

25p

The
SHORT WAVE
Magazine

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NUMBER 11



WORLD WIDE COMMUNICATION

LOWE ELECTRONICS

119 Cavendish Road, Matlock, Derbyshire, DE4 3HE

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

John: G3PCY

Bill: G3UBO

Alan: G3MME

MAIN DISTRIBUTOR FOR YAESU MUSEN EQUIPMENT

Hours: Tuesday to Saturday 9-5.30 (closed for lunch 1-2 and all day Monday)

SERVICE AND SALES (evenings and weekends only): John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel: Ringmer 812071. Sim GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel: 041-771 0364. Alan GW3YSA, 35 Pen y Waun, Efail Isaf, Nr. Poncypridd, Glam. Tel: Newton Llantwit 3809. Peter Ward, G3XWX, 47 Radstock Avenue, Ward End, Birmingham B36 8HD.

SERVICE ONLY (evenings and weekends): Dave Dryden, G3BKQ, 205 Main Street, Thornton, Leics.

Sim, John, Alan and Peter will be happy to demonstrate New Yaesu Gear by appointment. They also have a pretty good selection of second-hand trade-ins at the right price.

HAPPY NEW YEAR

Yaesu Equipment

FT101. 160-10m. ...	£255	FRdx400. SDL 160-10m. fitted ALL factory extras inclu ding 4m. ...	£160
FV101. VFO ...	£38-00	SP400 Speaker ...	£10-00
SP101. Speaker ...	£10-00	FLdx400. 80-10m. ...	£146
FL2100. Linear ...	£148	FL2000B. Linear ...	£148
FT200. 80-10m. ...	£134	YC355D. 220 MHz Counter ...	£111
FP200. A.C. p.s.u./speaker ...	£38-00	FT2FB. 2m. FM ...	£89-00
DC200. D.C. p.s.u. ...	£46-50	FT2AUTO ...	£143
FV200. VFO ...	£38-00	FR50B. 80-10m. ...	£59-00
FT401. 80-10m. ...	£230	FL50B ...	£68-00
SP401. Speaker ...	£10-00	FV50B. VFO ...	£27-50
FV401. VFO ...	£38-00	SP50B. Speaker ...	£5-00
FT75. 80-10m. ...	£99-00	DC75. D.C. p.s.u. ...	£22-50
FP75. A.C. p.s.u. ...	£22-50		
FV50C. VFO... ...	£27-50		

Yaesu Accessories

FT101 modification kit to improve I.M. performance. If any of our customers are interested, we will give details on request.
 FRdx400. 2m. or 4m. converters, £12-50.
 FT101. Fans, £8. FT101. CV filters, £15.
 FT101. AM filters, see filter list.
 FT401. CW filters, £15. 100 kHz crystals, £2-50.
 11-pin accessory plugs, 45p.
 Manuals: FT200, FT101, FT2F, FT401, FT560, FT75, YC305, 65p each.
 Log Books: Nice glossy jobs produced by Yaesu, 45p each.
 2m. crystals: The FT2AUTO and FT2FB supplied by us are fitted 144-48, 144-60 and 145-00 MHz as standard. Extra channels available at £3-20 per channel are 144-30, 40; 80; 145-20; 40; 60; 80. And of course the repeater channel (145-15/75).

NEW ITEMS

Yaesu SIGMASIZER 200 channel 2m. FM transceiver. Complete coverage of 2m. in 10 kHz steps by frequency synthesis.
 Yaesu FT501 80-10m. digital readout. 560W. p.e.p., mostly transistor, but a 6BZ6 r.f. amplifier is used and a 6UBA first mixer to ensure the best S/N ratio without degrading I.M. and cross mod. performance.

VHF Equipment

In addition to the popular Yaesu 2m. FM equipment we also stock the following:
 Liner 2 2m. SSB transceiver fully tunable, both Rx and Tx (which in addition has RIT) over 145-25 to 145-49 MHz. 20W. p.e.p. input. All transistor.

Inoue IC21	Crystal synthesis ensures unconditional stability. Requires 12-16v. D.C. so is ideal for mobile ...	£138
Braun SE600 DIG	Base station or mobile ...	£130
	Matching VFO ...	£35-00
	The complete 2m. station. AM/FM/SSB with digital readout ...	£535

Braun SE600	As above but without digital readout	£460
Braun SE280	80 channel 2m. FM. Ideal for all European repeaters ...	£198
Braun DGTC22	2m. converter. 28-30 MHz IF ...	£20-00
Braun DGTC 1702	70cm. converter (2m. IF) ...	£36-00
Braun LVV 270	Varactor tripler 2m./70cms. ...	£35-00
Braun TTV 1270	2m./70 cms. transverter ...	£24-00
Braun CWF 02	Active CW filter ...	£15-00
Weir 2m. Mosfet converter.	Extremely good value for money, 28-30 MHz I.F.	£13-65

The Dycomm range of FM amplifiers:—
 Type E ES 1-10-0 C D 10-0 35-0
 Input W 1-2 1-2 1-2 4-12 9-12 7-15 24-40
 Output W 20-25 35-45 100+ 15-30 45-55 80-125 80-110
 These amplifiers have RF VOX and can be remotely switched. Ideal for mobile or fixed station—choose from the wide range the model which suits you best.

Station Accessories

SWR Meters: Hansen single meter, £4-70; Asahi twin meter, £7-20
 PL259 plugs to suit, 30p. Reducers, 10p.
 Kuranishi Wattmeters. Dummy load/wattmeter 5" x 5" x 10", switched 20 or 120W. f.s.d. flat 50 ohms to 500 MHz. Not to be confused with frequency conscious so called power meters. This is an accurate, direct reading instrument ... £32-00
 Headphones. Low impedance padded ... £2-75
 Microphones. The handsome Yaesu YD844 desk mike ... £12-00
 or the very popular YD846 ... £5-00
 Katsumi EK9X electronic keyers ... £8-20
 CW practice oscillators ... £2-20
 Anextra solder dispenser—fastens on to the soldering iron and dispenses solder automatically. By combining the solder and iron in one hand, you have a hand free ... £3-75
 Digital Clocks Copal 222 ... £7-50
 Copal 601 ... £14-25
 Copal 227 (alarm) ... £8-50
 PL259 plugs, 30p; reducers, 10p; sockets, 30p; connectors, 75p
 Special 4CX250 bases complete with chimneys ... £2-95
 Books: World's Short Wave and Medium and Long Wave Radio Stations and FM and TV listing ... 35p
 Comprehensive Radio Valve Guide Books, 1, 2 and 3 ... each 30p
 Transistorized Test Equipment and Servicing Manual 20p
 Transistor Equivalents and Substitutes ... 40p
 Handbook of Radio, TV and Industrial Tube and Valve Equivalents ... 40p

FILTERS

Mechanical 900 Hz CW, £12-50; 2-4 kHz SSB, £10-50; 5-3 kHz AM, £7-50; 20 kHz FM, £7-50.
Carrier crystals 453-5 and 456-5 kHz, £2-00 each.
Crystal 9 MHz 2-4 kHz SSB, £14 and £18 complete with carrier crystals.
 3-75 or 5-0 kHz AM, £16.
 0-5 kHz CW complete with carrier crystal, £16-00.
Other Frequencies SEI QC 1246AA 5-2 MHz. SSB filter, £16-20; carrier crystals, £2-00 ea. SEI 3-2 MHz AM (5 kHz) specially made for us for the FT101, £18-00.

CABLES

- Coaxial Cable** POSTAGE EXTRA
UR43 52 ohms 5.1 mm. dia. 4.33 dB/100ft. attenuation at 100 MHz, 8d. yard.
UR70 72 ohms 5.8mm. dia. 4.65 dB/100ft. attenuation at 100 MHz, 10p yard.
UR67 (RG8/U) 52 ohms 10.2 mm. dia. 2.2 dB/100ft. attenuation at 100 MHz, 22p yd.
Balanced Twin Feeder Type 302 75 ohm 2.9 dB/100ft. attenuation at 50 MHz, 5p yard.
Type 306/B300 ohms 1.0dB/100ft. attenuation at 50 MHz, 5p yard.
Rotator Cable 4 core for AR22, etc., 15p yard.
12 core for TR44 and Ham-M, 30p yard.
This is heavy duty cable, well above minimum requirements for trouble free service.

- PLEASE NOTE THAT POSTAGE IS EXTRA ON ALL CABLE**
Baluns Either 1:1 or 1:4 in stock.
Improve your antenna system.
H2P 2H 1:1 for dipoles ... £4.80
H2P 1B 1:1 for beams or quads ... £4.80
H2P 1C 1:4 for folded dipoles ... £4.80
Kirk 5075B 1:1 for beams rated 2KW £7.50
Kirk 5075D LF 1:1 specially for 160, 80 and 40 rated 2kW ... £7.50

ANTENNAS

- Fixed Vertical** Echo 8G-40-10 trap vertical ... £18.50
Diamond KB103 80 and 40 trap vertical £26.00
Diamond KB104 20, 15 and 10m. trap vertical ... £17.50
Diamond KB105 80, 40, 20, 15 and 10m. trap vertical ... £34.50
Multi-Element Beams Asahi full size 3 element 20m. beam £60.00
Asahi full size 3 element 15m. beam £32.00
Asahi full size 4 element 15m. beam £40.00
Asahi full size 4 element 10m. beam £33.00
Asahi full size 3 element 10m. beam £18.00
Carriage paid on fixed antennas.

- Quads** New from the States—the Polygon fibreglass quad 2 element 3 band. Write for details.
Mobile Antennas Tavasus base loaded 160 to 10m. complete Securicor for £1.85.
G-Whips Tribander (20, 15 and 10m.), £10.50.
Ranger, 160m., £8.00.
Duobander (160 and 80m.), £9.00.
Multimobile 71 (20, 15 and 10m.), £12.50.
160, 80 and 40m. loading coils for Tribander and Multimobile, £4.00 each. Top whip section for loading coils, £1.00.
Base section for all G-Whips, £1.45.

Carriage. The whips are too long to go by mail, so we send them British Rail costing 50p. We can, if you wish send them Securicor for £1.85.

- 'J' Beams** 2/4Y. 4 element folded dipole Yagi with 1" boom ... £2.90
2/6Y. 6 element folded dipole Yagi with 1" boom ... £3.50
2/8Y. 8 element folded dipole Yagi with 1" boom ... £4.20
2/10Y. 10 element 'Long Yagi' with 1½" boom and 45 braces ... £9.00
2/14Y. 14 element Yagi with 1½" boom and 45 braces ... £12.00
2/10XY. Crossed 10 element Yagi with 1½" boom ... £12.10
2/14P. 14 element 'Parabeam' with 1½" boom and 45 braces ... £14.50
2/8. Double 4 slot-fed Yagi with 1" booms ... £5.10
2/12. Double 6 slot-fed Yagi with 1" booms ... £6.75
2/16. Double 8 slot-fed Yagis with 1" booms ... £8.40
2/HO. 'Halo' mobile aerial, head only £1.35
2/HM. 'Halo' mobile aerial, with ½" mast £1.65
2/XD. Crossed pair of centre fed dipoles c/w harness ... £4.60
2/OV. Omnidirectional or Bidirectional Dipoles ... £7.15

- PM2/2. Coaxial harness to match and phase two 2m. aerials ... £2.90
PM2/4. Coaxial harness to match and phase four 2m. aerials ... £6.10
Plus 2 unit. 2 metre add on 2 unit ... 85p
Plus 4 unit. 2 metre add on 4 unit ... £1.65
NOTE—Please state nominal impedance required 50 or 75 ohms.
Antenna AR-22R for 2m. beams or similar, £25.00.
TR44 for bigger arrays, £45.00 and the Ham-M for full size heavy beams, £70.00.
All items carriage paid unless stated otherwise.

VALVES :

- 6AH6 80p 6BZ6 40p 6CB6A 42p 6USA 80p
6CL6 50p 6AN8 74p 6EW6 75p 6EH7 45p
6BM8 50p 6AW8A £1.15 7360 £2.10 12BY7A 70p
EF183 45p 6GK6 92p 6146B £3.00 61M6A £1.25
6JS6C £1.75 6KD6 £1.75 61B6A £2.00 572B £8.00

SECOND-HAND CARRIAGE BY SECURICOR £1.85.

- Receivers** HA 350 ... £50.00
Sommerkamp FR500 ... £95.00
Collins URR390 in excellent condition £250
Hallicrafters SX110 crystal filter very good condition ... £40.00
Trio 9R59D a popular general coverage receiver with amateur bandspread £35.00
AR88D. Good condition (Callers only) ... £45.00
Hammarlund HQ170A VHF ... £75.00
Hallicrafters SX111. 80-10m. ... £65.00
Eddystone EC10 A.C. p.s.u. ... £45.00
Trio JR500S ... £50.00
Eddystone 730/1A ... £75.00
Sommerkamp FR100B ... £80.00

- Transmitters** Codar AT5, A.C. and D.C. p.s.u.'s (home brew but good) control unit £25.00
Heathkit SB400. 80-10m. ... £80.00
FL200B. 80-10m. SSB/CW rig with built in p.s.u. ... £80.00
FL200B same as above, immaculate £85.00
KW Vanguard AM/CW Tx (Ringmer Agent)... £25.00
Hallicrafters HT37 ... £60.00
KW Viceroy III A.C. p.s.u. ... £55.00

- Transceivers** Yaesu FT-75, A.C. p.s.u. used very little £105
National NCX5 Mk. 2 with A.C. p.s.u. Digital readout. 80-10m. ... £175
KW2000B matching A.C. p.s.u. Excellent condition ... £160
KW2000A matching A.C. p.s.u. Excellent condition ... £150
Swan 500 complete with 230 XC p.s.u. £150
Heathkit HW 12A. 80m. Single Bander no p.s.u. ... £40.00
Drake TR3 A.C. p.s.u. Remote VFO £165
Heathkit HW32A, calibrator and D.C. p.s.u. ... £55.00
TW Topmobile ... £30.00
M.L. Transistor Analyser ... £35.00
Cossor Oscilloscope CDU 110 + 111 25 MHz. Dual trace plug in ... £150
Codar PR30 ... £3.50
USM-240 10 MHz scope complete all probes, etc. and manual ... £37.50

SERVICE :

You may be lucky—your rig may never go wrong. You may never ever require a hard-to-get spare in a hurry. But should anything ever at any time go wrong, you'll be glad you got your gear from us, because all you have to do is pick up the phone and tell us. We arrange collection, repair your rig and return it to you within a very short space of time—average total elapsed time less than four days (excluding weekends of course), although on many, many occasions, we have repaired the rig and returned it the same day as received, making the total elapsed time 48 hours. This service is a result of years of experience of Yaesu, years of experience in communications equipment generally, top quality test equipment and an extensive stock of spare parts. This service is, we are convinced, the best in the country and it is for OUR customers. If you bought gear elsewhere, we will do our best to fit you in but quite clearly OUR customers MUST come first.

LOWE ELECTRONICS

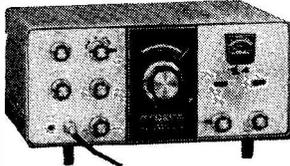
119 CAVENDISH ROAD, MATLOCK, DERBYSHIRE, DE4 3HE

TEL : Matlock 2817 or 2430 (9 a.m.—9 p.m.)

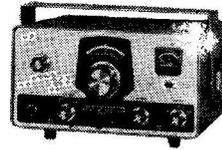
Members Amateur Radio Retailers' Association

Bill G3UBO, Alan G3MME, John G3PCY

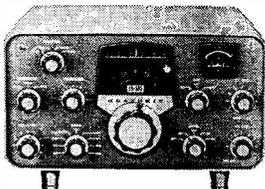
Look what HEATH can supply . . .



80-10m. Economy SSB Transceiver kit, HW-101
£129.50 carr. 80p



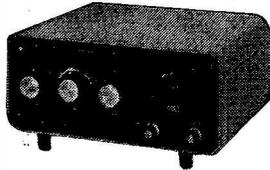
Single Band SSB Transceiver Kits
HW-12A £67.00 carr. 70p HW-32A £69.00 carr. 70p



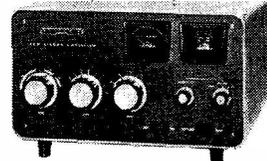
SSB Receiver kit, SB-303 £175.00 Carr. 90p



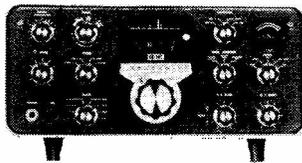
80-10m. Amateur Band Transmitter kit, SB-401
£190.00 carr. £1.00



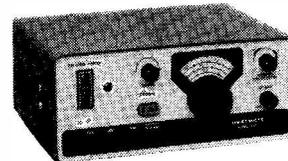
1 KW Linear Amplifier kit, SB-200
£127.50 carr. £1.00



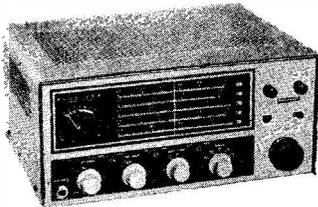
2 KW Linear Amplifier kit, SB-220
£178.00 carr. £1.50



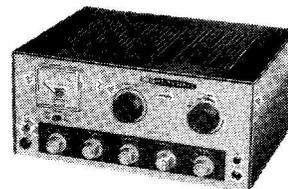
80-10m. De Luxe Transceiver kit, SB-102
£199.00 carr. 90p



40, 20, 15m. CW QRP Transceiver kit, HW-7
£35.00 carr. 40p



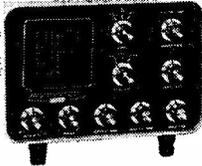
80-10m. Five-band Receiver kit, HR-10B
£44.00 carr. 60p



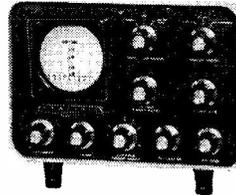
80-10m. Phone & CW Transmitter kit, DX-60B
£55.00 carr. 80p

ASK ABOUT THE HEATH EXTENDED CREDIT AND 'NO DEPOSIT TERMS' UP TO £30

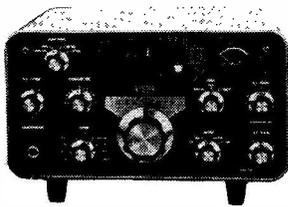
The're all in the Latest catalogue



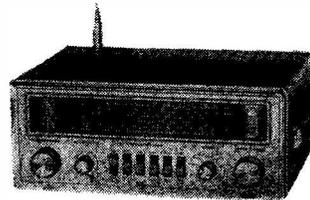
Signal Monitor kit, SB-610E
£47.50 carr. 50p



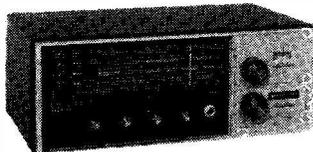
Spectrum Analyser kit, SB-620
£73.00 carr. 70p



Solid State SWL Receiver kit, SB-313
£185.00 carr. 90p



Solid State General Coverage Receiver, GR-78
£69.00 carr. 50p



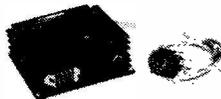
Transistor Gen. Cov. Receiver kit, SW-717
£31.50 carr. 70p



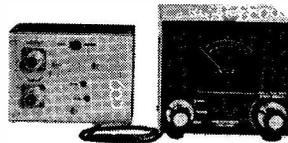
Digital Frequency Counter kit, SB-650
£79.00 carr. 60p



AC Power Supply kit
HP-23A £24.50 carr. 50p



Mobile Power Supply kit
HP-13A £37.50 carr. 50p



Wattmeter/SWR Bridge kit, HM-102
£15.50 carr. 40p



FREE HEATHKIT CATALOGUE

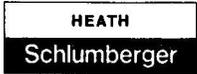
Covers full range—Stereo, Hi-Fi, Testers and Instruments. Metal Detectors, Intercoms. Portable Radios . . . even a battery charger. Send for your personal copy . . . today.

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DONT FORGET OUR ANCILLARY AND AUXILIARY EQUIPMENT.



OUR AESU MUSEN DISTRIBUTOR

WESTERN

FT-101 SPECIAL FREE OFFER!

For a limited period only we offer any licensed amateur whose QTH appears in the Callbook the opportunity to try in your own home on your own antenna the FT-101 (old model). Compare it against your present gear and marvel at its superb performance (sensitivity on 28 MHz etc.) and if you're not satisfied merely send it back to us. **DO NOT SEND ANY MONEY!** You have the FT-101 for seven days and then either send us the "101" back or **£229!** We will pay the carriage both ways so that you are put to no expense whatsoever!

SAVE ANOTHER 10% (or so) by BUYING NOW! BEAT V.A.T. BEFORE APRIL 1st!

REMEMBER THE YAESU RANGE IS SECOND TO NONE; LIKE OUR SERVICE!

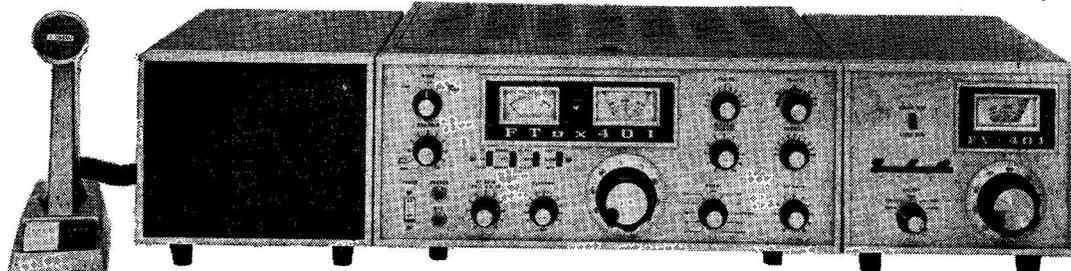
- SPARES:** We carry a full stock of factory recommended spares and more besides!
- SERVICE:** We do all labour FREE on warranty claims.
- GUARANTEE:** We maintain the YAESU 12 months guarantee.
- DELIVERY:** We deliver within 24 hours of receipt of order of items which are in stock. This is the fastest delivery service in the country and costs £1 per parcel only! 48 hour service to Scotland and remote places.
- COLLECTION:** In the unlikely event of your having faulty equipment, all you have to do is phone/write us and we will collect by SECURICOR AT OUR EXPENSE and return the unit to you AT OUR EXPENSE.

YD844

SP400 (Ex Stock)

FT 401 (Ex Stock)

FV 401 (Ex Stock)



THE FT401 offers a high power SSB/CW transceiver with many extra features at a minimum price.
SPECIFICATION: Power: 1p 560w. p.e.p. Built-in CW filter, noiseblanker and blower cooled pa. Complete coverage 80-10m. Plus WWV (10 MHz) to check the 25/100 kHz calibrator plus 3 spare band positions. VOX is built-in (not an extra). Dial readout to 1 kHz on all bands. Sensitivity 0.5µV for 20 dB S/S+N. Selectivity: 2.3 kHz (6dB), 3.7 kHz (60dB). CW filter 600 Hz. Clarifier 5 kHz. Break-in CW with sidetone. Selectable USB/LSB.

EVERY MODEL BELOW EX-STOCK

As there will be a last minute rush to beat V.A.T. you'll be wise to place your order with us now. Just DIAL 04216-4930 and Mary or Hilary will soon confirm availability.

YAESU PRICES—Carriage paid by Securicor

HF TRANSCEIVERS

FT-75. 50W p.e.p. 10-80m. 3 Ch. vxo	£99.00
FP-76. A.C. p.s.u. and speaker for above	£22.50
DC-75. D.C. p.s.u., speaker and mobile mount	£22.50
FT-200. 240W p.e.p. 10-80m.	£134.00
PF-200. A.C. p.s.u. and speaker for FT-200	£38.00
D.C.-200. D.C. p.s.u. for FT-200	£46.50
FT-101. 10-80m. A.C. and D.C. p.s.u. built-in. New model	£249.00
FT-101. As above — 160m. New Model	£255.00
FT-401. 560W. p.e.p. 10-80m.	£230.00

VHF TRANSCEIVERS

FT-2FB. 2m. 12 channel, 10W, O/P FM. New!	£89.00
FP-2AC. A.C. p.s.u. and speaker	£25.00
FP-2 ACB. A.C. p.s.u., speaker and Ni.cad batteries	£36.00
FT-2 AUTO. 2m. 8 ch. scanning	£146.00

HF TRANSMITTERS

FL-60. 50W. p.e.p. 10-80m. VOX control	£68.00
FL-50. Fitted VOX	£72.00
FL400. 240W. 10-80m. Transceivers with matching FR400 receiver	£146.00

HF RECEIVERS

FR50. Double conversion. 10-80m.	£59.00
FR50. Fitted WWV and xtal. Calibrator	£63.00
FR400DX. 160m. 80-10m. (28-29 MHz)	£120.00
FR400SDX. 160-2m. 4 Mech. Filters, 28-30 MHz	£160.00

MATCHING SPEAKERS

SP101, SP400, SP401	£10.00
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REMOTE VFO's

FV-101 for FT-101, FV-200 for FT-200	£32.00
FV-401 for FT-401	£38.00
FV-50 for FT-75 and FL50	£27.50

FREQUENCY COUNTERS

YC-305. 35 MHz. A.C. or 12v. D.C.	£85.00
YC-308D. 220 MHz. Built-in pre-scaler	£111.00

LINEAR AMPLIFIERS

FL-2100. 1200W p.e.p. 10-80m. (Matches FT-101)	£148.00
FL-2000B. As above. Matches FL400	£148.00
FL-2500 2kW. p.e.p. 160-10m.	£122.00

ELECTRONICS (UK) LTD

YAESU RECEIVERS

FR-50B



This **AM/CW/SSB** double conversion receiver offers first class value for money. This comes complete with built-in speaker, crystal calibrator and WWV band at **£63**. (Less Cal/WWV at **£59**).

SPECIFICATION

Sensitivity : 0.5V 10dB S + N/N ratio.

