, adjusting the level until the valve anode current rises by no more than 2 mA with the anode circuit resonant at 70 MHz. Resonate the buffer amplifier anode circuit. Gain control settings on the prime mover should be at normal. Do *not* reduce the 28 MHz signal by turning down the mike gain control since this will upset the operation of the SSB generator. An attenuator should be used to lose excessive drive. The ratio of 42 MHz to 28 MHz should be of the order of 10:1, so very little (half a watt or so) signal is required. With all circuits resonant, and the drive control pot. at maximum gain, an output of just under one watt should result. The anode current of V3 will vary between 5 mA and 25 mA depending upon the setting of the drive control. Check V2 and V3 grid circuits to ensure that no grid current is flowing. Reduce the input signal and set the spacing (normally about half-an-inch) between L6 and L7 until this condition is achieved. Connect the driver to the PA by a short coax link, the PA to a dummy load and output meter, and apply

operating voltages, setting the standing anode current of the 640A to 30 mA by means of the bias control. Approximately 30 volts of negative bias will be required. Apply a small amount of signal and resonate grid and anode circuits. Check for instability in the PA and proceed no further until any present has been cleared. With the drive control at maximum, adjust the coupling links L9 on Fig. 1 and L1 on Fig. 2 until a flicker of grid current shows on the 640A grid meter. These adjustments are interdependent, and the circuits must be restored to resonance after each adjustment.

The PA setting-up process should be completed as rapidly as possible and an eye kept on the plate current meter to see that the valve ratings are not being exceeded. The anode circuit should be adjusted for maximum output and the loading then increased until the output falls by about 10%. The dip in anode current at resonance should be barely perceptible. The application of an SSB signal should drive the anode current up to 165 mA on peaks, indicating 100 watts p.e.p. input. Check adjustments to ensure the continued absence of grid current in all post-mixer stages. The measured output under these conditions is 35 watts p.e.p. Grid and anode currents in the PA are measured on separate meters, the screen current measurement being made on the switched meter associated with the driver.

Finally, the usual warning: *Never* operate the amplifier without a load, and *never* apply the screen volts without anode volts.

All these adjustments are best made with a spectrum

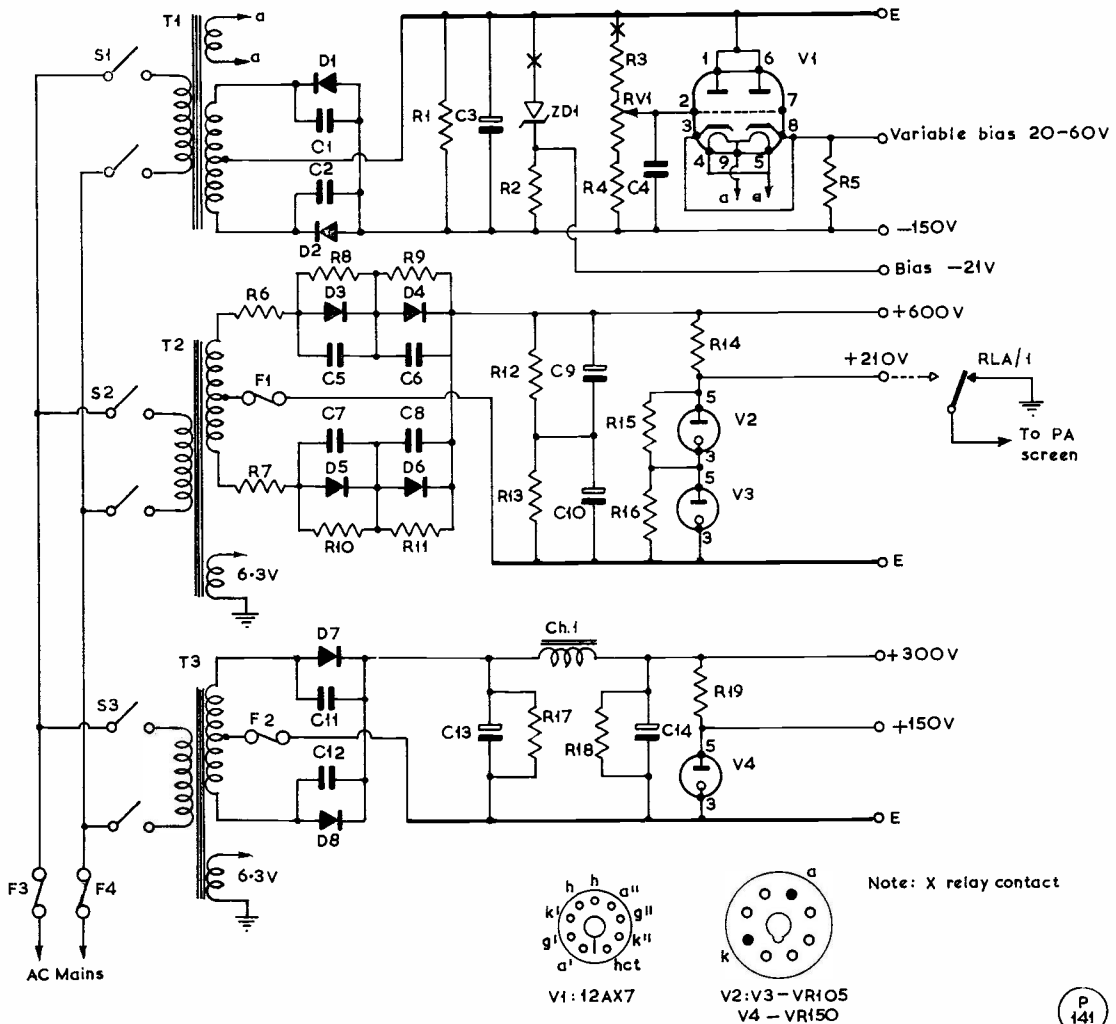


Fig. 3 FOUR METRE TRANSVERTER POWER SUPPLIES

Fig. 3. PSU for the prototype 70 MHz Transverter by G3DAH.

analyser at one's side, but in most cases this will not be possible. A simple way to get the driver broad-banded is to set the SSB input to give 70.2 MHz at the mixer anode and then adjust all subsequent driver circuits by off-setting slightly from resonance until, as is possible, the only adjustments which need to be made to cover 70.025 MHz-70.70 MHz are to the PA grid and anode. Coverage can be held within 1 dB.

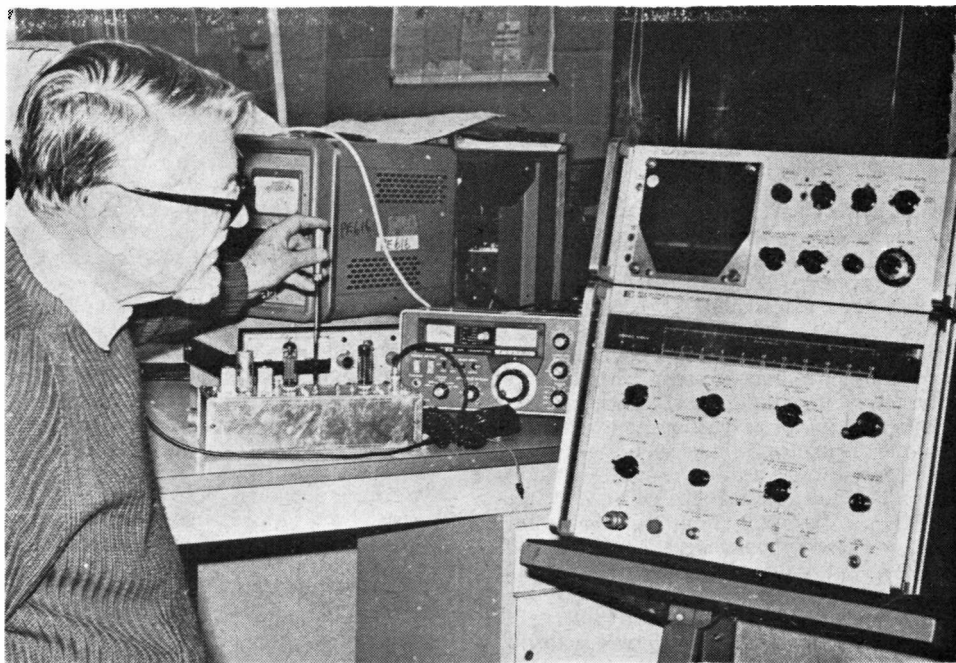
Other Modes

With the DC input to the PA set at 50 watts, the transverter will provide about 17 watts output on FM and CW. For plate-and-screen modulated AM, the

input must be reduced, and the output is then 10w.

Conclusion

Consideration was given, when this project was in its initial stages, to the use of solid-state devices. However, while this would have been feasible and economic for the oscillator chain, it would have meant a string of amplifiers post-mixer, with the attendant possibility of instability, to say nothing of the cost of a linear power transistor capable of handling 100 watts of SSB at 70 MHz! There is still a good case—financially, technically and on the score of availability—for using those devices (known as valves) which glow red when switched on where power is required!



A spectrum analyser in use to set up the Drive Unit for the G3DAH Four-Metre Transverter.

Table of Values

Fig. 3. PSU for the 4-Metre Tx

C1, C2,	R14 = 10,000 ohms, 20w.
C5, C6,	R15, R16 = 47,000 ohms, 2w.
C7, C8,	R17, R18 = 100,000 ohms, 2w.
C11, C12 = .001 μ F disc cer.,	R19 = 10,000 ohms, 6w.
500v./1 kV	VR1 = 50K pot.,
wkng., as appropriate	w/wound
C3 = 200 μ F, 350v.	D1, D2,
wkng.	D7, D8 = 1N4006
C4 = .01 μ F	D3, D4,
C9, C10 = 100 μ F, 450v.	D5, D6 = 1N4007
wkng.	ZD1 = 21.5v. 400 mW
C13, C14 = 16 + 16 μ F, 450v.	zener
wkng.	Ch1 = 20 Hy, 100 ohm
R1 = 15,000 ohms, 2w.	F1, F2 = 100 mA fuse
R2 = 10,000 ohms, 1w.	F3, F4 = 3 amp. fuse
R3 = 4,700 ohms, 1w.	T1 = 125-0-125v. 50 mA
R4 = One megohm, 1w.	T2 = 450-0-450v.
R5 = 22,000 ohms, 2w.	250 mA
R6, R7 = 20K, 5w. wire-	T3 = 250-0-250v.
wound	75 mA
R8, R9,	V1 = 12AX7, or equiv.
R10, R11 = 120,000 ohms, $\frac{1}{2}$ w.	V2, V3 = VR-105
R12, R13 = 20,000 ohms, 20w.	V4 = VR-150

Note: Switches SW1, SW2 and SW3 are DPDT and should be mains type, such as *Painton*.

CLUB FOR FOREST OF DEAN

There is a proposal to form an Amateur Radio club for the Forest of Dean area, across the Severn from Gloucester. Those who might be interested, either licensed or SWL, are invited to get in touch with M. J. Prior, G3XMI, 8 Market Place, Coleford, Glos. (Tel. Coleford 2717.)

RUSSIAN PIRATE "BROADCASTING"

According to a note we have seen recently, in the USSR there is the same trouble with pirate pop-type music as we have here. They give themselves fancy titles and often transmit on frequencies which can be dangerous for the radio safety services. The only difference is that these activities are now officially categorised as being "anti-Soviet"—which means that when caught the perpetrators do time under the rigorous conditions of a Russian labour camp. No excuses are accepted about being an "enthusiastic radio amateur," with a benign smile from the Bench and a nominal fine, with perhaps forfeiture of the gear. In Russia, they go inside, and can stay there for a term of years.

USEFUL CATALOGUE

In looking through the latest Catalogue No. 7 issued by Electroval, Ltd. we found it was a compilation of more than 100 pages, listing a wide range of semi-conductors and transistors of all kinds; integrated-circuit units, many with diagrams; items such as knobs, potentiometers, resistors and capacitors in great variety; cores and pot-core assemblies in siferrit materials, with dimensions; connectors of many types; also switches, relays, transformers and miscellaneous radio parts and accessories. All items are individually priced and many are illustrated in line. This is a very useful catalogue for the home-constructor, as well as being interesting for the general reader. At 25p it is good value, if only as a general reference.—Electroval, Ltd., 28 St. Judes Road, Englefield Green, Egham, Surrey, TW20 0HB (Tel. Egham 3603).

AN AUTO-MUTE CIRCUIT

Tx/Rx INTER-UNIT

F. G. RAYER, T.Eng. (CEI),
A.I.E.R.E. (G3OGR)

AN automatic muting and isolating unit which allows the receiver to be permanently connected to the transmitting aerial can be very handy. It avoids the need for a change-over relay operated by the "transmitter on" switch or receiver standby, or a similar means of control. These methods can and do of course function satisfactorily, but can become a bit of a nuisance when more than one transmitter may be used. In such cases, it may be necessary to transfer other connections as well, when changing from one transmitter to another, so as to complete the muting or relay actuating circuits.

Changes like these are not necessary with the auto-mute unit described here, because it is actuated by the presence of RF on the aerial, from the transmitter. When the unit and receiver are connected together, and to the aerial, the necessary change-over from transmission to reception is obtained automatically, so far as the receiver is concerned. This means that a transmitter need only be connected to the same aerial system, with the knowledge that when RF is present the receiver will be muted, and also isolated from the source of RF.

A single 6C4 small power RF triode is used in the circuit, as in Fig. 1. If this does not fit in with the discipline of the art in its most modern mode, at least it fits well with the rest of a non-solid-state station, and in the

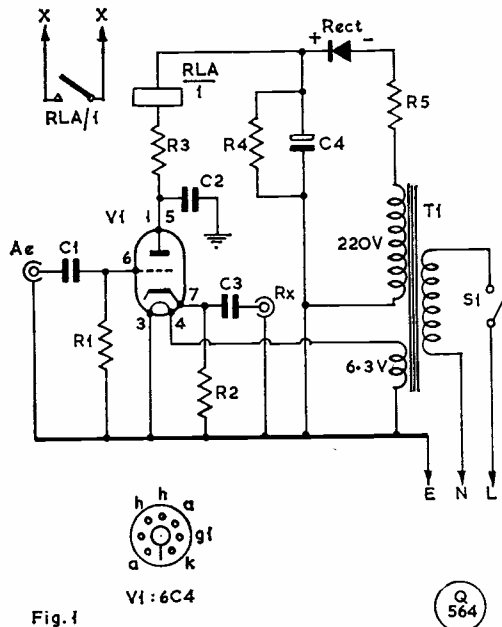


Fig. 1

Fig. 1. Circuit of the Auto-Mute unit

writer's case allowed the unit to be built with items to hand at small expense.

With no powerful RF present, V1 acts as a cathode follower, coupling the receiver *via* C3. This is a screened co-axial lead to the 75-ohm or similar aerial input socket of the receiver. At the same time, current through the relay holds this closed, giving a circuit from X to X.

When the transmitter is on, grid rectification in V1 builds up a high voltage bias across R1, almost cutting off V1. At the same time relay current drops, opening X-X, to silence the speaker.

With some set-ups, the circuit X-X may not be required. Where it is used, interrupt one lead from receiver to loudspeaker, fitting plugs which go into the sockets X-X. At the same time, a resistor of about 4.7 ohms, 1 watt, may be connected across the receiver output transformer secondary (speaker sockets) to load the receiver output stage when the speaker is disconnected. Whether or not sockets X-X have to be used depends on the relative positions of the transmitting equipment, microphone, and loudspeaker, and the volume to which the latter is adjusted, as well as upon other unknown factors such as stray coupling into the receiver, etc.

The grid blocking of V1 is fast enough for break-in with CW, but the relay circuit is of course intended for steady carrier conditions, or AM.

R5 is merely to limit peak current through the rectifier, and R4 is to prevent the HT line voltage soaring when current falls. A 22K 3w. resistor is suitable here, but if only a meagre source of HT is available (as, for example, from the receiver) then this would be unnecessarily wasteful and could be omitted. In a similar way, R2 and R3 could be subject to changes in value, to suit working conditions other than those given.

Construction

The unit is assembled on a 6 x 4in. flat plate, to which is bolted a 6 x 3in. flanged universal chassis runner. After assembly, this allows the whole to be enclosed by bolting on two 4 x 3in. flanged runners and another 6 x 3in. flanged runner, and fixing an additional 6 x 4in. flat plate with self-tapping screws. A few holes are punched for ventilation. Some form of case is necessary to avoid any accidental contact with HT or mains circuits, and the universal chassis box provides screening as well, and is inexpensive.

Fig. 2 shows the layout of components. The valve-holder could be fixed to a bracket, but is supported by two 3/4in. 6 BA bolts, with extra nuts so that the holder

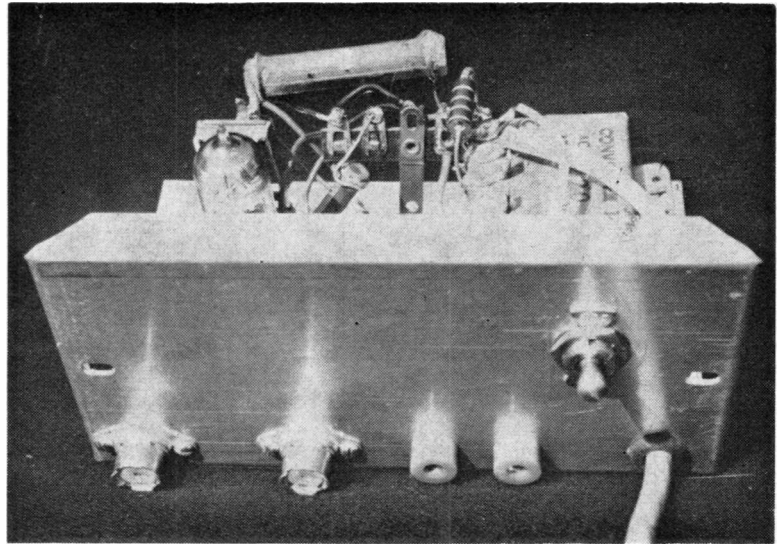
Table of Values

Fig. 1. Circuit of the Auto-Mute

C1 = 22 μ F mica, <i>see text</i>	R2 = 100 ohm, 1/2 watt
C2, C3 = 0.01 μ F 500v. disc ceramic	R3 = 2,200 ohms, 1/2 watt
C4 = 32 μ F 450v. electrolytic	R4 = 22,000 ohms, 3 watt
R1 = 1 meg. 1 watt	R5 = 1 watt
	V1 = 6C4

Notes: Relay, 500-600 ohm or similar; T1, Converter transformer, 220v, 40mA and 6.3v. secondaries; rectifier, 800 p.i.v. $\frac{1}{2}$ A or similar silicon diode. Two co-axial sockets; two insulated sockets; Box: 6 x 4 x 3in. universal chassis with extra 6 x 4 flat plate, (Home Radio, Mitcham); Mains toggle on-off switch; B7G holder.

General view
of the Unit



tags clear the metal easily. Leads are soldered to the holder tags before fixing the holder in place.

A tag-strip supports a few components. There would be no particular reason to place items exactly as shown.

It is important that C1 can easily withstand the peak voltage which will be present. With most equipment, a

1 kV capacitor should do. A coupling capacitance can be made, if wanted, by taking a *well insulated lead* from C1, and winding this for some inches round the aerial connection, where an end-fed aerial is used. With a dipole or tuner, a connection can be made with a coax "T." The RF voltages likely to be present naturally depend on the aerial arrangement, as well as upon the transmitter power. If the unit is connected into a 75-ohm dipole feeder, or 75 ohm lead from Tx to aerial tuner, the voltages will be much smaller, as example, than if the unit is connected into a $\frac{1}{2}$ -wave end-fed aerial circuit at its near, voltage-fed termination. C1 is of quite small value—say 10pF to 25pF. The larger values are more appropriate for lower power (say under 50 watts).

The relay was 600 ohm, but need not be this, provided it closes firmly with V1 drawing its usual current of about 10mA or so. It must be adjusted, if necessary, so that it opens when the Tx is putting RF into the aerial and V1 anode current falls. Current will naturally be less if the HT voltage is reduced, but a 150v. supply can be adequate. Should the switched circuit X-X not be required, then no relay is necessary at all.

Working

When working has been checked, the auto-mute, aerial and receiver can be permanently connected. It is then only necessary to switch the transmitter on and off, for full control. Provided C1 is not so large as to result in damage to the 6C4, V1 will protect the receiver against RF from the Tc, at all times. The unit is not intended for use with transistorised receivers which may have front-end circuits susceptible to damage by RF. These may well need protection by diodes.

It will be noted that if sockets X-X are used, no reception is possible unless the units is switched on. If this is overlooked it may be wondered why the receiving side of the station is dead!

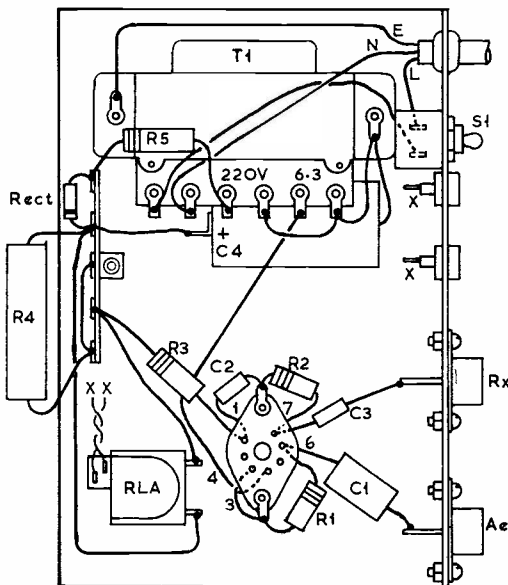


Fig. 2

Fig. 2. Suitable layout and wiring plan

REFLECTOMETER CONSIDERATIONS

READINGS AND MEANINGS

E. JOHNSON (G2HR)

MANY amateurs construct their own reflectometers the various circuits of which are relatively simple. The components are chosen such that the design is suitable for 50-ohm or 75-ohm line. It is a convenience to arrange that switchable resistors are used so that accuracy is assured on lines of both impedance. Often a meter is to hand of suitable range calibrated linearly in current. Although the calculation of SWR is little more than a simple mental exercise, it can be an irritation! At this stage it should be made clear that forward and reflected components are *voltage*, and it is more correct to refer to VSWR.

Calibration

The meter can either be calibrated from the formula

$$\text{SWR} = \frac{I_f + I_r}{I_f - I_r}$$

where f and r are forward and reflected readings respectively, or read from the illustrated graph. It is better to adjust forward reading to full-scale by the sensitivity control for ease of calculation, and is essential if one wishes to re-calibrate in SWR. Unless there is some overriding reason why, there is little point in re-marking the meter beyond half-scale which is an SWR of 3:1. The rest of the scale can be marked in a broad red arc, indicating an area to be avoided! It is in any case usually accepted that an SWR of 2 : 1 or less is acceptable.

Reflected Coefficients and Misconceptions

The reflected coefficient is given by the expression

$$\frac{\text{SWR} - 1}{\text{SWR} + 1}$$

In the case of an SWR of 3 the result is $\frac{1}{2}$. As this is expressed as a voltage, the reflected power is $\frac{1}{2}^2$, or $\frac{1}{4}$. A length of 50ft. of 75 ohm coax—and at many stations it would be much less than this—in a matched state, *i.e.*, “flat” line, could have an attenuation of but 1 dB. The additional loss with this SWR would be around 0.5 dB. Many text-books show this in graphical form. In the instance quoted the SWR would have to be around 12 for a noticeable loss of 3 dB. These losses are due to ohmic loss, dielectric loss plus a very small radiation loss. The *power* reflection coefficient in the latter case would be $(\frac{1}{13})^2 = 0.7$ approx. This appears a paradox, but contrary to ill-founded misconception, reflected power does not necessarily represent a loss. Apart from the real losses already quoted it is true that a reflected component suffers “go-and-return” attenuation, but this is small. Upon reaching the generator, *i.e.*, the PA valve, there is a gross mismatch, and the reflected power is re-reflected and adds to the forward component. The slight time-delay—perhaps a fraction of a μS —

is completely undetectable. It is only important when a TV receiver is badly mismatched to its aerial, when it can cause the effect known as “ghosting.”

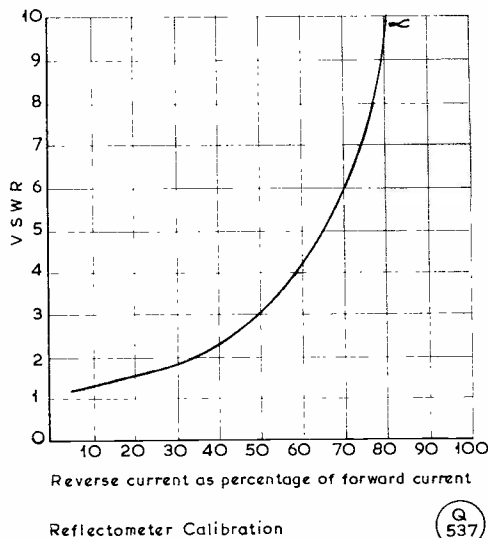
It has been assumed that the feeder is connected direct to the ρi -section output of the transmitter, which the writer considers undesirable. The insertion of an ATU, *e.g.*, a Z-Match, will help harmonic attenuation, and the short length of coax between transmitter and ATU needs little adjustment of the latter to obtain the desirable 1 : 1 SWR.

TVI and Transmitter Damage

Provided a resonant aerial is fed at its current loop, and the radiator is not less than quarter-wavelength high, the coax feeder should present a good match. Any departure from this cannot be remedied at the “home” end. This point has been repeatedly made and should remove misunderstanding. A perfect match is unlikely to be attained, and the reflectometer will not give a strictly correct reading. This is due to the reflected component suffering the normal line attenuation on its return path. This is only of importance where the feeder is unusually long.

Of far greater importance is ensuring that the link between transmitter and ATU is terminated in its correct impedance at both ends, *i.e.*, substantially a 1 : 1 SWR. Only when this condition is satisfied can a low-pass filter show its designed attenuation curve. The correct impedance must be “seen” both at input and output.

Of major importance, particularly with SSB transmitters where p.e.p. has to be considered, is to ensure that a voltage loop is not reflected back to the PA stage, as can happen with a high SWR. This can spell disaster to the output valve(s). Several types of the latter have been found unsuitable for the use to which they



Typical Reflectometer VSWR Calibration Curve.

were put. Certainly one manufacturer discovered this. Little abuse was needed to destroy the output stage, and even melt the polystyrene coil former. AM transmitters can tolerate mishandling within reason. Many will know what a "bashing" the old faithful 807 will stand, but many TV-type line-output valves used in PA stages are stretched to the limit when subjected to treatment for which they were not designed.

To sum up, do not worry (too much!) if your SWR does exceed 2 : 1 but *do* remember the real reasons and not become too preoccupied with "lost" power. Briefly returning to half-wave dipoles, the low radiation resist-

ance of aerials less than a quarter-wave high can often be made to present a centre impedance of apparently the correct value by altering the radiator length. The impedance is complex however, as reactance is introduced which can lead to complications. The resistive component can still be low, and it is only this which is important on efficiency grounds. Let one emphasise that reference is made to *radiation* resistance. Ohmic resistance is relatively unimportant with resonant half-wave aerials or integral multiples thereof. Clearly, they can only be fed at current maxima, which means the fundamental and *odd* harmonics.