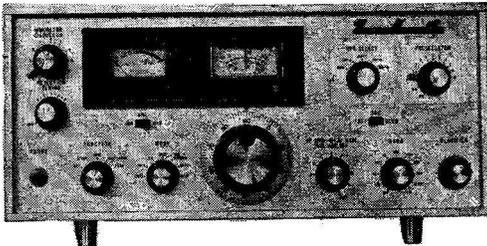
Selectivity : 3.6 kHz 6dB ; 10 kHz 50dB.

Frequency Coverage : 3.5-3.8 MHz, 7-7.5, 14-14.5, 21-21.5, 28-29.2 MHz.

Dial Calibration : 1 kHz divisions.

Image rejection : Better than -50dB.

FR400SDX



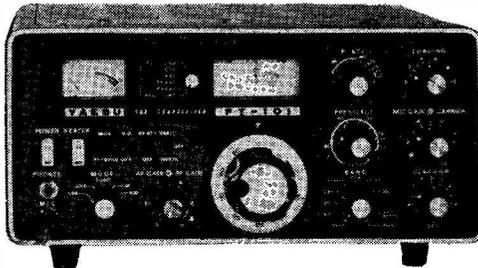
The **FR400SDX** is made especially for us with 2m, 4m, as well as 10-160m. It has :

- 4 Mechanical filters : CW 600Hz, SSB 2.3 kHz, AM 5Hz, FM 24 kHz.
- Rejection tuning.
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THE SUPERB FT-101



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FR400SDX	£16	6-£14, 6-£13	9-£10, 9-£9	12-£8, 12-£7	18-£6, 18-£5
FT/FP75	£12.50	3-£11, 9-£10	3-£8, 15-£7	16-£6, 8-£5	6-£5, 30-£4
FT/FP200	£18	5-£15, 7-£14	3-£11, 15-£10	1-£9, 23-£8	32-£6, 4-£5
FT101	£26	6-£22, 6-£21	2-£16, 16-£15	22-£12, 2-£11	27-£9, 9-£8
FT401	£23	5-£20, 7-£19	12-£14, 6-£13	19-£11, 5-£10	33-£8, 3-£7
FT-2FB	£9	7-£8, 5-£7	6-£6, 12-£5	6-£5, 18-£4	4-£4, 32-£3
FT-2 AUTO	£15	3-£13, 9-£12	12-£9, 6-£8	20-£7, 4-£6	36-£5
YC-305	£9	2-£8, 10-£7	1-£6, 17-£5	1-£5, 23-£4	35-£3, 1-£2
YC-305D	£12	4-£10, 8-£9	11-£7, 7-£6	6-£6, 18-£5	31-£4, 5-£3
FL-2100	£15	6-£13, 6-£12	14-£9, 4-£8	22-£7, 2-£6	3-£6, 33-£5

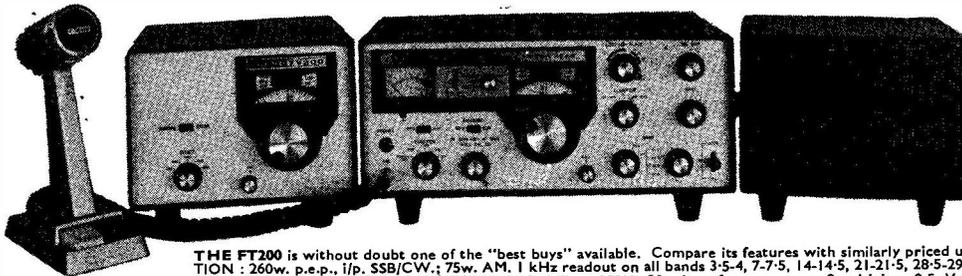
FV200

FT200

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FP200

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Clarifier
100 kHz
Calibrator

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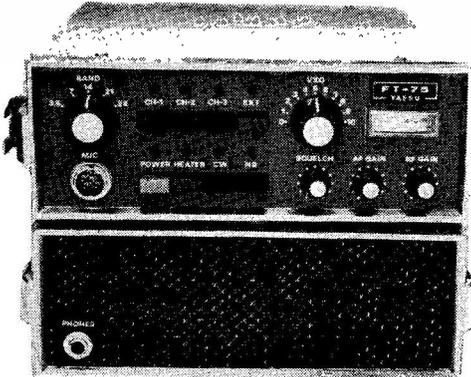
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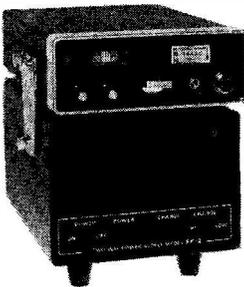
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A 10-80m. SSB TRANSCEIVER for ONLY £99 (carriage paid)

FT-75



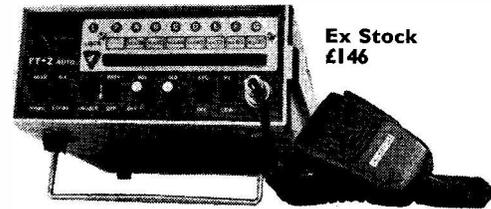
FP-75

Ex Stock



NEW—FT2FB. Similar to FT2F but with more efficient transmitter, tone for repeater triggering and improved receiver filter. Takes less current

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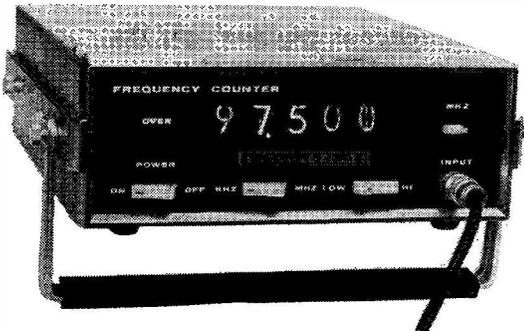
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£146

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The receiver automatically scans the 8 channels and will indicate on which one there is a signal. Power output: DX, 10w. Local, 1w. Frequency coverage: 144-146 MHz. Weight: 4.2 kg. Size: 210w. x 95h x 270d mm. Mode: F3. Power requirements: AC, 100, 110, 117, 220, 230v. DC, 13.5.

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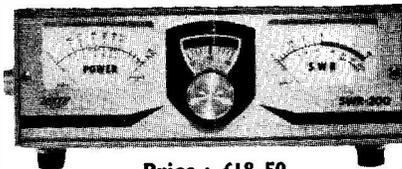
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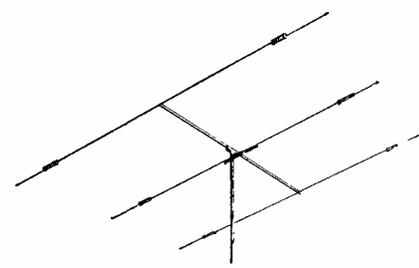
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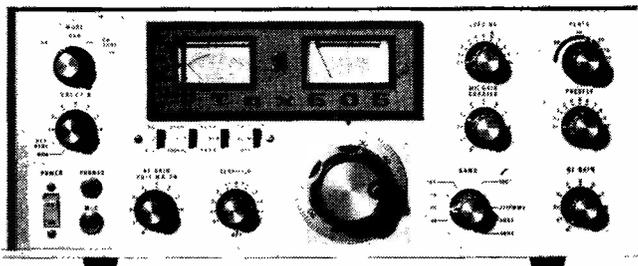


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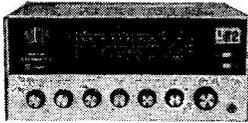
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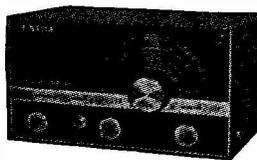
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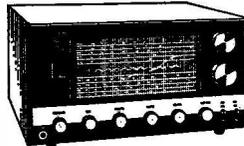
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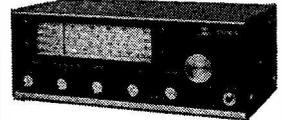
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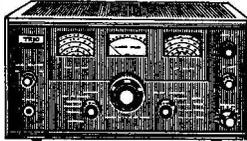


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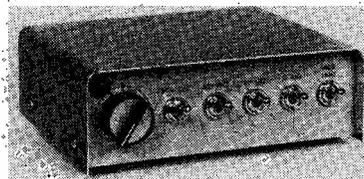
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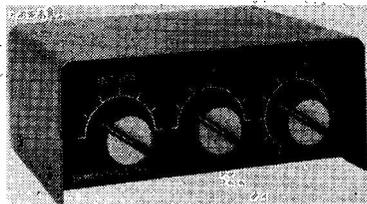
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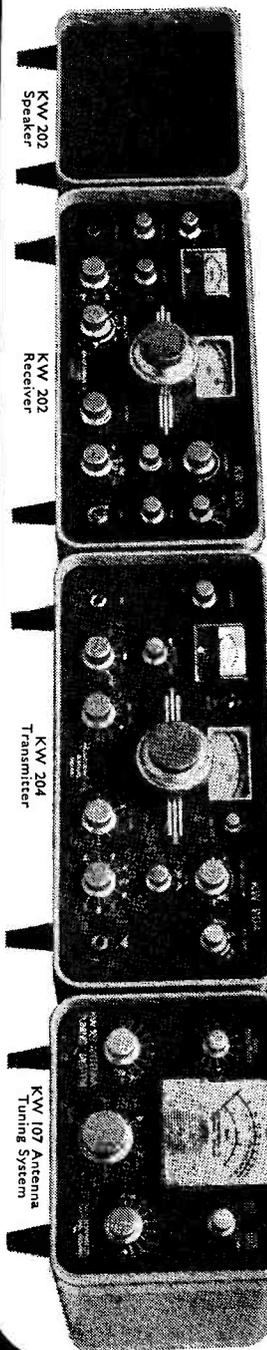
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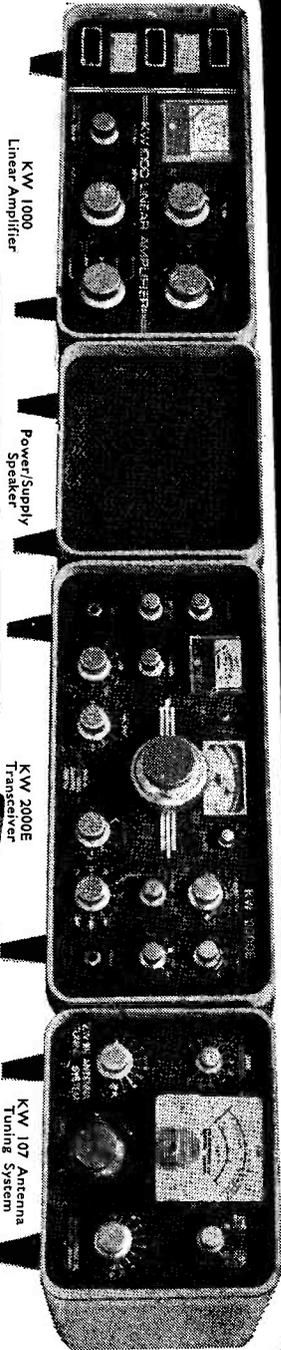


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(GB3SWM)

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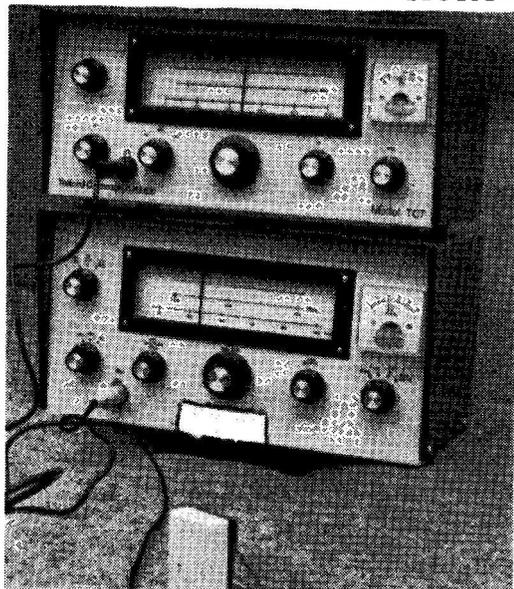
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The SHORT-WAVE Magazine

EDITORIAL

Safety

We have frequently touched upon the necessity for taking proper precautions in the design of a mobile installation, so that it would be safe to operate under all road conditions.

Safety does not, of course, begin and end with the mobile rig and the way you drive your particular box-on-wheels. In a different sense, due regard must also be paid to safety in and about the station itself. There is a long catalogue of precautions which can be taken, and which in any event will suggest themselves to the serious and responsible radio amateur. To attempt to list them all here will be of no help to anyone who fails to keep constantly in mind that the ordinary HT power pack is dangerous, and can be lethal.

It is not clever, or bold, or daring to dice with death when handling power leads—it is foolish irresponsible and inconsiderate, and frequently has the same consequences as those that eventually catch up on the reckless.

The most important precautions to be taken for safety in the amateur station have often been stated: Keep N, L, E, sorted out all through the mains wiring; fit a double-pole master switch for cutting the power to the whole station, and make sure other members of the household know where it is and what it is for; earth down all chassis; install high-voltage power units out of immediate reach, preferably in protective cages; bleed all HT filters; fuse HT supplies and packs at all possible points; protect all HV points on open-chassis apparatus—the easiest way to do this is to put it out of reach. Never use both hands if adjustments have to be made to live gear—one hand should always be in a pocket, and stand on a rubber mat. Fit a large aerial earthing switch, and use it when there is heavy static about. Make sure that even in the event of a major break-down, no HV DC can reach the aerial.

A station laid out in accordance with these broad principles should be absolutely safe not only to the operator, but also to his family and his friends.

As a footnote to the foregoing, we have just (as this was going down) been informed by the Ministry that in view of the health hazard (due to UHF radiation) no amateur will be allowed to operate in the new 24,000-24,250 MHz band without first obtaining permission from MinPostTel.

★ ★ ★ ★

AND A VERY HAPPY, PROSPEROUS AND SAFE NEW YEAR
TO ALL WHO SEE THESE LINES

*Austin Forsyth
G6FO*

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

ONCE again the start of another year, with your scribe still sitting in the "hot seat." By and large, conditions this last year on the bands have been better than one could reasonably have expected from the sunspot predictions of twelve months ago, certainly on Ten and Fifteen. Forty has remained largely its own inscrutable self, Eighty has been hardly mentioned by the correspondents although the DX has been worked by those who know how and have the persistence of purpose. As for Top Band, its decline in recent years has continued, coincident with the rise of Two as a matter band.

This last trend has been most alarming to informed observers; it is seen as the logical result of the extension of the G8/3 territory to two metres and the resulting shift there of the local nets as the common ground between them and the A-licences. In addition, the spread of UHF/TV has undoubtedly made TVI-free operation possible for many amateurs who have therefore abandoned 160 metres in favour of more DX'y pastures. Add to this the virtual death of the county-hunting ploys by the impossibility of filling in the rarer GI counties now DX-peditions to them are just not considered to be "on," and the cumulative result is depopulation of the Phone end of the band and a decline in the amount of inter-G CW operating. Interference to reception on Top Band by local TV receivers—that infuriating buzz modulating all signals—must also be a factor.

On a different tack, the past few weeks for your conductor have involved him in the process of clearing out the shack and moving the rig to a spot shared with the family—and it is *amazing* what a clear-out of a shack occupied continuously over a period of several years will reveal. At least two missing QSL's are accounted for by the outgoing ones having been "posted" down the back of the operating-table, for instance!

The Bands

The onset of winter conditions, with the more violent changes in MUF's brought about by longer hours of darkness has had its effect; the 15-metre allocation is usually just going out as one reaches the shack, and Twenty is not far behind it as the evening progresses, while Ten is dead almost before sundown. Forty has been, by and large, a bit below par, although evening DX is there to be worked by the brave, both on CW and SSB. Having said all this, let us see what our Correspondents have to say, starting with Ten.

G4BKI (St. Ives) wonders whether, at 14, he is the youngest amateur in the country—but, youngest or not, he is certainly going great guns, with his first ten weeks of activity showing 764 stations worked in 82 countries. On Ten, SSB yielded PZIAM, VE6GAF, K1LWI and local QSO's.

W6AM (Long Beach) offers VP2VPI, in Peter Is., with QSL via Box 411, Portola, Virgin Is. This is the Portola Radio club DX-pedition to Peter Is., which however counts for DXCC purposes as Virgin Islands.

In the Phone leg of the *CQ WW* DX contest, the call of GM3YOR (Kirkcaldy) was used by the local club to run up a claimed score of 354,878 points, which included a string of W's on Ten.

The countries total on Ten of GW4BLE (Newport, Mon.) remains at 97, although Stephen worked UL7PAR, UO5OAA, TZ2AC, ZS1OU, W0LSD (Colorado), SV1IM and KV4GV. Ten remains the only band on which operation is possible in TV hours, while the wait goes on for the GPO to turn up with their ferrite rings; however, only one neighbour is affected on Twenty.

Nice to hear again from G3TLX (Edgware), mainly on other subjects; but he did put the machinery on Ten to get his CW to ET3USB, CN8GG and ZD3Z.

Fifteen

DX'ers with normal work hours

get a QSO in on this band by having a late evening meal and going straight to the shack from work—if the XYL allows! Just such a manoeuvre gained your conductor his catch of the month in 9G1HE—a country which for some mysterious reason had previously eluded all his efforts, and finally appeared, as it were "on a plate."

The 240 watts from GW4BLE connected with XT2AC, 5T5BH, 5T5DY, TZ2AC, ZD8TS, ZP5TE, HI8LC, KV4CI, 7X2MD, EL9A, CT3AR and TI2RT, all SSB using the 18AVT/WB at 15 feet.

Paul, G4BKI, remarks that his brother has forgotten his report; odd, how these "pirate of Penzance" all report in different months! G4BKI stuck to SSB and raised VS6FB, VE3AYS, EP2TW, JA4HCR, KG6JBO, W1EOA, 9M2DQ, JA1ERY and VK9RY.

Only one 21 MHz QSO appears in the W6AM list, if we exclude the U.K. and that is 5V8WS (QSL via DJ6QT). The G was ex-VU2WP, who had, during his return to U.K., visited Don at Rhombic Farm.

The GM3YOR log for the contest shows, naturally, lots of W and VE, plus EP2TC, FP8AA, FP8DH, OD5BA, PJ1AA, W4GIW/VP7, W4EV/VP9, 4M4UA, 4M7AV, 4Z4HF, 9E3USA and 9H5D.

Work has made inroads into G3ZPF's operating time; W1, W4, W5, W6, W8 and W9 have been worked, plus VP9BO, 3B8CZ, FP8AA, VU25DK, ZD8RW and HP1KC—instead of the normal long list of DX. On a different line of thought, David noted the GW4BLE TVI troubles mentioned last month and says he, like your conductor, has found braid-breakers in the form of ferrite rings to be the proper answer where the TVI does not respond to a HPF. David also finds them very good as mains lead filters, saving all the normal hazards associated with an "in-line" filter. The method is just to coil as many turns of the mains lead round the ring as may be, as near to the TV set entry as possible. It is so simple,

involving nothing more than taking off the mains plug and threading the lead through the centre of the ring a few times before remaking the mains lead plug.

G3TLX's hands have not lost their old touch, as he showed by working his CW to DU6RH, KH6J, 9L1GC, UAØBL, KA6AY (Okinawa), ZS, ZL, VK, W, VE, JA and YV.

Contests

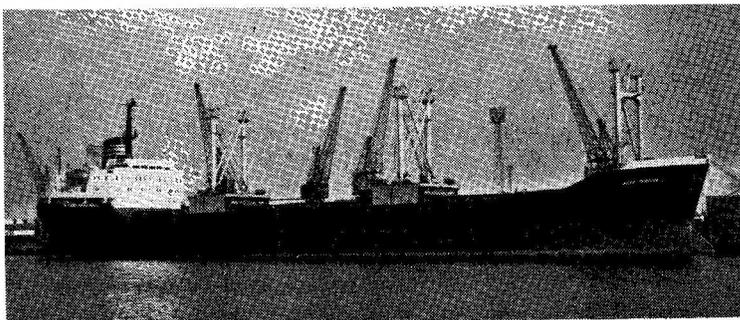
A brace of important ones are up for mention. The ARRL DX Contest runs from 0001 on Saturday to 2359 Sunday, GMT, with the Phone weekends February 3-4 and March 3-4, while the CW operators get their chance over the week-ends February 17-18 and March 17-18. The W's send signal report plus their state or province, we DX types respond with report plus three digits indicating power input. It should be noted that this year there are changes in the criteria governing disqualification—details, with the full rules for those interested from ARRL Communications Dept., 225 Main Street, Newington, Conn., 06111, U.S.A.—which is also the QTH for logs.

Now we must mention the CQ WW 160 contest, from 2200z January 26 to 1600z January 28, the W/VE's sending RST plus serial number and state or province, DX replying with RST and serial number. We score two points for a QSO with own country, five for a QSO outside one's own country, and ten for a W/VE contact. For everyone the multiplier is one for each state, province and country worked. (Hawaii and Alaska are considered for this purpose to be DX, not W). District of Columbia counts as Maryland, and don't forget there are three provinces, Nova Scotia, New Brunswick and Prince Edward Island, in the VE1 call area. Mailing deadline is February 28, to CQ 160 Contest, 14 Vanderventer Avenue, Port Washington, L. I., N.Y. 11050, U.S.A.

Thanks to W1WY, as always, for the invaluable help he gives in keeping track of the contests throughout the world, and in passing the word round.

Here and There

To the uninitiated reading this column, chasing DX must be



Under the cranes at Barry Docks, South Wales, the 14,000-ton bulk carrier "Sugar Producer," powered by diesel engines giving her a forward speed of up to 15 knots. She flies the Tate & Lyle house flag. All the accommodation is in the after part and it is from this ship that you can hear or work G3ZXH/MM or G3TZL/MM as they go round the world.

seemingly very simple. Take a CW/SSB transmitter or transceiver, an aerial, and away you go. However, it would not show up that, in general, the Amateur Radio DX station anywhere in the world is more efficiently organised, uses higher than average power, and has better than average aerial systems, at least on the favoured bands. And yet so little of this know-how percolates through to the Joe Average in the local club, with his bit of AM on Top Band and length of wire down the garden fed against a two-foot earth spike, whose only resort is to complain that anyone who has a big signal "must be exceeding the legal limit 'cos he's got a better signal than me!" Back in those pre-war days almost any amateur you met would have been operating for at least some of his time during the previous week on Twenty or Forty, after long-distance contacts. What has happened to generate this two-worlds situation in Amateur Radio?

G3NUA (Hartlepool) says he has become inactive on Top Band, in the main, because of the unbearable noise from TV receivers on occasion, a problem to which John wants a solution. There are various reasons for line-timebase QRM; usually, it is picked up from the set and radiated through the TV set mains lead, and one frequent cure is simply to make sure the TV mains lead makes the chassis go to neutral and live to live-side, by using a polarised (three-pin) plug if possible, or painting a mark to show which way round it should be plugged in. As much of this noise

finds its way on to the mains earth lead, it is vital to have a separate earth on the aerial and either to make it the only one if it is good enough to be the safety earth, or at least to filter the noise off the mains earth and ensure the RF only uses the signal earth.

Marconi Commemoration activity still seems to be mushrooming. This year there will be a station at Cape Cod, where Marconi himself was at the key with 30 kW of spark on about 1800 metres; they will sign WM1CC, all being well. Incidentally, it is interesting to notice that although radio techniques have improved, the Wx at Cape Cod certainly has not. Already, all but half of the original site has been eroded away into the sea, and all the visible remains are the concrete foundation of the transmitter-room and the base of one of the towers. Prefix hunters wanting WM1CC for the collection should be on the alert between January 13 and 18, CW frequencies 3587, 7060, 14070, 21060 and 28025 kHz, and Phone 3900, 7285, 14290, 21360, and 28520 kHz. From 0256 to 0300z on the morning of the 19th, they will send at 14 w.p.m., the original Marconi message, and if you send correct copy with your QSL, you get a certificate; at the end of this four-minute period there comes the station QRT.

Twenty Metres

As is to be expected at this time of the year, with its violent changes of MUF, Twenty has been like the curate's egg—good in parts.

G4BKI dismisses the band with a raspberry; but he had a good list

to offer, nonetheless, with his SSB reaching out to UL7GAJ and VS6AK, and CW to FP8AA, TF5TP, 3A2CP, XT2AC, VQ9R/D and ZB2CF.

GW4BLE only uses Twenty when a certain neighbour is out—but the ploy at least enabled contacts to be made with 3B8AW, 3B8CI, VE7SV, 9Y4VV, PZ1CI, TU2DO,

BRIEF DX DATA

Call	Details
A4FA	21354 kHz, 1300z, 14170 kHz 1445. Operator is ex-MP4MBB.
VK0AAD	Understood the Heard Is operation is cancelled.
VR6TC	Tom Christian now back home again after being in hospital since July with crushed leg in a boat accident.
ZF1SB	R. L. Sefton, Box 800 Grand Cayman. Note, Ron is not yet QRV, so the station recently heard signing "ZF1SB" is therefore a phoney. ZF1WB 21127 kHz 1230z, QSL to Box 701, Grand Cayman.
5X5NK	14185 kHz, 1420z, 7090 kHz 1900z. Udo will be there for about a year. QSL via DJ3JV.
HR1RF	QSL's to US Embassy, Tegucigalpa, Honduras.
JT...	Zone 23. JT0AE 14285 kHz, 0900z. JT1KAA, 14210 0700, 14030 kHz CW. JT1AA, QSL via Box 708, Ulan-Bator.
UK1ZFI	All the QSL's for this operation by UR2AR and gang will be shortly going out via the bureaux.
VQ9HCS	Reported often to be using 21295, 21310, 21370 kHz. QSL to WA1HAA, 238 Slater Street, Attleboro, Massachusetts 02703.
YV0AA	Aves Is. January 9-12, operation by Radio Club Venezuela group. Some Top Band, some SS/TV. Monitor 1805, 3525, 7025, 14025, 21025, 28025 kHz and 1805, 3790, 7080, 14190, 21290, 28590 kHz for SSB, round the clock.
3D2	Fiji. 3D2DI, 14252 kHz, 0915z; 14195 kHz 1005z, QSL via VE6TK. 3D2EK on CW, 21030, 14040 kHz.