RESTORING A ROTATOR

REJUVENATING AN AR22

N. A. S. FITCH (G3FPK)

AT the end of October, 1961, having struggled to 164 countries worked in twelve years of Amateur Radio, the author decided to invest in a tri-band three-element beam rotated by the popular Cornell-Dubilier AR-22 unit.

This installation was dismantled at Christmas, 1967 by which date over 300 countries were in the bag. The present QTH was acquired in February, 1969, but the tri-bander Yagi and a tri-band Quad antenna were not erected and remained stored in the garage. The main interest at present is VHF and excellent results were obtained up to mid-April, 1973, using only about five watts output of amplitude modulation fed to a three-element Yagi in the loft.

It seemed a shame not to erect a better outdoor aerial system for two metres so this was done in April, 1973, by installing a ten-element Yagi at 35 feet, to be controlled by the old AR-22 rotator.

It was here that there was considerable disappointment for, whilst the rotator had quite easily swung the large HF band array, it was most reluctant to cope with the much smaller and lighter VHF beam. At first it was thought that not having been energised for over five years, the poor thing did not remember what it was supposed to do. Sometimes it would work first time, albeit rather sluggishly, whilst on other occasions it just buzzed until the thermal switch cut out.

Eventually, the whole assembly was cranked down and the motor dismantled and inspected. There was no obvious mechanical fault; the bearings were not seized up, nor had the lubricant dried out and the motor windings were in order.

Solution

Now the electrics of the system are very simple as shown in Fig. 1 and there is very little that can go wrong. At the suggestion of G3BXI, the phase shifting capacitor C1 was checked on the C/R Bridge. This is a Cornell-Dubilier component 25mm. diameter by 73mm. long in a "cardboard" tube, fixed to the chassis by a clip around its middle. It is marked, "100-120MFD 50VAC" and "Intermittent A.C. Duty" and obviously consists of

two electrolytics, back-to-back. It checked out at about 300 μ F in a rather half-hearted manner and it was obvious it had dried up over the years.

It was replaced by a couple of 250 μ F, 25-volt working items which happened to be handy, connected as in Fig. 2, the positive leads being soldered to tags "3" and "4" in the Control Unit. The two electrolytics were mounted on a four-way tag strip which was bolted to a vacant hole towards the rear left of the chassis. There is no connection to the earth tag.

When the Control Unit was reconnected the rotor worked promptly as it did when new, although the two electrolytics do get rather warm when the antenna is swung all the way around, even though the D.C. across each is only 17 volts.

It is hoped that these notes will be of use to others whose AR-22's have been behaving erratically.

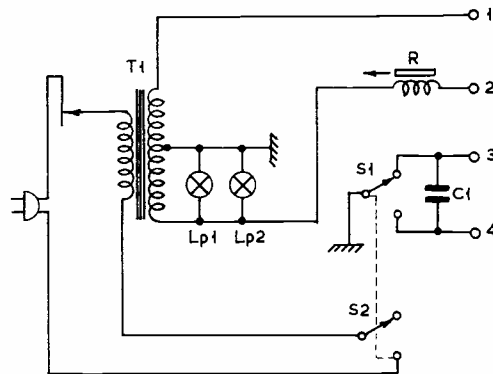


Fig. 1

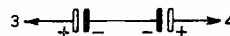


Fig. 2

Q
566

Fig. 1. Control circuitry in an AR22 beam rotator. R1, actuating solenoid; C1, phase shift capacitor; S1, motor reversing switch; S2, primary on-off switch; P, indicating lamps; T1, mains xformer (tapped primary). Fig. 2. The modification for C1, in Fig. 1, using a pair of 250 mF, rated 25v. working, capacitors.

MOBILE RALLY CALENDAR

The proposed A.R.M.S. Rally, to have been held on May 19 at R.A.F. Cosford, is definitely cancelled, due to there being doubts whether, in the prevailing circumstances, the attendance and trade support would cover the estimated £300 or so that the mounting of the Rally was going to cost.

With the new Wessex event on July 21 taken in, the full Mobile Rally programme looks like this:

April 21: North Midlands Mobile Rally at Drayton Manor Park, as in previous years. Located near Tamworth, Staffs., on the A.4091, within 12 miles of Intersection 4, M6, with AA signposting one mile from the A.5. Talk-in by G3MAR/A on two metres, G4CWJ on 80m. and G3GBU on Top Band. Map and further details from the secretary of the organising committee, A. Walton, G3ZKQ, 243 Barnes Hill, Birmingham, 29. (Tel: 021-427 3088, evenings.)

May 5: Spalding Tulip-Time Rally at Surfleet, 4 miles north of Spalding on the A.16. This is a pleasant riverside venue, with overnight camping and caravan facilities available. There will be trade stands, bring-and-buy stall, a raffle, refreshments on site, and tulips and vegetables for sale. Talk-in by G3VPR/P on 1980 kHz, G8HZF/P on 145.0 MHz and G3XBS on 70.26 MHz—R. Harrison, G3VPR, *QTHR*, is the contact man.

May 12: South Leicestershire Mobile Rally, Hinckley, with trade applications to M. B. Farr, G4CAJ, 23 Waterfall Way, Barwell, Leics.

May 19: Northern Mobile Rally, at a new venue—details later. D. G. Mott, G8BZY, *QTHR*.

May 26: Hull & District A.R.S. event at the East Riding College of Agriculture, near Beverley, Yorkshire, as in previous years. Organiser: L. D. Colley, G3AGX, *QTHR*.

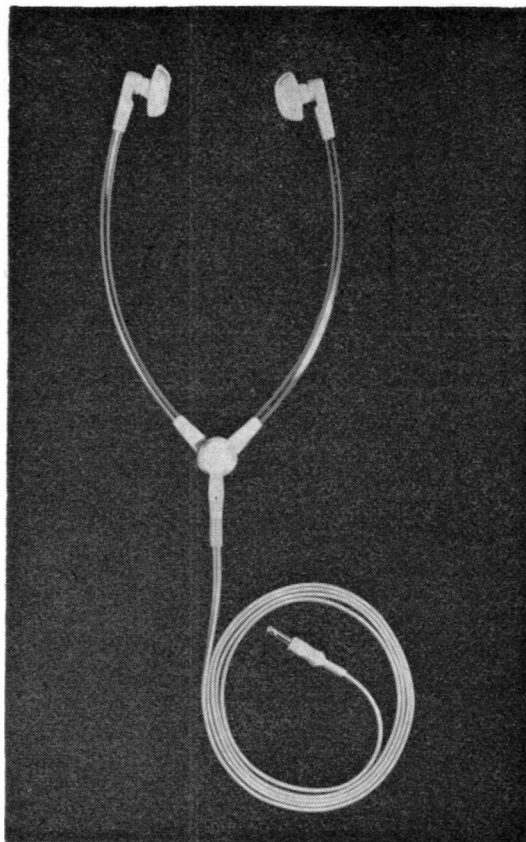
June 30: Upton Mobile Rally, Worcester. Information from B. A. Jones, G8ASO, *QTHR*.

July 7: West of England Mobile Rally at Longleat, Wilts., as in previous years. Details: Brian Croker, G3ULJ, *QTHR*.

July 21: Cornish Club Rally, at venue yet to be arranged. Information from M. C. Locke, G3NKE, *QTHR*.

July 21: Wessex Amateur Radio Group Rally at Braemore House, Nr. Fordingbridge, Hants., with talk-in on 2-4-160m.—A. G. Emery, G3YWG, 7 Brunel Drive, Preston, Weymouth, Dorset.

August 11: Torbay Amateur Radio Society annual Mobile Rally at Newton Abbot Rugby Club ground, as last year—L. H. Webber, G3GDW, *QTHR*.



The new Danavox noise-reducing headset, in the under-clip or eardrop style now popular. Known as the "Gemini," it is most suitable for personal radio listening, particularly in noisy locations. The instrument can be fitted with a variety of ear pieces and lead combinations.

"SPECIALLY ON THE AIR"

As in previous years, we shall be glad to publish brief details of Special-Event stations, these being defined as on-the-air Amateur Radio installations for some local occasion—such as a fête, sports day, leisure exhibition, or whatever—which is open to the general public, and for which MinPosTel will issue a special "for duration only" callsign. The information we require is the date, the callsign to be used, the event for which the station is to appear, band(s)/mode(s) to be worked, and the name/callsign/QTH of whoever is to be responsible for the running of the station and the QSL procedure.

We should have these details *early* in the month *preceding* the month during which the event is to take place, as a separate item addressed to: "Specially On The Air," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

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

VHF BANDS

A. H. DORMER—G3DAH

ALTHOUGH *Oscar VI* has already exceeded its planned life by several months, the AMSAT organisation seems pretty confident that, with careful husbanding of the power supplies, it has some time to go yet. They draw the attention of potential users to the *AMSAT—Oscar VI Predictions Book—1974* which contains details of equator crossing times and longitudes for the rest of this year. This is available from *Ham Radio, Greenville, New Hampshire, 03048, U.S.A.* against 16 IRC's.

The spasmodic operation of *Oscar VI* while over Europe is largely due to the fact that there is no Oscar control station for this Continent (VE2BYG handles the North American control) and while this situation persists there will be a reduced number of productive orbits. Thanks, however, to the efforts of G3IOR and G3WPO it has now been agreed that Oscar shall be "on" for all evening orbits, which will be a big help for those who have to spend the daytime hours at the salt mines. The usual proviso is attached to this concession—if it is abused by stations using excessive up-link power, it will be withdrawn. In addition, orbits which are ascending to us and descending to the North American Continent, and which would normally be switched off by the Canadian control, (that is afternoon orbits during "on" days) will now be left on, and this will give us more operational time.

For those who may have missed it, we draw attention again to the *Oscar Newsletter* produced by G3IOR and distributed free to those who send s.a.e. to G3WPO, *QTHR*. This is a detailed, up-to-the-minute summary of Oscar information culled from official and user sources.

Oscar VII is now about two months behind schedule. The 10m. and 2m./70 cm. antennae are still being fabricated and some work remains to be done on the two-metre bandpass filter, but launch with the *ITOS-G* satellite is still predicted for July of this year. Full details regarding *Oscar VII* were given in "VHF Bands," February.

Contests

Results: This is getting to be a habit! G3NHE of Sheffield had added to his previous achievements by leading the field in the 432 MHz Cumulatives of last autumn. Congratulations, Martin.

Reports: Conditions do not appear to be up to much for the current set of 70 cm. Cumulatives and activity is correspondingly low. There was a slight lift during the session on February 21 which appeared to favour the North of the country. G3NHE (Sheffield) had 28 contacts that evening, better by far than anything heard or reported from the South.

Propagation for the 144 MHz Open contest over March 2/3 was variable. There was a minor Continental opening around 0200z and another about 1400z, but these yielded only F, ON and PA. In spite of these poorish conditions there seems to have been considerable activity, since stations-worked scores of over 250, and a few over 300, were reported. These must have been for comparatively local contacts, and the points-per-contact low. Compared with similar events, there was less portable activity than might have been expected, particularly from the favourable sites in GW, although the regulars, GW3UCB / P, GW3OXD / P, GW3FEC/P and GW8BHH/P were all available, at times with surprisingly good signal strength in the Southeast. Multi-path reflection was also much in evidence to add to the difficulties of working the DX.

Under these circumstances, one might have expected to hear much more CW than was apparent.

The unspecified upper limit in the new band plan for SSB working on two metres was clearly shown to be unwise by reason of the heavy QRM (some of it patently deliberate) from FM stations in particular, many of whom persistently operated below 144-25 MHz, and in some cases used the SSB calling channel as an FM calling frequency, all of which called forth some fairly acid comments from SSB operators and from those who wished to work them. Whether one subscribes to the new band plan or not, it cannot be denied that the band is rapidly becoming a two-mode affair, SSB or FM, with AM on the decline, neither being compatible with the other at close frequency spacing, and the sooner a satisfactory boundary between the two can be arranged the better for the high blood pressure of both groups. Such an arrangement should not, of course, preclude inter-mode working on appropriate freq.

Forthcoming Events: *April 21—70 MHz Open; May 4/5—144 MHz Open; May 12, 1200-1600z*, is the time for the mid-Severn Valley 2m. RTTY contest. Full details from Bob Fisher, G3PWJ, *QTHR*.

Conventions

Just a reminder that the Twickenham VHF Convention this year is on April 6/7 at the Winning Post Hotel as usual. Full details were given last month, p.34.

The Scottish VHF Convention has been arranged for September 28 at the University of Dundee Tower Block Lecture Theatre, with the subsequent dinner at the near-by Angus Hotel. Tickets for the Convention only at 40p. Dinner only at £2, and combined at £2-25. Accommodation will be available at the University if required. Further information nearer the time, but if you have any immediate enquiries the chap to contact is Frenk Hall, GM8BZX, *QTHR*.

Scottish Scene

GM8HBU of Glasgow has been pretty busy during the winter months. He has now completed the 150-watt FM Tx for 2m., and that, into a ten-ele., represents about

2.3 kW e.r.p. He has also completed the mods. to a Vanguard which now operates as an AM/FM Tx with fully tunable Rx, BFO, VXO and "bleeper" for any repeaters which may become accessible.

Ten GHz operation in Scotland is on the increase. GM3DXJ, GM3VBB, GM3FYB, GM3DDE, GM3OXX and GM8DIJ are all active on the band and GM4BHA, GM8DKB and GM8GEC are all building. GM3OXX and GM3VBB recently set up the Scottish record for 3 cm. with a QSO over a 21 km path, GM3VBB and GM3DXJ have had a 7 km contact and GM3DXJ and GM3FYB had a one-way QSO over 10 kms. Most stations are using Gunn diodes and horn antennae, and FM seems to be the popular mode.

Mobile operation is also finding more adherents, but a timely warning comes from GM6XI to those who are planning for mobile in the Edinburgh area, and who are not aware of certain local restrictions. Arthur's Seat, towering above the City, looks like a good site for mobile/portable operation, but this is Crown property, and any transmissions from there are strictly forbidden. This is not just a bureaucratic *ukase* for the sake of being bureaucratic. Rescue services operate in the area to assist the unwary who frequently get trapped on the rock faces or fall over the precipices and R/T is used for communications. There have been instances when such operations have been jeopardised by visitors with mobile equipment, and hence the ban. Similarly, Blackford Hill is out of bounds for mobile operation, as many Police and other public service terminals are installed there, to say nothing of the havoc which can be caused by QRM with the Royal Observatory installations. So watch it!

A new call in the Lothians is that of G8IOL, son of GM8BGV, (sounds like a film title, doesn't it?) and in the Kingdom of Fife, GM8IEN, under the tutelage of such experts as GM3OLK and GM3NFW, is already radiating a fine signal. GM6XI has now acquired a Vanguard for the specific purpose of driving a 432 MHz tripler, and this should give him a fair step-up in power. The regulated power supply for this rig has been

designed by GM8BJF and, with an Op-amp and three 2N3055's as series stabilisers, produces 10 amps at 13 volts. *Wow!* GM6SR is back on Two with a Vanguard, and GM8BJF has now completed the solid-state linear amplifier for his 2m. SSB transceiver.

GM8DMZ in Patna, Ayrshire, soon hopes to have 70 cm. SSB going with a 46-ele. antenna. He must have a good site there, since he had a fine contact with HB9ARI during the January opening on 2m. Jimmy Hunter, GM6ZV in Glasgow, is running AM on 70 cm. and, now that he has retired, expects to be more active on both the VHF and HF bands. GM3SAN, also of Glasgow, has SS/TV equipment for reception and hopes to be able to transmit pictures in the near future. Another Glaswegian, GM3SZP, is now running RTTY and has already had one contact on 2m., with GM8BKE.

Club & Group

The Sheffield Amateur Radio Club invite those interested to attend a presentation which they have arranged for April 22 at 7.30 p.m. This is to be given by Dr. B. Chambers, G8AGH, at Sheffield University, Department of Engineering, Mappin Street, Sheffield 10, and the subject is "Microwaves." Dr. Chambers is professionally engaged in this field and will demonstrate, with working models, practical approaches to the problems of transmission and reception on amateur microwave bands.

A similar practical demonstration of microwave techniques will be the subject of an address to be given by Dr. K. Smith of the University of Kent to the South East UHF/VHF Group at their next meeting on May 3. The lecture theatre in the Electronics Building at 7.30 p.m. is the place and time to note.

The UK FM Group (Northern) has a new secretary. He is P. Avill,

G3TPX, and he is *QTHR*.

The newsletter of the Central Scotland FM Group advises that 145.6 MHz should continue to be used for FM simplex working in that area. Although in the new band plan this channel is allocated as a repeater down-channel (albeit as a spare) there is little likelihood of QRM at the present time. It might pay to bear this in mind if you are planning to visit that part of the country. Although newly formed, the Group now has eighteen members and would welcome more. Write to Jimmy Shankland, GM8FM, *QTHR*, for further details.

The West of Scotland Amateur Radio Society is planning an expedition to the Campsie Hills for VHF/NFD, so look out for a good signal from there. Their previous expedition to those hills was hampered by lack of transport and lack of operators, but several forays are being planned for the next few months. If you want a sked, write to GM8HBU, *QTHR*.

Mercury is the title of the Journal of the Royal Signals Amateur Radio Society, and their current issue discusses the following frequencies for "get-togethers" of their members. VHF CW, 144.075 MHz; VHF SSB, 144.330 MHz; and VHF All Modes (Local), 145.330 MHz.

Not a Rally nor a Contest: The Northern U.K. FM Group will be organising a two-metre activity day on Sunday, April 14, the purpose of which is to encourage the use of FM up North. They plan to operate G3TPX and G3YLS/A from the site of a proposed talk-through (repeater) station at Staincross, Barnsley, Yorks. (G3TPX/*QTHR*), near Junc. 38 on the M1, where G3YLS/A will also be for the day operating all speech modes on two metres.

The focal point for the event is QTH/G3TPX, where there will also be a display of FM equipment. His phone number is 022-678 2517.

About The VHF Spectra

Obituary

We very much regret to have to record the death, on February 13, of Walter Shearing, G5TZ, Isle of Wight, at the age of 69. He died of leukaemia, after a long illness. In the marine, radio and TV trade from the early days, he was very active on two metres from 1948 and into the 1960's, always with an impeccable signal and perfect operating style, from a magnificent site on the Island which, in a sense, he inherited from Marconi, as it was the site of one of the original wireless stations. "Jumbo" was a great on-the-air personality and in his own way one of those few operators who really adorn a band.

Licensed about 1926, in the 1937-'38 era, he was among the first to venture on VHF (or 56 MHz, as it was then) using super-regen. Rx's and self-excited oscillator Tx. As soon as we "got" two metres, in 1948, he took that band up seriously and gained much distinction on it. (Editor.)

UHF Power Modules

A typical, transistorised, FM transmitter for 70 cm. usually takes the form of a narrow-band, multistage oscillator/multiplier strip preceding multistage power amplifiers, the whole thing relying upon a multiplicity of trimmers of one sort or another to give maximum output at a discrete frequency. There are obviously several disadvantages to such a system. It is not easy to design and set up without some fairly sophisticated test equipment, efficient interstage networks are not easy to achieve, nor are efficient output arrangements for matching the final amplifier to the antenna. The use of discrete components often results in degraded performance due to the inductances of the emitter leads (which reduce the gain of the transistor) and the base leads (which restrict the bandwidth).

Many of these disadvantages may be eliminated by the use of wideband UHF modules which are now becoming available. In particular, the new *Mullard* power amplifier modules are of interest. The BGY22 used on its own will give 2.5 watts output at 432 MHz for a drive of 50 mW and the BGY23 an output of over

8 watts for an input of 2.5 watts. The two devices can be cascaded and driven from a source such as the readily available BFY90.

There are some obvious precautions which must be taken when using such wideband devices that accept inputs of 380-500 MHz. Without adequate post-driver filtering, one would expect the output spectrum to contain harmonics from the oscillator/multiplier chain as well as intermodulation products. A high-Q break is obviously a "must" here, with another at the output of the power module but, given these safeguards, this would seem to be a very reliable way of putting out a clean signal without

any of the design problems associated with transistor output stages at UHF.

News Items

From Overseas: A new repeater has been established in the Dordrecht area of Holland. Input on 145.250 MHz and output on 145.850 MHz. Power is 8-10 watts to a vertical antenna.

It is reported that West German amateurs have selected 144.350 MHz as the local SSB calling channel, so now you know where to look for them. The move to the lower frequencies for SSB on 2m. seems to be proceeding much more rapidly abroad than it is in this country,

THREE BAND ANNUAL VHF TABLE

January to December, 1974

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3NHE	19	2	40	13	25	9	108
G5DF	22	1	33	12	21	4	93
G3DAH	16	1	33	11	15	3	79
G3OHH	21	3	20	2	7	2	55
G3FIJ	14	1	21	7	5	3	51
G3XDY	—	—	25	7	13	4	49
G8GNE	—	—	30	8	7	2	47
G8ECO	—	—	34	5	4	1	44
G8GHZ	—	—	39	5	—	—	44
G8FWB	—	—	33	6	—	—	39
GW3KDG	—	—	28	10	—	—	38
G4AEZ	1	1	28	4	—	—	34
G8DGR	—	—	27	2	1	1	31
G3FPK	—	—	28	2	—	—	30
G8GXE	—	—	24	4	1	1	30
G3XSK	—	—	21	6	—	—	27
G8HQQ	—	—	24	2	—	—	26
G8GPR	—	—	22	3	—	—	25
GW3XJQ	—	—	16	7	—	—	23
G18EWM	—	—	15	8	—	—	23
GW4BXE	—	—	8	9	—	—	17
G8BPJ	—	—	11	2	—	—	13
G8HQA	—	—	8	2	—	—	10

The Table shows claims to date from January 1st, 1974 and will close on December 31st, 1974. Claims should be sent to "VHF Bands," Short Wave Magazine, Buckingham, MK18 1RQ at monthly intervals.

possibly because Continentals have always been more VFO-conscious than we have. Plans are for German repeater stations to be operating on their 1974 band plan frequencies with 600 kHz spacing by 1975. Many have already adopted the reduced Tx/Rx frequency separation.

Some of the best DX worked during the January openings must surely be the contacts between SM5BSZ (QRA JT41f, East of Stockholm) and two Spanish stations at a range of 2,300 km, getting on for 1,500 miles. Can any one in this country better that?

A new E.M.E. world record on 23 cm. was set up by VK3AKC and W2NFA on October 6 last. The Stateside Tx ran 500 watts from six 3CX100A5's and the Rx was preceded by a pre-amp with MT4000 transistors into a converter with V766 transistors in the RF stages. The antenna—wait for it—is a 60ft. diameter dish!! At the VK end, the Tx ran 160 watts input to two 3CX100A5's and the cascaded pre-amps used NEC1336 transistors. Antenna is a 20ft. dish and is manually tracked, quite a job. For information, the path loss was calculated to be 294 dB, which calls for quite a set-up at both ends.

At Home: Members of the Bury and Rossendale Radio Society have been experimenting with passive reflectors on 2m. without, they say, much success. This idea has been tried several times in the past with varying results and it would be interesting to know if such a "re-radiator" is being used successfully anywhere at the present time. This report came from G4BVE, QTHR, if you want to swap experiences.

GW3KGD is now up on 2m. SSB with a "Liner 2" and a six ele. beam, and operates from Haverford West in the rarish county of Pembrokeshire. G4HQ (Loughton, Essex) is building for SSB on 70 cm. and 4m. G3BA has got the 3-20A linear going on 70 cm., generating his SSB from the FT-101. The 4CX250B amplifier is in course of preparation. He has not neglected FM and has fitted a Burns Electronics SP-1 speech processor to the FV-101 external VFO and a single switch on the front panel gives him either facility. G3KMS (Bolton) also has QRO SSB on 70 cm., on which band he is active most evenings. G4ALN

(Chadwell Heath, Essex) is another with high power on 432 MHz—he runs a 4CX250B driven by a 3-20A to good effect. G3BW (Whitehaven, Cumb.) had QRP (circa one watt) of SSB going, but finds contacts difficult to come by at his rather remote location. He heard no stations at all during the February Cumulatives!

There is an increasing amount of SSB at the lower end of 2m. these days, although the shift from 145-4 MHz seems slower in the Midlands than in the South. It must be due to all those "Liner 2" rigs which are awaiting re-crystallisation at Matlock! The Continentals seem to have effected the transfer almost completely now.

Four-Metre SSB seems to be on the up-and-up with some 20 or so stations active on Sunday mornings although the late night activity, which was most welcome during the period when the "Box" was inactive, has dropped off.

You have a poor QTH with hills all round at a mile or two away. You need an antenna with medium gain, good front/back ratio, narrow bandwidth to give good S/N performance, reasonably small wind loading because of the exposed site and the 2in. dia. mast which must carry it, with good performance over the whole 144-146 MHz and it must take up little vertical space on the mast, which has to carry antenna for the other VHF bands as well as two metres. Many of these requirements conflict, but the best compromise—in the experience of G3HCW of Knottingley, Yorks., who has been experimenting with VHF aerials for many years—is the seven-ele. Yagi with twin reflectors on a 10ft. long, self-supporting, 1½in. boom. Readers in a similar situation may care to note. '3HCW

TWENTY-THREE CENTIMETRES

ALL-TIME TABLE

Station	Counties	Countries	Total
G8ARM	20	2	22
G3EHM	14	2	16
G4ALN	10	3	13
G8AOD	11	1	12
G5DF	3	1	4

is also trying to stimulate 23 cm. activity in Yorkshire. He and G8EOP are running QRP on the band with 60° corner reflectors. Incidentally, his CW sked on 2m. with G4CG in Barnstaple, Devon, over a 230-mile path, has now been going for 2½ years, six days a week.

Of the many who suffered gale damage to their antennae, G5DF (Reading) was one—he lost his 16-ele. stack and the 23 cm. dish. This puts him out of the DX picture until repairs can be effected. He reports progress on 23 cm. with a new long-Yagi (19 directors and very sharp), the Tx/Rx set-up consisting of a 2C39A in a box-cavity tripler and a Microwave Modules converter.

For Next Times

As we are gradually getting back to normal, closing dates for the next two issues for VHF material can be given as April 13 and May 11, addressed "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ—which gives you plenty of notice.

Our sincere thanks to the readers of this piece who, through the recent difficult period, have helped us to keep the ball rolling and the fire in.

73 de G3DAH

NICE BOTTLE

The new Mullard YL1540 is worth a mention. It is a forced-air cooled coax power tetrode for VHF transmission, taking 3000v. on the plate at 780 mA, giving about 1 kW RF output and needing 53 amps. on the heater. As to its price, one-off, ask Mullard's—we daren't!

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

GONGOOZLER: An idle and inquisitive person who stands staring for prolonged periods at anything out of the common—H. R. de Salis, *A Handbook on Inland Navigation* (1901).