Reporting the HF Bands

TY0ABD, TZ2AC and ZD8KO.

W6AM reports with pleasure the arrival of his card for the SY1MA operation which he reckons will be approved as a new country for DXCC purposes, probably in the January QST. His SSB contacts went to JY9VO, 4W1BC, 7Z3AB, G3UBR, WA2YMZ/MM (en route to Heard Is.), IT9JOY, OD5EJ, 4W1AF, and CW to VU25XY and IT9INU.

Another one who says "not much to report" is G3ZPF. David tangled with W1-2-4-6-8, VE1-2-3-7-8, plus FB8XX, VP2MAH, 8Q6AC, 9Y4VV, 9N1MM, VK6NS, VK6HD, FL8DJ, EA9EO, ZE1EA, 4UAITU, 7X2SX, M1D, CR7IZ, ZD3X, 8P6AZ, OH0NJ, 9G1WW, 9M2DQ and 9J2SS, all on Phone.

On an entirely different train of thought, though still connected with 14 MHz, we have a letter from Ian Dredge, who advises that the authorities issued him in error with VS6AD, when the call was in fact still held by someone else. The mistake was not picked up until after three months, so lots of people want cards from VS6AD who should be in fact aiming at the new and now correct call sign, which is VS6GA. Just for the record, Ian is also ex-G8ATV.

That contest effort at GM3YOR was not really fruitful in terms of DX on Twenty as although they hooked shoals of W's, "the others" added up to VP9GD and 8P6CE.

Odd Points

The Editor sorted out a fine collection of pictures to show with last month's CDXN, what with GW3UZZ's lighthouse, the Mowlem station and the TV and OT pictures. However, G5KS, who appeared with his A/TV set-up—with what appeared to be a very cunning method of transmitting transparency material for captions, etc.—writes in with a small correction, in that he was first licensed in 1936, and not as stated.

Such is the weight of the pile-ups in the big world-wide contests that

it is very hard not to just go on working W's all through the contest, as G4BKI found out when he entered the CQ WW event, to work 220 stations for a measly 15,000 points for 25 hours hard work!

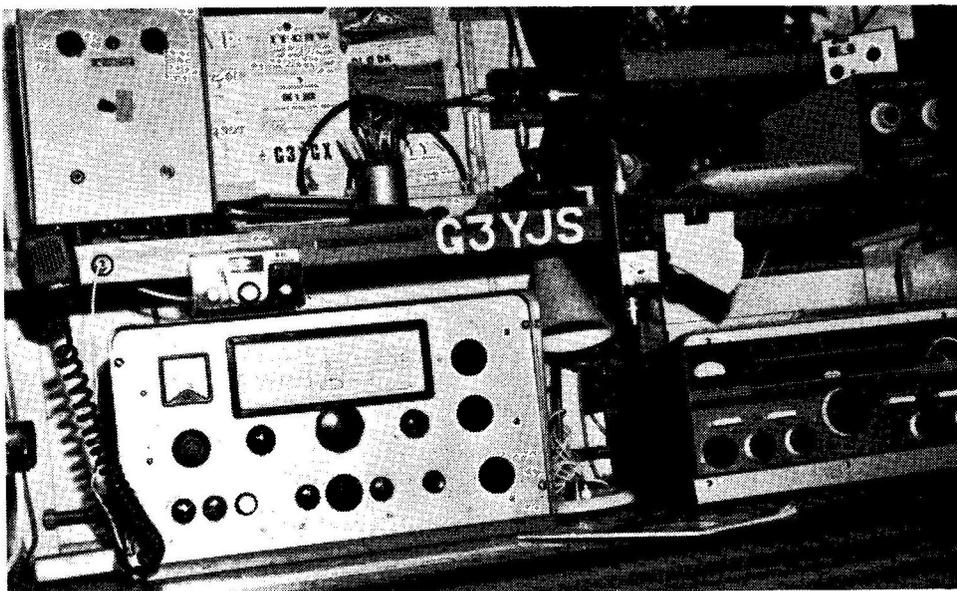
Reverting to the days of yore, OT's and that, your scribe was recently presented with a fine copy of the 1939 ARRL Handbook; one of the first things he noted in it was the data on a two-tube regenerative receiver, stated to be "thoroughly practical for day-to-day operation on the bands." Truly, times change!

Forty Metres

G3TLX noted our reference to him last time out and returns with the details of his QRP work. Ron has been using between one and 1.7 watts, of Phone and CW, on Forty and Eighty. He has not just worked G2NJ—he has even had the nerve to net in accurately and call the SSB chaps who mostly don't even realise Ron runs his QRP rig on AM! As for the normal rig, that is either a TCS-10 on 80/40, or a Drake 2NT on the HF bands, using a mixed output from the TCS VFO, tuning 1.5-2.0 MHz, against 5.5 MHz to give the 2NT VFO control at 35 watts input. On the receiving side it is a Drake 2B, with the associated Q-Multiplier. On Forty this station worked CW with EL0N/MM in the Caribbean, SV1BX, UA1KAE/1, VK, ZL, 9K2BQ, 9G1HE, OY1R, VP2ST, EA9EV (Ceuta), 9L1JT, 9L1GC, SM2AGD /CE0 and 5Z4KL.

During the contest GM3YOR and his team looked at Forty for a spell, finding it possible to make two-way contacts with HR1RF, IG9BAF, PJ1AA, PZ1AH, YX5AJ, VE3MR /4X, 4M4UA, and 9G1WW.

G2NJ (Peterborough) continues his merry way, working the QRP stuff and the /MM chaps. On the maritime-mobile front, Nick mentions the QSL card from SM7EQ/MM, m.s. *Vingaholm*. Right across the top of the card in large letters is the phrase "Make DX, not War!" G3TLX with his



Station of G3YJS, owned and operated by Maurice Roche, 16 Norrington Road, Maidstone, Kent, who passed his R.A.E. in 1965. He is a senior Police Officer with 25 years' service and on retirement became a driving instructor. The rig as now is comprises a K.W. Viceroy Mk. II as CW/SSB transmitter, with a KW-77 receiver. The TVI problem locally is tackled by the use of LPF filters and internally the screening of all leads using ferrite beading. The QTH of G3YJS is 350ft. a.s.l.—and he is one of those fortunate enough to have a garden 160ft. long by about 30ft. wide!

tiny rig has been worked again, this time on Phone, while the G4AWT contacts, with five watts have become almost a habit. Then there was a new one, in the shape of G3ILT in London, who runs two watts, worked on CW. For other chaps interested in ships and amateurs, G2NJ has a mention of the cruise of the Swedish Navy vessel *Alvsnabben*, which sailed on November 22 for a cruise lasting till March 23, taking in CT3, FM7, KZ5, HP, XE, W6, W7, W4, VP7, and CT2. They can be found, signing SL8AY/MM, using CW around 3515, 7015, 14015, 21015 and 28015 kHz or on SSB on 3720, 7050, 14160, 21180, and 28560 kHz.

G4AWT (Doncaster) was quite pleased to see his call mentioned in the QRP context; George often uses just five watts of CW to a Tavasu whip radiating from the stationary car, although he has a 150-watt station in the shack. Incidentally, G4AWT mentions as a nice clean signal the one from YO4ASS/MM, operator Geo, with a very good fist.

Eighty

Whatever is it that makes the

80-metre DX'ers so very secretive? We know it is being worked, we know who is working it, but we seldom get any form of report on the game.

One who does write is GW4BLE, who made it to LX1BW, ZL2BT, VE3BBN, VE3NE, VE1ADV, VE2APF, XE1IJJ, TF5TP, CN8HD, K2LWR, OX3EA, VE1AHF, VE1UA, VO1FG, K4YYL, WA2EAH, W2IWC, WA2FCA, WA2URS, WA5RXT, W3WGH, WA2HSU, VE3GCS, VE2UN, W3JXH, K3AU, F0ADO/FC and so made his mark on the band.

The CW, either from the QRP or the QRO rig, has been, as ever, wielded to good effect on Eighty by G3TLX, who offers the following from his log: ZL1AH, ZL3FZ, ZL4IE, U18AAB, UL7GW, UA9's, UA0AG, VE1, VE2, VE3, all W call areas except W6 and W7, also YN1CW, ZF1VD, KV4FZ, 8P6DR, 9Y4VV, YV5AW and 4M4AGP.

G4BKI has only locals to offer but GM3YOR was more enterprising on Eighty and came up with W3CS, VE1XW and VO1HI.

G3NUA writes to comment on the references to QRP and say that in

the years since he was licensed, the vast majority of his contacts have been on Top Band and 80 metres using ten watts of CW or, in earlier years, of AM, and he has had much fun in doing so. It pleases John that this sort of QRP operation still goes on, because, as he says, it will be a sad day for the hobby if once the depth of the wallet becomes the arbiter of one's potential contacts.

Top Band

Although at the start of this piece, we bemoaned the fallaway in activity on the band, this is not to say that the activity in the international sense is missing. For example, we have it that EP2BQ recently worked VK6HD to complete his WAC. He would, if he makes his application, then become Nr. 32 Top Band WAC. Arising from the earlier information on this, W1BB sends a list, which he believes to be complete, covering from 1953 (his own WAC which is believed to be the first ever) through to 1966 when ARRL started giving out 160m. WAC's as such, and through the sixteen or so since the latter event. Incidentally, we understand that from November 1972, applicants for Top Band WAC

get a nice new special certificate, and earlier holders can get one of the new ones if they send the relevant details to W4WFL, c/o ARRL Hq. However, to return to the list of Top Band WAC-merchants, a full third of them are G's and as many as three are from W6.

Turning to the question of inter-G working, G3NUA wants to see it revived, as it provides a good form of amusement for those chaps who cannot run the super-best in the way of aerials or rigs. He would like to see it possibly brought up to date by some form of geographical subdivision. Certainly the sooner we find a formula which will bring back the activity the better, if we are not to find pressure being brought to bear to exclude us from our share of the band.

GM3YOR mentions MCC, in which his call was in use, and also his own activities which have

brought his score up to 71 CW and 48 Phone for a total 119 plus daylight QSO's one Sunday afternoon with such as G5LP, G3HRW and PAØPN on CW and the latter again on SSB.

Signing

That's all the news for this time. By the time of the deadline for the next issue, you should be able to make up your final entry for the Counties Table, which we would like to receive so we can put the last one in, to put "county-chasing" as we have known it for so many years to bed properly, with full honours.

That, and your letters, should be mailed to reach us by **January 9**, please, addressed CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. And in conclusion, a Very Happy and Prosperous New Year to all who follow this piece.

COUNTIES TABLE

TOP BAND

Callsign	Counties		Total Score
	CW	Phone	
GM3YOR	71	48	119
GW3ZQN	34	66	100
G3VLX	33	41	74
G4ALG	44	25	69
G4ASV	3	65	68
GW3WSU	—	57	57
G3YPT	44	8	52
G4AXP	—	43	43
G3DCS	14	—	14

This Table will close on December 31, 1972.

THE B.A.T.C.

The latest financial report on the activities of the British Amateur Television Club shows a surplus for their last year's operations of £49 and the final accounting makes the current net assets the comfortable figure of £704. The hon. secretary is J. J. Rose, Pinchbeck Farm House, Mill Lane, Sturton-by-Stow, Lincs. Their journal is *CQ-TV*, produced for the A/TV enthusiast.

LICENCE FIGURES

There are now about 18,300 U.K. licences extant (A+B categories), the proportion being 25% B-licences and the remainder full A-permits. Of the total, some 20% are licensed for mobile operation. The latest issue of the U.K. *Call Book* (price 70p post free from our Publications Dept.) is a good deal thicker than any of its predecessors.

EDDYSTONE IN NORTH AMERICA

It is reported that the firm of Conway Electronic Enterprises, Ltd., of Weston, Ontario, Canada has been granted exclusive import and distribution rights for all products of Eddystone Radio, the Birmingham manufacturers of high-grade receivers. The current sales value of Eddystone in Canada is in the region of one million

dollars a year. Now able to take in the whole of the U.S.A. the Conway firm anticipates sales reaching \$5 million over the next few years.

HEAVY PENALTY IMPOSED

In the October issue, we mentioned the case of one W. R. Milroy, who allotted himself the bootleg call "GW5RMA" and was quickly pounced on by the authorities. The Ministry prepared a formidable indictment and the upshot was a fine of £88—he was lucky not to have his equipment (said to be worth £5000) confiscated into the bargain, this having been asked for by the prosecuting solicitor on behalf of MinPostTel.

TIME-BASE INTERFERENCE

If you are living-urban, the noise created by almost any colour-TV receiver sets up a racket such as to make weak-signal reception on our Top Band almost impossible. The effect is to modulate any signal with a characteristic LF buzz. Nothing is being done about this either by the Ministry or the set manufacturers, and it needs neighbour-co-operation to try a cure. This TV Rx QRM is probably the reason why activity on 160 metres has fallen off so much.

To keep in touch with the world of Amateur Radio, read "Short Wave Magazine" regularly—Independent, Unsubsidised, now in its 30th volume, and still under the same Editorial direction.

QRP TRANSMITTER CIRCUITS

TWO PRACTICAL DESIGNS

THE Q-code group QRP means "decrease power" and in radio amateur parlance has come to signify "low power", in terms of one or two watts, or even milliwatts.

At one time, there was quite a vogue for real-QRP working and astonishing results were being (and still can be) obtained with only a watt or two of DC input. In recent issues of SHORT WAVE MAGAZINE some interesting low-power work has been recorded in CDXN, and once again there is a positive trend developing in this direction.

The circuit of Fig. 1 herewith is that used by G3DOP (Mawgan, Cornwall) who is one of the successful exponents of QRP (see p.474, October issue). He is now running but 50 milliwatts input with a 7020 kHz crystal and is having R5 contacts at distances of over 300 miles using a standard 9v. transistor battery, the aerial being a 132ft. wire (full-wave on Forty) coupled through an ATU. The tuned circuit C1/L1 is proportioned for the band in use, i.e., the same circuit should "go" on any other band with a suitable crystal, though in fact 40 metres (strange as it may seem) is probably the best for range and the making of contacts.

Another interesting low-power circuit is shown at Fig. 2. It is energised by a battery of photo-electric cells and operates on ordinary daylight! Of course, the power output is a good deal better when the sun is shining! (As the circuit shows, a standard battery can be switched in to provide power for after-dark operation.)

The design is by John Osborne, G3HMO, and was first described in SHORT WAVE MAGAZINE for October 1954—and not only was this little Tx sun-powered but the transistor was a home-made point-contact type using a piece of germanium.

Operation was on Top Band and, as described in that issue, contacts were made at average daylight distances for 160m., e.g., up to 30 miles or so. An officially-observed demonstration was laid on for the National

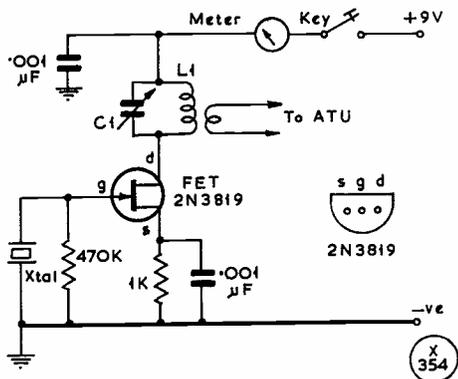


Fig. 1.

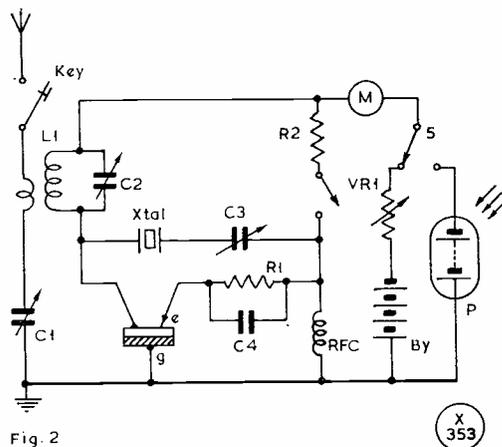


Fig. 2

Physical Laboratory to prove that the transmitter really did work to distance—off sun-power only and with the home-made transistor. The then Director, N.P.L., duly confirmed the *bona fides* of the experiment, which anticipated the use of solar-powered batteries (for space communication) by several years. (Readers still with us from those days may remember the *furor* that this created.)

For anyone interested in trying again and refining the data in a more modern context—after all, this was happening 18 years ago—any good HF transistor would substitute for the home-made one and the power could be derived by building a battery of photo-electric cells, such as the Mullard BPX-33, or any similar type (see p.411, September 1972 SHORT WAVE MAGAZINE). All that is required is a p-e battery capable of producing 4-5 volts at a loading reckoned in milliwatts—or enough to keep the transistor oscillating with the aerial resonated at the frequency.

Values for the circuit shown in Fig. 2 could be: C1, C2, 200 pF, tuning; C3, 50 pF trimmer, feed-back control; C4, .002 μF; R1, 2K; R2, 10K; VR1, 25K potentiometer; RFC, 2.5 mH RF choke; By, 4½v. transistor battery (for calibration and setting up); P, photo-electric cell battery; Xtal, for frequency required; and L1, C2, to tune operating band.

Note that the Tx is keyed *in the aerial*—this was an important factor in the success of the original experiment, because the crystal was kept in continuous oscillation and the result at the receiving end was a beautiful T9x note.

And just a final thought on a suitable PSU: It was found that, over much of England, enough power to keep a good transistor oscillating could be obtained by rectifying the BBC long-wave transmission (though this was felt to be a shade improper!).

A.J.F.

FOR THE A/TV OPERATOR

The English Electric Valve Co., Ltd., Chelmsford, Essex, CM1 2QU, have recently issued a new illustrated guide on Vidicons, giving a great deal of useful information. Copies are obtainable free of charge from the address stated.

FREQUENCY MODULATION

SOME MORE CIRCUITRY—THE REQUIREMENTS FOR FM OPERATION—BIBLIOGRAPHY

A. J. HENK (G8DIK)

The previous parts of this article appeared in our issues for July, August and October. This concludes the discussion on a subject on which much more could be said, as the bibliography suggests.—Editor.

GOING on from p.488, October, the condition there discussed leads on to the well-known response curve of Fig. 15 here. Detection takes place over the straight portion of the curve, which can be made very linear.

The self-limiting, or ratio, detector will not be described in detail here as the mechanism of frequency discrimination is very similar to that of the Foster-Seeley. However, the circuit is given in Fig. 16 and its operation is well covered in the literature (*Ref. 2*).

The other type of discriminator to be discussed operates in an entirely different way. The Foster-Seeley and ratio detectors work on phase shifts of *sine* waves in LC circuits and are basically analogue circuits. This one does not use either *sine* wave or LC circuits, only pulses, and can be considered digital in operation. This makes it very suitable for implementation using integrated circuits and/or transistors. It is called a "pulse counting" discriminator.

As can be seen from Fig. 17, the intermediate frequency is converted into pulses, one pulse per IF cycle, all pulses being identical (*i.e.*, equal widths and heights). The pulse frequency will therefore change with modulation. If the pulse train is passed through a low-pass filter, the pulses will disappear from the output which will take up a voltage equal to the average value of the pulses (*See Fig. 17*). A simple CR circuit has been chosen for simplicity and very often this is quite adequate, even for high quality reproduction. It can be seen from the diagram that the average value and hence the output voltage will be higher as the frequency increases and *vice versa*, recovering the modulation from the signal. This approach has many attractions, requiring no alignment or tuned circuits and being very simple. However, in order to obtain reasonable sensitivity it is necessary for the deviation to be a substantial proportion of the intermediate frequency and this leads to the need for a very low IF (50 kHz or below for communications purposes). This, in turn, requires an extra stage of frequency conversion if a satisfactory image performance is to be maintained. This problem is less acute in high quality broadcast systems due to the high deviation employed (± 75 kHz), and very low distortion figures can be obtained from this inherently linear discriminator. For broadcast use an IF of 150-200 kHz is satisfactory.

THE MINISTRY REQUIREMENTS—USING THEM TO THE BEST ADVANTAGE ON VHF

Unfortunately, there is a lamentable lack of information given on amateur licences, and this lack is very apparent when it is required to design an FM transmitter. It seems appropriate, therefore, to list in this article the MPT regulations as they apply to F3, frequency modulation.

There is no specified deviation or highest modulating frequency. What is specified is the band width occupied by the transmission, and this varies with frequency in accordance with international agreements. Permitted bandwidths are as follows:—

Below 30 MHz — 6 kHz bandwidth
(± 3 kHz)

30 MHz—100 MHz— 12.5 kHz bandwidth
(± 6.25 kHz)

Above 100 MHz — 25 kHz bandwidth
(± 12.5 kHz)

It is, of course, possible to "squeeze" a communications quality FM signal into a 6 kHz bandwidth, as can be seen from the curves in Fig. 6 (*see p.356, August*). When B is small (less than 0.2) the first sidebands only are significant ($f_c \pm f_m$) giving the same spectrum occupancy of the theoretical (zero distortion) AM case. However, as the deviation is reduced so is the recovered audio at the receiver, and the signal-to-noise ratio suffers. There must come a point at which the noise advantage over AM disappears, and, extrapolation from the figures given by Kiver (*ref. 2, p 41*) gives this as occurring at a value of B = 0.6. Allowing an arbitrary 50% power advantage in an FM transmitter brings us to B = 0.45, below which FM is inferior to AM.

This is one of the reasons why FM is less popular on the HF bands than on VHF, although not the only one by a long way. When we come to VHF above 100 MHz, however, the story is completely different. The permitted bandwidth enables us to realise the advantages FM has to offer. How best to use it, though, is less obvious. We can exchange bandwidth for increased signal-to-noise, or for increased high frequency response, but if we want to include both at once shall we have to settle for correspondingly smaller improvements? This latter, however, may well represent the best solution. We shall examine the two possibilities.

If we restrict our highest modulating frequency to 3 kHz by suitable filtering (and let us not fall into the trap of assuming that unfiltered speech contains negligible energy above this frequency) we can allow sidebands to be present at up to four times the highest modulating frequency (12 kHz). For the fifth order sideband to be negligible (-40 dB) a value of B = 2.0 is permissible.

$$\text{Since } B = \frac{f_d}{f_m} \text{ and } f_m = 3 \text{ kHz}$$

$$\text{we have } f_d = f_m \times B = 3 \times 2 = 6 \text{ kHz}$$

It seems, then, that if we accept this AF bandwidth we can deviate ± 6 kHz, the value B = 2 giving a signal-to-noise advantage over AM of over 12 dB (compare

with $B = 0.45$).

Let us now examine the other case—increased AF bandwidth. An increase from 3 kHz to 6 kHz makes a big difference to the acceptability of speech quality, so how much do we have to restrict the deviation to accommodate this within our 25 kHz bandwidth? The answer may be surprising. With a half bandwidth available of 12.5 kHz, only the second sideband of 6 kHz is now permissible, so the third order sideband must be negligible. Reference to the curves show that this happens at around $B = 1$, half its previous value. We still have a signal-to-noise advantage of 6 dB over the equivalent AM case (whose bandwidth will have doubled now). When we come to look at our deviation, though, we have, as before,

$$f_d = f_m \times B = 6 \times 1 = 6 \text{ kHz}$$

In other words *our deviation has not changed* so the extra audio bandwidth is not occupying any more spectrum—so why the need to restrict to 3 kHz? Why indeed! However, we cannot go on indefinitely as will be seen if the $f_m = 12 \text{ kHz}$ case is examined, so we had better stop at around 6 kHz although a sharp cut-off at this frequency is not necessary.

It seems, on the surface, a little odd that we should have calculated a signal-to-noise ratio improvement of 6 dB simply by restricting our AF bandwidth. The answer to this apparent paradox lies in the fact that optimum receiver filtering is assumed, and this includes the AF section of the receiver whose bandwidth needs to be 6 kHz in the second case but only half this value in the first. (The IF filtering needs, of course, to be 25 kHz in both cases). The decision to exchange signal-to-noise for high frequency performance can be seen, therefore, to be possible at the receiver. There is no need to restrict the transmission to anything less than 6 kHz for f_m . Obviously, the wider the receiver AF passband the more noise will be heard.

On a practical point, having chosen a deviation of $\pm 6 \text{ kHz}$, how do we know when our transmitter is correctly modulated? Referring to Fig. 6 (p.356, August) again an interesting feature can be seen. As B increases, not only do the sidebands appear, but the carrier component actually decreases and becomes zero at $B = 2.4$, $B = 5.5$, etc. Because of the relationship between B , f_d and f_m we can choose a modulation frequency f_m that will give $B = 2.4$ (i.e., zero carrier) at $f_d = 6 \text{ kHz}$, as follows.

$$B = \frac{f_d}{f_m}, \quad f_m = \frac{f_d}{B}$$

if $B = 2.4$ when $f_d = 6 \text{ kHz}$

$$\text{we have } f_m = \frac{6}{2.4} = 2.5 \text{ kHz}$$

We can now use this to calibrate the transmitter with the aid of a narrow band AM receiver. First switch the AM receiver to a very narrow bandwidth, e.g., CW with audio filter, and tune to the modulated carrier of the FM transmitter. Now feed an AF tone of exactly 2.5 kHz into the transmitter with the modulation level

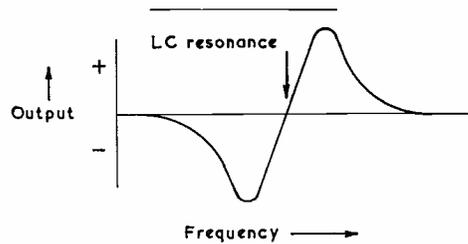


Fig. 15 Foster-Seeley Discriminator Characteristic

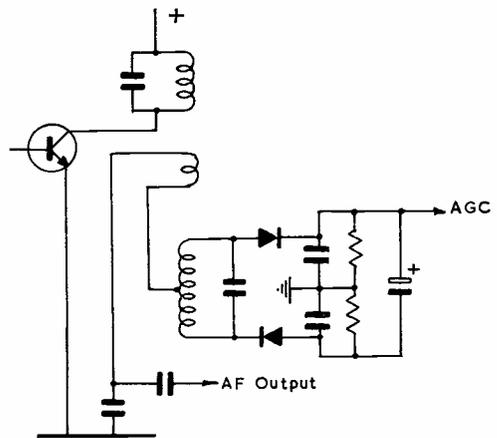


Fig. 16 Ratio Detector (Characteristic is similar to Fig. 15).

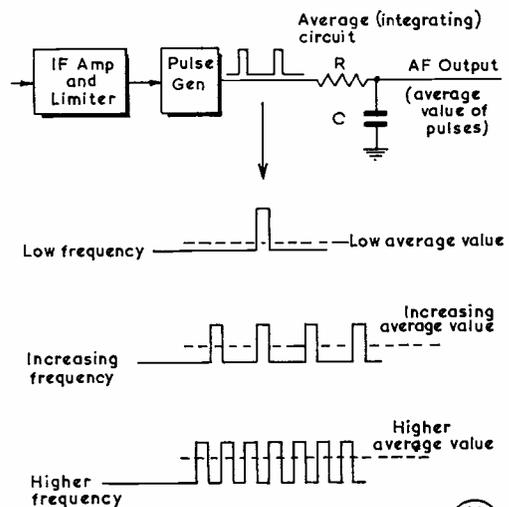


Fig. 17 Pulse Counting Discriminator

M 204

control at zero, and slowly start to increase the modulation, at the same time watching the carrier on the AM receiver. At a certain level the carrier will fall to zero, and at this point the deviation is exactly 6 kHz. As the level is increased the carrier will reappear, only to fall to zero again, and so on. It is important to make sure that it is the *first* zero that is chosen. If, now, the AF signal is measured, this is the level corresponding to 6 kHz deviation and the speech must be kept to, or below, this voltage for a satisfactory transmission. (This assumes, of course, a flat frequency response in the modulator).

A final point on the subject of Ministry regulations concerns the receiver provided at the transmitting station. If FM is being transmitted a proper FM receiver must be provided in order that the transmitted signal can be monitored properly. The use of an AM receiver using "Slope detection" does *not* qualify as an FM receiver for the purpose of satisfying amateur sound licence regulations. To quote a spokesman for the MPT, slope detection is "not considered good engineering practice".

With a proper receiver, FM is very easily monitored at the transmitting site—much more easily than in the case of AM. The limiter removes all the odd effects of "nearness" often present with AM, and if the receiver overloads due to proximity with the transmitter, the reproduced quality is unaffected. The operator thus knows exactly what the received signal will sound like at, say, 20 miles, except for the small amount of noise which will be introduced due to the path loss.

Conclusion and Summary

We have been dealing with a very complex subject and, in the space available for this series of short articles, we have been able to do little more than open the subject. Much simplification has been necessary, but it is hoped that this has been done in a way which has not misrepresented the facts about FM, and has led us to the right conclusions, even though things are not always what they seem. This surface-scratching has hopefully revealed a little of what FM has to offer in a well-designed system as applied to local and quasi-local VHF operation. Due to threshold effects FM is certainly not a powerful DX tool—but can give a marked improvement over AM for the vast majority of contacts. For best results, the limits laid down by the Ministry must be used intelligently and with this in mind, a deviation of 6 kHz with a 6 kHz speech bandwidth has been arrived at for above 100 MHz. Receiving techniques are very different from those used in AM. An AM receiver "off-tune" will not do! Not only will it give inferior results to an FM receiver on a given transmission, it will give results inferior to those which would be obtained were the transmitter on AM! In passing, the author has been using FM to the above specification for a while, and over a single weekend was called by no fewer than five stations (some using FM themselves) who complained of poor quality. Not one had an FM receiver! On a proper receiver it was almost studio quality.

One advantage often claimed for FM is that it is less likely to cause TVI. This is certainly true, but it is a pity to have to go to FM for this reason (surely the wrong reason) without reaping the benefits it has to

offer. So many two-metre transmissions are poorly deviated and "thin" in speech quality, not to mention distorted when a crystal is being pulled. It is hoped that this article will stimulate some interest by illustrating the direction in which efforts should be directed to make FM a goal to be sought rather than a penalty to be suffered. One thing a written article cannot do is to demonstrate how well a good FM transmission can sound. It has to be heard to be believed.

Acknowledgements and References

The author wishes to acknowledge with gratitude the co-operation received from the Ministry of Posts and Telecommunications and also from the Bradford staff of the Post Office Radio Service Department.

Grateful thanks are also due to *Mullards* for permission to use their published data in Fig. 8, p. 357, August.

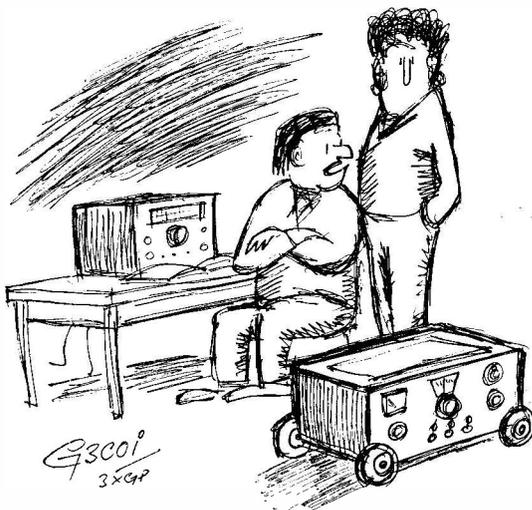
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- (2) M. S. Kiver. *FM Simplified*. Van Nostrand.
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ECHOES FROM LEICESTER

We are asked to make it clear that the stand attributed to the RSGB was in fact provided and manned by the Derby & District Amateur Radio Society. The exhibition station GB3ARE was put on by the local Leicester Radio Society, operating all bands. Interesting figures are that 74 stations were worked on Top Band and—the big surprise—no less than 319 on two metres!

The Editorial comment on the Exhibition, in our December issue, was quoted in the *Leicester Mercury* for December 2 under the heading "Those pretty dreary Granby Halls"(!)



"... Yes, OM, that's my mobile rig . . ."

View of the completed Unit. Picture of the interior layout appears elsewhere in the text.



SPEECH COMPRESSION UNIT

WIDE RANGE —
I.C. CONSTRUCTION
— CIRCUITRY AND DETAILS

R. H. H. GOULDSTONE (G3TAG)

THE unit described here was originally built for use with a tape recorder for recording lectures and interviews, where the signal available varied over a very wide range due to large changes in the distance between the speaker and the microphone. Chief requirements were to hold the input level to the recorder constant, and to have a reasonably low noise and distortion content.

An instrument of this sort also suitable for use with SSB, AM or FM transmitters to ensure optimum performance without the risk of over modulation.

For use with a speech compressor the amplifier in the circuit must have the following characteristics:

- (1) A relatively high input impedance, to prevent shunting of the AGC device,
- (2) It must have a low output impedance, to achieve rapid charging of the smoothing capacitor,
- (3) It must have a stable voltage gain of about 40 dB.

The 741 intergrated circuit operation amplifier meets these requirements at very low cost and with a minimum of external components. For those not accustomed to employing these devices it should be explained that this is a high-gain DC-coupled differential amplifier. Incorporated are no less than 20 transistors, 10 resistors and a capacitor. Frequency compensation is built in, *i.e.*, it is stable. Protection against short circuit of the output is also provided. From the author's experience they are practically indestructible!

Since the voltage gain of these amplifiers is of the order of 100 dB it must be reduced to a working value by means of negative feedback. The method chosen for doing this is shown in Fig. 1.

The AGC Element

As shown in Fig. 2 a junction FET forms the bottom half of a potential divider comprising R1-Tr1. Drain to source resistance of this FET can be varied between approximately 1000 ohms and several megohms, the value being dependent on the gate-to-source voltage. Under zero input signal conditions the FET is biased so the drain-to-source resistance is high, by means of R3 and R2. As the input signal increases the amplifier output is rectified by D1 and the resultant DC is passed to the gate of Tr1, causing the drain-to-source resistance to decrease, thus reducing the input signal available to the amplifier. Attack time (or the time in which the circuit will adjust to a sudden increase in input) is between 2 and 5 mS. Variable recovery or decay is

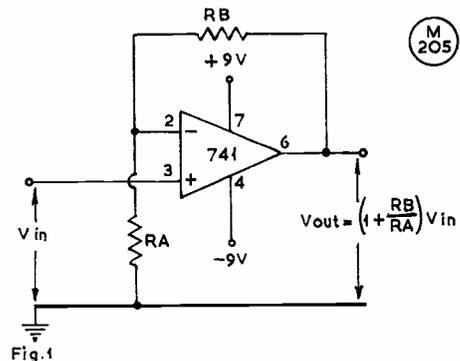


Fig. 1

Fig. 1. Negative Feedback Circuitry.

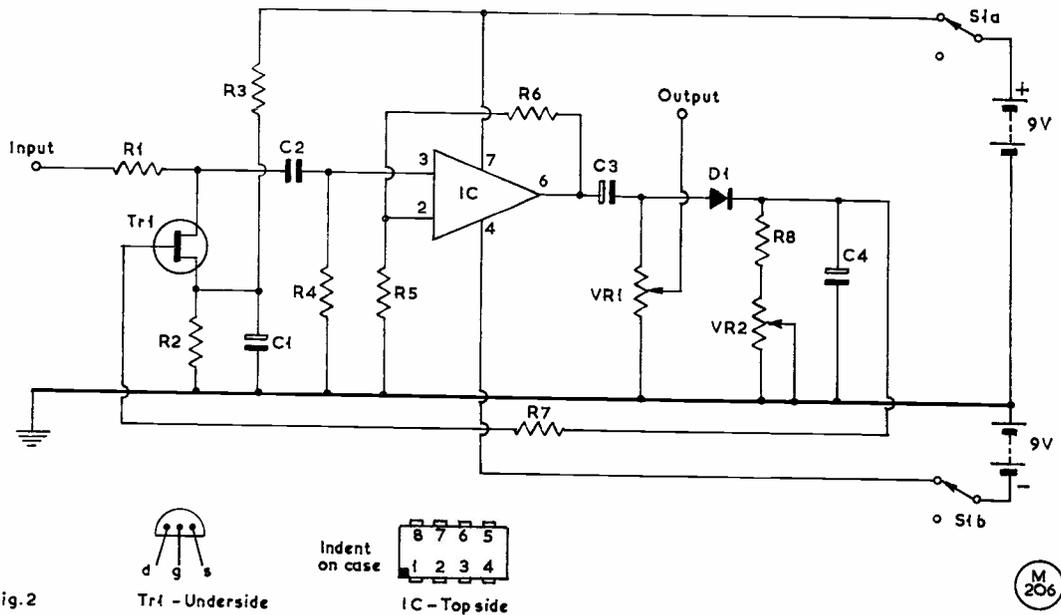


Fig. 2. The AGC Element.

Table of Values

Fig. 2. The AGC Element

- | | |
|----------------------------------|--|
| C1, C4 = 10 μ F elect., 10v. | R6 = 560,000 ohms |
| C2 = 0.25 μ F, polycarb. | VR1 = 25K pre-set pot. |
| C3 = 50 μ F elect., 10v. | VR2 = 1 meg. lin. pot. |
| R1, R4, R7, R8 = 100,000 ohms | D1 = Signal diode, germanium |
| R2 = 2,200 ohms | Tr1 = 2N3819 |
| R3 = 6,800 ohms | I.C. = 741-OPA or equiv. (Radiospares) |
| R5 = 5,600 ohms | |

provided by means of VR2 and is between 0.5 and 10 seconds.

Pre-Amplifier

The AGC action starts in the circuit Fig. 2 at approximately 15 mV r.m.s. input. This is known as the "threshold sensitivity." To boost signals above this level, and thereby obtain adequate compression, a small pre-amplifier is usually required. The circuit shown in Fig. 3 has a gain of about 30 dB, a very high input impedance and low noise. It has been found ideal for use with crystal or ceramic microphones. Potentiometer VR3 should be adjusted to bring the junction of R13-C6 to 4.5 volts DC.

Frequency Response

As described the frequency response of the unit extends from 40 Hz to above 10 kHz. It is therefore important that some means be provided to limit this to the region 300-3000 Hz if broad-band transmission and splatter are to be avoided. In most commercial rigs the frequency response of the audio input stage is curtailed and in this case nothing needs to be done. The same

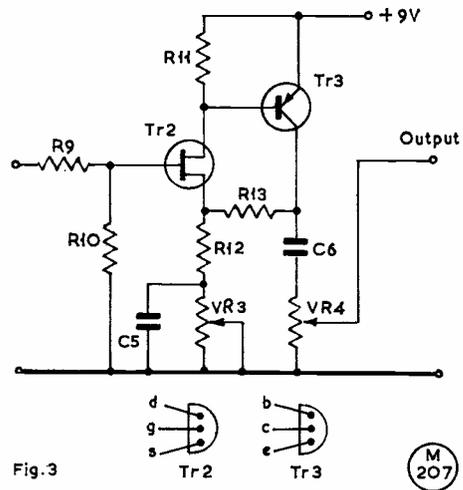


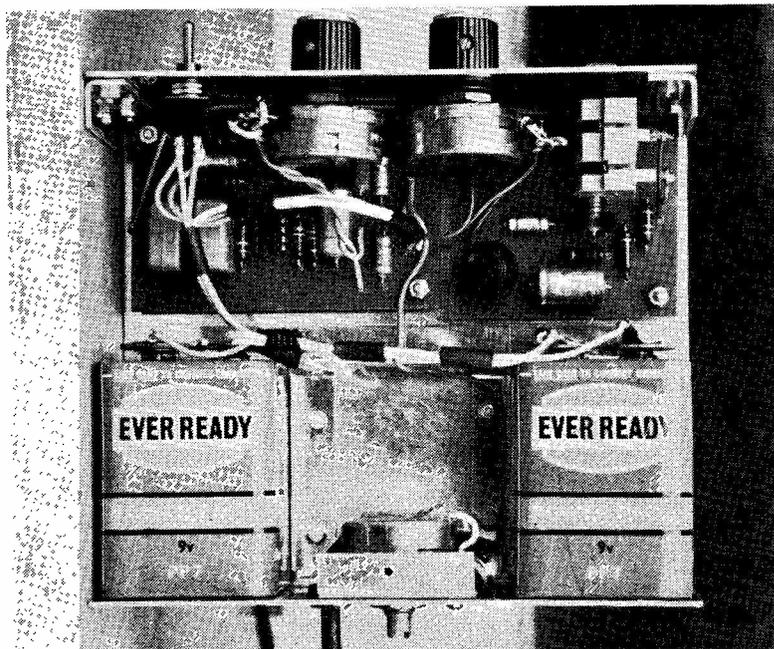
Fig. 3. Pre-Amplifier Circuit

Table of Values

Fig. 3. Pre-Amplifier Circuit

- | | |
|------------------------------|---------------------|
| C5 = 50 μ F elect., 10v. | R13 = 1,500 ohms |
| C6 = 0.1 μ F, polycarb. | VR3 = 2.2K, pre-set |
| R9 = 100,000 ohms | VR4 = 25K, log. |
| R10 = 1.5 megohm | Tr2 = 2N3819 |
| R11 = 6,200 ohms | Tr3 = 2N4058 |
| R12 = 22 ohms | |

Inside the Speech Compressor as described. At left the compressor board with the 741-OPA I.C. and at right the pre-amp. board. VR1 is on the centre rear panel. Case size is 6 x 5½ x 2 inches.



applies when using a frequency-tailored microphone. If these facilities are not available a filter comprising a 47K ohm resistor from the slider of VR1 Fig. 2 followed by about .02 μ F to ground will usually suffice.

Construction

Construction can be on *Veroboard* or P.C. board. Layout is not critical so long as normal precautions are taken regarding input and output leads. All unused pins on the I.C. should be left floating and *not* used as anchor tags.

If test equipment is available on completion of the unit a signal of 100 mV. r.m.s. should be applied to the input R1 Fig. 2. Resistance R3 should then be adjusted to give a volt r.m.s. at the output, with VR1 set to give maximum out. However, the values shown will give acceptable results should no equipment be to hand. It is also advisable to check the polarity of the voltage at the output (pin) of the amplifier. This may be a fraction of a volt positive or negative; C3 should then be connected accordingly.

Performance Data

The prototype produced the following figures: Threshold level with pre-amplifier, 0.5 mV r.m.s. Maximum input, (pre-amp. overload) 50 mV r.m.s. Output at 0.5 mV input, VR1 at maximum, 1 volt r.m.s. Output increase for 30 dB input increase, 2 dB. Distortion not measurable on 'scope except below about 40 Hz, where some positive-peak clipping occurred. Power consumption, +9v. at 5 mA; -9v. at 1.5 mA.

ATOMIC CLOCKS CHECKED BY SATELLITE

The Royal Greenwich Observatory at Herstmonceux, Sussex, is engaged in an experiment to compare time standards with the United States Naval Observatory in Washington, D.C. using for the first time a clock carried between the two sites—each site equipped with a similar caesium beam atomic clock—by satellite.

The U.S. time navigation satellite *Timation II* orbits at 500 nautical miles at an inclination of 70° to the Equator, and transmits signals at a frequency near 400 MHz. These are received first by the station in Washington and then about 15 minutes later at Herstmonceux, when the satellite is at its nearest point. By plotting the location of the satellite and computing the time required for the signal to travel from the satellite to the U.S. Naval Observatory, it is possible to get the time at the satellite clock as compared with the Naval Observatory standard. A similar procedure is adopted at Herstmonceux, and the difference in satellite times at Washington and RGO is a measure of the difference in time standards at the two sites.

The receiving equipment at Herstmonceux consists of a receiver display which shows the propagation time between satellite and receiver in microseconds. A result of the measuring time to this degree of accuracy is that distance can also be measured to a similar accuracy: in one half micro-second light travels 500ft. A possible application of the accurate clock is in the field of aircraft separation in airspace, and indeed they are proposed for use in aircraft collision avoidance systems.

For more than 30 years "Short Wave Magazine" has remained independent and unsubsidised, free to represent, throughout the world of Amateur Radio, the U.K. radio amateur interest.

SOLID STATE RECEIVER FOR TWO METRES

GOOD BASIC DESIGN
 — ECONOMICAL TO BUILD —
 UNIT CONSTRUCTION
 — EASILY MODIFIED

J. H. JONES (G3GBH)

THE need to reduce the size of table-top equipment for two metres, plus a desire to get away from "the converter into ageing communication receiver" approach to VHF reception, led to much pondering at this QTH. Many ideas were mulled over, and most of them tried, before the present receiver started to take shape.

Several criteria had to be met. Firstly, the cost had to be reasonable. Secondly, results had to be as good as, if not better than, the old converter-valve receiver set up. Also, because a supply of popular inexpensive transistors was to hand these types had to be used as far as possible, consistent with acceptable performance. Size and shape, also accessibility, made certain demands,

as did the desire to carry out circuit changes and modifications from time to time should the need arise.

Chassis and cabinet are, to some extent, integral, as study of photographs and sketches will show and allow any of the three sections of the receiver to be dealt with, without interference with the other two. Each section has its own screened compartment which greatly contributes to the stability of the receiver.

General Construction

The converter is housed in the left-hand compartment, the tunable IF, RF mixer and oscillator take up the chassis and the 465 IF, audio, output, AVC and BFO circuits are in the right-hand compartment.

The three sections of the chassis proper are each bent up from an 8in. square of 18g. aluminium. If a hard wood block is made to size, this greatly aids the formation of these units and the resultant channel formation can be used as a standard "building block" type of chassis for countless other projects. Assemble three of these channel sections as in the sketches. The centre section with flanged edges down, and one each side, with flanged edges outwards and secure all together with small bolts and nuts to make a firm three-compartment chassis.

The area shown dotted on the centre section may have

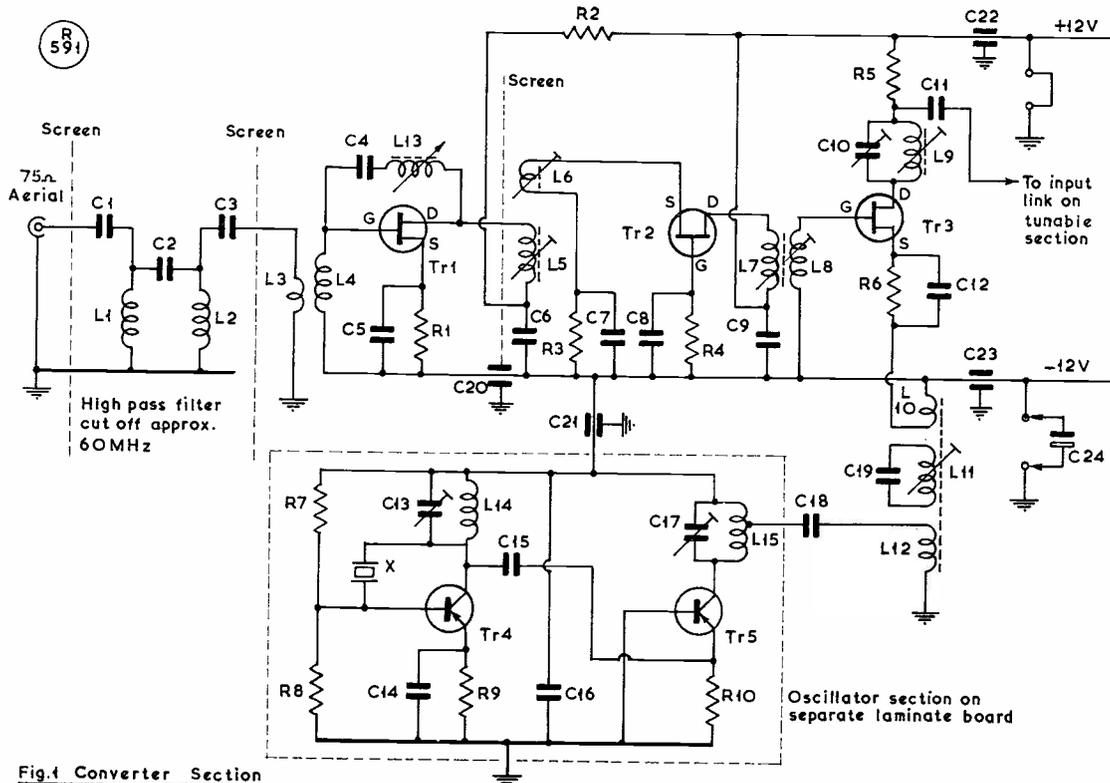
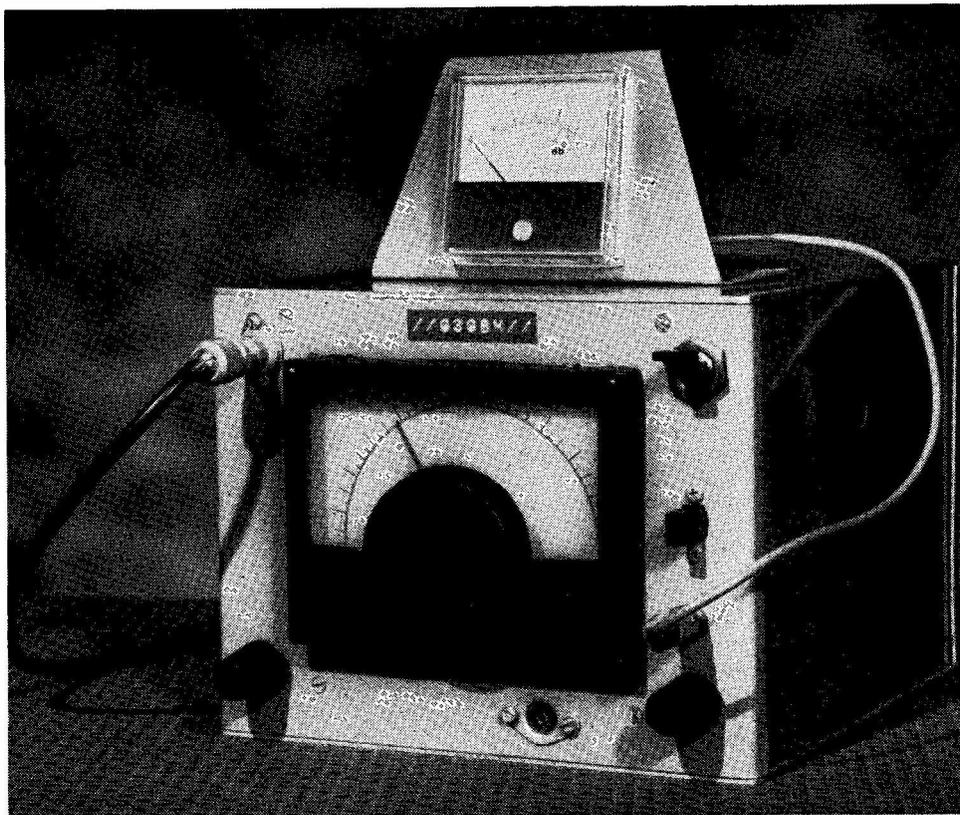


Fig.1 Converter Section

Fig. 1. The Converter Section



The G3GBH Two-Metre Receiver

Table of Values

Fig. 1. The Converter Section

C1, C2,		C14 = 100 μ F, elect, 25v.
C3 = 100 μ F, s/m		R1 = 680 ohms
C4 = 470 μ F		R2 = 470 ohms
C5, C6,	R3, R5,	
C7, C8,	R9 = 1,000 ohms	
C9, C11,	R4 = 100,000 ohms	
C14, C18	R6, R8 = 10,000 ohms	
= .001 μ F	R7 = 47,000 ohms	
C10, C13,	R10 = 330 ohms	
C17 = 3-30 μ F,	Tr1 = T1588A	
trimmers	Tr2,	
C12 = .002 μ F	Tr3 = 2N3819	
C15 = 10 μ F	Tr4,	
C16 = 0.2 μ F	Tr5 = OC170	
C19 = Cx, see note		
C20, C21,		
C22, C23 = .001 μ F, feed thru		

Table of Coil Data

L1, L2:	Three turns 14g. bare copper, spaced wire dia., to $\frac{1}{4}$ in.
L3:	Two turns $\frac{1}{4}$ in. dia. p.v.c. at centre of L4.
L4:	Five turns $\frac{1}{4}$ in. dia. 18g. tinned copper, spaced wire diameter.
L5:	Eight turns 20g. enam., spaced wire diam., on $\frac{1}{4}$ in. dia. former, dust core.
L6:	As L5, $1\frac{1}{2}$ turns 20g. enam. left loose on former for coupling adjustment.
L7:	10 turns as L5, on former separate from L8.
L8:	Six turns as L5, side-by-side with L7.
L9:	42 turns 30g. enam. close-wound on $\frac{1}{4}$ in. dia. former, with dust core.
L10, L12:	Two turns 22g. enam. interspaced with L11.