To gongoozle is one of the joys of Amateur Radio; to sit on a band, or even on a single frequency, and just listen to the parade, hour by hour. From a dead band, to the dawn chorus, the VK/ZL signals in the early morning, the JA's, then the W's through the day and into evening until the band becomes dead once more. However, gongoozling isn't much of a hobby on the bands when they are dead—and, Heaven help us, that's been the state of them for far too much of the available time, at least as far as the HF's go—indeed even Forty has been known to be unproductive, while Twenty upwards have been as dead as a doornail. This is, one supposes, the natural result of winter *plus* a dearth of sunspots, but at the weekend when this comes to be written, clocks go forward, spring is in the air, and both the lilac and the apple are showing spots of green, indicating the beginning of the Spring lift in weather and band conditions. As if this were not enough, there are indications, slight though they may be, of spots on the sun in the places one would expect them to be showing—who knows, the rise into a new cycle may not be so long deferred.

However, whatever we (relatively) old timers may think of the bands at this period, it has to be admitted that for many thousands of amateurs, this is all they have ever known; they have come to Amateur Radio since the last peak in conditions, which in itself was, if memory is to be trusted, not a patch on the early post-war period when, with many fewer amateurs on the air and far less elegant gear, it seemed that when conditions were right the world could be spanned on a watt or so with a bit of damp string—as conditions seemed to be for most of the time.

Top Band

A 160-metre WAC has always

been considered the apex of any DX ambition, and there is always interest in how many have managed it. Some time ago we gave a list and now, with thanks to W4WFL/1, we can up-date it by giving the chaps who have done it since January 1, 1973—namely OL1AOH, W4BRB, K4BHG, W4QCW, WB4JFK, K2GNC, W2BP, K4CIA, W2QD, WA8IJI, VK3CZ, W5RTQ, W4EX, W2LWI, W3IN, VE7UZ, JA7AO and JA1MCU to the end of February 1974, with additionally, G3XAP and W0NFL known to have done the trick but not having yet submitted the cards. As so often happens, the flow of claimants is now a trickle, but will soon become a flood, as people begin to realise it really is possible. However, for your scribe's money, the chap who deserves most congratulations is probably W5RTQ, as a glimpse of the Great Circle map will easily show—for most of his DX he has a *long* way to go before there is any sea-water at all over the paths.

Continuing about Top Band, we come to G2HLU (Reading) and his doings with a W3DZZ trap dipole, feeders strapped, working against an "average station's earth." Harold has now worked his first GM—not any old GM but GM3ANO (Sutherland), just to prove the job done properly; he couldn't have got *much* further North!

From G2HLU we turn to G2HKU (Sheppey) who continues to give the band the odd whirl; Ted found time to work SSB with PA0PN, DK3BJ and OH2BM, while his CW reached out for contacts with DK5OS, PA0CFW, GM3OLK and GM3YOR.

South Birmingham Radio Society have revised the rules for their Worked All Birmingham Postal Districts award, and now require you to work 25 of them, on Top Band, Eighty, Four, Two, or Seventy-cems, on or after March 1, 1974. In addition to the Transmitting Award, there is a section for SWL's. Non-members of the Club can obtain the award by sending their claim, with the cards and 25p plus

return postage, to R. Thompson, 23 Fox Hill, Selly Oak, Birmingham 29, who will also be pleased to forward the full Rules in return for an s.a.e.

EP2BQ seems from all accounts to have been going great guns of late on Top Band and has notched up a "First" by working 4U1TU. Another one who should stir 160 metres is VS5MC, for whom you should listen on 1803 kHz between 2200 and 2300. HC1XG is G3HVG and is QRV at weekends, on Top Band; contacts should be QSL'd via his father G8VG. It is understood that 4S7GV is on daily between 2330 and 0130 on 1804 kHz and has worked EP2BQ; 5B4AO is said to be on, *transceiving* on around 1824.5 kHz, which will make him a bit tricky for many people.

Eighty Metres

Is ignored by most people when they talk about DX, it being regarded largely as a natter band for the old-timers. However, an investigation of the natters will certainly prove that some participants at least, particularly on the subject of aeriels and feeders, do not believe the laws of Nature!

In terms of DX, though, there has always been the small amount of CW DX chased, and good DX at that, while in more recent years the HF end of the band has provided much good DX by way of net-MC operation, despite the deliberate QRM and bad language sometimes encountered. (*Why* do licensed amateurs indulge in this sort of behaviour? Is it another manifestation of the "Newcastle fans"?)

The SV chaps are now able to operate Eighty, having an allocation of 3500-3600 kHz, CW and Phone; the legal SV calls, we are told, are SV1AA to SV1IN inclusive, all others being either bootleggers assorted or just plain pirates.

G5NX sailed from Southampton on February 25 for his twenty-third trip to Australia, but this time with no /MM permit although he is carrying a receiver. He is going on the t.s. *Leonid Sobinov*, which was

at one time better known as the Cunard *Carmania*, and should be returning to the home QTH in Windermere sometime in June. The lack of a /MM ticket was a bit of a disappointment to G2NJ (Peterborough) who likes to work him on these trips. Changing tack a bit, G2NJ mentions the QRP chaps, his latest contacts being with G3CEL of Manchester who was running a couple of watts using two six-volt flash-lamp batteries as the main power source; interestingly enough, G2NJ was called by G3ENM as soon as his QSO was over, and told that G3CEL (on the flash-lamp batteries) was a steady 569 down in Weston-super-Mare.

G2HKU seems not to have had a lot of time for Eighty but on his SSB managed to hook up with CR3WB, VO1FX and 5T5DY, while CW yielded MIFOC.

Another one who looked at Eighty was G2HLU, who used it for a while on the first weekend of the ARRL CW contest. His only comment on it is not to offer a list of DX worked but rather to remark on how badly the band was "down" as compared with the same weekend the previous year. On a different line, Harold has been playing with one of these MFJ audio filters, and has found it very good. When he puts it in the "80 Hz" position he finds that adding his trusty FL8A does not make any significant difference, neither does his active audio filter, both of which have done good work in the past. As he says though, this sort of selectivity requires a stable receiver such as his KW-77, plus a very steady signal to receive—true, and a good enough reason for cursing all these twits who still, in this day and age, wander around the bands with signals that drift while they are sending and drift back again while they receive!

Forty Metres

Much-maligned as a band, especially at times when at the hours most of us can operate, it is still the only band open to give reasonable DX with simple aerials. For example, the use of a "5RV," a trap dipole, or a vertical such as the 14-AVQ at roof level can be enough to assure contacts at good DX, provided that one has, or can obtain, good enough CW selectivity for that mode, plus an aerial attenuator for use on CW or SSB.

Reporting the HF Bands

Nobody actually mentions Forty in terms of stations worked, mainly because we have been caught by the publishing hiatus. This being the case perhaps we should mention some of the DX which *is* available, as mentioned in Geoff Watts' *DX News-Sheet*, with times indicated alongside each one. This way we see, CW: GC2CNC, 1110; HR1AT, 0747; PJ2VD, 0426; PZ1BQ, 0305; W1FKD/VP9, 0221; 5T5FP, 2220; 6W8EM, 0058; 9J2BI, 2120; CP6FN, 0620; FG7TG, 2140; HI8LPN, 0350; HKØBKX, 2301; HV3SJ, 1750; JA2RJV, 1500; VS5MC, 1600—to name but a few. As for SSB: it showed AP2KS, 1428; HKØBKX, 0740; HS4AGN, 1235; JY3ZH, 2223; ST2SA, 2233; 5Z4LW, 2208; C31BC, 0758; CX4CR, 2145; HI8PAR, 2200; FG7XT, 2137; TI2AS, 0858; TR8VE, 2302 and VK7GK, 0800. Not a bad haul of stations all at good enough strength to be workable.

Here and There

The GI6YM Jubilee Award and Marconi-Kemp 75th Anniversary commemorative station, GB3MKB, will be active again over the Easter weekend from Ballycastle, and contacts will be allowed to count for the award in place of contacts which were not scored in the activity period, July last year. Frequencies to monitor over the period April 13-15 will be, on CW, 3520, 7010, 14050, 21020 and 28050 kHz, while SSB operation will be around 3775, 7070, 14150, 14190, 14300, 21250 and 28600 kHz. In addition GI6YM will be active over the weekend 6-7 April, and on April 25, the centenary of Marconi's birth—see p.24, March.

G4AFJ (Nottingham, *QTHR*) will be acting as QSL manager for VP8NO, who is better known as G3VUI; Mike will be on Adelaide Island by the time this comes to be read and will be staying there for a couple of years as a radio operator with the British Antarctic Survey. He has with him an FT-101 and a 14-AVQ, which latter will be supple-

mented by various wire aerials once he gets settled in.

We mentioned the DL/AGCW QRP Contest of January 6/7, and now we have a note from G8PG, to say that the logs were up by no less than half as much again on the previous shindig. Outright winner was DJ7HZ, with 8 watts to a lot of aeralis. U.K. entries were made by G8PG himself, G3DNF, G4AYS, G3VDW and G3JVJ, other entries coming in from as far afield as W6 and JA. WNØJXE was the first Novice entry ever, on 7 MHz only and with two watts to make 39th place—nice going. Gus adds that quite a lot of QRP activity takes place from his shack using a Ten-Tec PM3A at five watts, with which gear he raised 18 W/VE stations during the ARRL CW Contest, right through all that high-power QRM! Again, nice going.

Some of these exotic DX spots are pretty hard to find in the old school atlas. One of these is Spratly Island, which lies at Lat. 8°38' N by Long. 111°55' East, putting it in the South China Sea, about 440 miles S.E. of Saigon. It is eight feet high maximum at high tide, 2500 feet long by 1000 feet wide roughly, and difficult to land on because of the surge in the shallows for some way out. It is claimed by the Chinese.

Another such a one is Kingman Reef, reported as being soon to be added to the DX lists. This is in the Central Pacific, at the north end of the Line Islands, at 6°N by 162° West, about 920 miles south of Honolulu. It was discovered in 1798, annexed by the United States in 1922, and was used at one time as an experimental air station; it is believed that there was a naval airfield there during Hitler's War.

It is said that during April OH2BH plans a full-scale assault on Mount Athos, although details are not yet available. By the time you see this, the SM DX-pedition to Baja Nuevo and Serrana Bank will have played itself out—they will want their cards sent to SM3CXS, with s.a.e. or IRC's.

When W3JGM (seated left) was visiting in Northern Ireland he was at the joint station of G13VJ/G13JIM, 43 Holywood Road, Newtownards, Co. Down. Left to right, standing, are G13VJ, E16S and G14CSO, with G13JIM seated right. The gear at the GI station includes a Drake TR-4 transceiver, R-4C receiver and Heath SB-220 linear.



That expedition to Grand Turks and Caicos, in the West Indies, for the ARRL CW contest never came off, so the brethren intend to try a session signing ZF1AL, Grand Cayman, working all bands—and since W4BRB is of the party we can expect some Top Band activity. QSL's for this one go to WA4SVH.

For the Palmyra/Kingman Reef DX-pedition we have had no further solid information since last time, though it is known that planning is still going ahead.

The proposed China effort will, hopefully, sign the call BY1A and the operation will take place over April 19-21, using SSB on 14195 kHz, listening on 14200 upwards and 14275 kHz for working the W's. Donations are *not* wanted, and any QSL's should go to W1GEY, 321 Eastfield Drive, Fairfield, Conn. 06430.

Looking rather farther ahead, there are plans afoot to activate Clipperton Is., FO8C, probably during the early autumn. However at the time of writing no further details were known.

On the situation as far as operation from the mysterious Himalayan state of Sikkim goes, it is now understood that VU2KV and W6KNH are still trying to get things organised. This one rather looks as though eventually it will come off,

but the preliminary notice will be short, so a keen ear to the ground is called for by those who wish to work Sikkim, AC3 in Zone 22. (As a young schoolboy in Darjeeling, in the shadow of the mighty Himalayas, our Editor could look down on Sikkim without ever realising that he would one day become interested in it in the Amateur Radio context!)

It may be recalled that FL8OM and 4W1AF have been trying to organise a trip to Kamaran, in the Red Sea, off the Yemen coast. However, word has it that Yemenese troops have occupied it, resulting in loss of control by the South Yemen. This may well imply that VS9K will cease to be possible as a DX country. Perhaps we will hear more on this in due course.

On the Contests front, one that should not be forgotten is the Bermuda affair, running 0001 on April 20 to 2359 on April 21 for the Phone leg, and the same times May 4-5 for the CW. You exchange RST and county—the VP9's give their parish—and count three points per QSO, together with a multiplier of the number of Bermuda parishes worked on each band, the nine parishes being abbreviated as Dev, Ham, Pag, Pem, San, Smi, Sou, Stg and War. Certificates to winners in each call area, state and U.K. country. The overall winner of each leg gets a trophy

which is presented on October 18, with free transport out there and accommodation for a week's stay at one of the leading hotels in Bermuda, paid for by the Bermuda society. Though this is one of the more fatuous contests, the prize makes it worth winning! It has never had more than a small U.K. entry.

Twenty

If Twenty goes dead, for many people the world has come to an end! It's not quite as bad as that really—there are always the LF bands to try, if only you have taken the trouble to hang up an aerial!

G2HLU, oddly enough, found conditions worse on the LF's than on Twenty and Fifteen during the ARRL CW contest—possibly an effect caused by the distribution of activity?

G2HKU, despite all the business of losing aerials and feeders, managed to keep going in his usual fashion, although even he will admit that his ZL skeds on Twenty at 0800 are the worst he has known in years. However, it was not quite impossible, and contact was made with UL7NW, ZL1VN, ZL1AQ, ZL3SE and 9L1JT.

W4WFL/1 has, like your conductor, had many things to distract the mind from Amateur Radio activity, but Morgan did manage to get one new country up by way of 4W1GM; otherwise the tale has been of a few

casual QSO's mainly with the Caribbean and South American areas.