L11:	12 turns 22g. enam. close-wound on $\frac{1}{4}$ in. dia. former with dust core.
L13:	Eleven turns wound as L11.
L14:	15 turns 26g. enam. on $\frac{1}{4}$ in. dia. former, no dust core.
L15:	Six turns 18g. tinner copper, self-supporting, quarter-inch dia., spaced wire dia. Tap one turn from old end.

Notes: Cx (C19) should be winding ends twisted together for about an inch or so to form very small coupling capacity. C20, C21, C22, C23 are feed-through condensers. Crystal is 45.66 MHz, HC-6U.

to be removed to make room for the particular type of slow-motion drive fitted. (The writer used a National "Velvet Vernier" drive, a number having been stored since the days of the then popular TU tuning units. Although somewhat bulky they are very smooth and positive in use).

The three 70 μ F tuning capacitors are fitted with flexible couplers between each pair, on the centre line of the middle chassis. They are fitted on the top side of the chassis and the actual position will depend on the type of drive to be used, as will any cut-out that is called for at the front end of this central chassis to allow for the movement of the drive mechanism.

Front and rear panels are now prepared with "turn overs" (as opposed to sharp bends) down both sides

proportioned so that the slide-in side panels fit between these turn overs and the outward edges of the side chassis. (See drawings for detail). Before fitting the front panel the drive mechanism is placed to line up with the tuning capacitor shaft. Also before drilling the various holes for volume control, gain control, the sockets and switches, check that the chosen position allows clearance for the component when the panel is in position.

The front panel is fitted using small pieces of 3/8 in. aluminium angle bolted, in suitable places, to the forward edges of the three chassis sections and the front panel secured to the angle using 4 BA countersunk bolts and nuts or countersunk self tapping screws.

The rear panel is treated similarly.

Make the base panel next. It must be some nearly flush with the outside edge of both front and rear panels. In width, it should again be flush with the outside face of the front and rear panel turn-over section. This is secured in place with suitably placed self tapping screws.

The side panels can now be made. These slide in, from the top, between the front and rear panel turn overs and the outside faces of each side chassis and rest on the base panel at the bottom. The top edge should be finished off nearly flush with the top of front and rear panels. Make one spare side panel for the converter side of the cabinet. (This will be needed later on).

The top panel is next. A sheet of 18g. aluminium is cut to be flush with the outside faces of front and rear panels. Lengths of 3/8 in. aluminium angle are fitted on the inside top edge of the front and rear panels leaving half-inch clear at each end of both panels; the top face of the angle is made flush with the top edge of the panels.

Two more strips of the angle are fitted along each long edge of the top, on the under side of the panel, so positioned as to fix the fore and aft position of the top, and also to be a push fit inside the side panels. It has not been found necessary to secure the top but, if desired, a couple of small countersunk self tapping

screws front and rear will anchor it.

The 465 kHz IF strip and audio output were recovered from a discarded car radio. The double tuned IF transformers proved to have adequate selectivity for two meters even when the QRM was heavy. However, the AVC system was hopeless for amateur use; it needed an S9+ signal to move it. After modifying, the AVC was supplied to the first IF only. This worked fine for a normal S9 signal, but blocking occurred when a really local signal came up. A diode was wired as shown and this heavily damps the first IF transformer when a hefty signal appears, and stops what appears to be blocking, in mixer stage, taking place.

The S-meter circuit is very easy. A 100 micro-amp

Table of Values

Fig. 2. Tunable IF Section

C1 = 3/70 μF, var.	R2, R6 = 100,000 ohms
C2, C3, C4 = 3-30 μF trimmer	R4 = 100 ohms
C5, C6, C7, C8, C9 = .01 μF	R5 = 2,500 ohms
C10 = 8-9 μF	R7 = 4,70 ohms
C11 = .05 μF	R9 = 10,000 ohms
C12, C13 = .01 μF	R10 = 2,000 ohms
C14 = 0001 μF, feed thru	R12 = 200 ohms
R1, R3, R8, R11 = 1,000 ohms	R13 = 470 ohms
	RV1 = 25K, var. pot.
	Tr1, Tr2, Tr3 = OC171

Table of Coil Data

- L1: 40 turns 30g. enam. close-wound on 1/2 in. dia. former with dust core, link 6 turns 30g. at earthy end L1.
- L2: As L1, with tap 10 turns above earthy end; 5-turn link close-wound at earthy end L2.
- L3: 36 turns as L1, with two 3-turn link at earthy end—see text.

Notes: Coils L1, L2, L3, the 3-30 pF trimmers and the condenser pack C1 are chassis mounted. All other components are fitted on an insulated strip 6 1/2 x 1 1/4 in., so positioned that each stage lines up with its coil. A screen separated RF and mixer stages.

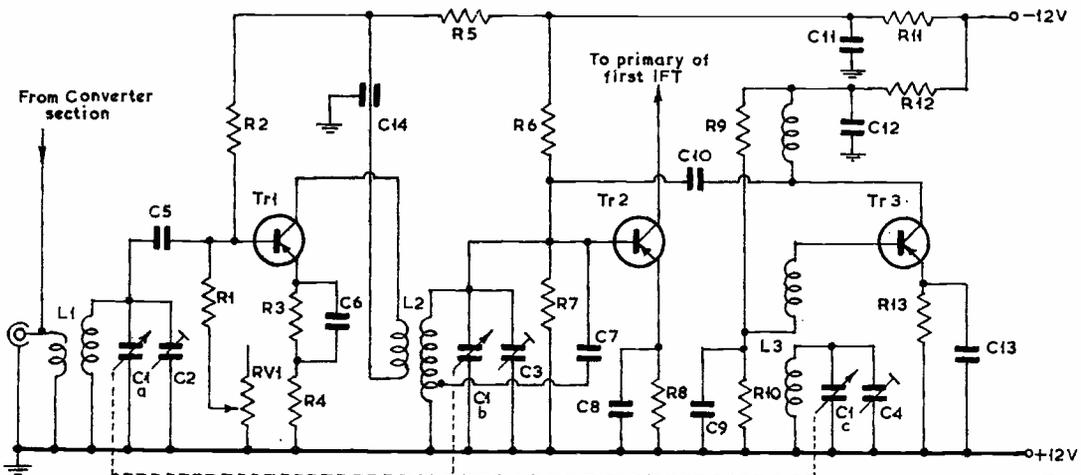
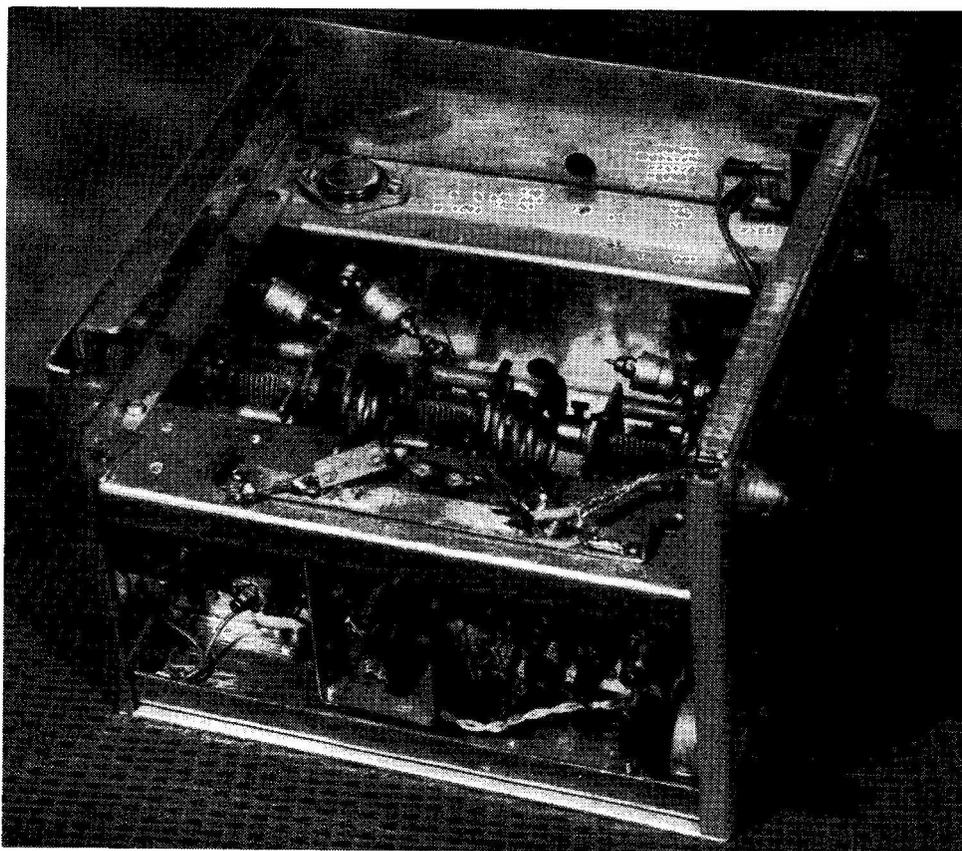


Fig. 2 Tunable IF Section

Fig. 2. Tunable IF Section



Underside view of the G3GBH Receiver with base removed

meter with a series resistor reads the AVC voltage and is remarkably linear for such a simple device. A series resistor of 30K is a starting value but should be adjusted to give the operator's idea of an S9 signal at two thirds meter deflection. The output transistor (an AD140) is mounted through the top face of the chassis to provide a heat sink. A separate speaker is used.

The BFO calls for little comment, except to say that more trouble was experienced with this stage than in any other part of the receiver! Several circuits were tried before a reasonable note with just the right amount of injection was given with the circuit shown.

The Coils

When making the oscillator coil, the feed back coil was left loose on the former, so as to permit adjustment of the coupling, as was the link coil to the mixer. These were adjusted, after the receiver was operative, to give maximum signal with minimum noise and lack of spurious responses. The low-impedance link into the tunable section RF stage was also treated the same way and, after adjustment, is very satisfactory, even when two inputs are fed into it. After adjustment all three coils were

cemented in position with *Bostik*.

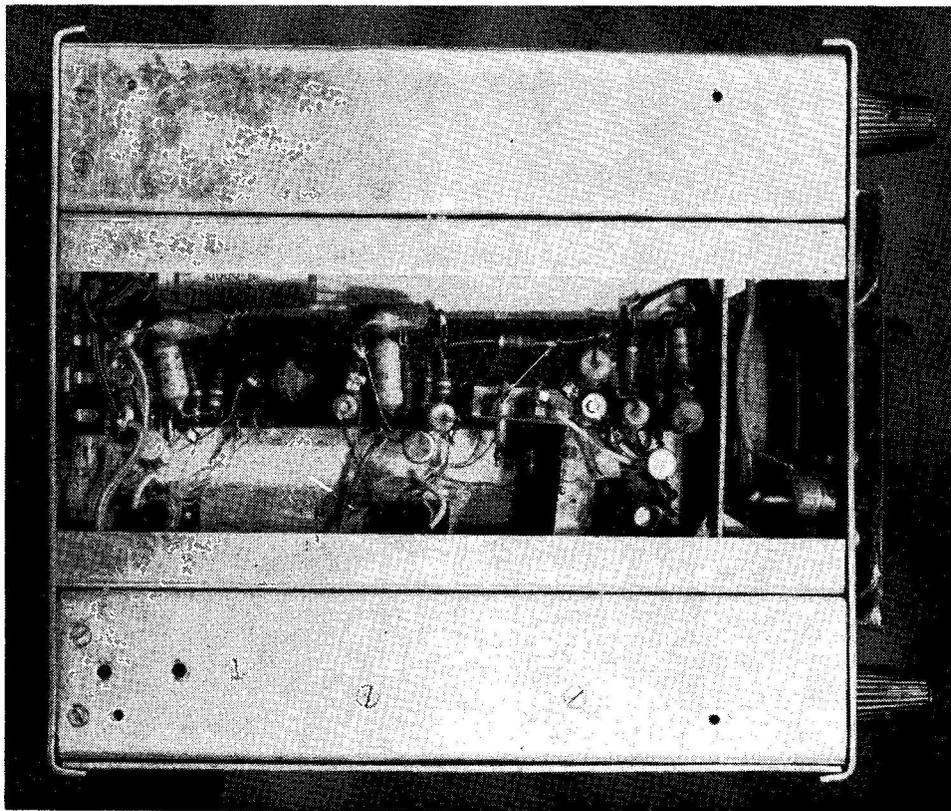
The actual tuning range was found to be 6.5 to 10 MHz and could have been band spread to cover just the 7 to 9 MHz required. However, as other converters can be fed to the socket on the front panel, it was left as it was, to allow slightly greater choice of crystals when trying out alternative converters.

Lining up the IF, RF and FC circuits followed normal procedure and presented no complications.

The unit was tested as a 6.5 to 10 MHz receiver and proved to be very sensitive, reasonably selective and, except for restricted band spread, very satisfactory on the 40-metre amateur band. SSB signals can be resolved without trouble.

Front End

Now for the front-end section. Several converter units have been tried since the receiver was built. It is a simple matter to make these on suitable sized pieces of laminate board and try them, before fitting, via the tunable IF input socket on the front panel. After all snags have been eliminated, the finished product can be fitted into the left hand side compartment to make a



Side view of the Receiver with top panel removed

complete fully screened two-metre receiver.

The circuit shown is the one in use at the present time. It is based on the G3BKQ Mk. II converter—as published in the *Magazine*—and it works very well indeed. It may be noticed that the crystal oscillator and frequency multiplier stages are on a small separate laminate panel. It uses a well tried and reliable circuit and normally is left *in situ*, and only the RF and mixer changed when desired. The constructor can, therefore, choose the type of front end and later try another type with minimum trouble.

Having chosen and made the converter section it can be fitted in place and connected up. The spare side panel, mentioned earlier, is then carefully marked and drilled to give small holes corresponding with any trimmers or coil cores that require adjustment when tuning up this unit.

Some Practical Points

With the converter circuit shown it was found that some de-tuning took place when the side panel was fitted. Using a spare side panel tuning can be carried out, the drilled panel removed, and the blank side panel slid into place.

If conditions are poor on two metres and good on the

tunable IF band, break-through signals can become a problem. Therefore, a high-pass filter with a nominal cut-off frequency of around 60 MHz was inserted between the aerial input socket and the input to the converter section. This did the trick. Insertion loss is extremely small, and tunable IF break-through ceased to become apparent.

The filter as shown is rather clumsy, but efforts to reduce its size without degradation of efficiency have, so far, failed. So it remains. It is mounted on the top face of the converter compartment. No stabilisation has been found to be required on the 12-volt supply when working with an AC power pack.

There is some upward drift for five or six minutes after switching on from cold. After that no discernible drift occurs. The whole of the receiver supply is switched on and off, and tuning is always spot on when switching on after a "transmit" period. Once the receiver has warmed up, as mentioned above, it needs to be switched off for almost an hour before the initial warm-up drift becomes apparent again.

If, however, the receiver is intended for mobile use, or with a portable PSU, the oscillator supply should be stabilised by a zener diode and the complete supply input (approx. 12v. at 800 mA) should be anchored with a good power type of stabiliser using zener control on

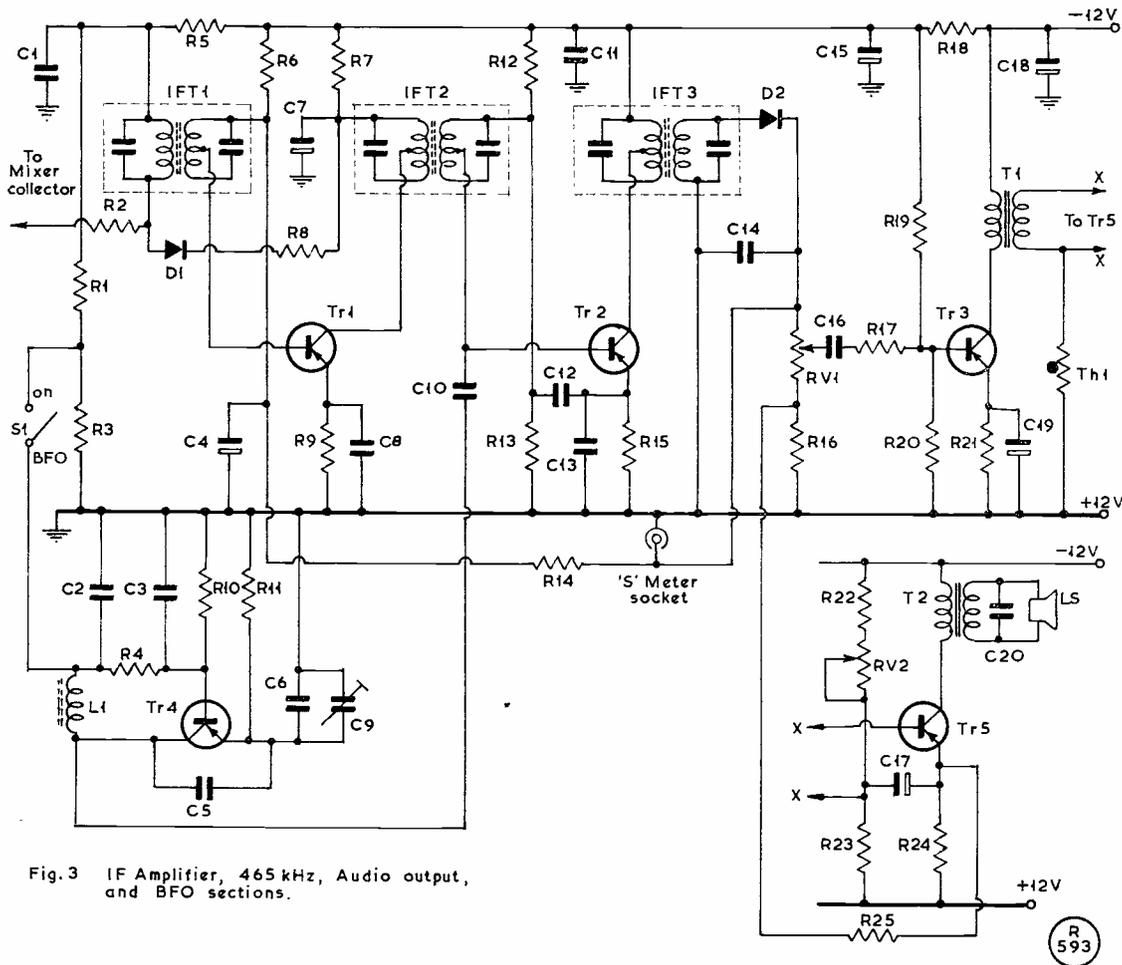


Fig. 3 IF Amplifier, 465 kHz, Audio output, and BFO sections.

Fig. 3. The IF, BFO and Output ends

Table of Values

Fig. 3. IF, Audio, Output Stages and BFO

C1, C2, C8, C11,	R12 = 22,000 ohms
C20 = 0.1 μ F	R13 = 4,700 ohms
C3 = .02 μ F	R14 = 8,200 ohms
C4 = 10 μ F, elect.	R15, R18 = 1,000 ohms
C5, C6 = 180 μ F	R16 = 22 ohms
C7 = 2 μ F, elect.	R17 = 3,900 ohms
C9 = 20 μ F trimmer	R19 = 27,000 ohms
C10 = 2 μ F	R22 = 120 ohms
C12, C13 = .05 μ F	R23 = 12 ohms
C14 = .01 μ F	R24 = 0.5 ohm (half-ohm)
C15, C19 = 100 μ F, elect.	RV1 = 5K, log. pot.
C16 = 0.5 μ F	RV2 = 220 ohms
C17 = 500 μ F, elect.	IFT1, IFT2,
C18 = 1000 μ F, elect.	IFT3 = 465 kHz IFT's
R1 = 6,800 ohms	D1 = OA200
R2, R25 = 47 ohms	D2 = OA91
R3 = 10,000 ohms	Th1 = VA1034 thermistor
R4 = 68,000 ohms	Tr1,
R5 = 100 ohms	Tr2 = AF117
R6 = 56,000 ohms	Tr3 = OC82D
R7, R20 = 22,000 ohm	Tr4 = OC45
R8, R9,	Tr5 = AD140
R21 = 680 ohms	
R10 = 33,000 ohms	
R11 = 12,000 ohms	

Notes: Coil L1 is one winding of 465 kHz IFT with internal capacitor removed. All 12v. neg. feeds are brought to common point and switched from front-panel on/off control.

an OC35 or similar power transistor. This has been tried and proved to be most satisfactory.

The writer certainly would not revert to the old converter-cum-receiver type of equipment for VHF. The signal-to-noise ratio is far better on the solid-state receiver. Selectivity for phone and CW is at least as good and general sensitivity a good deal better than when using various valve converters into a good HFO receiver.

While one could be very pleased with this receiver it must be borne in mind that simple designs of this nature must have some shortcomings, and it is only fair to point them out.

Using a second IF of 465 kHz it is almost impossible to be entirely free from second-channel interference from strong signals when tuning a full two megacycles. Strong signals high in the tuning range can appear, as weak signals, lower down the range. With this in mind, it may be a good idea to have the second IF around 1.6 MHz.

(To be concluded)

VHF BANDS

A. H. DORMER, G3DAH

THE excitement seems to be dying down a bit now that *Oscar 6* has been flying for over a month, though many correspondents still find it infuriating that one can never tell when the satellite Tx will be inoperative. Since setting up gear on both bands and monitoring the channels takes about 30 minutes, and since it seems that the most favourable orbits occur around meal times, with the consequent domestic QRM, there is some justification for feeling frustrated. Unfortunately, there seems to be no set programme for closing down the device during passes favourable for us, add to that the fact that much of the lost time may be due to unpredictable aberrations in the on-board gear or to the intermittent use of excessive power by ground stations, and it appears that we must just lump it. In the States, the satellite is switched on Thursday, Friday, Saturday and Sunday evenings and Saturday and Sunday mornings, this due to the need to conserve battery power as one of the solar cell panels is giving trouble.

A few points about the comments last month: The *orbital shift* is 28-74°W and not as stated. Some readers have queried the definition of a QSO *via* Oscar. This does not appear to have been laid down anywhere, but personally your scribe works on the usual basis that an "R" must be given and received by both operators before considering

the contact to be complete. The power required to access the translator at range still appears to be higher than the early forecasts. Whether this is due to the sensitivity of the satellite Rx, the polar diagrams of the station Tx and Rx antennae, propagation, or the fact that our PA's are not as efficient as we thought, cannot be accurately determined at this stage. The fact remains that those operators who are having most success with Oscar are those with a comfortable power margin in hand. It remains good practice to adjust the power output of the Tx to *just* above that required to copy the signal coming back on 29 MHz, and no more.

Reports

Lack of space precludes the publication of all the details in the reports submitted to date, but this does not mean that they are not very welcome. Details are being recorded, and it is intended to publish an analysis in due course. Any suggestions for improving contacts *via* Oscar will be passed on without delay.

Oscarmania? Amsatitis? Satellitosis? In this way G3NHE begins his report, to which your scribe might add Homophobia, to describe his feelings towards the chap who runs 3 kW to a 96-element stack and so closes the translator down! And there are a few of them!! 'NHE has had 86 QSO's at the time of writing, all on CW, and countries worked total 15. He runs up to 1 kW e.r.p. to the outdoor 10-ele. beam, but finds that the indoor 4-element, appropriately tilted in both vertical and horizontal planes by hand, gives best results at satellite elevations above 30°. Surprisingly, he has had contacts with W and VE at times when he has not been able to copy his own signals, so it looks as if the statement last month that this cannot be done needs some modification—it was based on personal observation.

Although not transmitting for Oscar contacts, G8AFN submits a comprehensive analysis of reception during 99 out of the first 500 orbits which shows that only 32 were copied for the full duration of the pass, four switched off in the middle of the pass and reappeared on the next orbit, nine switched off and did not appear again for several

orbits, and the remainder produced no signals at all. He suggests that, apart from the Rx overload situation, it is possible that there is some hysteresis in the DC power circuits such that when the battery has fallen below the Tx/Rx cut-off voltage limit it must be re-charged to a higher voltage level before reaching cut-on. He stresses the point that it should be noted that Doppler shift is greatest at TNA (Time of Nearest Approach).

EI6AS also send a very comprehensive report on his 103 contacts in 19 countries. Most interesting is the fact that he has heard his own signals back from West of Lake Superior and has had QSO's at 90°E. He runs 100 watts to a 4X150A feeding two 10-ele. Skybeams capable of 360° rotation in the horizontal plane and 6° in the vertical. He, also, has had QSO's when he cannot hear his own signals.

G3BHW has done remarkably well with his 20 countries worked and, although he is too modest to say it, some of his success is certainly due to the fact that he is a first-class CW operator on the HF bands, and can read signals well down in the noise, an absolute "must" for DX Oscar contacts. He can run up to 1 kW e.r.p. from a 6/6 slot and uses a three-ele. beam for 29 MHz.