G3FYR (Petts Wood) refers to the articles by Moxon in *Wireless World* some time back which demonstrated how the terrain may be used to obtain consistent VK and ZL propagation with only a watt or two of SSB. Bill reckons his QTH is situated rather in the situation envisaged by G6XN, relative to the valley of the river Ravensbourne. This is a gentle inclined plane facing westerly and so, if Moxon is right, should give good propagation in the direction of U.S.A. This indeed seems to happen; and another conclusion that one can come to is that the ground-plane aerial is at its best when the operating frequency is very near to the MUF.

In a later letter, which arrived right on the deadline, G3FYR added his contacts for the month; disregarding the quite interesting crop of EU's, there were W2HDW, WB2MVI, W8LBI, UK6DAC, W1EP, VE2UN, WA3KOC, UA9CB, W1TW and W2GHK/4, the big chief of DOTM.

Another one who answered the plaintive cry for immediate response on the tail of our last piece was G3NOF (Yeovil). Don heard nothing from the Pacific except for KH6BB around 1700 over the North Pole. The early-morning conditions to VK and ZL have been patchy, with either one or the other area but not, usually, both. W's have come in around noon and stayed, sometimes as late as 2200, the W6, W7, VE7 lads being concentrated around 1700-1900z. Also, on some evenings the African stations have been coming in well. Notwithstanding this good stuff the band has been patchy in the extreme, and it has been necessary to catch the right times.

G4CXM (Paignton), very new on the air, reports on his first two weeks of activity—his very first QSO's being on 20m., with PY7AV and FY7AQ. He also worked CW (*good!*) to a number of DX stations, including VE7DLB, K7PGL and W5DRW. His DX on Sideband included no less than six VK's, also VQ9R, VE8RE (Victoria Is.), G3ZXN/MM (off the Azores) and, for his very first G, not far away near Exeter, G5QA, one of the DX lions. G4CXM is organised for 10-20-40m. with a trap dipole and an FT-DX401. After this very auspicious start, we expect to hear more of Raymond.

And we would also like to hear from many more in the recently-licensed category, even if their results are not very startling in the way of DX. One of the functions of this feature is to lead the beginner, and other beginners are always interested to read of how the newly-licensed are faring.

Talking Point

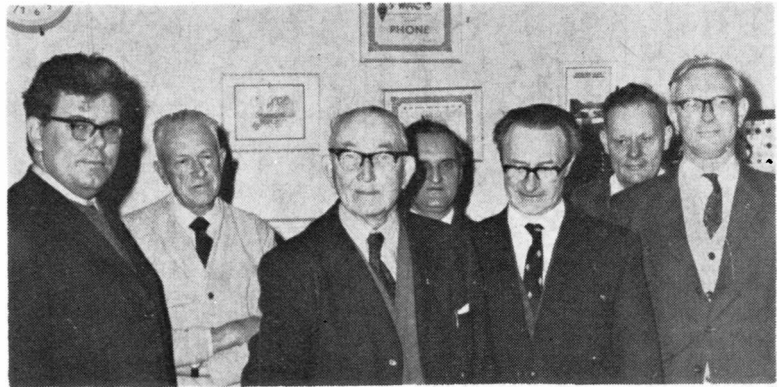
Some few weeks ago now your scribe had occasion to see a letter, not addressed directly to him, in which the writer beefed about old "KFE and his interminable lists of stations"—but he took no account of the fact that we can only comment

on the mail we receive and quote the lists of calls mentioned in the hope they may benefit some other station in the hunt for that elusive new country. But, you know, the title of this piece was changed from the original "DX Commentary" to its present title, years ago, just to enable it to take in the comments on the purely "communication" angle as well as DX. After all, the very definition of DX is something personal—what is DX to the VHF man is QRM to the HF chap, and what is DX to the 300-plus countries scorer is out of this world for the novice working his first QSO, to whom anyone outside his own shack



G3JNY, S. Ellis, 2 St. Mary's Close, Garforth, Leeds, with his XYL. He runs an FT-501 transceiver into a 14-AVQ aerial, with a beam in prospect. His other interest is clay-pigeon shooting.

Belfast YMCA Radio Club recently celebrated their golden jubilee, attended by senior Club members, with G13AV (centre) and original licensee of G16YM. Also in the picture are G15UR, G13NOH, G13AXI, G13ZJR and G13IVJ.



is DX. All these chaps can and do write in with news of their triumphs and their progress, and pleased we always are to give them a mention.

However, the novice excepted, one does not really think of Europeans as DX other than on Top Band, for example, nor, on say Twenty, do we really want to detail right out the strings of East-Coast Statesiders, although W6 and W7 is DX in any man's language.

The whole object of this feature being to keep the reader informed as to what is happening on the bands, it follows that lists of calls worked, in their proper context, are part of the process of disseminating information.

Fifteen

Hardly a shadow of its former self. However, there are gleanings to be taken have you but the patience and spare time to be on when the opportunities occur.

G3FYR has a W3DZZ-type trap dipole and a 12-AVQ to play with, and both have their uses. By picking the right time to operate, he managed to work 9J2BO, VE1TX, K1MTD, W0TRF, W2OGE, 4Z4KF, WA3AMO/3, W3SQ, WN8PMF, W4BW, W9CSL, WB4ZKX, WA5PQX, W5ARV, WB2FUH, K2HRH, UK6DAC, PY7AHO, UF6DX, W1AW, VE2UN and WA3KOC, plus a peck of European stuff. Interesting point: On 21 MHz, the trap dipole puts a thumping signal into the Moscow area and around the Black Sea, with the result that he gets even more calls than could reasonably be expected from this part of the world.

G3NOF reckons that things are

beginning to improve, as the days get longer, but 15m. is still very patchy. Africans and W's have been heard around 1400, the Africans having been there since as early as 1000z. VU popped up around 1300, and then again at tea-time the W's and Africans came in. The G3NOF QSO's, all SSB, were with W's, SV1GK, VU2CK, VU2DK and 9J2DT, but there were gotaways in the shape of 3B8AS and 5U7BB. Never mind.

Ten

Nary a word from anyone of DX activity. Of course there will always be the odd "opening" in the VHF sense, covering parts of Europe and even down to the Mediterranean. On occasion, propagation may be by Aurora and other such effects that send VHF operators into raptures. However, these sort of things, it has to be admitted, are pretty small beer when compared with the honest-to-goodness DX activity at the peak of the sunspot cycle—soon may it be here!

On a different tack, it is a fine band for running local nets, especially now that so many people have multiband rigs or transceivers which cover Ten.

Odd Points

Back in February, we mentioned that G3BID was contemplating a trip to Sint Maarten with W2JKN. Unfortunately, plans can be upset, and in the event G3BID developed an eye condition which stopped him going. However, he says he is looking forward to next year's event.

G2HKU offers a few QSL ad-

dresses, including CR3WB, via CT1BH; JY3ZH, via DJ9ZB; and CT3AB, to P.O. Box 643 Funchal, Madeira.

New call-sign block allocation gives A8A-A8Z to Liberia. Among the phoneys reported around of late, we hear of a "TI9NA" which was most certainly not any connection with the DX-pedition to that neck of the woods; and we would be prepared to bet that the "BV1PCZ" also reported around could well be another stinker. We have, on the other hand, news for the folk who are still looking for a contact with the Khmer Republic, or who want a card. It seems that the only satisfactory way to get XU1AA cards is to route yours via W1YRC, as apparently all the other possible routes have now dried up for one reason or another and sent their logs on to W1YRC. Another XU call to look out for soon will be XU1DX, a club station at the American Embassy. Authorisation had already been received at the time of writing but it had been sent back for correction of a minor error.

Deadlines

With a more normal work condition developing, we can give deadline dates for the next couple of issues as April 13 and May 11, addressed: CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ—but post at least two days earlier to be sure.

Our sincere thanks to the stalwarts who have helped us to keep this feature on the rails during the recent awkward period—even if at times it looked like trying to make bricks without much straw. 73 es BCNU.

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.

G4CMT, R. C. Andreang, 10 Vermont Street, Beverley Road, Kingston-upon-Hull, Humberside. (Tel. 0482 45140.)

G4CSF, B. Beckwith (ex-G8HSJ), 25 Whitfield Avenue, Glossop, Derbyshire.

G4CVF, B. Sheppard, 159 Willerby Road, Hull, HU5 5HH.

G4CVT, A. R. Tozer, 13, Wake Lawn, Southsea, Hants., PO4 8HU.

G4CXA, A. J. Cowley, 44 Epworth Road, Bentry, Bristol, BS10 6QF.

GM4CXF, J. Thomson, 6 King George Street, Invergordon, Ross-shire, IV18 0BB.

G4CXN, S. J. George (ex-G8HFZ), 100 Middlepark Road, Russells Hall Estate, Dudley, Worcs., DY1 2LJ. (Tel. Dudley 57395.)

GM4CXP, D. Dance, Station House, Maxton, St. Boswells, Roxburghshire, TD6 0RW.

G5BFV, J. M. Noeding (LA8AK), IMTR-RES-1.3LAB. P.O. Radio Station, Bearley, Stratford-upon-Avon, Warks., CV37 0HA.

G8HOQ, S. J. Whalley, Copperfields, Birchall Close, Leek, Staffs.

G8HXK, C. Tucker, 21 Westmere Crescent, Burnham-on-Sea, Somerset.

G8IAC, G. E. Brown, 14 Bramble Walk, Eggbuckland, Plymouth, PL6 5SJ. (Tel. Plymouth 776104.)

GM8IEH, Rev. S. J. Smith, St. Ninian's, Bowhill, Gardenden, Fife, KY5 0JG. (Tel. Cardenden (059-272) 224.)

G8IEM, M. A. Hall, 19 Britannia Road, Southsea, Hants., PO5 1SN.

G8IEX, G. T. P. Knott, 27 Edinburgh Road, Cambridge, Cambs.

GM8ILE, R. J. Scott, Monksford, 1 Edderston Road, Peebles, EH45 9DT.

G8IMA, A. J. Wisbey, 13 Colebrook Road, Norbury, London, S.W.16.

G8IMC, D. N. Chapman, 12 Cresta Gardens, Mapperley, Nottingham, NG3 5GD. (Tel. Nottingham 63828.)

G8IME, R. Skelding, 10 Peel Crescent, Ashton, Chester, CH3 8DB.

G8IMH, D. Fitch, 67 Hollyfield Road, Sutton Coldfield, Warks., B75 7SE.

G8INC, K. Davenport, 10 Woodend Lane, Hyde, Cheshire.

G8INP, G. P. Webb, 91 Gallows Hill Lane, Abbots Langley, Watford, Herts.

G8INW, K. M. Walker, 126 Thornes Lane, Wakefield, Yorkshire.

G8IPL, W. Ragg, 103 White Lion Park, Malmesbury, Wilts., SN16 0QR.

GW8IQC, M. J. White, 25 New Pastures, Newport, Mon., NPT 3GF. (Tel. Newport 54126.)

CHANGE OF ADDRESS

G3HEA, J. U. Burke (ex-9VIQT), Woodleigh, 15 Dalry Road, Stevenage, Herts., SG1 4AW. (Tel. Stevenage 4251.)

G3IRM, P. Lumb, 14 Linton Gardens, Bury St. Edmunds, Suffolk, IP33 2DZ.

G3KDP, A. G. Bounds, Amberley, 70 Mountpleasant Road, Camborne, Cornwall, TR14 7RJ.

G3LZV, C. A. Berry (ex-VS6EF/ZC5CB), 9 Cripps Close, Aylesham, Canterbury, Kent. (Tel. Nonington 840924.)

GM3MBP, R. P. Masters, 30 Strathalmond Park, Barnton, Edinburgh.

GM3MBP/A, R. P. Masters, Maryfield, Chirnside, Berwickshire.

G3XME, C. W. Wright, Romerstrasse 10, D-6201 Oberlibbach, Germany.

G3XNI, W. J. Hopkins (ex-GW3XNI), 10 Waverley Avenue, Exeter, Devon.

G3XSX, J. Harrison, 64 St. Oswalds Lane, Netherton, Bootle, Lancs., L30 5QQ. (Tel. 051-521 5614.)

G3XVL, C. J. McCarthy, 6 Lymington Avenue, Leigh-on-Sea, Essex, SS9 7AU.

GM3XWJ, S. K. Shakeshaft, 34 Munro Road, Jordanhill, Glasgow, G13 1SF.

G3YKB, J. B. Hodgson, 234 Gillingham Road, Gillingham, Kent, ME7 4QT.

GW4AEC, S. W. Davies, Park Dairy, 37 High Street, Portmadoc, Caerns.

G4BKY, S. G. Spencer, 57 The Quarry, Cam, Dursley, Glos.

G4CHN, D. Kelly, 42 Furness Grove, Norris Bank, Stockport, Cheshire.

G4CIY, J. A. Cass, 5 Lark Drive, Wellingore, Lincs. (Tel. Navenby 362.)

G4CWB, D. C. Andrews (ex-G8HYD), 63 Bulmershe Road, Reading, Berks., RG1 5RH. (Tel. Reading 666502.)

G5BBW, B. D. Woodall (W5MBO), 9 Birch Crescent, Aylesford, Maidstone, Kent, ME20 7QE.

G6SU, E. A. Parsons, Southcroft, Barmoor Lane, Ryton-on-Tyne, Co. Durham, NE40 3AB.

G8ARR, P. J. Edwards, 62 Oak Tree Lane, Selly Oak, Birmingham, B29 6HX.

G8ARU, J. T. Lumb, 14 Linton Gardens, Bury St. Edmunds, Suffolk, IP33 2DZ.

G8BNO, C. R. Street, Brockwells Cottage, Little Horsted, Uckfield, Sussex, TN22 5QS.

G8BPJ, D. S. Powis, 247 Sutton Road, Walsall, Staffs.

G8BZN, D. V. Goadby, 5 Queens Road, Hinckley, Leics., LE10 1ED.

G8DDB, W. F. Kirby (ex-DA4BK), c/o Sgts. Mess, R.A.F. Scampton, Lincoln.

G8EVP, D. R. Dabinett, 37 Hillside Avenue, Oakworth, Keighley, Yorkshire.

G8HDZ, P. Toirance, 15 Swanne House, Gloucester Circus, Greenwich, London, S.E.10.

G8HNS, R. J. Stanleigh, 31 Littleton Court, Blakeny Road, Patchway, Bristol, BS12 5RS.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for May issue: April 13)

Address all reports for this feature to "Club Secretary", Short Wave Magazine, Buckingham, MK18 1RQ

PERHAPS the most important news at the moment of sitting down to write this piece is the fact that the five-day working week and the consequent return towards normality were announced. This of course means that all those groups who found it necessary either to close down or to modify their routine will now be taking steps to return to their old ways—and they won't have time to get it mentioned in this column. The message is plain enough—if your Club changed its routine, ring up the secretary and ask him how they are playing things rather than miss a meeting.

This being said, we have quite a large clip to deal with, and so we will go straight in to the pile. The top one this time is from **South Birmingham**, who foregather at West Heath Community Centre, Hampstead House, Fairfax Road, West Heath. They have a formal meeting on the first Wednesday in every month, and in addition the Club shack is open every Friday evening.

Next comes **A.R.M.S.**, somewhat pre-occupied, naturally enough, with the summer and the rallies. It seems that the proposed rally at R.A.F. Cosford on May 19 is cancelled, in favour of an alternative date and venue rather later in the year when there is no clash of dates.

April at **Solihull** means a trip to the "Glover's Needle" in Worcester, where the highlight of the evening will be a skittles match, XYL's *versus* members. Last year the distaff side won, so no doubt the members have some scores to settle. This one is down for Friday, April 5.

Saturday, April 20 for **Crystal Palace**, at Emmanuel Church Hall, Barry Road, London S.E.22. The speakers will be G300U and G2FKZ, in the series of talks on Components, and this time they will be discussing Inductors and Transformers.

It is quite a while since last we heard from the **Wessex** crew. However, we understand everything is still in fine fettle, and meetings continue on the first Friday of each month and the Monday seventeen days later, at the Cricketers Arms, Windham Road, Bourne-mouth. For April 5, we are particularly to note that this is the AGM.

Every Monday is club-night at **North Staffs.**, the place to aim for being the Community Centre, Uubberley Road, Bucknall, Stoke-on-Trent. In general the first Monday is down to using the Club rig; the second is a Natter

session, the third Monday is a talk and the fourth a tape-and-slide lecture.

Another group holding meetings on a weekly basis are **Dunstable Downs**. Here there are "between weeks" on April 5 and 19, and no meeting on Good Friday, April 12. This leaves April 26, when G3GGK will be giving his talk on the "History of VHF Mobile Radio"—a large subject. Hq. is at Chews House, 77 High Street South, Dunstable.

April 16 is an important date for the membership of the **Sutton and Cheam** group, as it is their Annual General Meeting. The Library, Cheam, is the place to head for.

* * *

North Kent occupy the Congregational Church Hall, at Bexleyheath Clock Tower, on the second and fourth Thursdays of each month. April 11 is down for a discussion on NFD, and on April 25, Vic Drake of Jermyn Industries will be there to talk about Electronics Hardware.

Although they get together every Tuesday, primarily for R.A.E. and Morse, the main meeting for **Bury and Rossendale** is on the second Tuesday in the month, at the Community Centre, Mosses, Bury, with visitors always welcomed.

Colchester Radio Amateurs are still taking their meetings at the Army Amenities Centre, Reed Hall Avenue, as there has been no progress in the search for better accommodation. This being the case, we suggest it would be as well to contact the Secretary—see Panel—for the latest information.

On to **Coventry**. Here no detail is given as to the venue, but on April 5 and 26 they have "Nights-on-the-Air." April 23 is scrubbed as being in the holiday period, and on April 19 they have one of their light-hearted Quizzes, intended to entertain as well as be competitive.

* * *

Next we come to Bristol's **Shirehampton** group, anxious to make it clear there are at least two Clubs in the city, with Shirehampton looking after those on the West side of the City. Hq. is at Twyford House, High Street, Shirehampton, where they can be found every Friday evening. For more details, we suggest you contact

G4BOL, address as Panel opposite.

The hon. sec. of the **White Rose** group based on Leeds, tell us that their Mobile Rally will be happening on March 31, at Lawnswood High School. This date will be past by the time this is published, but we can say that the normal routine is of a weekly meeting at the Hq. address, 83 Town Street, Armley, Leeds 12, every Wednesday.

The Old Pheasant, New Street, Worcester, is home for the **Worcester Club**, and they have booked April 1 and 20 this month; the former date is the Annual Construction Contest, with a class for non-members (entry forms to be obtained from G8ASO) and the latter is a tape lecture session.

Verulam have an interesting one on April 17, when they will entertain, and be entertained by, Guy Moore, G3RVU, who will be talking about Quartz Crystals—we gather that members were so keen with the questions last time that this talk is to cover, as a second instalment, the applications side of Quartz crystals. As usual, the venue is the Market Hall, St. Albans.

One of the best, and most consistent, of the newsletters to come our way is the *Cornish Link* which as its name implied is the mouthpiece of the **Cornish Club**. The main meeting of the group comes on April 4, at the SWEB clubroom, Pool, Camborne, starting at 7.30, and is the AGM. Covering as it does such a large area, there are subsections for operating or territorial interests—such as the West Cornwall section, based on the Guildhall, Penzance, also the Newquay section in the town of the same name, and a VHF group still in process of being re-formed. Details on any of these from G3XTF—see Panel of Secretaries.

For **Echelford** the last meeting of which we have any details is that in March. However, we have the regular dates as being the second Monday and the last Thursday of every month, at St. Martins Court, Kingston Crescent, Ashford, Middlesex. Since there has just been an AGM, by the time this reaches print the programme will no doubt have been finalised.

A copy of the **Silverthorn** newsletter is to hand, the skilful editing bearing the mark of G2HR, who for long acted for them in letting us know of the Club goings-on. They have Hq. at Friday Hill House, Simmons Lane, Chingford, London E.4 where they get together each week. For more details, we refer you to G4AJA, as Panel.

B.A.R.T.G. write to mention their Convention, to be held this year at the Village Hall, Meopham, Kent, on May 18, running from 11.00 till 18.00. This location is on the east side of the A227, to the south of the village centre. As in past years, transport will be meeting trains reaching Meopham station at or before 1300. This one would seem to be a "must" for all the devotees of the art of RTTY.

Around April seems to be a favoured time for the annual general meeting of a radio club—**Torbay** have theirs in April, but they completely forgot to put the date on the letter, so we have to refer you to G3UIQ. However, we can say that they assemble in their Hq. at Bath Lane, 94 Belgrave Road, Torquay, monthly.

The Secretary at **York** sounds quite pleased with the way things are going there. They meet at the British

Legion Club, 61 Micklegate, each Thursday evening, and in addition there is a Sunday-morning net developing on both Top Band and Eighty. Visitors are always welcome to any meeting.

Barking must be one of the most active clubs in the country, getting together on no less than four evenings each week! Mondays are set aside for Morse practice, Tuesday for R.A.E. work, on Wednesday they operate the club stations, and on Thursdays there is an informal meeting and constructors' evening. The latter is where the main interest lies at the moment, as the group is to present a feature on "Past and Present Radio Equipment" at the local Town Show.

For **Acton, Brentford & Chiswick**, the next get-together is on April 16, when they will hear G3CCD demonstrating and describing his Transceiver for 144 MHz, which is home-designed and constructed. The venue for this one is, as usual, Trades and Social club, 66 High Road, Chiswick, London W.4.

Fridays at Sale Moor Community Centre are the main sessions for **South Manchester**, but they also have an Activity Night on Monday evenings for the VHF and D/F interests. Details of the Friday evening activities in April are: April 5, visit of G2AMV accompanied by a mystery guest lecturer; April 12, Radio Theory Questions and Answers; April 19, G4BJT talking about RF Spectroscopy; and April 26, a Home-construction competition. It is also understood that the D/F enthusiasts in the Club hope to run some practice events during the summer.

To judge by the report of their AGM the **Hereford** crowd are doing fine, although the committee are a bit unhappy that there are some members who don't turn up—it's no cause for serious worry, because if all the paid-up membership turned up regularly the society would be unique! To meet them, try the first and third Friday of each month, at County Control, Civil Defence Hq., Gaol Street, Hereford.

* * *

If any reader is interested in Amateur TV, he should certainly apply to join **B.A.T.C.**, which is the Club catering for their interests. Details can be obtained from the secretary at the address given in the Panel.

An informal discussion is lined up for April 11 at **Mid-Sussex** to decide what to do with the shack and the tower. Then on April 25, there will be a constructional contest. The venue for all normal meetings of the group is at Marle Place, Leylands Road, Burgess Hill, which is also the home of the Club station.

Yet another AGM crops up, this time at **Cray Valley**, on April 4. This one is at the United Reformed Church Hall, Court, as is also the Natter session on April 18.

Next we go down to the West Country, **Plymouth** to be more exact. The locals here have a place in Virginia House Settlement, Palace Street, St. Andrews Cross, where they can be found on the first and third Tuesdays each month. There is an open meeting on April 2, followed by the annual general meeting on April 16.

At **Wirral** the boys get together at the Sports Centre, Grange Road, West, Birkenhead on the first and third Wednesdays of the month, but unfortunately we do not have, from the newsletter at hand, any data on the

April programme. However, all is not lost; no doubt G3YGL (see Panel) would be only too pleased to oblige with all the latest gen.

The same situation arises in connection with **Wolverhampton**, so here again we have to point you in the direction of the Secretary. However, we are able to say that the general form of things is to have a meeting every Monday evening at Neachells Cottage, Stockwell End.

Now we have to mention a new formation in the Leicester area, to be known as the **Leicester Post Office** group. They have an Hq. at 66 London Road, where they assemble on the first and third Wednesdays of every month—and he would be pleased to hear from any potential new members.

All the meetings of the **Nottingham** group are held at Sherwood Community Centre, Mansfield Road. They have bookings here on Thursdays, and we notice on the 4th there is a "Forum" and on the 11th a talk on the Puff-meter, by G8HLD; this leads up to the AGM—what, another one?—which is on April 18.

One way of attracting interest, as lots of Clubs have proved, is to run classes leading to R.A.E., preferably to include a good amount of practical work; even if the class itself dies, there is usually a spin-off in the way of new members. **Mid-Lanark** realise this, and so they are going to try and set something up—anyone who is interested and within striking distance should get in touch with the hon. secretary at the address in the Panel. Hq., incidentally, is at Wrangholm Hall Com-

munity Centre, Jerviston Street, New Stevenson, Motherwell, and it is assumed by the writer that this will be the venue for any such classes. One hopes sincerely this one "gets off the ground." April 12 sees GM8BBA talking about the Club testgear and how it should be used, while on the 26th GM3YRK will give a talk on RSGB, to be followed by a Q. and A. session.

Just what keeps the **Sheffield** Club full of members in a relatively unpopulated part of the world is one of the minor mysteries of life to your conductor—nonetheless they do it, and rarely command less than a couple of dozen at an ordinary meeting. They get together every Thursday evening in the Church Hall, Ampthill Road, saving that this month there will be no meeting on April 11. This leaves the 4th for a Junk Sale; 18th for an R.A.E. Questions and Answer session; and the 25th for G8AFN to talk about Amateur Satellite Communication.

* * *

There are 455 members of **R.A.I.B.C.**, the Invalid and Bedfast club, including 28 YL's, spread over 14 countries. The Club can always do with members, both of the "full member" status, and also—perhaps more so—by way of the "helper" member, who can be conned at odd times into doing his turn at G3LWY's behest. Her address is in the Panel below.

The **Amateur Radio Society of Ireland** put out a very good journal, if the one at this desk at the moment is anything to go by; there is a very comprehensive piece

Names and Addresses of Club Secretaries reporting in this Issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3-8LB.
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HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford.
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WORCESTER: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester (29208), WR5-2EG.
YORK: K. J. R. Cass, G3WVO, 4 Heworth Village, York.

on the modification of the Pye Vanguard for home station operation off the mains. Details from the Secretary—see Panel.

The Radio Society of Harrow come next, and here the venue is the Harrow Sea Cadets Hq. Woodlands Road. They get together every Friday evening, with a programme as follows: April 5, Morse Practice and Trouble-shooters Corner; April 12 cancelled due to the holiday date clash; April 19 Morse Practice plus practical work on the Club project; and April 26, a talk by G8BJO on domestic Electronic Servicing.

For Spalding the venue is the intriguingly-named Teachers Centre, Pinchbeck. Here they can be found on March 29, shifted from the normal April 5 date, and May 3, the latter to be devoted to the final preparations for their Tulip-Time Rally.

April's meeting is at "the usual place" and no date is given in the Southgate news letter—so we have to suggest that if you want to join them, you will have to get in touch with their secretary.

Deadline

With the return towards normal working, closing dates for this feature in the next two issues will be April 13 and May 11, addressed as usual to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

And here a word of thanks to those secretaries and scribes who have kept the news flowing even though at

times they may have felt it was like trying to fill a bottomless pit. By noting the dates given, we shall soon be back to normal. 73 *es tnx.*

NOTE ON R.A.F.A.R.S.

One of the Service organisations in the radio amateur field is the Royal Air Force Amateur Radio Society, with Hq. at R.A.F. Station Locking, Weston-super-Mare, Somerset, and callsigns G8FC and G3IRS. Current membership is around 600 and the last annual report shows that the RAF-ARS cash assets amount to £1,022. The Society is very fortunate in being able to charge its postages to the Service, itself a considerable asset that other Amateur Radio organisations would envy.