G3WW sends along some details of contacts by SS/TV between W9NTP and WA9UHV. The

OSCAR VI TABLE
Operating Results

Station	Worked	Countries
G3BHW	20	DL, EA, EI, F, G, GI, HG, LA, LZ, OE, OH, OK, ON, PA, SM, SP, SV, UA, UT, VE.
EI6AS	19	<i>list to come</i>
G3NHE	15	DL, EA, F, G, GW, HB, HG, I, LA, OH, OK, SM, SP, VE, W.
G3DAH	10	DL, DM, EA, EI, F, G, GI, OK, SM, W.

It is intended that this Table shall run for the duration of *Oscar VI* activity. When putting in a claim, please show Countries Worked in alphabetical order, as given here. To keep the Table up-to-date, claims should be made monthly. It is open to U.K. two-metre operators only and at present no award status for working through *Oscar VI* is contemplated. Contacts *via* Oscar do not count for VHFCC awards. Claims for entry in this Table should be made to "VHF Bands", SHORT WAVE MAGAZINE, BUCKINGHAM.

former, the well-known Don Miller, suggests that transatlantic contacts should be possible on the early evening passes, and he would like to hear from any British amateur prepared to have a go—QTH Box 95, Waldron, Indiana, 46182, or on 14,230 MHz at 1130z on Wednesday mornings for a sked.

Although receiving only at present, John Haydon, G3BLP has put in a lot of Oscar time and turns in a comprehensive list of countries heard. He notes that signals usually appear around 29.49 MHz at first, and the activity then spreads out, although there is more of it below 29.5 MHz than there is above.

Gordon Smith of Aberdeen also sent in a listener report covering 18 countries, all done with a Mohican and a long wire, which is not bad. For real DX though, how about the report from G3TR that he has heard JA1?

How long the interest in Oscar will be sustained is anyone's guess, but it looks as if it might be of interest to start off an Oscar Table, so the first one is shown herewith.

Contests

The VHF/NFD results are now out and show the winners to be as follows: 70 MHz—GW4BBR/P, Golden Valley VHF Contest Group; 144 MHz—GW3BA/P, Midlands A.R.S.; 432 MHz—GW3VXK/P, North Liverpool Radio Club, and on 1296 MHz GW3LTF/P, the mid-Essex and mid-Severn VHF/UHF Contest Group. Once again the Welsh portables sweep the board!



At the recent Leicester Amateur Radio Exhibition the two-metre station GB3ARE was able to use a production model of the new Braun SE-600 transceiver—which appears to give everything one could want (see text). In our picture are, left to right, G3JVQ/DJØBQ, the Brauns' firm representative, G8CAC (on the microphone) and, on the right Jack Hum, G5UM, who is a respected colleague in the field of VHF reporting.

Overall winner was the mid-Essex/mid-Severn Group with a commanding lead over their nearest rivals, Pye Telecommunications and the Midland A.R.S.

G8CDW, BARTG contests and awards manager, comes up with the results of the 4th VHF RTTY Contest. Leader on 70 MHz was G3NHZ with 27 points followed by G3OLM and G3WHQ, both with 26 points. A very close thing! On 2m., G3XSO led the field with 324 points, 15 ahead of G3NHZ. It was interesting to note that among the 16 entrants on two metres there were six DJ/DK and one OE. General comment was that conditions were not too good and this is borne out by the comparison between the

distances quoted for best DX this year as against 1971. It is planned to have a similar event next year.

Forthcoming Events

The BATC Cumulative Contest starts on January 8 (s.a.e. to G8ACB, QTHR for complete details) and the 144 MHz SSB Open contest for January 7. The 4m. Cumulatives close after the sessions on January 14 and 28th, 1973.

The Liverpool and District A.R.S. are running a two-metre phone contest on Sunday, February 4, 1973 with the general idea (they say) of putting the Liverpool Clubs in the limelight for a least the three hours between 1400-1700 local time. Rules are a bit complex, but full details may be obtained from the hon. secretary, G3AHD, QTHR.

VHFCC Awards

Pride of place this month must go to Tony McKillop, G8CIT (Hampton, Middlesex) who gains both the 2m. and 70 cm. Awards, Nos. 172 and 15 respectively. First licensed in February, 1969, a start was made on Two with a QRP rig running 150 mW to a 2N708 modulated by a pair of OC72. The Rx was then an AF239 converter feeding a home-built IF strip and a 10-ele. Yagi at 30ft. Power was increased to 500 mW with a 2N2218 in the PA and on OC84 modulator. With these two rigs, 150 stations were worked during the first year of operation, including ON, F and

Oscar 6 Prediction Data

(a) Orbit	(b) Date	(c) Time (GMT)	(d) Position	(e) Direction
972	Jan. 1	0801	27°E	N/S
973		0956	02°W	N/S
974		1151	31°W	N/S
977		1712	39°E	S/N
978		1907	10°E	S/N
979	Jan. 2	2100	18°W	S/N
984		0701	42°E	N/S
985		0856	13°E	N/S
986		1051	16°W	N/S
987		1246	44°W	N/S
990		1807	25°E	S/N
991		2002	03°W	S/N
992		2157	32°W	S/N

Notes:

To calculate later orbits deduct 5 minutes from the crossing times and add 1°E every 25 orbits.

Those who prefer a visual presentation of orbital data are referred to the April, 1972 issue of "Radcom" describing the construction of a simple calculator which, used in conjunction with this Table, shows at a glance the orbital path, the 52°N and Equator crossing times and the range and bearing at all times during the pass.

GW. Subsequently, power was raised to 12 watts with a 2N3632, the converter became a 3N140/3N141 combination with an EC10 and the beam an 8-ele. Yagi at 25ft.

The original 70 cm. gear consisted of a BF180 converter, varactor tripler and Parabeam at 30ft., since changed to a BF180 front end with TIS88 mixer, QQV03-20A PA with optional QQV06-40A add-on amplifier with OC36 modulators.

Tony is also active on 23cm. with a 2C39A at 20 watts input, a K6AXN converter and a 34 ele. beam at 35ft., with which he has now made 16 contacts from his QTH in the Thames Valley.

G8DWD (Welling, Kent) gains Award No. 167 for 2m. operation. He first came on the 2m. air in November, 1970 and now runs a mosfet converter into an EC-10, a 6/6 at 26ft. and a PA with a QQV03-20A in the final. He has decided to have a go at the Morse Test if only to avoid having to sign GW8DWD/P when he goes portable in Wales.

G8EEM (Leeds), Award No. 168, also 2m. work. He runs a QQV03-10 with 20 watts input, a dual-gate mosfet converter into a home-built IF strip and an 8-ele. Yagi at 36ft., the QTH being 360ft. a.s.l.

G8FNI (Wyton, near Hull) made the necessary contacts on 2m. for Award No. 169. In December, 1971 he started up with a Pye base station at 25 watts input and an 8-ele. Yagi. For reception he uses a "Sentinel" mosfet converter and a BD-348, the latter having been modified by replacing the original RF valves with 717A "doorknobs" with considerable improvement in performance, which he claims is comparable with that achieved with an AR88. His QSL return rate is still only the usual 25%, but he does find that direct QSL with DX stations pays off and also that "A" licences are much better than "B" chaps at confirming contacts.

GM3ZVB, Edinburgh, is awarded certificate No. 170. Equipment is at present a 50-watt Tx with a QQV03-20A, a mosfet front end and mixer in a home-built Rx, but an FR-100B is on the way with a high performance FET converter and high-Q break to cope with the QRM from nearby amateurs. The QTH is at 100ft. but, as with most, if not all, of the Edinburgh stations, the

2,000ft. hills to the South, South-East and South-West make contacts difficult in those directions. However, Robert has worked LA, OZ and SM through a 200ft. hump just up the road. The 4/4 antenna at 25ft. is rotated by ropes and pulleys and this has a big advantage over most of the motorised beams which, lacking direct drive, turn far too slowly.

Finally, G8FCY (Battle, Sussex) has Award No. 171. He came up on 2m. in August, 1971 with a 5-watt Tx which is now used as a driver for the 4CX250 linear. Rx is an FET converter and an EC-10 and the beam a 14-ele. at 35ft. He has recently acquired an FR-400SDX transceiver and hopes to obtain his full ticket during the winter months.

VHF Equipment at Leicester

The Editorial last month covered the general aspects of the ARRA exhibition. However, there were some items on display which were of particular interest to the VHF man, and which merit special mention here.

Highlight must have been the Braun equipment which was on Bill Lowe's stand, and which was being demonstrated by G3JVQ/DJØBQ. This SE-600 two-metre transceiver was about the best seen and, if one can afford the price, would put one in the front rank for the next 10 years or so. It has CW, AM, FM and SSB facilities, built-in power meter, speech clipper, squelch and noise limiter, will work from the mains or from 12v. DC, has independent sideband switching, tone-burst generator for repeater working and, in one version, digital readout of "transmit" and "receive" frequencies which can be split. In fact, just about everything one could wish for. It behaved magnificently on the air, it being put to good use as the two-metre talk-in station signing GB3ARE. An 80-channel, 2m. transceiver, the SE-280 with an output of 10 watts and suitable for home station or mobile use, also came from the Braun stable and represented good value for money.

Lowe Electronics introduced the "Linear-2" Japanese mobile SSB transceiver. This covers 145-25 MHz to 145-49 MHz as supplied, but this range may be varied to suit

other requirements by simple xtal changing. With 10 watts output, this also makes it an attractive driver for a pair of 4CX250B's. Price is £138 and five of the six models in the initial delivery have already been sold to those who consider that mobile SSB is the coming thing—G3BA, G3BHT and G8AGU among them!

Not as widely known as it might be, was the Osler Power-SWR meter Type SWR200. Frequency coverage extends to 2m. and power measurements may be made up to 2 kW on the HF bands, and up to 200 watts at 144 MHz, each instrument being individually calibrated. Price is £18-50 from Western Electronics. They also offer a solid-state, two-metre NBFM amplifier capable of 100+ watts output for 5 watts of drive. Price is £131-90 which may scare some people off, but it looks a well-engineered piece of equipment.

News Items

70 Cm.

As an echo of the comments last month about the sheer doggedness of the GM stations who are sited in difficult terrain and yet persist in their UHF/VHF endeavours, comes news of GM8BDX, Duns, Berwickshire, who has worked only 12 stations on 70 cm. in *three years!* He runs 10 watts output from a varactor and a 46-ele. Multibeam. He is also equipped for 4m. and 2m. How about some skeds?

G4AEQ, Worsley, Manchester is now active on the band with 5 watts to a QQV02-6 and a Multibeam. The Rx consists of an AR88 with a BFY90 pre-amp and a Microwave Modules converter. He will have 4m. shortly.

Two Metres

Those who have heard or worked the BBC 50th Anniversary station GB2ZY in Manchester may like to know that the operator was G3LEQ who was also the subject of a first-class interview on "Radio Manchester" which spanned the years since the first broadcasts from 2ZY in November, 1922 to present day operations on the amateur bands. If only *all* the communication *media* would turn to someone like Gorgon Adams for their information on matters Amateur Radio, we

should have fewer of those awful solecisms of which we are all too frequently the impotent recipients.

GM3KYI of Dundee asks that his apologies be passed to the many operators from the South who called him during the October 6 opening without success and explains that the QRM from stations in the North of England, and the Continentals, was so intense that he just couldn't hear them through all the din. He worked LA, SM, PA, DL, DM, ON, OZ, G and GM that night, with 6 watts from a Cambridge!

The friendly rivalry between GD2HDZ and G3BW on 2m. continues, but Arthur was foiled when, after having set up a sked with G3XC in Cornwall for a new county, he learned that 'XC had lost his antenna in a gale!

G8BQX in a well-reasoned letter again raises the old question of AM/FM stations transmitting on the SSB calling channel. Among pertinent questions he poses is this one "Does the cost/complexity factor of one's equipment give one priority or exclusive right of access to the DX?" Well, of course it doesn't, and perhaps a little elaboration will be in order. First, not all the DX is on SSB. Secondly, most of the DX does not occupy the SSB calling channel but operates clear of it to avoid the QRM, certainly *tunes* clear of it, and is therefore available for contacts on other modes. Lastly, one should remember that 145.41 MHz is allotted internationally as the SSB calling channel, and this implies SSB at *both* ends of the contact, and not just at one. So, although one would not wish to deny anyone, using whichever mode he prefers, the opportunity to work DX, the fact remains that coming up with AM or FM, and therefore with a *carrier and two (or more) sidebands*, on an exclusive SSB channel can cause a fair bit of blood pressure for locals and for the DX operator. One supposes that this argument will continue to be ventilated for some time to come, but the growing tendency for SSB operators to use other than the frequencies immediately adjacent to the calling channel and to tune the band for signals from stations using other modes and frequencies, should eliminate, in due course, this cause of friction.

THREE BAND ANNUAL VHF TABLE

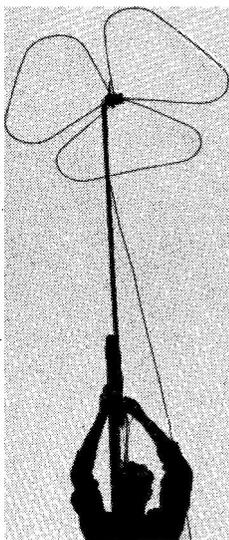
January to December, 1972

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL points
	Counties	Countries	Counties	Countries	Counties	Countries	
GD2HDZ	33	4	75	16	34	8	170
G5DF	52	6	59	10	33	4	164
G3DAH	34	2	59	17	32	8	152
G3OHH	51	6	57	6	24	2	146
G8CUT	—	—	63	14	35	7	119
G3NHE	—	—	67	17	29	6	119
G3YRH	2	1	62	11	24	7	107
G8FUI	—	—	67	11	23	4	105
G8ATS	—	—	49	9	38	6	102
G8BXX	—	—	54	7	33	2	96
G8CIW	—	—	69	15	10	2	96
G2AXI	28	2	42	8	12	1	93
G3BW	—	—	79	13	—	—	92
G3FIJ	11	2	42	6	14	3	78
GW8FKB	—	—	63	14	—	—	77
G8BKR	—	—	49	6	19	2	76
G8AGL	—	—	53	9	9	1	72
G4ALN	—	—	40	6	22	3	71
GM8BDX	—	—	44	9	4	4	61
G8CBU	—	—	40	6	13	2	61
G8ERM	—	—	53	5	—	—	58
G8DWT	—	—	48	5	4	1	58
G3PQF	5	1	42	9	—	—	57
G8DYK	—	—	47	9	—	—	56
G4AVX	—	—	48	8	—	—	56
G4AJE	—	—	44	11	—	—	55
G3EKP	23	6	16	5	2	2	54
G8EMS	—	—	42	4	6	1	53
G3RAF	—	—	46	6	—	—	52
G3DAO	—	—	39	12	—	—	51
G8FIH	—	—	43	8	—	—	51
G8FKL	—	—	46	5	—	—	51
G8COG	—	—	34	5	7	1	47
G8FAG	—	—	41	4	—	—	45
G4BKG	—	—	38	6	—	—	44
G8GJV	—	—	37	4	—	—	41
GW3CBY	3	1	22	5	6	2	39
GM3ZVL	—	—	31	8	—	—	39
G4APV	—	—	33	5	—	—	38
G3SMU	5	1	—	—	23	3	32
F6BQH	—	—	24	7	—	—	31
G8GJN	—	—	26	5	—	—	31
G8BBV	—	—	26	3	—	—	29
GM3ZVB	—	—	24	4	—	—	28
G8BMD	—	—	23	4	—	—	27
G3MEW	—	—	23	4	—	—	27
GMGBH	—	—	23	2	1	1	27
G8FNH	—	—	20	2	—	—	22
GM3IBU	—	—	19	2	—	—	21
G8BBP	—	—	16	4	—	—	20
G8FVI	—	—	17	2	—	—	19
G4AZK	—	—	14	2	—	—	16
G8GFW	—	—	13	2	—	—	15
GW3FTQ	—	—	13	2	—	—	15
G8FSO	—	—	6	3	—	—	9
G8DBX	—	—	6	2	—	—	8
GW8CGH	—	—	5	2	—	—	7

This Table closes on December 31, 1972. It shows claims to date for the year commencing January 1st, 1972. Please send your final claims as soon as possible after the New Year to:—"VHF Bands", SHORT WAVE

MAGAZINE, BUCKINGHAM.

[over



For the Peterborough Mobile Rally on October 1st, they used a clover-leaf aerial for the two-metre talk-in station, here seen being erected by G3TGO.

The Scottish Scene

There is some interesting QRP work going on these days. GM3ZVB has built a solid-state, 2m. transceiver with 100 mW out and has worked the West of Scotland from Edinburgh with it, to say nothing of paralysing half the front ends in that City when he came on from the top of one of the Pentland Hills recently. GM3KJF runs similar power from Ayr and is being copied

in Edinburgh which, when one looks at the intervening terrain, might have been thought impossible. GM3OXX has returned to the fold rather earlier than we had expected, and is active again with his milliwatt rig feeding a stacked clover-leaf antenna with a gain of 3 dB. Also back in harness are GM3EUM in Cowdenbeath and GM8CZU in Lochgelly, both on two metres.

Further to the notes last month about the VHF activity at Heriot-Watt University, it is learned that GM8FWS and GM8SSP also are now students there and both are active on 2m. Though hardly a student any longer, GM6SR still keeps the party in order during the regular morning net activity on 2m. He has just celebrated his 85th birthday, and his many friends may like to join in passing him heartiest congratulations. Keep it up, Syd! Another Old Timer on 2m. is Charlie Winton, GM6XW of Larbert, Stirlingshire who now runs 60 watts to a 10-ele. Yagi and hopes to be on SSB shortly.

Annual VHF Tables

Very little movement in the Tables this month. Poor conditions must be one contributory factor and the dreaded Oscar another. Your next claims will wind up the proceedings for this year and it would be greatly appreciated if they could be sent in just as soon as possible after the close of the year so that the final

placements, both overall and by bands, may be ready for publication in the February issue as usual.

Please note that contacts via Oscar may *not* be claimed for these Tables.

Club and Group

The U.K. FM Group (London) are holding a convention and AGM on February 24 commencing at 1430 hrs. at Brooklands Technical College, Weybridge, Surrey. Tickets, at 20p for the convention only and £1 for convention and buffet, are available from G8CKT, *QTHR*. Talk-in on 2m., 4m. and 70 cm.

The next meeting and AGM of the South East UHF/VHF Group is at Wye College, University of London, near Ashford, Kent on Friday, January 19. The election of a new president will be followed by an Open Forum.

We are asked to say that the U.K. FM Group (Southern) meets on the first Wednesday (evening, 7.30 p.m.) each month at Chineham House, Popley, Basingstoke, with talk-in on 144.48 MHz. Details from G8AKA or G8FFV, *QTHR*.

Deadline

Deadline for the next issue is **January 5**. The address for news, views claims and comment is:— "VHF Bands," *SHORT WAVE MAGAZINE*, BUCKINGHAM. Cheers for now, a very happy New Year and *73 de G3DAH*.

INTERNATIONAL BROADCASTING CONVENTION

This Convention, the fourth in the series, was opened by Lord Hill, erstwhile Chairman of the ITA and now Chairman of the Board of Governors of the BBC, at Grosvenor House, London on September 4. It had as object the presentation to engineers in this country and visitors from abroad a comprehensive range of techniques and equipment which will influence technical progress in the radio and television fields for many decades to come, and in this endeavour it succeeded admirably.

Possibly the most significant advance in TV technique is the impending introduction of a digital, as opposed to analogue, system of processing the TV signal from the camera head to the transmitter, and EMI were showing both systems on adjoining monitors. The new system should give reduced noise and distortion on the video signal and will ensure almost error-free signal handling throughout the chain. In combination with new techniques for automatic error detection and correction, all accomplished within five seconds of a fault occurring, the viewer in this country should be entitled to expect, and will probably get, a vastly superior service to that which he now enjoys.

Of interest on the radio broadcasting front is the

confirmation that a successful pulse-code modulation system has now been developed by the BBC which will enable stereo signals to be transmitted over lengthy landline and radio links without deterioration in quality standards.

More than 60 British and overseas exhibitors were demonstrating the latest advances on the technical front with displays of equipment starting at the studio and finishing with microwave link transmitters operating in the 13 GHz region. Throughout the five days of the Convention, a series of lectures had been arranged covering management and engineering training, TV programme origination and recording, the introduction of automatic monitoring and control techniques, satellite relay systems and the impact of radio and television on educational methods.

The overall impression given by a convention of this type is that Britain has, despite active foreign propaganda to the contrary, much to offer in the way of technical know-how and performance in this field, although the excellence of colour registration and reproduction on some of the commercial monitors showed that the average *set* manufacturer, like Thursday's child, has far to go in spite of the help he receives from public apathy!

A.H.D.

MAGAZINE CLUB CONTEST

REPORT AND RESULTS, THE 27th ANNUAL MCC, NOVEMBER 4-5, 1972

THIS year's MCC, the 27th in our SHORT WAVE MAGAZINE Annual Series, shows a marked drop in Club entries put in—from 83 last year to 61 this time. This is partly due to the fact that many of the Clubs actually playing in the Contest did not, in the end, get round to sending in a log—which is a pity.

On the other hand, it also suggests that because of (a) A dearth of CW operators prepared to have a go under really competitive conditions, and (b) The turmoil associated with night-time operation on Top Band nowadays, fewer Clubs feel that they can compete in the CW mode. Indeed, it has been suggested that MCC should now become an SSB phone contest—so far as we are concerned, *never!*

But, after 27 years, the time may well have come to make a fundamental change in the operating aspects of MCC relative to Top Band conditions as they actually are these days, in terms of propagation, level of commercial QRM, the method of Club identification and the zonal division of the British Isles for the purpose of MCC. However, that is for the future. Immediately, we are considering the 27th Magazine Club Contest.

* * *

The **First Five**, nationally, are shown in the accompanying Table. Because we have always stressed that in MCC the competition is primarily between Clubs in the same Zone, the entry has been broken down by Zones, so that Clubs can see how they got on in comparison with their neighbours. At the same time, an overall placing is given.

Rules and Conditions

It seems to be generally agreed that, once again, the rules were fair and reasonable—though we would be the first to admit that there are anomalies, where Clubs only a few miles apart qualify for different multipliers. Because of geography, this is insurmountable, however Zones may be delineated. There will always be border-line cases. It is just a pity that some Clubs do not enter merely because they feel that the Zone divisions work against them when it comes to multipliers—they think on a *national* scoring basis, forgetting that in fact they are competing with Clubs in their own Zone.

This is why, this year, Zone placings are shown separately and there is no national tabulation—that is to say, a Table showing placings overall, as in previous years.

The Logs

For the first time in many years, the logs were beyond reproach in terms of accuracy and presentation. Not one had to be thrown out, all were fair copies and very few adjustments were needed on account of doubtful

TABLE I

The First Five

1st	Durham Contest Club, G4ANR	(Zone B)	5910 points
2nd	Manchester UMIST, G3CXX	(Zone B)	5538 points
3rd	Dyno Contest, Kent, G4BAD	(Zone F/L)	5146 points
4th	Cambridge University, G6UW	(Zone D)	5050 points
5th	Manchester University, G3VUM	(Zone B)	4994 points

claims or arithmetical error. The notes on p.565 of the November issue had certainly been heeded.

A few entrants did not give all the incidental information they might have done—such as antennae used, the callsigns of the operators involved, comments on the rules, general experiences, etc., but this was not obligatory under Rule 7.

Invigilators' Reports

These were uniformly favourable—as regards operating procedure, signal quality and the general conduct of the Contest as monitored. There were a few minor transgressions, such as one or two stations occasionally calling “Test de — — —” instead of “CQ MCC” and running the dot-side of the key when changing frequency.

As usual, there was far too much bunching in the narrow LF segments of the band and there were always many MCC stations three or four layers down. Some who have a good score could only be heard by the invigilators about three layers down—whereas those with reportedly much stronger signals have not been able to claim a particularly high score. A few Clubs who have put in quite respectable scores were never logged at all by any of the invigilators. (This merely proves that even by careful listening it is not possible to be sure of hearing everything).

Individual Comments

These have been taken *verbatim* from a selection of entries, and illustrate as well as anything how the Contest

TABLE II

Zone A—Scotland

Zone Pos.	Club and Callsign	Score	Placing Overall
1	Glenrothes, GM3FXM/A	4853	6th
2	Kingsway Tech., Dundee, GM4AAF	2336	52nd
3	Glasgow Univ., GM4AGU	2188	53rd

went from the entrants' point of view.

"One of our near-neighbours was so strong that they were audible over the whole of the CW segment of the band, so we installed a Beveridge Rx aerial on the Sunday, which improved things no end" (*Durham Contest*) . . . "Would it be possible to have a higher multiplier for working foreign non-Club stations?" (*Dyno Contest*) . . . "Why bother with a multiplier system?" (*Cambridge Univ.*) . . . "Seemed to be less activity than usual, and conditions poor" (*Manchester Univ.*) . . . "We are rather disappointed with our score though agree that the rules give quite a fair chance to all parts of the country" (*Glenrothes*) . . . "Very enjoyable Contest despite Tx troubles; spend all Sunday re-resonating antennae—no difference!" (*Glasgow Univ.*) . . . "Conditions seemed quite good both nights, with static level low; hope rules are left as they are" (*Leyland Hundred*) . . . "Conditions seemed rather worse on the Sunday evening, although the whole week-end did not show the band at its best" (*White Rose*) . . . "Our result is disappointing when compared with last year's winning entries; there was an unusually high static noise level during both sessions" (*North of England Field Operators Group*) . . . "Our first effort at MCC; not a good score but we feel it gave newer operators the chance to have a go" (*Doncaster Tech.*) . . . "We were very grateful to the Water Board for giving us permission to hang a dipole on their 110ft. tower; this and the tens of thousands of gallon of water made up a bit for the bad conditions" (*Hereford*) . . . "Was surprised to collect the first-ever T7 report in six years of operating" (*Eddystone*).