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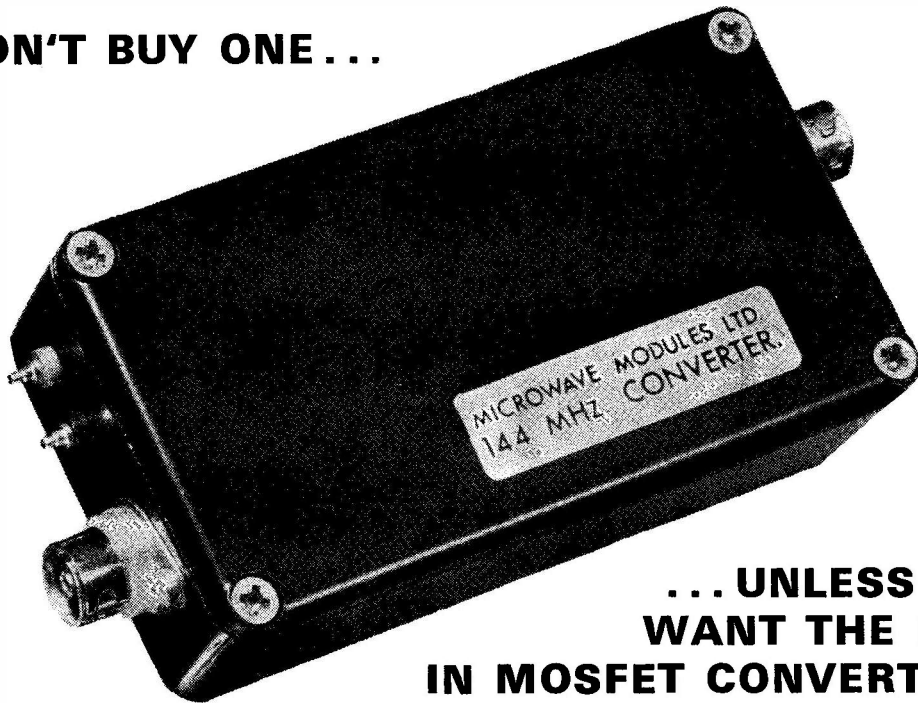
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OFFERING: Murphy Admiralty receiver, coverage 60-550 kHz and 1.5-30 MHz, new condition perfect working order; 170 "Practical Wireless" from August 1944. No sound offers refused. Moving, must clear. Buyer collects.—Manns, 25 Ivy Road, Hounslow, Middlesex.

SELLING: Trio receivers: JR-500S with SP5-D speaker, beautiful condition, £40; JR-310, with narrow filter, SP-5D, and replacement valves, £65.—Price, G8FIH, Sherwood House, Brimpsfield, Gloucester. (Tel: 045282-3382).

FOR SALE: Laboratory double-beam oscilloscope, good condition, £35.—Stenning, 14 Bell Crescent, Waterlooville, Hants.

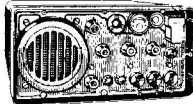
FOR SALE: Racal RA-17, LF converter, RA-98 ISB adaptor, plus all Racal handbooks (RA-17 looks and works like new), £250 the lot.—Duce, G4BQF, 28 Thompson Avenue, Canvey Island (62394), Essex.

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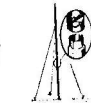


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WANTED: Trio JR-310 and 9R-59DS receivers, with handbooks; must be in excellent working condition. Details and price including carriage, please.—Arasu, School House, Brighton College, Brighton BN2 2AL.

WANTED: Circuit diagram for 19 Set Mk.III Rx, to buy or copy. Urgently required.—Plaice, 58 Lan Coed, Winch Wen, Swansea, Glam., S. Wales.

EXCHANGE OR SELL: Decca Legarto cassette recorder, mains/battery, auto record level, digital counter, brand new, accept £20 or would exchange. W-H-Y? **WANTED:** Jockey idler wheel, 2½-in. dia., suitable for 'Reps. R10' tape recorder.—Lindars, 52 Heathcote Drive, East Grinstead (23950), Sussex.

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SELLING: Eddystone EC-10 Mk.I receiver, mains and battery, immaculate condition, hardly used, £40 or very near offer. Will deliver.—Ring Penney, Kimpton (0438) 83202 (Herts.).

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FOR SALE: Unused Versatower (planning permission refused), 40-ft., £100; TH-6 beam, used but complete, £40. Buyers collect.—Whitehead, Church End, Weston Colville, Cambs. (Tel: 0223-829 524).

SALE: G.E.C. BRT.400E communication Rx, with SRCH.1067 handbook, virtually unused from new and in excellent condition, offers over £70. (Warks.).—Box No. 5205, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF. (Or ring 0203-73840, evenings).

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FOR SALE: Eddystone EC-10 Mk. II Rx, a beauty for £55. Cash only. **WANTED:** Codar Q-multiplier.—Ring Hall, 061-766 8937 (Manchester).

SELLING: Drake R4-B, less than one year old and as new, £200; Comdel speech processor, mint, £60.—Barry, G3UFU, 15 Fairlawn Court, London W4 5EE. (Tel: 01-994 6931).

OFFERING: HA-350 Rx with xtal calibrator and handbook; 8amp. Variac; Stepdown transformer, 10-amp., 240-115v.; U.S. Navy "calibmeter", CW60. ABM; Tuning unit Type Y180; 16 Morse keys, new, suitable for practice; UHF distribution amplifier; G.E.C. cassette recorder; Ajax battery/mains radio, MW/SW/Aircraft/Marine/VHF; 625/405-line 23-in. TV; Car radio, MW/LW/VHF, slight fault. Offers? Buyers collect. **WANTED:** Good general coverage receiver.—Earnshaw, 12 Clarke Brow, Middleton, Manchester.

SALE: Drake SPR-4 transistorised communications receiver, less than 20 hours' use, as new and in maker's packing (list price with accessories, £390), must be a bargain at £290.—Fletcher, 62 Moorbridge Lane, Stapleford, Nottingham. (Tel: Sandiacre 397446).

WANTED: Racal RA-17 or RA-117 Rx; Telequipment, or similar high-quality, oscilloscope; Eddystone 730 Rx; FM signal generator or wobulator to 30 MHz. Details and price please.—Lord, G3PHN, (Tel: 05304 4626, Ashby-de-la-Zouch).

FOR SALE: Sphinx SSB Tx, coverage 160/80/20m. and 40m. CW, perfect, £33. Buyer collects. (Nottingham)—Box No. 5206, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF.

WANTED: R.1155 circuit diagram, will buy for £1 (or hire for 50p); R.1155 parts also required. (Lincs).—Box No. 5208, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF.

WANTED: Manual for Lafayette KT-320 receiver, buy or borrow.—Hughes, 15 Princes Avenue, Liverpool 23 5RR.

OFFERING: Complete station: Collins TCS-12 receiver, coverage 1500-12000 kHz, 12v. 1A., with 12v. transformer; TCS-6 transmitter, Type T.1542A, with 6v. transformer, aerial loading coil and all ancillaries.—Ring Reid, 01-992 9164.

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SALE: FT-75, FP-75, DC-75, FV-50B and G-Whip Multimobile with all coils, £145. Might split.—Ring Harrison, G3OPJ, Maidenhead 20399.

SELLING: Drake R4-B Rx, with extra xtals, £175; TR-44 rotator, unused, £30; Minibeam HQ-1, almost new, £30; K.W. E-Zee Match, £8; Tech TE-15 GDO, £8.—North, G3TRY, QTHR. (Tel: High Wycombe 881258).

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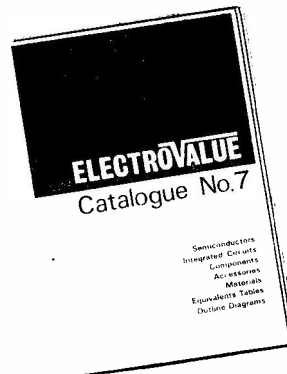
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SALE: Trio 9R-59DE general-coverage receiver, with speaker and headphones, in good condition throughout, £30. (Staffs.)—Box No. 5211, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF.

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SALE: Pye Cambridge AM.10D, six channel, aligned for two metres, transmit/receive crystals for 144.6 and 145.0 MHz and seven extra "receive" crystals, complete with microphone, manual and five-element beam, £30. Also 200 MHz Scaler, short version (see "Radcom", Jan. '73, p.34), complete in case, £14. Carriage extra, or delivery by arrangement.—Michaelson, G3RDG, QTHR, or ring 01-455 8831.

WANTED: I am looking for an RTTY converter Type BC.908B. Can you help, please?—Hamel, 11 Avenue de Picardie, 8000, Amiens, France.

FOR SALE: FR-50B, as new, coverage 10-15-20-40-80m., with calibrator, built-in two-metre converter, plugs and handbook, £57. AR88D receiver, in mint condition, with spare valves, phones and manual perfect I33. Two-metre Tx, with built-in SSM MF converter, can be used separately, £16-10. Brand new 805's, £4 each. 813 with base, £2-10. Carriage extra.—Davies, GW8EHR, 6 Church Road, Burryport, Carmarthenshire.

EXCHANGE: G.E.C. RC-410R for Collins R.389 or R.390A.—Passfield, 30 Greenleaf Close, Tulsa Hill, London S.W.2. (Tel: 01-674 5825).

FOR SALE: Property of late G2BYI: NCX-500 with NCX AC/PSU, ATU and Shure mic., £165; Hammarlund HQ-145X amateur band receiver, coverage 540 kHz-30 MHz, with bandspread and Hammarlund speaker, £65; AR88D with spares, £45; HRO, £20; CR-100 (B.28) £18. Multi-Elmac Rx, BC/160-10m., £25; Multi-Elmac Tx complete with mic., £25. All items with manuals. All "or near offer" plus carriage.—Byrne, G3KPO, QTHR. (Tel: 077584-485).

WANTED: War surplus 52 and 53 Tx/Rx Sets, and 62, 68 & 22 Sets, in any condition; two BF5 valve bases; 500 and 1000 pF Tx variable capacitors, must be very high-voltage type or even in vacuum; HT transformers, up to 4 kV at 500mA., and 7 kV at 1A; LT transformers 5v at 14A., and 5v at 75A. Smoothing capacitors, 16 or 32 mF at up to 10 kV.; low voltages considered, also any 813's plus bases and anode caps to suit. That's it until next month, all letters answered.—Jenkins, 30 Gainsborough Road, North Finchley, London, N12 8AG.

FOR SALE: Hammarlund SP-600JX receiver, with Hamgear ATU, crystal calibrator, preselector unit and handbook, all in good condition, price £80 or any reasonable offer? Buyer to collect.—Street, Greggs House, Collington, Bromyard (3319), Herefordshire.

SELLING: FR-SDX400 receiver, coverage 160-10m. plus 4m. and 2m., all modes, with matching speaker, mint condition, £150 or near offer. —Powell, G8BPK, QTHR. (Tel: Aylesbury 630600).

WANTED: Any information on Redifon G.12 receiver, particularly circuits of receiver and its external power supply.—Hooker, G8HK, 49 Melfort Road, Thornton Heath, Surrey CR4 7RS.

FOR SALE: Drake R4-B Rx, £160; FR-DX400 Rx, 1972 model with all options, £140. Buyers collect. (London).—Box No. 5209, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SALE: Trio 9R-59DS Rx with voltage stabiliser, good condition, £40. Minimitter Tx, 150w., AM/CW, coverage 3.5 MHz to 28 MHz, £12. Buyer collects.—Smith, G4AJM, 20 Munhaven Close, Mundesley, Norwich, Norfolk.

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SALE: Trio 9R-59DS Rx with calibrator and speaker, and Hy-Gain 18VT/WB 10-80m. aerial, £80 the lot.—Mills, York House, 13 Woods Lane, Dobcross, Nr. Oldham, Lancs.

SELLING: Yaesu FR-50B Rx, fitted with 160m., new, used, a few hours only, £63; Hamgear PM.IIA preselector, mains, new, £6-50. (Nottingham). —Box No. 5210, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

FOR SALE: Sommerkamp FL-200B transmitter, 240 watts p.e.p., coverage 10 to 80m., with Vox, £70. FR-100B receiver, AM/CW/SSB, 10 to 80m., with WWV and 100 kHz crystal calibrator, £65. Also Shure microphone, £3-50. All in superb condition. Complete station £130.—Ward, G4AOQ, 2 Lincoln Road, Oxford, OX1 4TB.

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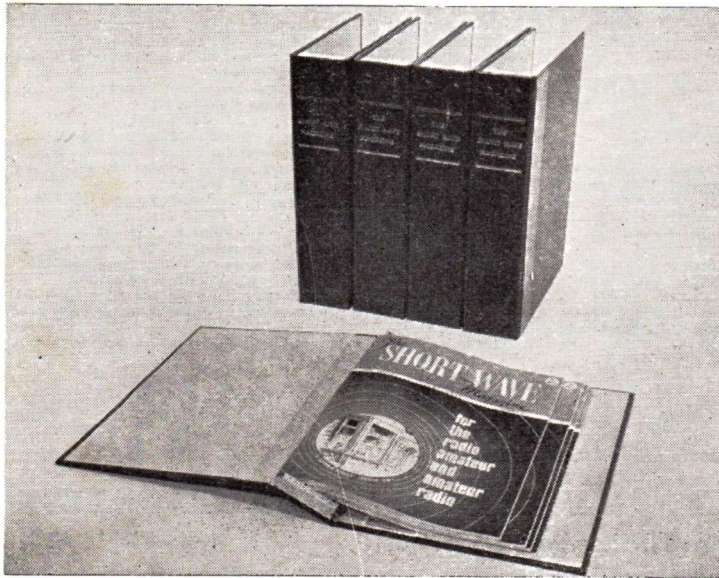
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