* * *

"Thought conditions poor both evenings but really enjoy operating this Contest" (*North Staffs.*) . . . First MCC year the equipment has not broken down or the aerial blown away, therefore our best score for several years" (*Nuneaton*) . . . "Cannot see the point of the Zone multiplier as this is more a function of the aerial, depending whether you use horizontal or vertical" (*Kent Univ.*) . . . "No complaints regarding the rules and whole Contest had the air of friendliness and the true amateur spirit about it; enjoyed every minute and hope some of our EU neighbours were listening to a lesson in gentlemanly behaviour" (*Spalding*) . . . "We think there are a few transceivers that don't transceive! Most GM signals pretty good and points-wise worth pursuing" (*Maidstone*) . . . "It was an enjoyable Contest though conditions were very poor on the Sunday. We were fortunate to have some home-brewed beer to keep us going" (*Finchley*) . . . "Perhaps somebody should have remembered that it was Guy Fawkes' week-end" (*Verulam*) . . . "We found the rules very fair" (*Salisbury*) . . . "Conditions seemed poor, worse than last few years and fewer stations on; by some miracle the aerial stayed up for both sessions; it is no lie that in the last three years it has always blown down half-way through the Contest" (*Fareham B*) . . . "Usual MCC weather—rain, mist and miserable but again a lot of fun" (*RNARS*) . . . "Who switched the band off in the middle of the second evening? And couldn't the scoring system be rounded off to save a bit of slide-rule work?" (*Fareham C*) . . . "Rules all seem fair and certainly our best effort since we re-started entering contests; more CW practice on the air is repaying

TABLE III

Zone B—Northern

Zone Pos.	Club and Callsign	Score	Placing Overall
1	Durham Contest Club, G4ANR	5910	1st
2	Manchester UMIST, G3CXX	5538	2nd
3	Manchester Univ., G3VUM	4994	5th
4	Leyland Hundred, Lancs., G3GGS	4445	10th
5	White Rose, Leeds, G3XEP	4353	13th
6	North England Field Operators Group, G4ZZZ	4089	17th
7	Hull, G3AMW/A	2963	41st
8	Eccles, Lancs., G3GXI	1909	55th
9	Doncaster Tech., G3UER/A	1627	58th

TABLE IV

Zone C—Midlands

Zone Pos.	Club and Callsign	Score	Position Overall
1	Hereford, G3YDD/A	4411	12th
2	Eddystone Amateur Radio, G4AHY	3861	23rd
3	North Staffs., G4BEM	3830	25th
4	Nuneaton, G3XJU	3163	33rd
5	Bromsgrove, G3VGG/A	2506	49th
6	Leicester Polytechnic, G3SDC/A	2505	50th

TABLE V

Zone D—Eastern

Zone Pos.	Club and Callsign	Score	Position Overall
1	Cambridge Univ., G6UW	5050	4th
2	Wheatshaf, Grimshy, G3PDL	4775	8th
3	Kent Univ., G3UKC	4077	19th
4	Spalding, G4OO	2336	51st

TABLE VI

Zone H—All GW

Zone Pos.	Club and Callsign	Score	Position Overall
1	Univ. College North Wales "A", GW3UCB	3133	34th
2	Sully, Glam., GW3ZIT	2184	54th
3	Univ. College North Wales "B", GW4BGD/A	1242	60th
4	Blackwood, Mon., GW6GW	992	61st

its rewards for us and we were all very pleased with the Contest" (*Kingston*) . . . "Lots of strong signals about; once a freq. was found it paid not to let it go" (*Fareham A*) . . . "Very enjoyable Contest; keep the rules and timing exactly as they are; 9.0 p.m. is an ideal time to finish" (*Wimbledon*) . . . "We would like to see the Contest run between 1800-2000z, to make meal times more convenient" (*Manchester Univ.*) . . . "Same problem as last year—dinner in College is at 7.30 p.m., so it was a case of competitive CW on an empty stomach" (*Cambridge Univ.*)

"Despite poor CW selectivity on the KW-2000A we enjoyed the Contest and thought the scoring system, although slightly complex, very fair to all participants.

TABLE VII
Zone F(L)—Southern

Zone Pos.	Club and Callsign	Score	Position Overall
1	Dyno Contest, Kent, G4BAD	5146	3rd
2	Maidstone YMCA, G3TRF	4794	7th
3	Finchley, G3XTJ/A	4583	9th
4	Verulam, G3VER	4412	11th
5	Crawley "A", G3WSC	4287	14th
6	Echelford, G3UES/A	4133	15th
7	Sutton and Cheam, G2DMR	4100	16th
8	Standard, Harlow, G3NIS	4082	18th
9	Addiscombe, G4ALE/A	4013	20th
10	Salisbury, G3KFF	3948	21st
11	Fareham "B", G3YRO	3932	22nd
12	Royal Navy, G3BZU	3477	26th
13	Horsham, G3TNO	3464	27th
14	Edgware, G3ASR/A	3454	28th
15	Acton, Brentford and Chiswick, G3IUU	3398	29th
16	Fareham "C", G3VXM	3356	30th
17	Essex Univ., G3UOE	3325	31st
18	Kingston, G3KIN	3272	32nd
19	East Kent, G3LTY/A	3107	35th
	Fareham "A", G3VEF	3107	
21	Wimbledon, G3WIM/A	3084	37th
22	Royal Signals, G4RS	3062	38th
23	Chiltern, G3CAR/A	3001	39th
24	Shirehampton "B", G4AEL	2993	40th
25	Southampton, G3SOU	2947	42nd
26	Shirehampton "A", G4AHG	2775	43rd
27	Crawley "B", G4BNT/A	2748	44th
28	Purley, G3XMW	2696	45th
	Silverthorn, G3SRA	2696	
30	Verulam "B", G3ZUJ	2687	47th
31	Sutton and Cheam "B", G4ADM	2606	48th
32	Shefford, G3FJE/A	1815	57th
33	Wimbledon, G3ZQF	1574	59th

Jersey, GC3DVC made 3858 pts. for 24th place overall, and EI9ONE 1848 pts. for 56th position.

"MONTH WITH THE CLUBS"

This feature will resume in its normal format with our February issue, due out on January 26. All Club reports for that issue should be with us not later than January 4, sent to Club Secretary, Short Wave Magazine, Buckingham. Please don't be late because we cannot write in reports received after the deadline.

a noise-level on the band never heard before or since" (IRTS Region One).

So there you have some of the individual Club comments and experiences, from which all interested can judge how MCC went this time for the contestants.

Our Thanks

Are due to all who took part in the 1972 MCC, sent in such splendid logs and made so many helpful and interesting comments—and by no means have we been able to quote more than a part of them. If no note of criticism by contestants seems to appear it is because we have not been able to find any beyond those quoted in the foregoing paragraphs.

* * *

The usual "Month with The Clubs" feature will recommence in the next issue, taking in all reports already received relevant to the February appearance, for which the closing date must be **Thursday, January 4**, addressed "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM—and a Very Happy New Year to all who read these lines.

On the whole a well-organised and well supported Contest" (Chiltern) . . . "Disaster in the shape of TVI struck us and we had to move our antenna; thought logging standard poor as we had difficulty in convincing some stations we had already worked them" (Shirehampton B) . . . "Conditions very good at start of the Sunday session, then heavy static QRN and considerable QSB; Niton Radio made things difficult, as usual" (Southampton) . . . "Our aerial was made from 27 amp. copper fuse-wire—invigilators please note that we didn't blow it!" (Purley) . . . "We would prefer a single 8-hour Contest rather than two 4-hour sessions; we are looking forward to the next MCC and hope that it will be as enjoyable as this year's event" (Verulam B) . . . "Conditions very good for the Saturday sessions, with several EU's heard; hope we can catch up on our A-station next time!" (Sutton & Cheam B) . . . "Rules OK but could we have later start and longer spells" (Shefford) . . . "We believe that the Contest should start one hour later to take advantage of night skip" (Sully) . . . "We made a late decision to enter and paid the penalty! Although we had 400ft. of wire out it didn't load too well and proved to be too directional North. Despite our low score all who took part enjoyed themselves and that's what it's all about, really!" (Blackwood) . . . "Possibly we could have done better but we gave all members, experienced and inexperienced, a turn on the key, and everybody enjoyed it" (Jersey) . . . "Once again a very enjoyable Contest though here at EI9ONE nothing, but nothing, went right; Murphy's Law decreed that we had

NORTH SEA OIL WELLS CONTROL

The first tropospheric-scatter radio link in Europe to be used for oil production control is to be provided by Marconi Communication Systems Ltd. for B.P. for their Forties Field production platforms 110 miles out in the North Sea. The link will carry voice and data transmissions for both telemetry and control systems between the shore control terminal at Brimmond Hill, Aberdeen, and the four platforms in the Forties Field.

The shore terminal, which will have two 30ft. dishes and operate in the 2.5 GHz band, is capable of providing 132 telephone channels. Two 1 kW power amplifiers, using a klystron for the output stage, will be employed as main and standby transmitters. The equipment on each of the platforms will be similar to that at Brimmond Hill, except that each station will have two 15ft. dishes working in quadruple diversity with polarization and vertical space diversity.

The complete system will be designed to operate unattended, with control being exercised from a main station at Dyce, near Aberdeen, and connected to Brimmond Hill by a microwave radio link.

THINKING OF THE R.A.E.?

POINTS FOR THE ABSOLUTE BEGINNER

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

PROBABLY few are the short wave listeners who have not more or less often wished they could put out their own signal, to try to raise that DX they hear, or just chat on Top Band or two metres. This wish can foster one of several attitudes: (1) The "I can't do it"; (2) Become a pirate; (3) Do something active towards getting a licence.

The "I can't do it" attitude may change to (3) when it is realised that getting a licence may not prove as difficult as it seemed. As regards type (2) this is of course completely illegal (though bad pirates may reform into good licensed operators).

Suppose we all decide to be type (3), to see how hard it is. We write to "The Ministry of Posts and Telecommunications, Radio Regulatory Division (Amateur and Special Licensing Branch), Waterloo Bridge House, Waterloo Road, London, S.E.1" asking for a copy of *How To Become A Radio Amateur*.

When we get this we find it is about 21 pages of foolscap, mostly both sides, and we may momentarily revert to the (1) type. But having got the copy, we may as well look at it a bit more closely.

Pages 1 and 2 tell us we must be over 14, must pass the dreaded Radio Amateur Examination (*and* Morse, unless we wish to keep to VHF), have to pay £3, and other facts, including the information that G is for England, GM for Scotland, GW for Wales, GI for N. Ireland, GC for the Channel Isles, and GD for the Isle of Man.

Pages 3 and 4 tell us we have to send and receive 36 words in Morse in 3-minute periods of sending and listening, and other details. But as we can take the Morse test *after* the R.A.E., and can speak our piece on 144 MHz and higher frequencies without ever doing Morse, we may as well leave the Morse out temporarily.

Subsequent pages tell how the Amateur Licence should be used. All this free information is highly important—knowing it will assure a good mark in the first section of the R.A.E., when we come to do it.

We must use a stable transmitter, not interfere with other happy listeners, or use grandad's spark sender. Nor must other folk use our transmitter (unless licensed) while we have to keep a log in GMT. We must add "/A" for temporary premises and "/P" (portable) for temporary locations. We may not broadcast our favourite records, or rude sayings, or conduct our stock market business over the air. We probably realise we vaguely knew most of this anyhow. There is also a useful phonetic alphabet list, *Alfa, Bravo, Charlie, Delta* and so on, which in later years we shall probably know automatically.

Then "The Schedule" shows the bands, classes of emission, etc., which may be used. They are 1.8-2.0 MHz with a maximum power of 10 watts; up to 150 watts on 3.5-3.8, 7.7-1 megacycles . . . all right, we know already, but ought to memorise these to get a full mark if the

question comes up in the Paper.

Now we come back with a bump to realisation that we still have to pass the R.A.E. So we are now reading "Syllabus of The Radio Amateur Examination." It is a "pass" examination—you don't have to be best out of a hundred in competition with 99 other folk. The paper is in two parts. Part I has two questions, both compulsory. Ah, Question 1 is on licensing conditions, and we have just read the answers. Question 2 is about transmitter interference—stability, harmonics, key clicks, over-modulation, etc. Clearly we must study this.

Part II has eight questions, but we need only attempt six, so we will plan to do those we can answer best. We should know about elementary electricity and magnetism, alternating current, valves and semi-conductors, receivers, low power transmitters, propagation of radio waves, aerials, and measurements. This is where we revert to the "I can't do it" attitude, or decide that we know a bit on many of these subjects already, and can patch up the gaps, small or great, by means of a little systematic study.

Getting to Grips With It

Our plan, now, is to look the R.A.E. fully in the eye with enormous courage and write to the City & Guilds of London Institute, 76 Portland Place, London, W1N 4AA, asking for a set of past question papers for Subject No. 55, Radio Amateurs' Examination. These cost 25p, including postage. While waiting for them you can go back to reading *How to Become A Radio Amateur* because knowing these facts will help secure a pass, and you will need to know them when you transmit, anyway.

Eventually the papers arrive. Should we have one which was for the Exam. set for May 11, 1971, we may note that we could have gained the full 15 marks for Question 1 of Part I just from reading *How to Become A Radio Amateur*.

And how about the other questions? (N.B.: The following is *not* an extract from them.)

$$(1) V = I \times R$$

$$(2) R = \frac{R_1 + R_2 + R_3}{R_1 \times R_2}$$

$$(3) R = \frac{R_1 \times R_2}{R_1 + R_2}$$

The sight of this may produce various reactions: (1) You may automatically avert the eyes as from a great mystery and read on at "The sight of this . . ." (2) You may think "I know that anyway!" (3) You may look at it and try to understand what it means. Types (2) and (3) would seem to have a good chance of passing the Exam. Type (1) ought to change smartly into type (3) because everything is (a) utterly incomprehensible when first encountered and not understood, (b) more or less simple and straightforward when we have got into our heads those pearls of knowledge which enable us in turn to give out similar pearls.

If we have not worked mathematical calculations or done sums since youth, never mind. (It has been said that all the knowledge gained at school from the age of 6 to 16 could be gained by an adult in six months of regular study.) All we may need is a little more system, a little less time with the receiver and a little more with pencil and paper.

As we introduced $V = I \times R$, though actually for

another purpose, we may as well see what it means. It is one way of writing Ohm's Law.

- V = Voltage
- I = Current in Amperes
- R = Resistance in Ohms

We can write it in other ways, as follows:—

$$I = \frac{V}{R}$$

$$R = \frac{V}{I}$$

Knowing the voltage V of a supply and the resistance of the circuit R, you can thus find the current I which flows by dividing the voltage by the resistance in ohms. Suppose a 2-ohm resistor is connected across a 6v. battery—what current flows? $V/R = 6/2 = 3$ amperes.

On the other hand, suppose you know the voltage V and the current I which flows, the resistance of the circuit can be found. Imagine 100v. is present across a load and a meter shows that 20 mA flows—what is the circuit resistance? Here, remember that I is current in amperes, so 20 mA must be expressed as a part of an ampere. There are 1000 mA in 1 ampere. If it is over 50 years since you did a sum with a decimal, it may help to write a series like this:—

- 1000 mA — 1 ampere
- 2000 mA — 2 „
- 200 mA — 0.2 „
- 20 mA — 0.02 „

so $V/I = 100/0.02 = 5000$ ohms. Do not worry if the sight of 100/0.02 brings back the "I can't do it" feeling. Each time you move the decimal point to the right, you add "0" to the 100, thus: 1000/0.2, and 10000/2, which is 10,000 divided by 2, or 5,000. However, if you had to do it this way, you ought to get an arithmetic book.

This leaves the last case: If you know the current and resistance, you can find the voltage. "A thermionic valve audio amplifier has an anode load resistor of 25,000 ohms and during normal operation an anode current of 2 milliamperes flows. What voltage is lost in the anode circuit component?" Answer: $I \times R = 0.002 \times 25,000 = 50$ volts.

For mental working or checks, note that the answer is the same if you use K-ohms and milliamperes together. The previous calculation would then be $2 \times 25 = 50$ volts.

If "I can't do it" has changed to "I can't remember where to put V, I and R, and what to do with them," then write down

Vulcanised

India - Rubber

Change the hyphen to \times , and put only the capitals:—

$$I \times R = V$$

Now if you cover the wanted or unknown term with a finger you see what to do with the others: $V = I \times R$, $I = V/R$ and $R = V/I$.

Resistors in Different Ways

Now let us look at formula (2) which was $R = R1 + R2 + R3$. This is simply the way of finding the overall value R, of sundry resistors R1, R2, R3, etc., connected in series. Suppose resistors of 10 ohms, 12 ohms and 15 ohms are connected in series—what is the total resistance? Total resistance $R = 10 + 12 + 15 = 37$ ohms.

The other formula (3) is for resistances in parallel. Suppose a resistor of 4 ohms is connected in parallel with a resistor of 2 ohms—what is the value of the combination?

$$\frac{R1 \times R2}{R1 + R2} = \frac{4 \times 2}{4 + 2} = \frac{8}{6} = 1\frac{2}{3} \text{ or } 1\frac{1}{3} \text{ ohm.}$$

With a parallel combination, the answer obtained should always be lower than the value of the lowest value resistor.

We can obtain the same answer by writing this as follows:—

$$\frac{1}{R} = \frac{1}{R1} + \frac{1}{R2} = \frac{1}{4} + \frac{1}{2} = \frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

So $1/R = 3/4$ and $R/1$ or $R = 4/3$, and $R = 1\frac{1}{3}$ ohm.

This has the advantage of doing for more than two resistors. $1/R = 1/R1 + 1/R2 + 1/R3$, etc.

On the basis of this, it should be a straightforward matter to gain the full 10 marks for a question such as No. 5 of the 1971 Radio Amateur's Examination.

Assuming that a short-wave listener wishes to remain in the type (3) category and continue to do something active towards obtaining a licence, it is a good plan to buy an exercise book. Use one page for each item, below writing the bare facts, or an example or two—"Log Entries," "Amateur Bands," "Ohm's Law," "Resistors in Series," "Resistors in Parallel," and so on. The R.A.E. is a written examination, and this is practice in writing it down. Writing it down also helps the memory, while it will become a valuable reference, and as time goes on will show those subjects you have studied.

EIRE EXHIBITION STATION

In connection with the "National Young Scientist of the Year" exhibition at the show-ground of the Royal Dublin Society, Ballsbridge, Dublin, station EI0YSE will be in operation during January 5-7, working all bands 10-80m. and 4 metres, CW/SSB/RTTY. The set-up is being provided by Terenure College Radio Club, Terenure, Dublin 6, Eire—which is also the QTH for QSL's (a special card is to be issued) addressed to Rev. T. Brennan, EI5A.

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



SHORT WAVE LISTENER FEATURE

By Justin Cooper

RESOLUTION OR TWO — SOME TECHNICAL POINTS — QUESTIONS AND ANSWERS — NEWS, VIEWS AND COMMENTS — HPX LADDERS

By the time this comes to be read, Christmas will be over; maybe, too, the New Year celebrations. Should anything at all be required in the way of a New Year resolution, let us make it that we will do all that lies in our power to check the falling standards of morality in the ranks of the practitioners of Amateur Radio. Not just a question of sex—this has nothing to do with our theme—but rather a question of personal honesty in our dealings with other amateurs and SWL's. There used to be something called the "Spirit of Amateur Radio" in a more sentimental age; it referred to the principle that an amateur should, as a matter of principle, help any other amateur or SWL in any way he could, in the certain knowledge that any material loaned would be returned. Not so today. If one is not to lose the entire contents of one's station and library, one has to make a firm rule *never* to lend *anything*, be it a transmitter or a test-prod, lest the lent item fails to return.

Again, consider the R.A.E. courses. Some are under the *aegis* of the local authority, and so attract payment, but a great many are purely voluntary, done by good-natured Club members giving a helping hand. Even the paid chaps have *far* more to do than just give a lecture once a week—indeed, that is the easiest part of the task. All of them do good work, and they cannot give it a miss, as the students do when the weather gets a bit rough in January. The least one can do, whether one is an R.A.E. class student or not, is to try and emulate their helping hand in your own way, however small your contribution may be, rather than gripe that the "lecturer is no good"—good or not, he is putting something more into Amateur Radio than he is taking out.

Technical Matters

N. Askew (Coventry) wants to know if a frequency counter can be used with any receiver? A good one, this. First, the receiver must be a superhet, so that there are local oscillators to be counted. This immediately disposes of the TRF's unless one can make them oscillate strongly enough to pick off around half-a-volt or so of oscillation, depending on the counter and the frequency. Secondly, you have to add the receiver local oscillator signal in a mixer with the BFO signal, and have enough of the mixed product (from a superhet receiver, of course) to provide the required five hundred or so millivolts for the counter. If the receiver is a double superhet—and how many receivers these days are not double supers?—then the mixing process aforementioned becomes also a double process. This is because the signal frequency is numerically equal to a combination of all the oscillators (other than any calibrator) in the receiver.

For the transmitter, a counter is so much easier, involving just putting in a whiff of carrier and counting it, or, if a "whiff of carrier" is not readily available, of keying the CW tone, measuring that, and either adding or subtracting the tone frequency from the counter indication when reading the RF signal (key-down) at low power. It all sounds awfully complicated; but once you have a counter working in the shack, you wonder how you ever put up with the old methods, using BC-221, or Class-D, or whatever.

For H. Alford (*Burnham-on-Sea*) the topic of the moment is Aerials, and he wants to know why one never seems to see a description of the Cubical Quad aerial. Probably because it is, in the DX context, such standard equipment nowadays that it is in almost all the books, *e.g.*, the *Radio Communication Handbook*, Chapter 13-66; the ARRL *Radio Amateur's Handbook*, at p.376 in the 1971 edition; the ARRL *Antenna Book*, and, best of all, the book by W6SA1 on *Cubical Quad Antennae*. However, the Quad is most emphatically *not* an aerial to hang up and then hope for DX. It needs to be accurately dimensioned and made, and to be carefully tuned up in accordance with the design data. In addition it is, although superficially a simple design mechanically, more Quads than any other beams have fallen through bad mechanical engineering. In other words, one of the main problems is to keep a Quad airborne! Personally, J.C. has always fought shy of it, if only because it is such a three-dimensional beast when it is on the ground—one is afraid to move for fear of treading on something!

The Mosley multi-band trap dipole is extolled by E. Parker (*Hove*). Ernie uses it, with a Heathkit GR-78, for armchair listening while his wife watches the Lantern, thus avoiding becoming annoyed with the TV programmes! The B.40 receiver in the shack proper is operating as well as ever, but it has the advantages of a Parker-inspired Q-Multiplier, pre-selector, and ATU to make it as good or better than some of the transceiver receivers Ernie has met.

W. B. Taunton (*Meopham*) like several others, has bought a Yaesu FR-50B, which he used the day after he got it in one of the contests—he didn't roll up his usual big score, but he did learn how to drive the new set to its best ability, as compared with the Trio 9R-59 which preceded it. To go with the FR-50B, there is an Echo 8G aerial up in the loft with the dipoles, although the required radials have not been installed as yet.

L. A. S. Poole (*Winchmore Hill*) is thinking of lashing out on a 14AVQ or similar vertical trapped aerial, but wonders a little as to whether it will be a nuisance by its very omni-directionality when the band is open, particularly Twenty. This is an arguable one; the vertical's low take-off angle reduces the strength of the high-angle signals, but, of course, the low-angle signals are nearly all DX rather than QRM. Certainly J.C.

comprises a couple of bed-supports bolted together! On a different line, Steven heard a Sicilian amateur giving his location as "Whisky Is." and wonders where it is—certainly it does not appear in the Bartholomew *Edinburgh* atlas.

Back to that question of other hobbies; *D. J. A. Noakes (Cranbrook)* lists his as banging on amateur station front doors, which has made him several friends. Sam has got on to VHF, with beam, converter and beam-rotator all coupled nicely to give a better result than he had thought possible from his location.

A new reader and a new listener is *R. Leslie (Bridge-of-Weir)* who has a Yaesu FR-50B and is finding the interesting things on each band with it, coupled to a 7 MHz dipole. Ritchie would like to tackle the R.A.E. this year, but is prevented from anything at the moment by his "highers" which are the equivalent of A-levels in Scotland. Explaining HPX, the prefix is collected, so hearing a G3 earns one point, a G4 another and so on—but a second G3 or G4 is worth nothing. To chase Prefixes effectively, you want a copy of our Prefix List, covering all the world by countries and alphabetically by prefix, plus a list of the numerical prefixes issued to countries from which they are likely to derive any "special" prefixes or call signs used on the amateur bands. (See advertisement p.643, December, for instance; separately, the Prefix List is 23p post free.)

R. Griffiths (Ventnor, I.O.W.) used to be very active and reported to this feature in the early days, until a spell of ill-health cleared up and allowed him to take up other, more active, interests. A year ago a radio-engineer friend called, with a VHF converter in the back of the car, and interest was re-kindled, although only in the VHF bands. However a combination of a flat two-metre band and a dose of 'flu was enough to force Bob on to the other bands, and his AR88D has managed since then to amass 301 prefixes for a start in the table. Bob, incidentally, is looking for a unit he can tack on to a transistor portable to act as a BFO, the old trick of using two portables being a bit too awkward for practical application in a car.

A change of job has come about for *D. Harris (Telford)* who has joined Decca, Bridgnorth as an apprentice, on a full-time course at Bridgnorth College, where one of the staff is G3JCK. Of his HPX queries, all are perfectly good calls, some indeed well-known.

Now to *A. Judge (Bishops Stortford)* who threatens each month to turn up at the club meeting of the local lads, but each time, spy G3KFE tells us, is ambushed on the way. Tony is still struggling with a somewhat poor aerial and no ATU for Top Band, but without them has still managed 13 countries, with OE and 4U1ITU the outstanding ones in Europe on 160 metres.

What a sad state of affairs! *M. Cuckoo (Herne Bay)* has gathered together the boodle, but now finds himself unable to make a choice between a KW-202, a Trio JR-599, or the Yaesu FR-400DX. Probably the easiest way is to pick one out with a pin!

Talking of receivers, *S. Wessely (Sheffield)* shares J.C.'s opinion of the KW-77; his is at least fourth-hand, beaten-up on the outside, but goes like a dream, as the prefix list entered this time shows. At school, a radio club has been formed, and G4BNE is "doing the necessary" to teach them Morse, which is a good thing.

A nice long letter from *N. Henbrey (Northiam)* who has been a correspondent for as long as J.C. can remember. Norman recently had a call from Sam Noakes of Cranbrook, which resulted in a good old yarn together. On the aerial side, Norman is planning for a forty-foot Telomast, atop which will be a TA-31 which will then be turned by the Good Fairy one night into a TA-32 tri-band beam. On QSL's, Norman has some pertinent comments, he having several times received "via bureau" duplicates of ones sent direct. His reports are intended to be *useful*, and as a result they attract more than the usual percentage of replies, plus compliments from the recipients—at least one of them sent the report back with the QSL, asking Norman to show his idea of a report to the other SWL's within reach.

Sad to say, work interferes with listening, finds *C. Verstage (Old Basing)*, with the bands getting ready to close by the time he gets home. Never mind, one can always try Forty or Eighty.

Another one to suffer interference with his pursuit of the DX, as he is revising for the R.A.E., is *K. Plumridge (Southampton)* who says that if he fails this time he will give up trying to get a ticket and concentrate on passing Stewart Foster at the top of the Ladder!

An R.1155B and a Codar TRF receiver are the tools used by *D. Churchill (Bexleyheath)*, who incidentally was the "mystery entry" last time. He finds his Codar suffers from hand-capacity effects and doesn't work on weak signals, while the 1155 stops short at 18 MHz. However, David is planning ahead, to splitting the RF and IF gain controls on the R.1155 and to fitting it with an S-meter. Doubtless after that there will be some activity in the front-end converter line.

K. M. Rogers (Ullesthorpe) wonders what exactly has gone wrong with his HPX score—we agree with his total and have the correct one on record! We can only assume that two cards in the index stuck together, which sometimes occurs.

* * *

Ross Pullen (Crawley) has raised an interesting point—what about his list of SS/TV stations heard, do they count as a new set of prefixes? Sorry, Ken, *no*, since an SS/TV station is operating from his normal rig, and with his normal call sign prefix. Should any country adopt a new series of *callsigns* for SS/TV we would have to look at the whole question again.

Yet another one to have thoughts of receivers is *K. Kyezor (Perivale)* who has been pretty heavily committed business-wise of late and so has a short entry in the table this time. However, this had the advantage that it brought him into contact with a friend who has both a FR-DX400 and a good location, where he was able to sample the receiver, and also to take, for the first time, a good look at two metres. Now, of course, the short list of one has become a short list of two for the time when SWL Kyezor comes into the market for a new receiver!

Two letters from the *Bingham* scribe, in *Carrickfergus*—the family share the work of SWL here, with one doing the listening, another the records and one writing the letters! Noel's second letter indicates that as we had credited them with rather more than they had picked

up—your arithmetic, OM's, *not* J.C.'s!—so they had listened specially hard to catch up. Catch up they did, with 348 new ones to bring them up to the magic 1000 mark.

A. West (*Herne Hill*) is an observant sort of chap, noting the variations in conditions and ascribing it, correctly, to the change between autumn and winter conditions. He has also added a dipole for Twenty to his garden, and comments on how much it reduces the general level of electrical noise as compared with the end-fed; this is probably partly due to the feeder shielding the signal from picked up noise "in transit" from the aerial to the receiver, and partly the use of a mains earthing system for the end-fed aerial, or no earth at all.

As J. H. Sparkes (*Trowbridge*) says, conditions were good for the CQ WW Phone contest, when many new prefixes were logged, but it is also true to say that conditions always *seem* better when there are more stations about to be heard. A new aerial recently put into use is proving to be an improvement on all bands.

P. L. Newman (*Thame*) transposed the Leicester show to Leeds in his letter! However, wherever it was, the show was visited and enjoyed; Paul returned with converters for 144 and 432 MHz. But he now has a major problem, as the impending arrival of a harmonic means he will be turfed out of his nice warm shack into a cold dank cellar. He should be thankful—a cellar of your own is an improvement over nothing at all, which results in equipment in living-room or bedroom and resulting complaints from the XYL.

The spies of J. Fitzgerald (*Gt. Missenden*) told him of your conductor's visit to the Show—and told J.C. of reader Fitzgerald's alleged misdeeds! Seriously, John is using G3XTJ's Heath RA-1 at the /A place during the week, G3XTJ's objective being to make John learn his Morse. This is a slow process, John being much more interested in Phone WAB listening and such activities.

No question of spies for S. Foster (*Lincoln*)—he met your conductor at the Show for a good old natter which, sadly, had to be cut a little short as J.C. had much to do before returning home. Stew has turned up some more prefixes, so we will have now to see whether the competition catches him or just fades away again.

On to R. Philpot (*Shenfield*) who has been having a tape correspondence with Matt Cornwall of Harefield; an "eyeball QSO" as the Yanks have it, is planned but must wait till one or t'other can drive over, as they are too far apart for walking!

Hankering for a BFO is P. Barker (*Sunderland*) who wants a circuit for his Knight-kit receiver so he can know where and how to hook one in circuit. He is now fully installed in his outside shack, with a heater and an additional 275 watts from one of these combined lamp-and-heater devices.

Back to the fold comes I. Brown (*Newtownabbey*). Irwin has been missing because of his other interests, such as sailing, photography, and that ancient sport, known as "elbow bending." Irwin seems to have profited quite a bit from his activities with *Oscar VI*, having heard a lot of licensed types making asses of themselves, with parts of W audible beneath them for QSO's with the savvy chaps.

A query from P. Jerromes (*Newton Abbot*) who enquires what does VE3MR/4X count as? Easy—if he

NEW HPX LADDER

(Starting January 1, 1972)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
N. Gerdes (Basingstoke)	458	J. Gravell (Burry Port)	338
M. North (Bath)	434	D. Harris (Telford)	320
P. Newman (Thame)	428	R. Griffiths (Ventnor, I.o.W.)	301
P. Barker (Sunderland)	423	M. J. Stringer	
R. Smye (Parkgate)	401	(Southend-on-Sea)	300
P. G. Jerromes		W. McFaul (Londonderry)	294
(Newton Abbot)	398	A. K. Milner (Grantham)	270
D. Churchill (Bexleyheath)	396	C. L. Lee (Ilford)	266
B. Stone (Penzance)	385	R. Sharpe (Orpington)	247
Mrs. R. Smith (Nuneaton)	380	S. Hurst (Sheffield)	237
R. Philpot (Shenfield)	370	N. Callaghan (Cardiff)	213
K. M. Rogers (Ullesthorpe)	347	W. Stallard (Cardiff)	212
R. F. MacLeod		S. Scott (Stockport)	200
(Glasgow, W.3)	338		

Listings include only recent claims. Starting score 200.
Rules as for HPX—see Panel, p.420, September 1972.

is signing in that fashion he is counted as 4X3.

The *Thomases*, father *Les* and son *Bruce*, come respectively from *Ferry Fryston* and *Pontefract*; both are a bit worried about the fact that their score was not taken in although they were mentioned, as happened to several people who missed the deadline by even one post on that occasion. However, everything should be back on the rails this time, if your scribe's burning of midnight oil has any useful effect.

Yet another move has come about for J. *Dunnett*. Jim is now working in PA and living in ON-land, but the situation now should be stable for at least the next couple of years—we keep our fingers crossed for him!

Having just acquired an Eddystone 840C and a Joystick system, K. C. *Webb (Reading)* is in the process of making all good as new and hooking it together. We are promised a progress report next time round.

Are there any "unattached" SWL's or licensed amateurs in the *Wigan* area, enquires A. *Mercer* of that place? He wants them all to know that there is a Club now formed in Wigan which they would be welcome to attend.

Unfortunately Mrs. R. *Smith (Nuneaton)* has a very short list this time, as her son, whose receiver she uses, has been much at home and so she has not been able to have the Rx. However, Ruth is continuing to listen when she can—as she says, it is a shame to waste the prefixes she has already gathered.

* * *

The trials of a new SWL are related with glee by C. B. *Russell (Runcorn)* who, after reading about it for years, finally made a start, after getting the home and family to rights, by joining the Warrington group and buying a Trio 9R-59DS. Up in the boxroom there has been much activity since, learning the ways of the apparatus, and the ways of the amateurs on all the bands, helped by a co-operative XYL who switches the rig on to warm up for a quick session at lunch-time. Brian has also (wise man) tried listening out on the early-morning parade with some good results, all continents having been booked in.

(over)

A question from *J. Woods (Woodbridge)*. Does anyone know where he can get a receiver to take in two metres? One would have thought a two-metre converter would be the best answer to this one, with the FM wallahs taken by the technique known as "slope detection," whereby one tunes to one side of the FM station until the slope of the IF passband resolves the signal. (Not too good a method, of course, but practicable).

Other hobbies for *T. Vale (Abingdon)* include photography, camping, and training a German sheepdog, which, one feels is a good way of protecting one's rig from the wolves! Terry is another one who favours the early morning periods for DX listening.

M. Cornwall (Harefield) lost his aerial in the autumn gales, but has since re-erected them; he uses a Heath HR-10B and hopes soon to have a pre-selector to add to the DX hearable from what Matt reckons to be a good spot for listening.

A couple of letters from licensed chaps come next. That from G4BOE arrived minus its back page, but we suspect it is signed by *J. Halden*. He managed to pass R.A.E. with good grading in the technical part, and followed up by taking the Morse in Liverpool. He now uses a DX-40U as transmitter and the old AR88 as receiver, the Tx on a 7 MHz dipole and the receiver on the old SWL aerial, now provided with a shorting switch to ground it when transmitting. He claims the worst CW on Forty; but having heard it, we would say it is not *that* bad! Anyhow, congratulations to G4BOE and long may he enjoy his ticket.

* * *

Our final one comes from *9M2DQ (Penang)* who has some pithy comments to make on the question of SWL reports. James finds many DX stations are thinking of giving up answering such reports as they are just useless, and not even interesting in other ways. He cites the case of the SWL who reported on signals a year after the event; of the chaps who ask direct airmail replies and don't send even an IRC. The delay in a lot of cases, like the one mentioned, makes the reports useless; the bureaux are not at fault, as QSL's come in pretty promptly in general and most bureaux clear their quotas at least monthly, and in some cases even more often. James then offers some guidelines: Send at least by sea mail direct, with reports of 3.5 and 7 MHz signals being of interest, as also are long-path contacts, reports on his signals when he is beamed in some other direction, or when the band appears to be dead and when he is the only Far Eastern station in evidence. But a report on his signals from the U.K. covering a time when he is working strings of G transmitters is no use or interest whatever. Good points these, from the chap at the distant end who has to deal with your report, and who knows the form where Amateur Radio is concerned. And, at that, we could add that 9M2DQ is most emphatically *not* the chap to disregard a report from anyone who is really trying, as we ourselves know.

Left Over from Last Time

We now come to the letters mentioned in the box on p.557, November. Most of these have been out-dated by more recent ones, but we mention a few here: *S. Scott*

(*Stockport*) has his first entry for the Table at exactly 200, and promises to send details of his gear later.

M. J. Stringer (Southend-on-Sea) has a first list and an interesting letter. He has at last pensioned off his old BC-348 and bought a shiny HQ-170A. Since getting the latter he has, as he puts it, joined "The League of Serious Listening" by taking the trouble to log his catches, leading to the entry mentioned, which has been taken in.

There seems to be a hot-bed of amateur activity in the *Penzance* area; now we have *B. Stone* taking the mickey out of himself for chasing a fault on his CR-100 for two hours before he caught on to the fact that it had a *fuse!*

The two *Prouds*, *G. G.* and *S. J.*, from *Letterston*, have stapled their two entries together for safety. *G. G.* queries 3B4TMB, heard CQ'ing on Twenty one evening in early September. One doubts if this one hails from Mauritius, although it is possible—on balance, and in view of the lack of any other reports or mentions of him, one is inclined to write him off as dud unless proved to be otherwise.

A new addition to the station of *H. M. Graham (Harefield)* is a Codar PR-40 preselector; by careful juggling between it and the Eddystone 840C main receiver, the task of resolving SSB on the HF bands is eased, says Maurice. As for the DX, Ten has been good during the autumn, adding the odd few prefixes to the total, the meat of the useful activity having been on the HF bands, while Top Band and Eighty were listened to but nothing of note logged.

R. Smye (Shrewsbury) finds himself back at the school grindstone; his father had him out to put up a forty-foot homemade mast during the holidays, for an aerial to go with the KW-2000B ready for the day when Dad can transmit, hopefully very soon. This is the sort of atmosphere that does much to generate a junior SWL—one foresees fun when both are licensed and competing for the use of the rig!

Piece Complete

That's the lot for this time; all the Table Entries omitted last time, and all received this, have been taken into the HPX Ladder scores, so everyone should be up-to-date. Deadline for the March piece will be to arrive by **first post February 1**, addressed as usual to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM. 73, and very HNY.

NOTES ABOUT THE R.A.E.

We are asked to say that a "second-term" course for the Radio Amateurs' Examination will start at Selly Oak, Birmingham, on January 18. Details from *W. V. Shepard, G8ALF, QTHR*.

Incidentally, it is reported that the pass-rate for the May 1972 R.A.E. improved to 61% from the 54% of 1971—a significant improvement. It means that about 950 new R.A.E. pass-certificates were issued. We would estimate that only about 400 of these have gone forward to take the Morse Test for a full AT-station licence.

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.

- G4BGW**, I. E. Wilson, 28 Helliars Close, Chard, Somerset.
- GW4BIF**, E. J. Evans, Arwynfa, Bethania, Blaenau Ffestiniog, Merioneth.
- G4BJA**, B. J. Armstrong, 24 The Paddocks, Weybridge, Surrey. (Tel. *Walton-on-Thames 20238*.)
- G4BKD**, Mrs. Doreen L. Frith, 86 Craven Road, Newbury, Berkshire.
- G4BKG**, S. Emlyn-Jones, 36A London Road, Southborough, Tunbridge Wells, Kent. (Tel. *Tunbridge Wells 28935*.)
- G4BKH**, A. Chorley, 354 Denton Lane, Chadderton, Oldham, Lancs., OL9 8QD.
- GM4BKO**, J. E. Francis (*ex-GM8BKO*), 8 Dwarwick Court, Thurso, Caithness.
- G4BKU**, R. G. Foot, 10 Hughenden Road, Horfield, Bristol, BS7 8SF. (Tel. *Bristol 47949*.)
- G4BLS**, P. W. Appleby, 10 Downsview Way, Hailsham, Sussex, BN27 3DH.
- G4BMB**, W. O. Allen, 92 Parkside, Wollaton, Nottingham.
- G4BMM**, P. Knight (*ex-G8DAW*), 75 Ashcroft Road, Luton, Beds., LU2 9AX.
- G4BMV**, W. Bryan, 19 Astley Gardens, Seaton Sluice, Whitley Bay, Northumberland. (Tel. *Seaton Delaval 48-1977*.)
- G4BMX**, V. G. Downham, Mill House, Toadsmoor, Brimscombe, Stroud, Glos. (Tel. *Brimscombe 3808*.)
- G4BNE**, R. N. Herring, 29 Norton Park Drive, Sheffield, Yorkshire, S8 8GP.
- G4BNO**, M. C. Ayling, 36 Corporation Road, Boscombe East, Bournemouth, Hants.
- G4BNU**, P. R. Cope, 81 Southwell Road, Linthorpe, Middlesbrough, Teesside, TS5 6NG.
- G4BPC**, A. Askew, 4 Southwood Avenue, Highgate, London, N.6. (Tel. *01-340 9729*.)
- G4BPM**, R. W. G. Graves (*ex-G8FSG*), 7 Brecklands, Mundford, Thetford, Norfolk. (Tel. *Mundford 265*.)
- G18FYP**, R. H. Miskelly, 56 Talbot Street, Newtownards, Co. Down.
- G8GCS**, C. J. Coker, Josack, 6 Lower Collins Road, Totnes, Devon, TQ9 5PS. (Tel. *Totnes 2974*.)
- G8GGT**, W. J. Turford, 2 Peveril Road, Bolsover, Chesterfield, Derbyshire.
- G8GJB/A**, P. J. Roberts, 269 Uxbridge Road, Hampton Hill, Middlesex.
- G8GJJ**, R. W. M. Taylor, 100 Quebec Road, Lammack, Blackburn, Lancs., BB2 7DA. (Tel. *Blackburn 57338*.)
- G8GJS**, H. A. Stanger, Langham Hotel, Harrogate, Yorkshire, HG2 0JL.
- G8GLU**, Slade Radio and Scientific Society, Church House, High Street, Erdington, Birmingham 23.
- G8GPE**, J. R. Dales, 100 Ruskin Avenue, Lincoln, LN2 4BT. (Tel. *Lincoln 27610*.)
- G8GRA**, N. Atkins, Keeper's Cottage, Hangersley Hill, Ringwood, Hants.
- G8GSL**, I. D. Liston-Brown, 132 Westwood Road, Sutton Coldfield, Warks.
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- CHANGE OF ADDRESS**
- G3GHS**, J. G. Holland, 26 Grand Avenue, Berrylands, Surbiton, Surrey.
- G3HAB**, D. J. Black, Alameda, 1 Portnalls Rise, Coulsdon, Surrey.
- GM3JHL**, J. H. Lepper, 128 Sheephousehill, Fauldhouse, West Lothian.
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- G3NVA**, F. F. Dodson, Cephas, Crete Road East, Folkestone, Kent.
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- G3YGW**, G. E. Whitehead, 27 Trenchard Road, R.A.F. Locking, Weston-super-Mare, Somerset.
- G3YYU**, M. O. Binns, Harelaw House, 3 Main Street, Caldecott, Market Harborough, Leics., LE16 8RS. (Tel. *Rockingham 552*.)
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- G4PX**, G. W. Belsey, 24 Glenmore Park, Ross Road, Hereford.
- G6SU**, E. A. Parson, Southcroft, Barmoor Lane, Ryton, Co. Durham, NE40 3AB.
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WANTED: Socket Type PL-184A for PL-8295/172.—Box No. 5117, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: Katsumi AT-8 monitor, EX9x keyer, or el-bug with sidetone.—Sherwood, 12 Albion Close, Heaton Norris, Stockport, Cheshire.

FOR SALE: Heath 717 receiver, factory built, with speaker and phones, **£24**. Buyer collects.—Potter, 37 Wykeham Hill, Wembley, Middlesex.

SALE: Trio 9R-59DS receiver, with fitted stabiliser, Joystick aerial, Joymatch ATU, speaker, mint, **£45**.—Rodgers, 72 Brecks Lane, East Herringthorpe, Rotherham S65 3PT.

SELLING: Trio 9R-59DE, with SP-5D, Codar RQ-10 Q-multiplier, PSU, xtal calibrator No. 10, all in good condition, **£47**. Buyer collects.—Ring Worrall, Penkridge (Staffs.) 3099, after 7 p.m.

WANTED: Eddystone (or similar) UHF receiver, coverage 30-500 MHz. Details and price, please.—Emerson, Scotch Street, Armagh, N. Ireland.

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WANTED: Circuit or manual for No. 19 Mk. II Wireless Set, good price paid.—Spashett, 117 Lough Road, Grimsby DN33 2JU, Lincs.

WANTED: "QST" for September 1966, or complete bound volume; would collect if reasonable price and in good condition. Details and price, please.—Everett, Marloes, Comp Lane, St. Mary's Platt, Borough Green, Kent.

SELLING: Eddystone EC-10 Mk. II receiver, with manual and headphones, in original box and in mint condition, **£50**. No offers.—Box No. 5118, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: A.T.M. Type FSY 1-1 (AP.100386), with PSU and manuals, in good working order.—Lumb, 4 Rydall Street, Leeds, LS11 9LF.

WANTED: Collins 490 T/1 antenna tuning unit, or 618 series aircraft transceiver, 115v./400 Hz. All letters answered.—Reekie, G3GSN, The Skerries, Bury Ring, Stafford.

FOR SALE: BC-221/LM-14 spares: tuning capacitor, **£2.50**; transformers, calibration book, valves, etc., s.a.e. please.—Bowshar, 102 Formby Avenue, Atherton, Manchester.

SELLING Receivers: Eddystone 770R VHF; Eddystone EA-12; Rascal RA-17; R.1155; also AN/URT-33, **£8.50**. Converter, 36-100 MHz; TS-382 audio oscillator, **£25**. Silicon rectifiers 1250v./1.4A, 10p each; s.a.e. please.—Wright, 249 Sandy Lane, Wigan (55948), Lanes.

FOR SALE: Trio 9R-59DE receiver, coverage 550 kHz to 30 MHz, fitted with internal Trio crystal calibrator, hardly used, as new and unmarked, £30. Similar condition Codar PR-30X mains preselector, £7. Burns CC-10 crystal calibrator, £9.—Neale, 98 Bustleholme Lane, West Bromwich, Staffs.

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SALE: Trio 9R-59D receiver, £35 or near offer. Partridge Tx Joystick and tuner, £5. Class-D wavemeter £5. Field strength meter, £2-50. Carriage extra.—Bailey, G3BNW, 13 Heywood Road, Alderley Edge, Cheshire.

OFFERING: Latest call books: U.S. DX, "Radio Communications Handbook," RSGB. Two advanced Morse records; "Surplus Conversion Handbook"; Codar mains preselector; new Triplett 0-150 mA meter. Offers? **WANTED:** Vibroplex bug, jewel bearings.—Box No. 5119, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

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FOR SALE: Three Pye "Bantams" for high-band AM, with DEACs, £15 each; also Pye DEAC charger, £5—or The Lot plus one Bantam for spares, £50. Codar A.T.5, T.28 Rx, DC/PSU/M control unit, £25. T.W. Topmobile receiver, £8. National HRO with all bands—spread coil packs but no PSU, £12. Pair 10-metre transceivers, £25. Send s.a.e. for appointment to view (shift worker).—Croxford, G3OIC, 16 Chesterwood, Hollywood, Near Birmingham, Wors.

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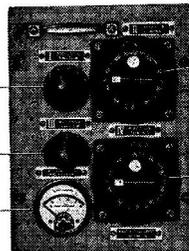
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FEBRUARY Issue Short Wave Magazine due out on Friday, January 26. Single copies at 30p post free can be supplied to orders reaching us by Wednesday, 24th, for despatch on Thursday 25th, the day before publication. These copies go out flat in an envelope, first-class posting. Orders with remittance to:—Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

SELLING: Halson 160/80m. mobile aerial, £5; DL6SW 2m. converter, IF 28-30 MHz, new, £9; "Airflow" blowers, silent running, new, £2 each. Meters: 100 micro-amp. 150 mA, 80 mA forward 20 mA neg., 50 volts, 50p each; P.A.P.S.T. motors, 110v., ideal for blower, etc., £1-50. Postage extra, please.—Jones, GW3TMP, QTHR.

FOR SALE: Heathkit 301 Rx, factory-built and recent Heathkit overhaul costing £30, mint condition, £95; Trio 9R-59D with xtal calibrator, SP-5D speaker and fitted voltage regulator, about twelve hours' use, £35; Heathkit RF-1U signal generator, brand new and unused, £16; Eagle K.110 SWR/Power Meter, 75/50-ohm, as new, £10.—Lee, G5FH, QTHR. (Tel: 0425-2-5974).

SALE: Eddystone 680X SW receiver, with matching speaker, headphones and mains filter, £80 or near offer.—Crisp, Flaxmead, 27a Broadway, Duffield, Derbys. (Tel: Derby 840011).

WANTED: Bendix RA-1J receiver, coverage 0-15 to 20 MHz, in mint condition. Also American Signal Morse key with brass base.—Box No. 5119, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF.

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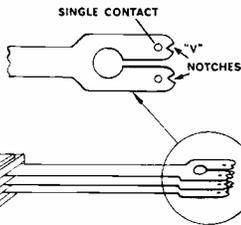
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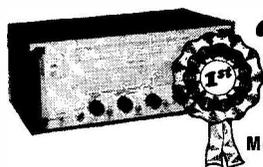
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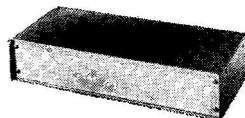
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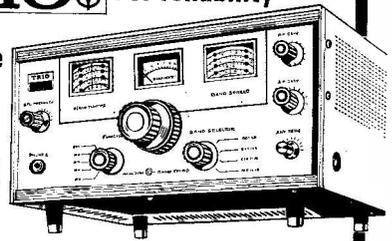
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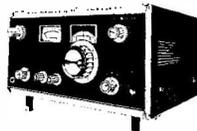
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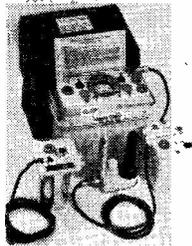
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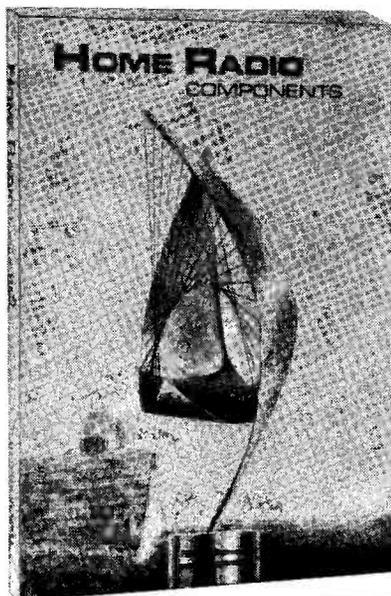
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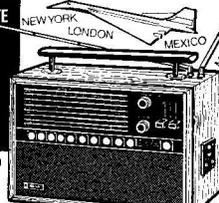
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